



October 6, 2022

Mr. Gonzalo E. Gonzalez, Chief Operating Officer
City Planning and Development Department
Houston Land Bank
P.O. Box 131106
Houston, Texas 77219

**Subject: Quality Assurance Project Plan/Work Plan
Phase II Environmental Site Assessment
7811 Harrisburg Boulevard, Houston, Texas 77012**

Dear Mr. Gonzalez:

Tetra Tech submits the attached revised Quality Assurance Project Plan/Work Plan for a Phase II Environmental Site Assessment (ESA) of the property at 7811 Harrisburg Boulevard in Houston, Texas. If you have any questions or comments regarding this submittal, please call me at (816) 412-1773.

Sincerely,

A handwritten signature in blue ink that reads 'Kaitlyn Mitchell'.

Kaitlyn Mitchell
Program Manager

Enclosure

**QUALITY ASSURANCE PROJECT PLAN/WORK PLAN FOR
PHASE II ENVIRONMENTAL SITE ASSESSMENT**

**7811 HARRISBURG BOULEVARD
HOUSTON, TEXAS**

Prepared For:

Houston Land Bank
P.O. Box 131106
Houston, Texas 77219

October 6, 2022

Prepared By:

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APPROVED BY:



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Kaitlyn Mitchell, Program Manager

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Heather Wood, Quality Assurance Manager

Date


Christa Stoneham

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Christa Stoneham, President and Chief Executive Officer

Date

Michael Kennedy, EPA Region 6 Project Officer

Date

CONTENTS

<u>Section</u>	<u>Page</u>
1.0 PROJECT MANAGEMENT.....	1
1.1 DISTRIBUTION LIST	1
1.2 PROJECT, TASK ORGANIZATION, AND SCOPE OF WORK	1
1.3 PROBLEM DEFINITION, BACKGROUND, AND SITE DESCRIPTION	2
1.4 PROJECT AND TASK DESCRIPTION.....	3
1.5 QUALITY OBJECTIVES AND CRITERIA FOR MEASUREMENT DATA	3
1.6 SPECIAL TRAINING REQUIREMENTS AND CERTIFICATION	4
1.7 DOCUMENTATION AND RECORDS	5
2.0 MEASUREMENT AND DATA ACQUISITION.....	6
2.1 SAMPLING PROCESS DESIGN	6
2.1.1 Surface Soil Sampling	6
2.1.2 Subsurface Soil Sampling.....	6
2.1.3 Groundwater Sampling.....	7
2.1.4 Soil-gas Sampling.....	7
2.2 SAMPLE ANALYSIS.....	8
2.3 SAMPLING METHODS REQUIREMENTS	8
2.4 SAMPLE HANDLING AND CUSTODY REQUIREMENTS	9
2.5 ANALYTICAL METHODS REQUIREMENTS.....	10
2.6 QUALITY CONTROL REQUIREMENTS	11
2.7 INSTRUMENT, EQUIPMENT TESTING, INSPECTION, AND MAINTENANCE REQUIREMENTS	13
2.8 INSTRUMENT CALIBRATION AND FREQUENCY	13
2.9 INSPECTION AND ACCEPTANCE REQUIREMENTS FOR SUPPLIES AND CONSUMABLES.....	14
2.10 DATA ACQUISITION REQUIREMENTS.....	14
2.11 DATA MANAGEMENT	14
3.0 ASSESSMENT AND OVERSIGHT.....	15
3.1 ASSESSMENTS AND RESPONSE ACTIONS	15
3.2 REPORTS TO MANAGEMENT.....	15
4.0 DATA VALIDATION AND USABILITY	16
4.1 DATA REVIEW, VALIDATION, AND VERIFICATION REQUIREMENTS.....	16
4.2 VALIDATION AND VERIFICATION METHODS.....	16
4.3 RECONCILIATION WITH USER REQUIREMENTS	16
5.0 REFERENCES	17

TABLES

<u>Table</u>	<u>Page</u>
TABLE 1 SPECIFIC DATA REPORTING UNITS	4
TABLE 2 ANTICIPATED SAMPLE SUMMARY	8
TABLE 3 SUMMARY OF SAMPLING METHODS	9
TABLE 4 ANALYTICAL METHODS.....	11
TABLE 5 QUALITY ASSURANCE/QUALITY CONTROL SAMPLE SUMMARY	13

APPENDICES

Appendix

APPENDIX A FIGURES
APPENDIX B STANDARD OPERATING PROCEDURES

ATTACHMENTS

Attachment

ATTACHMENT 1 TEXAS RISK REDUCTION PROGRAM TIER 1 PROTECTIVE CONCENTRATION LEVELS
ATTACHMENT 2 PACE QUALITY MANUAL AND CERTIFICATIONS

1.0 PROJECT MANAGEMENT

1.1 DISTRIBUTION LIST

Houston Land Bank (HLB)	Gonzalo E. Gonzalez, Chief Operating Officer
Tetra Tech, Inc. (Tetra Tech)	Kaitlyn Mitchell, Program Manager Rebecca Thomas, Project Manager Heather Wood, Quality Assurance (QA) Manager
U.S. Environmental Protection Agency (EPA), Region 6	Michael Kennedy, Project Officer/Project Manager (PO/PM)

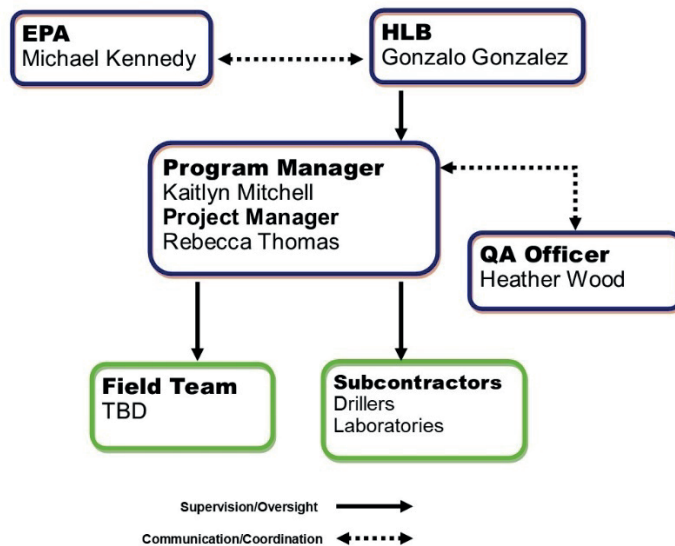
1.2 PROJECT, TASK ORGANIZATION, AND SCOPE OF WORK

HLB tasked Tetra Tech to conduct a Phase II Environmental Site Assessment (ESA) of the property at 7811 Harrisburg Boulevard in Houston, Harris County, Texas (subject property) (HLB 2022). Rebecca Thomas will serve as the Tetra Tech Project Manager of the Phase II ESA activities described in this Quality Assurance Project Plan (QAPP)/Work Plan. She will be responsible for ensuring implementation of field activities described in this QAPP/work plan and providing periodic updates to HLB concerning the status of the project, as needed. Kaitlyn Mitchell will serve as the Program Manager and will provide contract support as needed for this project. Heather Wood will serve as the Tetra Tech QA Manager and will provide technical assistance, as needed, to ensure that necessary QA issues are adequately addressed. Gonzalo Gonzales will be the Chief Operating Officer for this activity and will be responsible for review of project plans (including the QAPP/Work Plan) and final deliverables to help ensure compliance with the Federal Cooperative Agreement that funds this project. Michael Kennedy, EPA PO/PM, will review and approve the QAPP/work plan to ensure that planned work is within the approved scope of the cooperative agreement, as well as compliant with programmatic, work plan, and award conditions requirements.

All Tetra Tech personnel have the authority to stop work based on Tetra Tech's health and safety program guidelines. Further, as the program manager, Ms. Mitchell will oversee the project and stop work should any issues regarding the scope of work occur and Ms. Wood, the QA Manager will stop work should quality issues arise.

The Tetra Tech Project Manager, Rebecca Thomas, Environmental Professional (EP), as defined by All Appropriate Inquiries (AAI) Rule, will be the field manager responsible for acquisition and calibration of sampling equipment, sample collection, documentation of property conditions, and coordination of laboratory analyses. The Tetra Tech QA Manager, also a qualified EP with 20 years of experience and a Tetra Tech quality control coordinator (QCC), will provide technical assistance, as needed, to ensure that necessary QA issues are adequately addressed.

Exhibit 1 Project Organization Chart



Preparation of this QAPP/Work Plan has accorded with EPA *Requirements for Quality Assurance Project Plans* (EPA 2001) and *Guidance for Quality Assurance Project Plans* (EPA 2002). Procedures described in this QAPP/Work Plan may be altered in the field if warranted by site-specific conditions or unforeseen impediments that prevent or hinder implementation of any aspect of this QAPP/Work Plan. Such deviations will be recorded in the project logbook. This QAPP/Work Plan will be available to the field team at all times during sampling activities to serve as a key reference to proposed activities described herein.

1.3 PROBLEM DEFINITION, BACKGROUND, AND SITE DESCRIPTION

Tetra Tech prepared this QAPP/Work Plan for sampling activities intended to address concerns that could impact human health and the environment and affect possible redevelopment at the subject property. The subject property encompasses approximately 1.77 acres of undeveloped land in Houston, Harris County, Texas (**Appendix A, Figures 1 and 2**). The subject property is depicted on the U.S. Geological Survey (USGS) Park Place, Texas, 7.5-minute series topographic quadrangle map. Approximate global positioning system (GPS) coordinates at the center of the subject property are 29° 73' 10.49" north latitude and 95° 28' 85.49" west longitude (USGS 2019).

In September 2020, Environmental Science and Engineering Partners, LLC (ESE) conducted a Phase I ESA of the subject property (ESE 2020). Recognized environmental conditions (REC) and vapor encroachment conditions (VEC) identified during ESE's Phase I ESA include the following:

- Rudy Garza and Associates Garage, at 7806 Harrisburg Boulevard, adjacent to and southwest of the subject property, is cited in the Environmental Data Resources, Inc. (EDR) Radius Map Report as a historical automotive repair facility operating in 1980. Historical automotive repair facilities are known to store and use hazardous substances (automotive fluids, coolants, degreasers, paints, solvents), as well as petroleum products (gasoline, diesel) as part of their operations. This facility was not registered with any applicable regulatory agency. Based on documented use of this facility as an automotive repair facility, ESE concluded that historical operations could have impacted the site, rendering this facility a REC for the subject property.
- Four sites were identified in the EDR Historic Cleaners database within 0.125 mile of the subject property as early as 1930. Based on proximity of these historical drycleaners to the subject property and their operation prior to implementation of environmental regulations, ESE concluded that these sites posed a REC and a VEC for the subject property.

1.4 PROJECT AND TASK DESCRIPTION

Project objectives for this Phase II ESA are to: (1) determine concentrations of contaminants of concern (COC) in soil, soil gas, and groundwater throughout the subject property to confirm or eliminate RECs and VECs identified during the 2020 Phase I ESA; and (2) compare concentrations of COCs to applicable Texas Risk Reduction Program (TRRP) Tier 1 0.5-Acre Residential Protective Concentration Levels (PCL) and the Texas-Specific Soil Background Concentrations for Metals (Texas Commission on Environmental Quality [TCEQ] 2022) (**Attachment 1**). The Limited Phase II ESA will accord with the most recent version of the ASTM International (ASTM) Standard E 1903-19 (ASTM 2019).

Activities specified in this QAPP/Work Plan are as follows:

- Sample soil, soil gas, and groundwater throughout the subject property to confirm or eliminate RECs and VECs identified during the 2020 Phase I ESA.

Tetra Tech will perform the Phase II ESA and submit draft deliverables to HLB within 45 days after EPA approval of the QAPP/Work Plan.

Aspects of the project are described in the following sections of this QAPP/Work Plan.

1.5 QUALITY OBJECTIVES AND CRITERIA FOR MEASUREMENT DATA

The QA objective for this project is to develop data of sufficient quality and quantity to design comprehensive response actions under the TRRP rule and guidance, or newly proposed guidance. Specific data quality objectives are discussed in terms of accuracy, precision, completeness, representativeness, and comparability.

For this project, accuracy is defined as percent recovery, based on analyses of laboratory-prepared spike samples and performance evaluation audit samples. Precision for this project is defined as a measure of agreement among individual measurements of laboratory-prepared duplicate samples.

Data completeness will be expressed as the percentage of data generated that is considered valid. A completeness goal of 100 percent will be applied to this project; however, if that goal is not met, site decisions may still be made based on the remaining data.

Representativeness of collected samples is facilitated by establishing and following criteria and procedures identified in this QAPP/Work Plan.

Data comparability is achieved by requiring that all data generated for the project be reported in common units. **Table 1** below lists the various types of data that will be generated and specific reporting units.

TABLE 1
SPECIFIC DATA REPORTING UNITS

Parameter	Unit
VOCs in Soil via Laboratory Analysis	Micrograms per kilogram
TAL metals in Soil via Laboratory Analysis	Milligrams per kilogram
SVOCs in Soil via Laboratory Analysis	Micrograms per kilogram
TPH-GRO, TPH-DRO, and TPH-ORO in Soil via Laboratory Analysis	Milligrams per kilogram
PCBs in Soil via Laboratory Analysis	Milligrams per kilogram
VOCs in Groundwater via Laboratory Analysis	Micrograms per liter
TAL metals (total and dissolved) in Groundwater via Laboratory Analysis	Micrograms per liter
SVOCs in Groundwater via Laboratory Analysis	Micrograms per liter
TPH-GRO, TPH-DRO, and TPH-ORO in Groundwater via Laboratory Analysis	Milligrams per liter
VOCs in Soil Gas via Laboratory Analysis	Micrograms per cubic meter
Time	Military time (00:01 - 24:00)

Notes:

DRO Diesel-range organics
GRO Gasoline-range organics
ORO Oil-range organics
PCB Polychlorinated biphenyl
SVOC Semivolatile organic compound
TAL Target Analyte List
TPH Total petroleum hydrocarbons
VOC Volatile organic compound

1.6 SPECIAL TRAINING REQUIREMENTS AND CERTIFICATION

All personnel to work on site will be required to have completed a basic 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training course and annual refreshers.

1.7 DOCUMENTATION AND RECORDS

Tetra Tech personnel will maintain a field logbook to record all pertinent activities associated with the sampling. Appropriate documentation pertaining to photographs taken by Tetra Tech also will be recorded in the field logbook. Information pertaining to all samples (such as sampling dates and times, locations, and so on) obtained during this event will be recorded in the field logbook. Labels generated by the laboratory will be affixed to sample containers and identify sample numbers, dates collected, and requested analyses. Chain-of-custody records will be completed and maintained for all samples from time of sample collection until submittal of the samples to the laboratory for analysis.

Prior to field activities, Tetra Tech will prepare a health and safety plan (HASP) addressing site-specific hazards. All field personnel will review and sign the HASP prior to field work, indicating that they understand the plan and its requirements. A copy of the HASP will be available to all personnel throughout sampling activities.

The PM will ensure availability of the approved QAPP/Work Plan to all personnel throughout sampling activities by Tetra Tech.

Tetra Tech will submit soil, soil-gas, and groundwater samples to Pace Analytical (Pace), in Lenexa, Kansas, with a laboratory-provided chain of custody. Pace will convey detected concentrations of analytes identified in Section 2.2 in this document. Soil sample results will be in milligrams per kilogram or micrograms per kilogram. Soil-gas sample results will be in micrograms per cubic meter. Groundwater sample results will be in milligrams per liter or micrograms per liter. Pace will provide soil, soil-gas, and groundwater sample results per its Quality Manual (Pace 2020). Pace's laboratory certification is included in **Attachment 2**.

Tetra Tech will maintain all final reporting documents electronically at its Kansas City office for a minimum of 10 years, and the end user will maintain those documents for an undetermined amount of time.

2.0 MEASUREMENT AND DATA ACQUISITION

The following sections discuss design and implementation of measurement and acquisition of data.

2.1 SAMPLING PROCESS DESIGN

The sampling design proposed in the following subsections has been selected to delineate extents of soil, soil-gas, and groundwater contamination at the subject property. Because no site visit specific to Phase II requirements (for example, to locate utilities) occurred prior to development of the Work Plan for the Phase II ESA, all sampling locations are specified tentatively, based on results of the previous Phase I ESA at the subject property. Proposed sample locations are depicted on **Figure 2** in **Appendix A**. Sample locations are subject to change based on site observations, utility locations, and additional information obtained during Phase II ESA field activities. Actual sample locations will be recorded during sampling using handheld GPS devices.

2.1.1 Surface Soil Sampling

To assess surface soil at the subject properties for presence of COCs, Tetra Tech proposes collection of six surface soil samples for laboratory analysis. Boreholes will be advanced with a direct-push technology (DPT) rig, and surface soil sample locations will be collocated with subsurface soil sampling locations. DPT borings will be advanced to maximum depth of 30 feet below ground surface (bgs), to groundwater, or to refusal/bedrock, whichever is reached first. At each boring, one discrete surface soil sample will be collected within the 0-2-ft-bgs interval of the soil boring.

2.1.2 Subsurface Soil Sampling

To assess subsurface soil at the subject properties for presence of COCs, Tetra Tech proposes collection of six subsurface soil samples with a DPT rig. Sampling locations will be collocated with surface soil sampling locations (**Appendix A, Figure 2**).

DPT borings will be advanced to 30 feet bgs, to DPT geologic refusal, or to groundwater, whichever occurs first. Tetra Tech will use a photoionization detector (PID) to screen continuous soil cores in the six 30-foot borings for volatile organic vapors and will complete a boring log describing soil lithology in each soil boring. One subsurface soil sample will be collected from each boring. Subsurface soil samples will be collected within the depth interval inducing the highest recorded PID reading. If no elevated PID readings above background are observed, sample collection will occur within the interval where visual impacts appear or odor is detected. If none of those indications of contamination occurs, the soil samples will be

collected at the capillary fringe (if groundwater is encountered), or from the bottom of the boring. The sampler will be lined with polyvinyl chloride (PVC) sleeves, and the sampler and rods will be decontaminated with a non-phosphate detergent and tap water wash, followed by a tap water rinse following work at each sampling location.

2.1.3 Groundwater Sampling

Groundwater samples will be collected directly from the on-site soil borings on the subject property with a DPT screen point sampler containing a reusable stainless-steel screen. No permanent wells will be installed. At each boring location where the water table was encountered above 30 feet or refusal, the sampler will be advanced to just below the water table, and then the screen will be exposed to the aquifer. A sample will be collected through disposable polyethylene tubing with a check valve placed at the bottom of the tubing. If groundwater recovery allows, approximately 1 gallon of water will be purged prior to sample collection. After sampling at each boring location, the groundwater sampler and rods will be decontaminated, and new tubing will be used at the next boring location. Groundwater samples will be collected directly from the polyethylene tubing into the laboratory-prepared sample containers. A groundwater sample will not be collected if the DPT sampling probe reaches a refusal point above the water table or if the water table is deeper than 30 feet bgs. The sampler and rods will be decontaminated with a non-phosphate detergent and tap water wash, followed by a tap water rinse following work at each sampling location. After completion of sampling, all DPT boreholes will be plugged with hydrated bentonite from the bottom of the hole to the ground surface. Any disturbance to surface materials (concrete or asphalt) will be patched with appropriate material to match the surrounding surface.

2.1.4 Soil-gas Sampling

Tetra Tech will collect soil-gas samples from a second boring adjacent to each of the six soil borings, on the subject property. At each sampling location, steel rods will be advanced to approximately 6 feet bgs, and then retracted approximately 6 inches to create a void space to allow collection of soil-gas vapors. Soil-gas samples will be collected through the steel rods via disposable polyethylene tubing connected to the bottom of the rod string and an evacuated vacuum canister on the ground surface with a vacuum pump; air in the tubing will be evacuated prior to connection of the tubing to the canister. After the canister is connected to the tubing, a valve on the Summa canister will be opened to begin sample collection. The canister will remain attached to the polyethylene tubing until the vacuum pressure gauge indicates approximately -5 to -7 inches of mercury in the canister. Collection time will depend on the soil type encountered during field activities. After completion of sampling at each location, each piece of dedicated

sampling equipment, except for the polyethylene tubing, that encountered the soil-gas sample will be decontaminated with a non-phosphate detergent and tap water wash, followed by a tap water rinse.

2.2 SAMPLE ANALYSIS

Soil and groundwater samples will be analyzed for the COCs listed in **Table 2**.

TABLE 2
ANTICIPATED SAMPLE SUMMARY

Matrix	Number of Samples	Laboratory Analyses
Surface Soil	6	TAL metals, VOCs, SVOCs, TPH-GRO, TPH-DRO, TPH-ORO, and PCBs
Subsurface Soil	6	Target Analyte List metals, VOCs, SVOCs, TPH-GRO, TPH-DRO, TPH-ORO, and PCBs
Groundwater	6	Target Analyte List metals, SVOCs, TPH-GRO, TPH-DRO, and TPH-ORO
Soil-gas	6	VOCs

Notes:

See Section 2.5 for details pertaining to laboratory analyses.

DRO Diesel-range organics
 GRO Gasoline-range organics
 ORO Oil-range organics
 PCB Polychlorinated biphenyl
 SVOC Semivolatile organic compound
 TAL Target Analyte List
 TPH Total petroleum hydrocarbons
 VOC Volatile organic compound

2.3 SAMPLING METHODS REQUIREMENTS

Each soil sample for VOC analysis will be a grab sample collected before any other samples and in accordance with EPA SW-846 Method 5035. The VOC sample will consist of the following: two 40-milliliter (mL) vials, each preserved with sodium bisulfate and containing approximately 5 grams of soil; and one 40-mL vial preserved with methanol and containing approximately 5 grams of soil. Remaining soil from each sample interval will be homogenized and placed into 8-ounce jars for semivolatile organic compound (SVOC), total petroleum hydrocarbons (TPH), and Target Analyte List (TAL) metals analyses.

Groundwater samples for VOCs and TPH-GRO analyses will be collected in three 40-mL vials preserved with hydrochloric acid. Samples for VOCs and TPH-GRO will be collected first. Samples for SVOCs and TPH-DRO/ORO analyses will be collected in two 1-liter ambers. Samples for TAL metals analysis will be collected in one 250-mL plastic bottle preserved with nitric acid and one 250-mL plastic bottle unpreserved.

The containers will be prepared following procedures described in Pace's Quality Manual (included in **Attachment 2**). Preservation and holding times of samples are specified in the Quality Manual. Groundwater samples will be field-filtered prior to preservation for analysis for dissolved TAL metals.

Table 3 lists Tetra Tech standard operating procedures (SOP) to be followed during sample collection. Copies of the SOPs are in **Appendix B**.

TABLE 3
SUMMARY OF SAMPLING METHODS

Matrix	Sample Description	SOP Numbers
Soil	Soil	005-4
Groundwater	Temporary Monitoring Well	010-5
Soil-Gas	Soil-Gas	074-4

Notes:

SOP Standard Operating Procedure

Disposal of investigation-derived waste (IDW) in the form of disposable sampling supplies (for example, gloves or paper towels) will occur off site as municipal solid waste.

Sampling equipment used in the field will include the following: disposable metal spoons, a PID, and a DPT rig. Additional support facilities will not be required for this project.

To assess decontamination procedures applied to DPT sampling equipment, one equipment rinsate sample will be collected during field activities (as determined by the Project Manager) following decontamination of the screen point sampler. Following decontamination, the equipment rinsate sample will be collected by pouring deionized water through the sampling apparatus and into the appropriate sample containers.

2.4 SAMPLE HANDLING AND CUSTODY REQUIREMENTS

Samples will be submitted to an off-site laboratory for analysis. Sample containers and holding times will comply with procedures defined in the Quality Manual of the selected laboratory (Pace) (**Attachment 2**). Chain-of-custody procedures also will be specified in the laboratory's Quality Manual.

Samples will be packaged and shipped according to Tetra Tech SOP 019-8. Immediately after sample collection, sample containers will be labeled with the appropriate identifiers. Soil and groundwater samples will be placed in zippered plastic bags and then immediately placed on ice in coolers containing double-sealed bags of ice, and thus maintained at temperature between 2 and 6 degrees Celsius (°C). Glass

containers will be wrapped in bubble pack and placed in zippered plastic bags. Samples will be transported or shipped to the laboratory within a time span allowing analyses before exceedances of holding times. Prior to shipment, the chain of custody forms, airbills, and all other relevant documents will be completed. COC forms will be sealed in plastic bags and taped to the inside of the cooler lid. Cushioning material, consisting of bubble-wrap, will be placed in the cooler. A temperature blank consisting of a jar or vial containing water will be included in every cooler to be used by the laboratory to determine the cooler temperature at the time of sample receipt. The shipping cooler will then be sealed with tape and custody seals (signed and dated) in a manner that will indicate whether the cooler will have been opened. The preferred procedure includes placement of custody seals at diagonally opposite corners of the cooler. The custody seals will be covered with clear plastic tape or strapping tape. Coolers will remain in a secured area or in view of the sampler until properly sealed for delivery to the laboratory.

2.5 ANALYTICAL METHODS REQUIREMENTS

Soil, soil-gas, and groundwater samples will be sent, along with Tetra Tech's chain-of custody documentation, to Pace (chain-of-custody procedures will be as specified by Pace's Quality Manual in **Attachment 2** to this document). All samples will be analyzed according to the subcontracted laboratory's SOPs and analytical methods referenced in the QAPP/Work Plan. All detection limits will be below screening levels; standard detection limits likely will be adequate for most analytes. Appropriate containers and physical/chemical preservation techniques will be applied during field activities to help verify acquisition of representative analytical results. Standard turnaround times (TAT) will suffice for this project unless the HLB decides that shorter TATs are necessary. **Table 4** below lists analytical methods to be applied.

Pace's analytical detection limits for the soil, soil-gas, and groundwater samples are below applicable TRRP Tier 1 PCLs for all analytes. Applicable PCLs will be those in effect when the samples are submitted to the laboratory. The requested analyses have been selected based on information obtained during the previous Phase I ESA and information from HLB.

TABLE 4
ANALYTICAL METHODS

Analytical Parameter	EPA Analytical Method
Soil	
VOCs and TPH-GRO	SW-846 8260
SVOCs and TPH-DRO	SW-846 8270
TPH-ORO	SW-846 8015
PCBs	SW-846 8082
TAL Metals	SW-846 6010/7471
Groundwater	
VOCs and TPH-GRO	SW-846 8260
SVOCs and TPH-DRO	SW-846 8270
PCBs	SW-846 8082
TPH-ORO	SW-846 8015
TAL Metals	SW-846 6010/7470

Notes:

DRO	Diesel-range organics
EPA	U.S. Environmental Protection Agency
GRO	Gasoline-range organics
ORO	Oil-range organics
PCB	Polychlorinated biphenyl
SVOC	Semivolatile organic compound
SW-846	Test Methods for Evaluating Solid Waste (EPA 2022)
TAL	Target Analyte List
TPH	Total petroleum hydrocarbons
VOC	Volatile organic compound

Individual laboratory managers will be responsible for any corrective action that may be necessary per individual laboratory SOPs.

2.6 QUALITY CONTROL REQUIREMENTS

Where applicable, the SOPs and chain-of-custody procedures referenced in the QAPP/Work Plan will be followed throughout sampling activities to verify integrity of samples from time of collection until submittal to the laboratory for analysis.

Tetra Tech will evaluate duplicate samples to measure precision of analytical data generated during this project. One duplicate groundwater sample will be sent to the laboratory. In evaluating results from duplicate sampling, Tetra Tech will consider acceptable a relative percent difference (RPD) of less than 67% between original and duplicate sample results (as calculated by the equation below). If the RPD exceeds 67%, the data will be reevaluated, and Tetra Tech will consult the HLB Project Manager.

The RPD will be calculated as:

$$RPD = \frac{X_2 - X_1}{\left(\frac{X_2 + X_1}{2}\right)} \times 100$$

Where:

X_2 = Original sample concentration
 X_1 = Duplicate sample concentration

Because disposable supplies will be used for all soil samples (for example, PVC sleeves, sampling gloves, stainless-steel spoons, and pie pans) and groundwater samples will be collected with disposable tubing, only one equipment rinsate blank will be collected to evaluate effectiveness of decontamination procedures for DPT groundwater sampling equipment. One aqueous trip blank quality control (QC) sample will be required to determine whether cross-contamination of samples will have occurred during shipment. All soil and groundwater VOC samples will be shipped in the cooler with the trip blank.

One field blank sample will be collected to indicate overall precision, to evaluate potential contamination of sampling containers and/or preservatives, and to assess contamination potentially introduced during sampling and laboratory procedure(s). Evaluation of whether environmental samples are representative depends on a comparison of levels of contamination found in blank samples with levels of contamination found in environmental samples. Analytical results from blank samples will be evaluated on a qualitative basis by Tetra Tech for a general indication of field-introduced and/or lab-introduced contamination.

Extra volume will also be collected for one soil and one groundwater sample for matrix spike/matrix spike duplicate (MS/MSD) analyses. Analytical error (precision and accuracy) will be assessed via analyses of laboratory-prepared duplicates and spike samples. **Table 5** is a QA/QC sample summary.

TABLE 5**QUALITY ASSURANCE/QUALITY CONTROL SAMPLE SUMMARY**

Matrix	Number of Samples	Laboratory Analyses
Duplicate Soil Sample	1	VOCs, SVOCs, TPHs, TAL metals
Duplicate Groundwater Sample	1	VOCs, SVOCs, TPHs, TAL metals
Trip Blank	1	VOCs
Rinsate Blank	1	VOCs, SVOCs, TPHs, TAL metals
Field Blank	1	VOCs, SVOCs, TPHs, TAL metals

Notes:

See Section 2.5 for details pertaining to laboratory analyses.

DRO Diesel-range organics
 EPA U.S. Environmental Protection Agency
 GRO Gasoline-range organics
 ORO Oil-range organics
 SVOC Semivolatile organic compound
 TAL Target Analyte List
 TPH Total petroleum hydrocarbons
 VOC Volatile organic compound

2.7 INSTRUMENT, EQUIPMENT TESTING, INSPECTION, AND MAINTENANCE REQUIREMENTS

Tetra Tech personnel will test, inspect, and maintain all sampling equipment and supplies, along with field screening instrumentation, prior to deployment for field activities. Testing, inspection, and maintenance of analytical instrumentation will accord with manufacturers' recommendations. Equipment to undergo these procedures includes a PID. Tetra Tech will record any testing, inspection, or maintenance activities regarding the equipment on field sheets for the individual sampling activities. The vendor that rents out the instruments will be responsible for any malfunctions and repairs of instruments. Spare parts for all sampling equipment and supplies are available at either the Tetra Tech office in Houston, Texas, or at the location of the vendor that rents out the instruments in Houston, Texas.

2.8 INSTRUMENT CALIBRATION AND FREQUENCY

Calibration of field screening and laboratory analytical instrumentation will accord with manufacturers' recommendations. The PID is the only equipment that will require calibration for this project by Tetra Tech field staff. The PID will be calibrated at the equipment rental facility, according to the manufacturer's instructions. Laboratory equipment will be calibrated by the laboratory according to the Quality Manual in **Attachment 2**.

2.9 INSPECTION AND ACCEPTANCE REQUIREMENTS FOR SUPPLIES AND CONSUMABLES

Certificates of analysis will be provided with sampling supplies and reviewed by the field sampling team before samples are collected.

2.10 DATA ACQUISITION REQUIREMENTS

Tetra Tech anticipates that data generated by the off-site laboratory will be sufficient to determine natures and approximate extents of soil and groundwater contamination on site. Before this determination, the data will be verified by a Tetra Tech EP with a chemistry degree and a minimum of 5 years of experience validating data in accordance with EPA protocols.

Tetra Tech has compiled previously obtained data and information pertaining to the subject property from various sources (including other analytical data, reports, photographs, and maps referenced in this QAPP/Work Plan). Some of those data have not been verified; however, that unverified information will not be used for decision-making purposes without verification of its authenticity.

2.11 DATA MANAGEMENT

Tetra Tech will maintain all laboratory data acquired from the off-site laboratory in the project files. All data acquired during field work will be maintained in a logbook according to Tetra Tech SOP 024-3. All logbooks will be maintained in the project files, in hard and electronic versions. Project files are routinely reviewed for quality purposes to ensure proper management of information and resources. Based on the small size of this project and the small number of samples, no specialized hardware or software requirements apply. A copy of all laboratory data will be forwarded to HLB.

3.0 ASSESSMENT AND OVERSIGHT

The following sections discuss assessment and oversight of sampling activities.

3.1 ASSESSMENTS AND RESPONSE ACTIONS

Corrective action will be taken at the discretion of the HLB PM, the Tetra Tech Program Manager, or Tetra Tech QA Manager whenever problems appear that could adversely affect data quality or resulting decisions affecting future actions pertaining to the subject property. Due to the short duration of the field activities, no field audits will be conducted.

Individual laboratory managers will be responsible for any corrective action that may be necessary per the individual laboratory SOPs (**Attachment 2**).

3.2 REPORTS TO MANAGEMENT

Tetra Tech will prepare a Phase II ESA report for the HLB Project Manager, describing sampling techniques, locations, problems encountered (with resolutions to those problems), and interpretation of analytical results following completion of the field activities described herein. Laboratory analytical results from soil, soil-gas, and groundwater samples will be compared to applicable TRRP Tier 1 PCLs. These PCLs are specified for various contaminants of concern and different exposure pathways for residential and commercial/industrial settings. Although the Tier 1 PCLs are intended for use after report of a release, they may be used for assessment and project planning. Assessment with use of the PCLs will be based on applicable TCEQ regulator guidance including RG-366/TRRP-12, Affected Property Assessment Requirements under TRRP (TCEQ 2010).

Tetra Tech will offer recommendations for potential cleanup/further investigation of the subject property (if necessary) based comparisons of analytical data to TRRP Tier 1 PCLs.

4.0 DATA VALIDATION AND USABILITY

The following sections discuss aspects of validating data and determining usability of the data:

4.1 DATA REVIEW, VALIDATION, AND VERIFICATION REQUIREMENTS

A qualified laboratory analyst and each laboratory's section manager will perform data review and verification in accordance with the laboratory's QA program. The HLB Project Manager will be responsible for overall assessment and final approval of the data, in accordance with the scope of work (SOW) provided in the request for proposal from HLB. If the data provided do not cover the entire SOW, the HLB Project Manager will identify the deficiencies and request completion of the SOW before the report is deemed final.

4.2 VALIDATION AND VERIFICATION METHODS

Analytical data packages will be validated internally by the laboratory in accordance with the laboratory's established SOPs (**Attachment 2**). Tetra Tech's PM will be responsible for overall validation and final approval of the data, in accordance with projected use of results. Tetra Tech will also compare sample descriptions with field sheets for consistency, and will ensure appropriate documentation of any anomalies in the data.

4.3 RECONCILIATION WITH USER REQUIREMENTS

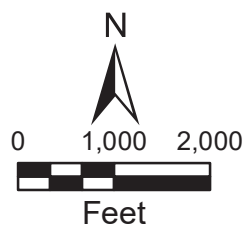
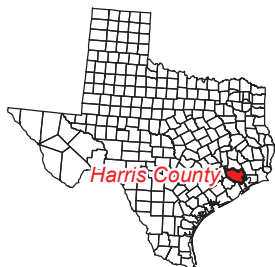
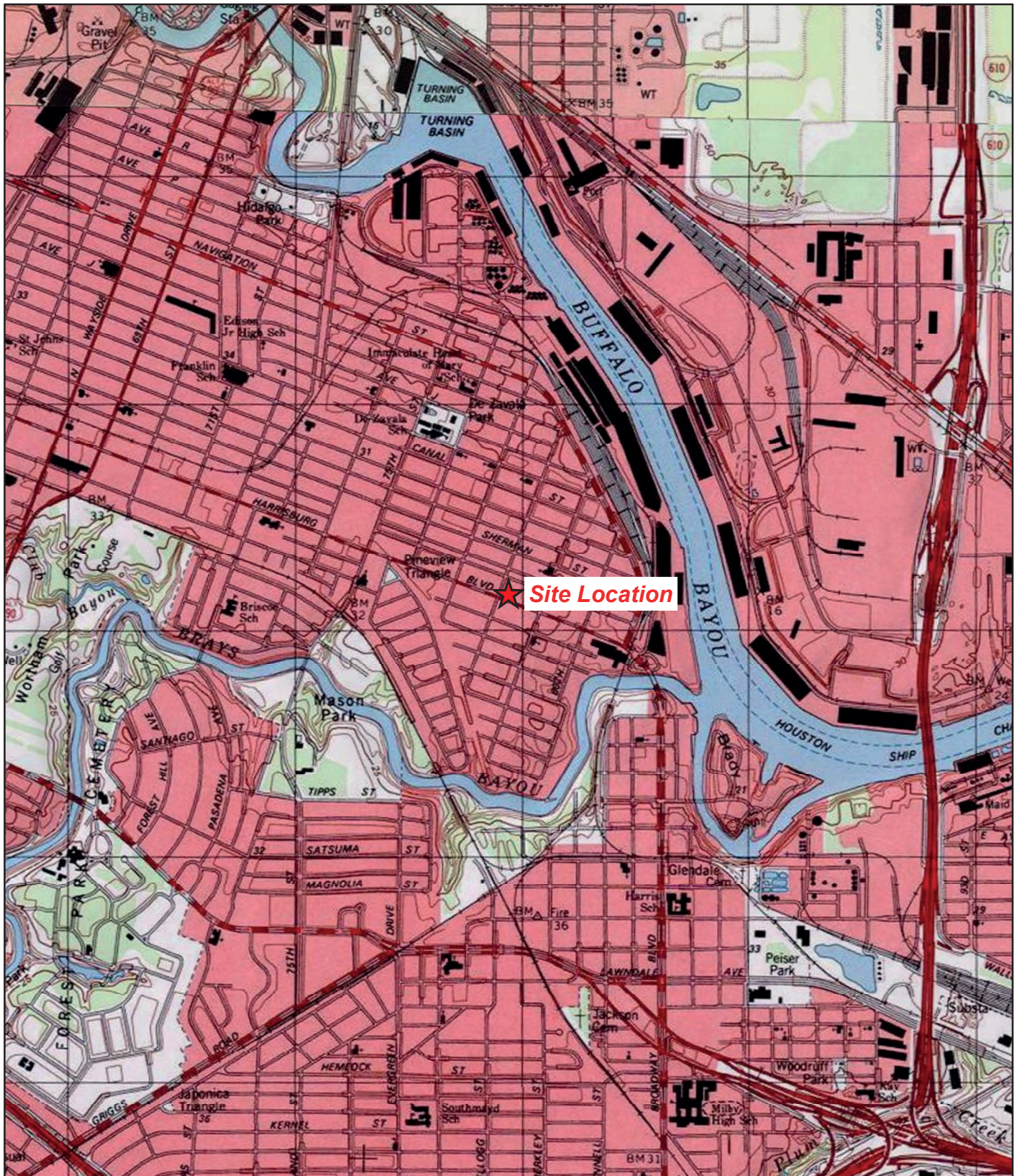
If data quality indicators do not meet the project's requirements as outlined in this QAPP/Work Plan, the data may be discarded, and re-sampling or re-analysis may be required. The HLB Project Manager is responsible for directing subsequent activities if data quality objectives are not met. For data quality indicators, see Section 2.6.

5.0 REFERENCES

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APPENDIX A

FIGURES



7811 Harrisburg Boulevard
Houston, Texas

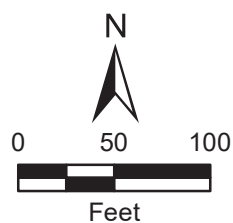
Figure 1
Site Location Map





Legend

- Soil, Groundwater and Soil-Gas Sampling Location
- Approximate Property Boundry
- Recognized Environmental Condition (REC)



7811 Harrisburg Boulevard
Houston, Texas

Figure 2
Proposed Sampling Map



APPENDIX B
STANDARD OPERATING PROCEDURES

SOP APPROVAL FORM

TETRA TECH, INC.

EMI OPERATING UNIT

ENVIRONMENTAL STANDARD OPERATING PROCEDURE

SOIL SAMPLING

SOP NO. 005

REVISION NO. 4

Last Reviewed: August 2021



Quality Assurance Approved

August 2021

Date

1.0 BACKGROUND

Soil is sampled for three main reasons: (1) for chemical analysis in the laboratory, (2) for physical analysis in the laboratory, or (3) for evaluation in the field (for example, visual classification, assessment of staining, and field screening). These three sampling objectives can be achieved separately or in combination. Sampling locations are typically chosen to provide information in both the horizontal and vertical directions. A sampling and analysis plan or a site-specific quality assurance project plan (QAPP) is used to outline sampling methods and to provide a preliminary rationale for sampling locations. Sampling locations may be adjusted in the field based on the screening or sampling methods used and the physical features of the area.

1.1 PURPOSE

This standard operating procedure (SOP) establishes the requirements and procedures for soil sampling. Soil is sampled to evaluate the chemical and physical characteristics of surface and subsurface soils.

1.2 SCOPE

This SOP describes procedures for soil sampling in different areas using various implements. It includes procedures for test pit, surface soil, and subsurface soil sampling and describes a variety of soil sampling devices.

1.3 DEFINITIONS

Aliquot: A portion of a larger whole, especially a sample taken for chemical analysis or other treatment; in particular, the discrete portions of a composite sample.

Bucket Auger: A type of auger that consists of a cylindrical bucket 10 to 72 inches in diameter with teeth arranged at the bottom.

Composite Sample: A sample that consists of soil combined from more than one discrete location (also called an aliquot). Typically, composite samples consist of soil obtained from several locations and homogenized in a stainless-steel or Teflon bowl, tray, or plastic bag.

Core Sampler: A thin-walled cylindrical metal tube with diameter of 0.5 to 3 inches, a tapered nosepiece, a “T” handle to facilitate sampler deployment and retrieval, and a check valve (flutter valve) in the headpiece.

Direct-push technology (DPT): Investigation tools that drive or push small-diameter rods and tools (typically not exceeding 4 inches in diameter) into the subsurface by hydraulic or percussive methods. Geoprobe Systems is a manufacturer of DPT equipment, and its brand name is often used interchangeably with “DPT.”

EnCore Sampler: A disposable volumetric sampling device. It comes in sample sizes of 5 and 25 grams. It is a hermetically sealed, single-use soil sampler made from a high-tech, inert polymer. EnCore samplers are used to collect soil samples with zero headspace, as required for volatile organic compound (VOC) analysis (including purgeable total petroleum hydrocarbons). Each sample is collected using a reusable “T” handle.

Grab Sample: A sample collected from a discrete location or depth.

Hand Auger: An instrument attached to the bottom of a length of pipe that has a crossarm or “T” handle at the top. The auger can be closed-spiral or open-spiral.

Spatulas or Spoons: Stainless-steel or disposable instruments for collecting loose unconsolidated material.

Split-Spoon (or Split-Barrel) Sampler: A thick-walled steel tube that is split lengthwise. A cutting shoe is attached to the lower end; the upper end contains a check valve and is connected to drill rods.

Terra Core Sampler: A disposable volumetric sampling device. It comes in sample sizes of 5 and 10 grams and is part of a sampling kit. It is a single-use sampler used to collect soil samples with zero headspace, as required for VOCs. Each sample is collected with the disposable coring device. However, unlike the EnCore sampler, the sample is placed directly into a 40-milliliter (mL) glass volatile organics analysis (VOA) vial after the soil is collected. The VOA vial is included in the sampling kit.

Thin-Wall Tube Sampler: A steel tube (1 to 3 millimeters thick) with a tapered bottom edge for cutting. The upper end is fastened to a check valve that is attached to drill rods.

Trier: A tube cut in half lengthwise with a sharpened tip that allows for collecting sticky solids or loosening cohesive soils.

Trowel: A metal or disposable tool with a scooped blade 4 to 8 inches long and 2 to 3 inches wide with a handle.

VOA Plunger: A disposable, plastic, single-use soil device to collect samples for analysis of VOCs.

1.4 REFERENCES

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EPA. 2021. Quality System and Technical Procedures for LSASD Field Branches. <https://www.epa.gov/quality/quality-system-and-technical-procedures-lsasd-field-branches>

1.5 REQUIREMENTS AND RESOURCES

Soil sampling requires the use of one or more of the following types of equipment:

- Spoon and spatula
- Trowel
- Shovel or spade
- Trier
- Core sampler
- EnCore sampler
- Terra Core sampler
- VOA plunger
- Hand auger
- Bucket auger
- Split-spoon
- Thin-wall tube

In addition, the following equipment may also be needed for various methods:

- Sample containers, labels, and chain-of-custody forms
- Logbook and field forms
- Stakes or flags for marking sample locations
- Tape for measuring recovery
- Soil classification information, including Munsell Color Chart

- Wax or caps for sealing ends of thin-wall tube
- “T” Handles
- Stainless-steel or Teflon bowls, aluminum pans, or other vessels for composite sampling (made from material that will not interfere with the planned analyses)
- Plastic sheeting
- Decontamination equipment
- Drilling equipment
- Backhoe
- Health and safety equipment

2.0 PROCEDURES

This SOP presents procedures for collecting test pit, surface soil, and subsurface soil samples. The site sampling plan will specify which of the following procedures will be used.

Soil samples for chemical analysis should be collected in order of decreasing volatility, with samples for VOCs collected first. Samples for physical analysis can be containerized after the chemical samples have been containerized. Typical physical analyses conducted include (1) grain size distribution, (2) moisture content, (3) saturated permeability, (4) unsaturated permeability, and (5) Atterberg limits. Additionally, visual descriptions of samples, using the Unified Soil Classification System (USCS, ASTM D2488-17e1), should be recorded. Field tests such as head-space analysis can also be conducted using a photoionization detector or a flame ionization detector before samples are collected for chemical or physical analysis.

Soil samples for chemical analysis can be collected either as grab samples or as composite samples. A grab sample is collected from a discrete location or depth. A composite sample consists of soil combined from more than one discrete location. Typically, composite samples consist of soil obtained from several locations (aliquots) and homogenized in a stainless steel or Teflon bowl, tray, or plastic bag. Refer to the site-specific QAPP for the methodology for composite sample collection, including number and location of aliquots. Samples for VOC analysis should not be composited.

All non-disposable equipment used for soil sampling should be decontaminated between sampling locations in accordance with SOP 002, General Equipment Decontamination.

2.1 SOIL SAMPLE COLLECTION PROCEDURES

Soil samples can be collected as discrete samples for VOC analysis using specialized equipment for preservation in the laboratory or in the field. Samples for VOC analysis should not be composited. Soil samples collected for non-VOC analysis can be collected as either grab or composite samples using standard equipment.

2.1.1 Procedure for Preserving and Collecting Soil Samples for VOC Analysis

Samples collected for VOC analysis using traditional methods, such as collection in a jar with no preservation, are shown to yield nonrepresentative results based on loss of VOCs. Soil samples collected for analysis for VOCs should be collected so that an undisturbed aliquot can be submitted for analysis. The aliquot should be taken directly from the sampling device and put in the sample container. EPA SW-846 Method 5035 is the preferred method for collecting samples for analysis for VOCs.

There are several options for collecting samples under Method 5035, including a variety of sampling devices, preservatives, and containers (including the potential presence of stir bars in the containers). The sampling team should work with the analytical laboratory to identify the anticipated range of concentrations, the window for sample delivery to the laboratory from the field, and the data quality objectives for the project.

Soil may be collected using any method described in Sections 2.3 or 2.4 that results in an undisturbed soil core. Once the soil is collected, a sampling device such as an EnCore sampler, a Terra Core sampler, syringe, stainless-steel spoon, plunger, or other device may be used to collect the sample into the container. The container may be unpreserved or may be pre-preserved with methanol, sodium bisulfate, or other solvents. Table 1 lists some of the options for Method 5035.

TABLE 1
METHOD 5035 SUMMARY

Option	Procedure	Advantages	Disadvantages
1	Collect two 40-milliliter (mL) vials with about 5 grams (g) of sample and one 2-ounce (oz) glass jar with a septum lid for screening, percent moisture, and preservative compatibility.	• Screening conducted by laboratory	• 48-hour holding time for unpreserved samples • Sample containers must be tared
2	Collect three EnCore samplers and one 2-oz glass jar with a septum lid for screening and percent solids.	• Lab conducts all preservation and preparation procedures	• 48-hour holding time for unpreserved samples
3	Collect two 40-mL vials with 5 g of sample and preserve with methanol or sodium bisulfate and one 2-oz glass jar with a septum lid for screening and percent solids.	• Longer holding time	• Hazardous materials used in the field • Sample containers must be tared
4	Collect one 2-oz glass jar with septum lid for analysis and percent solids.	• Lab conducts all preservation and preparation procedures	• May have significant loss of constituents of concern

Because the EnCore and Terra Core samplers are most commonly used, specific procedures for these devices are included below. For other sampling devices, the laboratory should be consulted to ensure their correct use.

EnCore Sampler: Soil samples collected for VOC analysis that are to be preserved at the laboratory may be obtained using a hand-operated, hermetically sealed sample vial such as an EnCore sampler. Each sample is collected using a reusable sampling handle (“T” handle) that can be provided with the EnCore

sampler when it is requested and purchased. Using the EnCore sampler eliminates the need for field preservation and the shipping restrictions associated with preservatives. A complete set of instructions is included with each EnCore sampler.

Collect the soil sample in the following manner for each EnCore sampler. Typically, three EnCore samplers will be collected per sample location.

- The EnCore sampler is loaded into the “T” handle with the plunger fully depressed.
- Press the “T” handle into the soil to be sampled. The plunger will be forced upward as the cavity fills with soil.
- When the sampler is full, rotate the plunger and lock it into place using the “T” handle. If the plunger does not lock, then it is not filled with soil. Soft soil may require several plunges or soil may be forced against a hard surface such as a decontaminated sample trowel to ensure headspace has been eliminated.
- Remove soil from the outside of the sampler so a tight seal can be made between the sample cap and the O-ring.
- With soil slightly piled above the rim of the sampler, force the cap on until the catches hook the side of the sampler.
- Remove any surface soil from outside of the sampler and place the sampler in the foil bag provided with the sampler. Seal the bag and label it with sample location information.
- Decontaminate the “T” handle between sample locations.
- Place samples on ice immediately and deliver them to the laboratory within 48 hours.

Terra Core Sampler: Terra Core disposable samplers may be used instead of EnCore samplers. These devices are used when samples will be preserved and have the advantage of a longer holding time. Each Terra Core sampling kit typically comes with one Terra Core sampler that collects either a 5- or a 10-gram aliquot into multiple pre-preserved containers that may also have stir bars. The sample containers will also typically be tared at the laboratory before sampling. Because the vials are pre-weighed, no additional labels should be added. Sampling information should be written directly on the label already on the vial.

Collect the soil sample in the following manner for each Terra Core sampler. Typically, multiple containers with different preservatives will be filled for each sample.

- With the plunger seated in the handle, push the sampler into freshly exposed soil until the sample chamber is filled.

- Wipe any excess soil and debris from the exterior of the sampler and remove any soil that extends beyond the mouth of the sampler.
- Rotate the plunger that was seated in the handler top 90 degrees until it aligns with the slots in the body.
- Place the mouth of the sampler into the desired 40-mL VOA vial and extrude the sample by pushing the plunger down. Quickly place the lid back on the VOA vial.
- After all vials provided have been filled, the sampler is now contaminated and must be disposed of unless additional duplicate or matrix spike sampling will be collected at the same location.
- Place the samples on ice immediately and ensure that samples are delivered to the laboratory within the holding time allowed for the preservation regime.

2.1.2 Procedure for Collecting Soil Samples for Non-VOC Analysis

Samples collected for non-VOC analysis may be either grab or composite samples as follows. When collecting a grab sample, transfer a portion of soil to be analyzed to a stainless-steel or Teflon bowl, disposable inert plastic tray, or plastic bag. Avoid or remove vegetation and small stones. When a composite sample is collected, collect four to five discrete soil samples of roughly equal volume, based on the sample design in the QAPP. Remove roots, vegetation, sticks, and stones larger than the size of pea gravel (about ¼- to ½-inch diameter). Thoroughly mix the soil with a stainless-steel spoon to obtain as uniform a texture and color as practicable. Transfer the mixed soil to the appropriate sample containers and close and label the containers. Place the sample containers on ice; ice may not be required for some analytes such as metals, but samples should be iced as a best practice.

2.2 TEST PIT AND TRENCH SOIL SAMPLING

Test pit and trench soil samples are collected when a complete soil profile is required or as a means of locating visually detectable contamination. This type of sampling provides a detailed description of the soil profile and allows for multiple samples to be collected from specific soil horizons. The sampling team should ensure that the sampling area is clear of utility lines, subsurface pipes, and poles before any test pit or trench is excavated with a backhoe.

A test pit or trench is excavated by incrementally removing soil with a backhoe bucket. The excavated soil is placed on plastic sheeting well away from the edge of the test pit. A test pit should not be excavated to depths greater than 4 feet unless its walls are properly sloped or stabilized. No personnel may enter any test pit or trench excavation more than 4 feet deep; such action would constitute confined space entry and must conform with Occupational Safety and Health Administration (OSHA) regulations at Title 29 *Code of Federal Regulations* (29 CFR) § 1910.

Personnel entering the test pit may be exposed to toxic or explosive gases and oxygen deficient environments. Air monitoring is required before they may enter the test pit, and use of appropriate respiratory gear and protective clothing is mandatory. At least two persons must be present at the test pit before sampling personnel may enter the excavation and begin soil sampling. Refer to project-specific health and safety plans for required safety procedures for excavations.

Soil samples can also be obtained directly from the backhoe bucket or from the excavated material after it has been removed and deposited on plastic sheeting. The sampling personnel may direct the backhoe excavator to obtain material from the selected depth and location within the excavation. The backhoe operator will set the backhoe bucket on the ground in a designated location, at a sufficient distance from the excavation to allow the sampler safe access to the bucket. The backhoe operator must disengage the controls and signal to the sampler that it is safe to approach the bucket. Collect the soil sample from the center of the backhoe bucket to reduce the potential for cross-contamination of the sample.

Test pits are not practical for sampling at depths greater than 15 feet. If soil samples are required from depths greater than 15 feet, samples should be obtained using test borings instead of test pits. Test pits are also usually limited to a few feet below the water table. In some cases, a pumping system may be required to control the water level within the pits.

Access to open test pits should be restricted by flagging, tape, or fencing. If a fence is used, it should be erected at least 6 feet from the perimeter of the test pit. The test pit should be backfilled as soon as possible after sampling is completed.

Various equipment may be used to collect soil samples from the walls or bottom of a test pit. A hand auger, bucket auger, or core sampler can be used to obtain samples from various depths. A trier, trowel, EnCore sampler, Terra Core sampler, VOA plunger, or spoon can be used to obtain samples from the walls or pit bottom surface.

2.3 SURFACE SOIL SAMPLING

Surface soil samples can be used to investigate contaminants that exist in the near-surface environment. Contaminants detected in the near-surface environment may extend to considerable depths, potentially migrating to groundwater, surface water, the atmosphere, or biological systems. Sampling depths for surface soil are typically those that can be reached without use of a drill rig, DPT, or other mechanized equipment. Surface soil sample depths typically extend up to depths of less than 2 feet below ground surface (bgs). However, the definition of “surface soil” and the resultant sample depths may vary based

on risk assessment or other project requirements. Be aware of these site-specific constraints and follow the requirements of the QAPP to select the depths for surface soil samples.

The surface soil sampling equipment presented in this SOP is best suited for sampling to depths of 0 to 6 feet bgs. The sample depth, analytical suite, soil type, and soil moisture will also dictate the most suitable sampling equipment. The sampling locations should be cleared of any surface debris such as twigs, rocks, and litter before samples are collected. Surface soil samples may be grab samples or composite samples, and samples may be collected for analysis from the sample device following the procedures described in Section 2.1. Samples collected using EPA SW-846 Method 5035 may only be collected from an undisturbed core.

Excess soil remaining after sample containers are filled should be retained for disposal or returned to the borehole as required by the site-specific investigation-derived waste (IDW) plan.

Table 2 presents various surface soil sampling equipment and their effective depth ranges, operating means (manual or power), and sample types collected (disturbed or undisturbed).

TABLE 2
SURFACE SOIL SAMPLING EQUIPMENT

Sampling Equipment	Effective Depth Range (feet below ground surface)	Operating Means	Sample Type
Hand Auger	0 to 6	Manual	Disturbed
Bucket Auger	0 to 4	Power	Disturbed
Core Sampler	0 to 4	Manual or Power	Undisturbed
Trier	0 to 1	Manual	Undisturbed
Spoon/Spatula	0 to 0.5	Manual	Disturbed
Trowel	0 to 1	Manual	Disturbed

The procedures for using these various types of sampling equipment are discussed below.

2.3.1 Hand Auger

A hand auger equipped with extensions and a “T” handle is used to obtain samples from depths of up to 6 feet bgs. It is possible to hand auger deeper than 6 feet. However, hand-augering below this depth is uncommon because of the time, effort, and cost effectiveness when sampling to depths greater than 6 feet bgs. If necessary, a shovel may be used to excavate the topsoil to reach the desired subsoil level. If topsoil is removed, its thickness should be recorded. Samples obtained using a hand auger are disturbed in their collection; establishing the exact depth where samples are obtained is difficult.

The hand auger is screwed into the soil at an angle of 45 to 90 degrees from horizontal. When the entire auger blade has penetrated the soil, the auger is removed from the soil by lifting it straight up without turning it, if possible. If the desired sampling depth has not been reached, the soil is removed from the auger and deposited onto plastic sheeting. This procedure is repeated until the desired depth is reached and the soil sample is obtained. The auger is then removed from the boring and the soil sample is collected directly from the auger into an appropriate sample container.

2.3.2 Bucket Auger

A bucket auger, similar to the hand auger, is used to obtain disturbed samples from depths of up to 4 feet bgs. A bucket auger should be used when stony or dense soil is sampled that prohibits the use of a hand-operated core or screw auger. A bucket auger with closed blades is used in soil that cannot generally be penetrated or retrieved by a core sampler.

The bucket auger is rotated while downward pressure is exerted until the bucket is full. The bucket is then removed from the boring, the soil collected is placed on plastic sheeting, and this procedure is repeated until the appropriate depth is reached and a sample is obtained. The bucket is then removed from the boring and the soil sample is transferred from the bucket to an appropriate sample container.

2.3.3 Core Sampler

A hand-operated core sampler (Figure 1), similar to the hand auger, is used to obtain samples from depths of up to 4 feet bgs in uncompacted soil. The core sampler is capable of retrieving undisturbed soil samples and is appropriate when low concentrations of metals or organics are of concern. The core sampler should be constructed of stainless steel. A polypropylene core sampler is generally not suitable for sampling dense soils or sampling at greater depths.

The core sampler is pressed or driven (for example, using a slide hammer) into the soil at an angle of 45 to 90 degrees from horizontal and is rotated when the desired depth is reached. The core is then removed, and the sample is placed into an appropriate sample container.

2.3.4 Trier

A trier (Figure 2) is used to sample soil from depths up to 1 foot bgs. A trier should be made of stainless steel or polypropylene. A chrome-plated steel trier may be suitable when samples are to be analyzed for organics and heavy metal content is not a concern.

Samples are obtained by inserting the trier into soil at an angle of up to 45 degrees from horizontal. The trier is rotated to cut a core and is then pulled from the soil being sampled. The sample is then transferred to an appropriate sample container.

2.3.5 Shovel

A shovel or spade may be used to obtain large quantities of soil that are not readily obtained with a trowel. A shovel is used when soil samples from depths of up to 6 feet bgs are to be collected by hand excavation; a tiling spade (sharpshooter) is recommended for excavation and sampling. A standard steel shovel may be used for excavation; either a stainless-steel or polypropylene shovel may be used for sampling. Soil excavated from above the desired sampling depth should be stockpiled on plastic sheeting. Soil samples should be collected from the shovel and placed into the sample container using a stainless-steel scoop, plastic spoon, or other appropriate tool.

2.3.6 Trowel

A trowel is used to obtain surface soil samples that do not require excavation beyond a depth of 1 foot. A trowel may also be used to collect soil subsamples from profiles exposed in test pits. Use of a trowel is practical when sample volumes of approximately 1 pint (0.5 liter) or less are to be obtained. Excess soil should be placed on plastic sheeting until sampling is completed. A trowel should be made of stainless or galvanized steel. It can be purchased from a hardware or garden store. Soil samples to be analyzed for organics should be collected using a stainless-steel trowel. Samples may be placed directly from the trowel into sample containers.

2.4 SUBSURFACE SOIL SAMPLING

Subsurface soil sampling is accomplished in conjunction with borehole drilling for depths greater than approximately 6 feet bgs. Subsurface soil sampling is frequently coupled with exploratory boreholes or monitoring well installation. As described above for surface soil, the definition of “subsurface soil” may vary based on risk assessment or other project requirements. Be aware of site-specific constraints and follow the requirements of the QAPP to select the depths for subsurface soil samples. Surface soil samples may also be collected using these methods as part of a larger sampling event that includes subsurface soil sampling.

Subsurface soil may be sampled using a drilling rig, power auger, or DPT. Selection of sampling equipment depends on geologic conditions and the scope of the sampling program. All sampling tools should be decontaminated before and after each use. All three of the methods described below may be used to collect undisturbed samples from unconsolidated soils. Subsurface soil samples may be grab

samples or composite samples, and samples may be collected for analysis from the sample device following the procedures described in Section 2.1. Samples collected using EPA SW-846 Method 5035 may only be collected from an undisturbed core.

Excess soil remaining after sample containers are filled should be retained for disposal or returned to the borehole as required by the site-specific IDW plan.

2.4.1 Split-Spoon Sampler

Split-spoon samplers are available in a variety of types and sizes. Site conditions and project needs, such as large sample volume for multiple analyses, dictate the specific type of split-spoon sampler to be used. Figure 3 shows a generic split-spoon sampler.

The split-spoon sampler is advanced into the undisturbed soil beneath the bottom of the casing or borehole using a weighted hammer and a drill rod. The relationship between hammer weight, hammer drop, and number of blows required to advance the split-spoon sampler in 6-inch increments indicates the density or consistency of the subsurface soil. After the split-spoon sampler has been driven to its intended depth, it should be removed carefully to avoid loss of sample material. A catcher or basket should be used to help retain the sample in noncohesive or saturated soil.

After the split-spoon sampler is removed from the casing, it is detached from the drill rod and opened. If samples for VOC analysis are to be collected, the sample device (for example, the EnCore sampler) should be filled with soil taken directly from the split-spoon sampler. Samples for other specific chemical analyses should be taken as soon as the VOA sample has been collected. The remainder of the soil recovered can then be used for visual classification of the sample and homogenized and containerized for physical analysis.

2.4.2 Thin-Wall Tube Sampler

A thin-wall tube sampler, sometimes called the Shelby tube (Figure 4), is used to collect soil samples for geophysical analysis. Tube samplers are best suited for collecting cohesive soils such as clays and silts. The tube sampler may be pressed or driven into soil inside a hollow-stem auger flight, wash bore casing, or uncased borehole. The tube sampler is pressed into the soil, without rotation, to the desired depth or until it meets refusal. If the tube cannot be advanced by pushing, it may be necessary to drive it into the soil without rotation using a hammer and drill rod. The tube sampler is then rotated to collect the sample from the soil and removed from the borehole.

After the tube sampler is removed from the drilling equipment, the tube sampler should be inspected for adequate sample recovery. The sampling procedure should be repeated until an adequate soil core is obtained (if the tube sampler can retain the sample material). The soil core obtained should be documented in the logbook. Any disturbed soil is removed from each end of the tube sampler. If chemical analysis is required, samples for VOC analysis must be collected immediately after the tube sampler is withdrawn. The sample device (for example, the EnCore sampler) should be filled with soil taken directly from the tube sampler. Before use, and during storage and transport, the tube sampler should be capped with a nonreactive material. The tube is sealed using plastic caps for physical sampling parameters. The top and bottom of the tube sampler should be labeled and the tube sampler should be stored accordingly.

2.4.3 Direct-Push Technology Methods

In many cases, DPT is less expensive and faster than collecting soil samples with a standard drilling rig. In addition, the use of DPT causes minimal disturbance to the ground surface and generates little to no soil cuttings. DPT drill rigs, as well as traditional drill rigs, often use clear polyvinyl chloride (PVC) sleeves or brass liners inside of split-spoon or thin-wall tube samplers for collecting soil samples.

The sample sleeve is extruded from the sampling rod when the sampling rod is retrieved from the ground. The sleeve is sliced lengthwise twice to open the sleeve. Soil samples can be collected directly from the opened sleeve. If samples for VOC analysis are to be collected, the sample device (for example, the EnCore sampler) should be filled with soil taken directly from the opened DPT sampler. Samples for other specific chemical analysis should be collected after the VOC sample. The remainder of the recovered soil can then be used for visual classification of the sample and homogenized and containerized for physical analysis.

FIGURE 1
HAND-OPERATED CORE SAMPLER

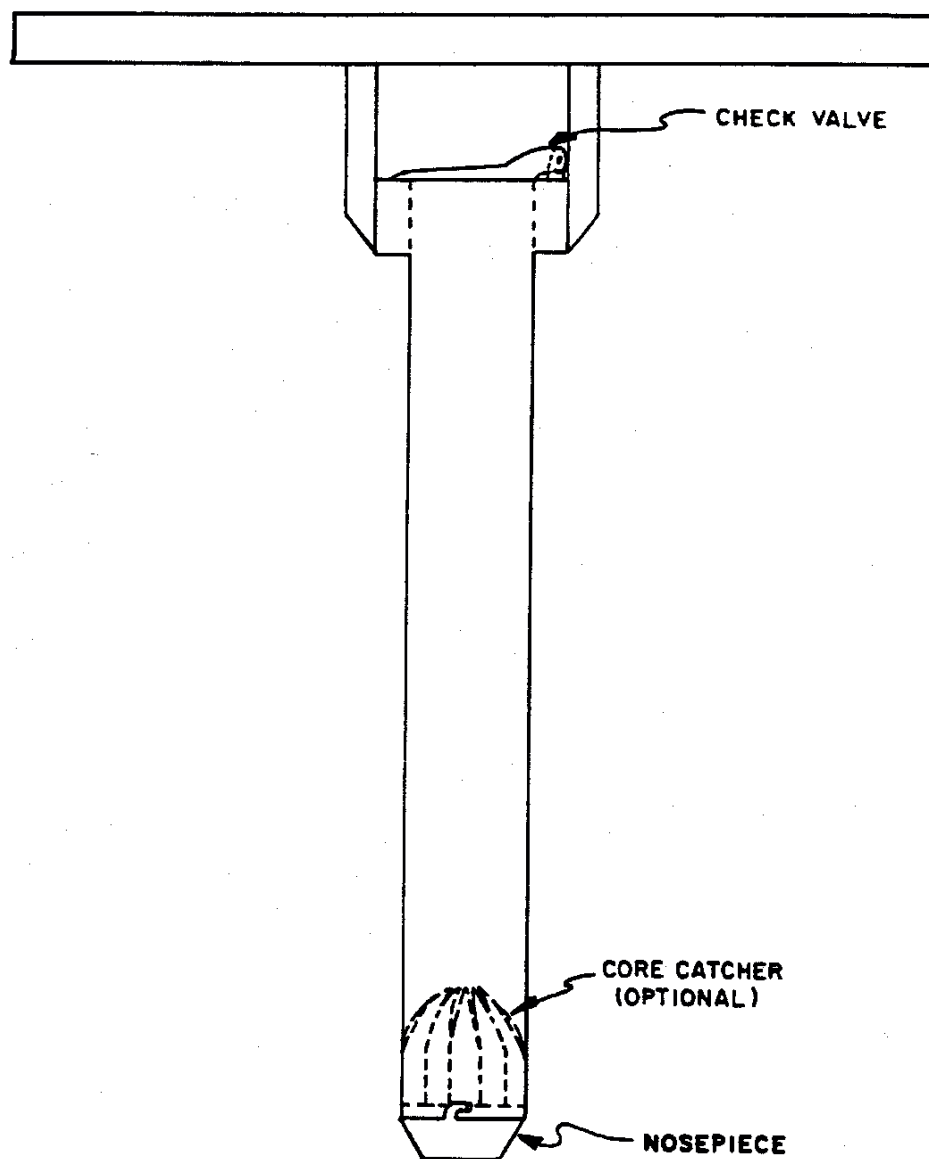


FIGURE 2

TRIER

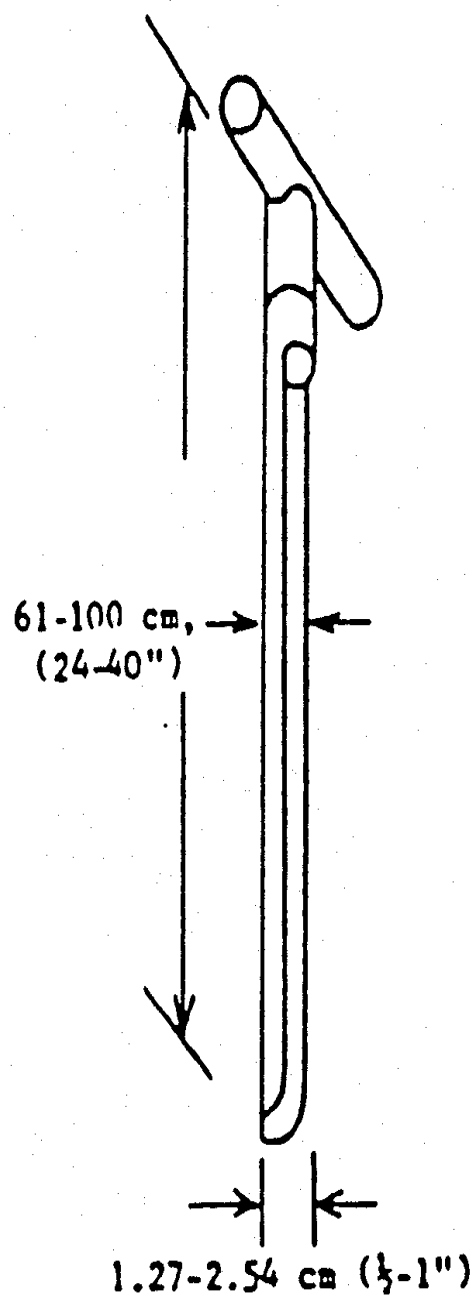


FIGURE 3
GENERIC SPLIT-SPOON SAMPLER

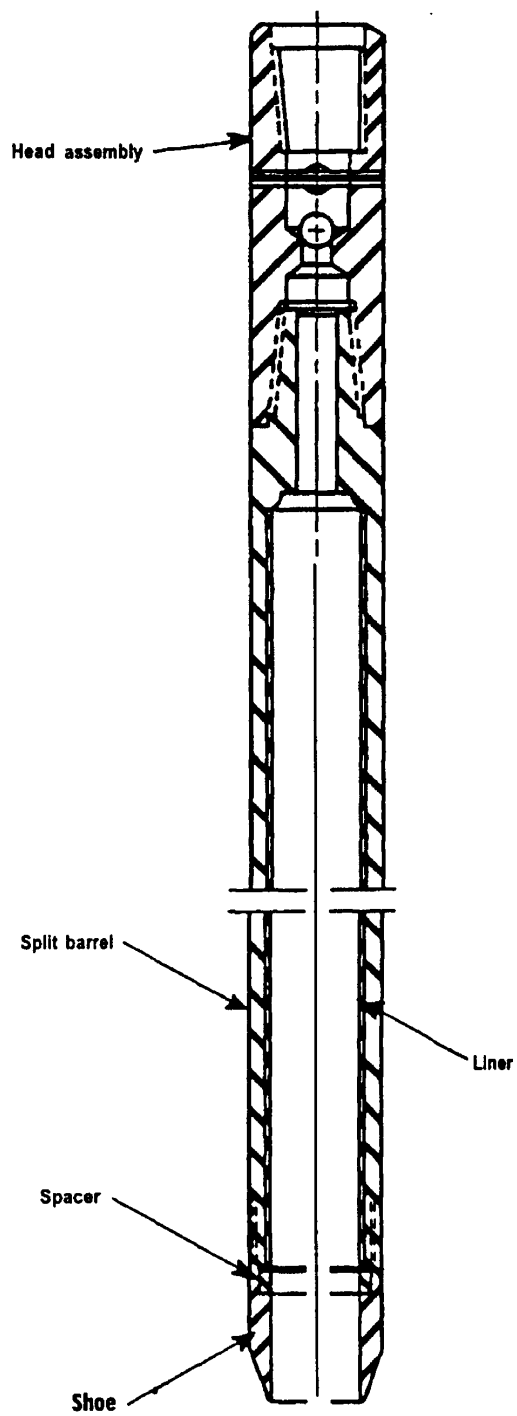
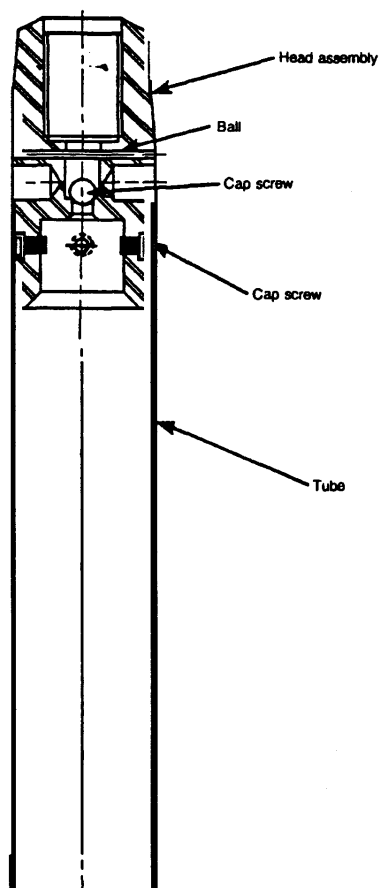


FIGURE 4

THIN-WALL TUBE SAMPLER



SOP APPROVAL FORM

TETRA TECH, INC.

EMI OPERATING UNIT

ENVIRONMENTAL STANDARD OPERATING PROCEDURE

GROUNDWATER SAMPLING

SOP NO. 010

REVISION NO. 5

Last Reviewed: March 2020



Quality Assurance Approved

March 2020

Date

1.0 BACKGROUND

Groundwater sampling may be required for a variety of reasons, such as to examine potable or industrial water supplies, check for and track contaminant plume movement in the vicinity of a land disposal or spill site, conduct regulatory compliance monitoring, or examine a site where historical information is minimal or nonexistent, but where groundwater may be contaminated.

Groundwater is usually sampled through an in-place well, either temporarily or permanently installed. However, it can also be sampled anywhere groundwater is present, such as in a pit or a dug or drilled hole.

Occasionally, a well will not be in the preferred location to obtain the sample needed (for example, to track a contaminant plume). In such a case, a temporary or permanent well will have to be installed. SOP No. 020 (Monitoring Well Installation) provides guidance for installing new monitoring wells.

An experienced and knowledgeable person (preferably a hydrogeologist) will need to locate the well and supervise its installation so that the samples ultimately collected will be representative of the groundwater. Personnel installing wells should work under the supervision of a registered professional, and the requirements of the state where the work is being performed should be followed as to the specific requirements for the registered professional and their level of involvement and oversight.

1.1 PURPOSE

This standard operating procedure (SOP) establishes the requirements and procedures for measuring the quality of groundwater entering, leaving, or affected by site activities through groundwater sampling. The samples are obtained by retrieving water from a well screened in the aquifer or aquifers underlying a site.

1.2 SCOPE

This SOP provides general guidance for groundwater sampling activities conducted in the field. SOP No. 015 (Groundwater Sampling Using Low-Flow Methodology) provides additional specific guidance for using low-flow methods to collect groundwater samples. The sampling methods referred to in this SOP are not a comprehensive list of all possible sampling methods. For other sampling methods, such as the use of passive diffusion bags, the manufacturer's instructions or other SOPs should be consulted.

1.3 DEFINITIONS

Bailer: A cylindrical sampling device with valves on either end, used to extract water from a well. Bailers are usually constructed of an inert material such as stainless steel or polytetrafluoroethylene (Teflon) or of

easily decontaminated plastic, such as polyvinyl chloride (PVC) or polyethylene. Bailers may be reusable (decontaminated between use), disposable, or dedicated to a single well (and typically stored in the well). The bailer is lowered and raised by means of a cable that may be cleaned and reused, or by disposable rope. Temporary wells, such as those installed with direct-push technology (for example, Geoprobe screen points) are sometimes sampled with tubing to which a check valve has been attached. This tubing is functionally a bailer, and similar precautions should be taken.

Electrical Water Level Indicator: An electrical device that has a light or sound alarm connected to an open circuit, used to measure the depth to liquid. The circuit is closed when the probe intersects a conducting liquid. The wire used to raise and lower the probe is usually graduated.

Immiscible Phase: A liquid phase that cannot be uniformly mixed or blended with water. Heavy immiscible phases (also known as dense nonaqueous phase liquids, or DNAPLs) sink, and light immiscible phases (also known as light nonaqueous phase liquids, or LNAPLs) float on water.

Interface Probe: An electrical probe that measures the distance from the surface to air-water, air-immiscible, or immiscible-water interfaces. Similar in operation to an electrical water level indicator, these instruments are typically used when the thickness of an immiscible layer must be measured.

Purge Volume: The volume of water that needs to be removed from the well prior to sampling to ensure that the sample collected is representative of the formation groundwater.

Riser Pipe: The length of well casing above the ground surface.

Total Well Depth: The distance from the reference measuring point (top of well casing or ground surface) to the bottom of the well.

Water Level: The level of water in a well, measured as depth to water or as elevation of water, relative to a reference mark or datum.

1.4 REFERENCES

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1.5 REQUIREMENTS AND RESOURCES

There are various options available to obtain groundwater samples. The procedures are outlined in the following section. The equipment needed to accomplish these procedures includes the following:

1. Organic vapor detector with a flame ionization detector (FID) or a photoionization detector (PID)
2. Pipe wrench and other tools needed to open monitoring wells (socket wrench, screwdriver, mallet, etc.); keys to well locks
3. Electrical water level indicator or interface probe
4. Purging device (type needed depends on well depth, casing diameter, and type of sample desired; see sampling devices below)
5. Graduated cylinder or bucket
6. Sampling device (type needed depends upon depth to water, well diameter, and type of sample analysis desired)
 - o Bailer
 - o Bladder pump
 - o Stainless steel submersible (non-oil-bearing) pump
 - o Existing dedicated equipment
 - o Peristaltic pump
7. Sample containers
8. Wastewater containers for purge water

9. Field logbook and field forms

10. Stopwatch

Additional equipment is required to complete measurement of field parameters (for example, pH, specific conductance, and temperature) of the groundwater in the well. Refer to Tetra Tech SOP 061 (Field Measurement of Groundwater Indicator Parameters) or individual field parameter SOPs as appropriate.

2.0 PROCEDURES

Prior to sampling, a site-specific sampling plan should be developed. The plan should take into consideration the site characteristics and should include:

1. Specific, repeatable well measurement techniques and reference points for measuring the depth to water and the depth to the bottom of the well
2. Specific method of purging and selection of purging equipment
3. Specific methods and equipment for measurements of field parameters
4. Specific method of sample collection and the sampling equipment that will be used
5. Specific parameters for which samples will be analyzed
6. Order in which sample bottles will be filled, based on the analytical parameters

The following sections discuss procedures for approaching the well, establishing a sample preparation area, making preliminary well measurements, purging the well, and collecting samples.

2.1 APPROACHING THE WELL

In general, all wells should be assumed to pose a health and safety risk until field measurements indicate otherwise. Approach the well from the upwind side. Record well appearance and the general condition of the protective casing, surface seal, and surrounding area in the logbook.

Once at the well, the lead person should systematically use the organic vapor detector to survey the immediate area around the well (from the breathing zone to the top of the casing to the ground). If elevated FID or PID readings are encountered, retreat to a safe area and instruct the sampling team to either let vapors dissipate and approach the well again or put on the appropriate level of personal protective equipment (PPE), as specified in the site-specific health and safety plan. See SOP No. 003 (Organic Vapor Air Monitoring) for additional air monitoring guidance.

Some monitoring wells have the potential to contain pressurized headspace—for example, through the generation of gases from contaminated groundwater, biological processes, degradation of contaminants, or simply based on location such as near a landfill or in areas that intersect lithological abnormalities; or through intentional artificial means such as those associated with air sparging systems. Injection or extraction wells may be artificially pressurized and may remain so for several days after the system has been turned off. Over-pressuring presents a hazard to people opening these wells. Employ the following practices to minimize these hazards:

1. Wear safety glasses to protect the eyes. If site-specific observations and conditions indicate that the wells may be pressurized, wear a full-face shield over the safety eye protection.
2. Do not place the face or any other part of the body over the well when opening because this may place you in a strike zone.
3. Open the well cover at arm's length, then step away and allow the well to off gas and stabilize.

Upon opening the well casing, the lead person should systematically survey the air inside the well casing, above the well casing in the breathing zone, and in the immediate area around the well. Any positive PID or FID readings should be recorded in the logbook or on field forms. If elevated FID or PID readings in the breathing zone are encountered (see the health and safety plan for action levels), retreat and put on appropriate PPE. It is important to remember that action levels are based on readings in the breathing zone, not within the well casing. Representative organic vapor detector readings should be recorded in the logbook. Also look out for insects or other animals that may nest in well openings, and refer to the health and safety plan for site-specific hazards.

2.2 ESTABLISHING A SAMPLE PREPARATION AREA

The sample preparation area is generally located upwind or to either side of the well. If elevated readings are encountered using an organic vapor detector, this area should be taped off and the sample preparation area should be located upwind of the well, where ambient conditions are measured. Plastic sheeting or a tarp should be laid down around the well head and under the sample preparation area to prevent discharge of groundwater to soil and to protect tubing from touching the ground.

2.3 MAKING PRELIMINARY WELL MEASUREMENTS

Several preliminary well measurements should be made prior to initiating sampling of the well. These include measuring the water level and total well depth, evaluating the presence of immiscible phases, and calculating purge volumes. All preliminary measurements will be recorded in the logbook or a groundwater sampling data sheet as they are gathered (examples of typical data sheets are included as an exhibit to this SOP). SOP No. 014 (Static Water Level, Total Well Depth, and Immiscible Layer Measurement) provides additional information concerning these preliminary measurements.

2.3.1 Water Level and Total Well Depth Measurements

Tetra Tech typically uses an electric water level indicator for water level and total well depth measurements. This device sounds an alarm or triggers a light when the measuring probe touches the water surface, thus closing an electrical circuit. The electric cable supporting the probe is usually graduated to 0.01 foot and can be read at the well site directly. The distance between the static water level

and the marked or notched location at the top of the riser pipe is measured. If the casing is not marked or notched, the measurement should be taken from the north side of the casing. The height of the riser pipe above ground surface, as obtained from well location survey data, is then subtracted from the total reading to calculate the depth to static water. To improve accuracy, three separate readings should be made, and the values averaged. This helps to eliminate any errors caused by kinks or bends in the cable, which may change in length when the water level indicator is raised and lowered, or from water level probes catching on flaws or joints in the sides of the casing.

After sampling is completed, the total well depth can be measured by lowering the probe into the well until resistance is met, indicating that the probe has reached the bottom of the well. The total well depth is then read to the 0.01-foot fraction. The distance between the bottom of the well and the marked or notched location on the riser pipe is calculated. The height of the riser pipe above the ground surface, as obtained from well survey data, is then subtracted from the total reading to calculate the depth to the bottom of the well. To improve accuracy, three separate readings should be made, and the readings averaged. If the bottom of the well feels “soft” (suggesting sediment accumulation in the well), a note should be made in the logbook or on field forms. If a well is known to have a soft bottom, the total well depth measurement should be made after the sample is collected to minimize sediment disturbance and turbid samples.

2.3.2 Evaluating Whether Immiscible Nonaqueous-Phases Liquids are Present

If immiscible, nonaqueous-phase liquids (NAPL) are known or are strongly suspected to be present, based on previous or nearby groundwater sampling, the following measurement activities should be undertaken. Organic liquids are measured by lowering an interface probe slowly to the surface of the liquid in the well. When the audible alarm sounds, record the depth. If the alarm is continuous, a floating immiscible layer has been detected. To measure the thickness of this layer, continue lowering the probe slowly until the alarm changes to an oscillating signal. The oscillating signal indicates that the probe has detected an aqueous layer. Record this depth as the depth to water and calculate the thickness and the volume of the immiscible layer.

Continue lowering the probe into the well to evaluate whether dense immiscible phases (sinkers) are present. If the alarm signal changes from oscillating to a continuous sound, a heavier immiscible layer has been detected; record this depth.

Continue lowering the probe to the bottom of the well and record the total depth. Calculate and record the sinker phase volume and total water volume in the well (see equation in Section 2.3.3). If immiscible

phases are present, immediately refer to Section 2.5.3 or 2.5.4 of this SOP for sample collection procedures.

2.3.3 Calculation of Standing Water in the Well

If the presence of immiscible phases does not need to be determined, measure the depth to water and the total depth of the well as described in Section 2.3.1. Once these measurements have been made and recorded, calculate the total volume of water in the well. The volume of water in the well is based on the following formula:

$$V = \pi r^2 h \times 7.48$$

where

- V = static volume of water in the well (gallons)
- r = inside radius of the well (feet)
- h = length of water in the well (total well depth minus depth to water) (feet)
- 7.48 = conversion factor (cubic feet to gallons)

Common well sizes and corresponding volumes are as follows:

- 1-inch well = $h \times 0.041$ gallons per foot (gal/ft)
- 2-inch well = $h \times 0.163$ gal/ft
- 3-inch well = $h \times 0.367$ gal/ft
- 4-inch well = $h \times 0.652$ gal/ft

2.4 PURGING THE WELL

Once the water level is measured and the volume of water in the well is known, purging may begin. Wells are purged to eliminate stagnant water residing in the casing and screen that has undergone geochemical changes or loss of volatile chemicals. At the end of purging, the water being drawn from the well should be representative of groundwater in the aquifer.

Turbidity is often elevated during purging by the disturbance of formation materials at the borehole walls. As many contaminants (metals and many organic compounds) will sorb to the formation particles, a sample including these particles will not represent the dissolved concentrations of the contaminants. Thus, a secondary goal of purging is to reduce the turbidity to the point that the sample will represent the dissolved concentration of contaminants.

The amount of water to be purged will depend on site-specific program requirements, individual well yield characteristics, or stabilization of field parameters measured during purging. In some cases, a standard volume is purged (for example, three well volumes). Field parameters (for example, pH, specific conductance, and temperature) should be measured prior to purging and at standard intervals (for example, after each well volume or every 3 to 5 minutes). All field parameter data should be recorded in the field logbook, on field forms, or in electronic applications. Refer to specific Tetra Tech SOP 061 as appropriate for more detailed procedures for measuring these field parameters.

The most common methods for purging wells are:

1. Bailers
2. Bladder pumps
3. Submersible pumps
4. Dedicated pumps or other dedicated equipment
5. Peristaltic pumps

As previously stated, the minimum purging volume is typically three casing volumes, unless a low-flow sampling strategy has been chosen. SOP No. 015 (Groundwater Sampling Using Low-Flow Methodology) provides additional specific guidance for using low-flow methods (including purging methods) to collect groundwater samples. Exceptions to a three-well-volume purge standard also may be made in the case of low-yield or slow-recharging wells. When purging low-yield wells, purge the well until the water level is equal to the top of screen elevation (if possible). Samples should be collected no sooner than 2 hours after purging and when sufficient groundwater volume is available.

The well should be purged until measured field parameters, such as pH or specific conductance have stabilized. If any field parameter has not stabilized, additional purging should be performed. To be considered stable, field parameters should change by no more than the stabilization criteria listed on Table 1 between each well volume purged or within the purging interval specified in the sampling plan (for example, every 5 minutes). If the above conditions have not been met after a specified period of time, purging will be considered complete and sampling can begin. Refer to the field sampling plan or quality assurance project plan (QAPP) for specified time period. Record the final well stabilization parameters on the Groundwater Sampling Data Sheet, and indicate if the well purging was considered complete based on stabilized parameters or exceeding the specified period of time.

TABLE 1

STABILIZATION CRITERIA FOR WATER QUALITY PARAMETERS

Parameter	Stabilization Criterion
pH	± 0.1 unit
Specific Conductance	± 3 percent
Oxidation-Reduction Potential	± 20 millivolts
Turbidity	± 10 percent (when greater than 5 nephelometric turbidity units [NTU]); considered stable if less than 5 NTU
Dissolved Oxygen	± 10 percent when greater than 0.5 milligram per liter (mg/L); considered stable if less than 0.5 mg/L
Temperature	± 3 percent

At no time should the purging rate be high enough to cause groundwater to cascade back into the well, as this could result in excessive aeration and potential stripping of volatile constituents.

The actual volume of purged water can be measured using several acceptable methods:

1. When bailers are used, the actual volume of each bailer's contents can be measured using a calibrated bucket if the volume is not specified on the packaging.
2. If a pump is used for purging, the pump rate can be measured by using a container of known volume or with graduated measurements, a stopwatch, and the duration of pumping time necessary to purge the known volume.

2.5 SAMPLE COLLECTION

This section first describes general groundwater sample collection procedures. This section also describes procedures for collecting groundwater samples for volatile organic analysis (VOA) and for collecting samples when light or heavy immiscible layers are present in a monitoring well. Samples of light and heavy immiscible layers should be collected before the well is purged. Site-specific sampling plans may indicate that, based on the presence of NAPL, no groundwater sample is to be collected.

2.5.1 General Groundwater Sampling Procedures

The technique used to withdraw a groundwater sample from a well should be selected based on the parameters for which the sample will be analyzed. To ensure that the groundwater samples are representative, it is important to avoid physically altering or chemically contaminating the sample during collection, withdrawal, or containerization. If the samples are to be analyzed for volatile organic compounds, it is critical that air does not become entrained in the water column.

In some cases, it may become necessary to use dedicated equipment already in the well to collect samples. This is particularly true of high-volume, deep wells (>150 feet) where bladder pumps are

ineffective and bailing is impractical. If existing equipment must be used, however, identify the make and model of the pump and obtain information on component construction materials from the manufacturer or facility representatives. If an existing pump is to be used for sampling, make sure the flow volume can be reduced so that a reliable VOA sample can be taken. Record the specific port, tap, or valve from which the sample is collected. If nondedicated sampling equipment is used, the least contaminated wells should be purged and sampled first and most contaminated wells should be purged and sampled last (if past sampling data are available to make this determination).

General sampling procedures are as follows:

1. Clean sampling equipment should not be placed directly on the ground. Use a plastic drop cloth or feed line from clean reels. Never place contaminated lines back on reels.
2. A clean pair of new, non-powdered, disposable gloves will be worn each time a different location is sampled, and the gloves should be donned immediately prior to sampling. The gloves should be changed any time during sample collection when their cleanliness is compromised.
3. Sample containers for samples suspected of containing high concentrations of contaminants or NAPLs shall be stored separately to minimize cross-contamination.
4. Check the operation of the bailer check valve assemblies to confirm free operation.
5. Lower sampling equipment slowly into the well to avoid degassing the water and damaging the equipment.
6. Pump flow rates should be adjusted to eliminate intermittent or pulsed flow. The settings should be selected during the purging operations. In general, pumping rates should be set to the lowest rate that allows a smooth flow.
7. A separate sample volume should be collected to measure necessary field parameters. If samples are being collected with a pump, a flow-through cell should be used to measure water quality parameters.
8. Samples should be collected and containerized following procedures outlined in the project-specific field sampling plan, QAPP, and in the order of the parameters' volatilization sensitivity. Table 2 lists the preferred collection order for common groundwater parameters.

TABLE 2

ORDER OF PREFERRED SAMPLE COLLECTION

1.	Volatile organic analysis (VOA)
2.	Purgeable organic halogens (POX)
3.	Total organic halogens (TOX)
4.	Cyanide
5.	Extractable organics
6.	Purgeable organic carbon (POC)

7.	Total metals
8.	Dissolved metals
9.	Total organic carbon (TOC)
10.	Phenols
11.	Sulfate and chloride
12.	Nitrate and ammonia
13.	Radionuclides

Intermediate containers should never be used to prepare VOA samples and should be avoided for all parameters in general. All VOA containers should be filled at a single sampling point or from a single bailer volume. Also refer to site-specific sampling plan for other sample handling requirements that may be unique to a site or to specific chemical constituents.

2.5.2 Collection of Volatile Organics Samples

This section discusses in detail the collection of samples for VOA using either a bailer or bladder pump. Other pumps (such as positive displacement) can be used. The following factors are critical to the collection of representative samples for VOA: ensuring that no air has become entrained in the water column, achieving low pump flow rates (less than 100 milliliters [mL] per minute, if possible), avoiding flow surges, and adjusting sample preservatives if they are found to cause reactions with the sample.

2.5.2.1 Collection with Bailers

Samples for VOA should be collected from the first bailer removed from the well after purging is complete. The most effective method requires two people. One person should retrieve the bailer from the well and pour its contents into the appropriate number of 40-mL VOA vials held by the second person. When filling the vials, overflow slightly, so that a convex meniscus forms on the top of the vial. Each vial should be capped, inverted, and gently tapped to check if any air bubbles are present. If a bubble exists, unscrew the cap and add more water, or discard and repeat if vials are not pre-preserved. If bubbling persists in a vial containing acid preservative, the sample may need to be collected without the preservative and the laboratory notified to add preservative upon receipt. The sample should be transferred from the bailer to the sample container in a manner that will limit the amount of agitation to reduce the loss of VOCs from the sample.

Always fill VOA vials from a single bailer volume. If the bailer is refilled, samples cannot be considered duplicates or splits.

2.5.2.2 Collection with a Pump

To successfully perform VOA sampling with a pump, the following steps should be completed:

1. Following manufacturer's directions, activate the pump. The discharge and recharge settings should be manually set and adjusted to pump at optimum flow rates. Reduce water flow rate for VOA sample collection to the lowest flow rate that allows a smooth flow.
2. Disconnect the discharge tubing from the flow-through cell, then collect VOA sample from discharge tubing. VOA vials should be placed beneath the discharge tubing while avoiding direct contact between the vials and the tubing. Never place tubing past the mouth of the VOA vial. The pump control should be adjusted as necessary to maintain a trickle of water to obtain a meniscus in the vial.
3. Continue with non-VOA sampling. The pump flow rate can be increased for non-volatile analytes as long as the discharge does not become turbid.

2.5.3 Sampling of Light Immiscible Floaters

The approach used when collecting a sample of a floating layer depends on the depth to the floating layer and the thickness of that layer. If the thickness of the floater is 2 feet or greater, a bottom-filling valve bailer should be used. Slowly lower the bailer until contact is made with the floater surface, and lower the bailer to a depth less than that of the floater-water interface depth as measured by preliminary measurements with the interface probe.

When the thickness of the floating layer is less than 2 feet and the depth to the surface of the floating layer is less than 15 feet, a peristaltic pump can be used to extract a sample.

When the thickness of the floating layer is less than 2 feet and the depth to the surface of the floating layer is beyond the effective lift of a peristaltic pump (greater than 20 to 25 feet), a bailer can be modified to allow filling from the top only (an acceptable alternative is to use a top-loading Teflon or stainless-steel bailer). Disassemble the bailer's bottom check valve and insert a piece of 2-inch-diameter Teflon sheet between the ball and ball seat. This will seal off the bottom valve. Remove the ball from the top check valve, thus allowing the sample to enter from the top. To overcome buoyancy when the bailer is lowered into the floater, place a length of 1-inch stainless steel pipe on the retrieval line above the bailer (this pipe may have to be notched to allow sample entry if the pipe remains within the top of the bailer). As an alternative, use a top-loading stainless-steel bailer. Lower the device, carefully measuring the depth to the surface of the floating layer, until the top of the bailer is level with the top of the floating layer. Lower the bailer an additional one-half thickness of the floating layer and collect the sample. This technique is the most effective method of collection if the floating layer is only a few inches thick.

2.5.4 Sampling of Heavy Immiscible Sinkers

The best method for collecting a sample of a sinker is the use of a double check valve bailer. The key to sample collection is controlled, slow lowering and raising of the bailer to and from the bottom of the well. Sample collection methods are equivalent to those described in Section 2.5.3 above.

EXHIBIT 1

EXAMPLE GROUNDWATER SAMPLING DATA SHEETS



GROUNDWATER SAMPLING DATA SHEET

Monitoring Well No.: _____ Date: _____

Project Name: _____ Project No.: _____

Sampler: _____

Depth to Well Bottom: _____ ft Well Volume: _____

Depth to Water: _____ ft 1-inch well = water column (ft) x 0.041 gal/ft

Water Column: _____ ft 2-inch well = water column (ft) x 0.163 gal/ft

Well Diameter: _____ in 3-inch well = water column (ft) x 0.367 gal/ft

Immiscible Layers (Y/N): _____ Well Volume: _____ gal 4-inch well = water column (ft) x 0.653 gal/ft

Time	Vol. Purged	Water Level	pH	Conductivity (µmhos/cm)	Temperature (°C/°F)	Turbidity NTU	DO mg/L	Other
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____

Purge start time _____ Method of Purging ☐ Pump (specify type below) ☐ Bailer (specify type below)

Purge end time _____ Purged Dry (y/n)? _____

Total Volume Purged: _____ How Measured? _____

QA/QC Sample Collected Here? ☐ Duplicate ☐ Matrix Spike ☐ Equip. Blank ☐ No QA/QC Sample

Date and Time of Sample Collection: _____ Sample Number(s): _____

Comments: _____



GROUNDWATER SAMPLING DATA SHEET

Site Name _____ Project Number _____
 Well Number _____ Date _____
 Field Personnel _____
 Weather Conditions _____

Well Depth _____ ft Well Diameter _____ in
 Static Water Level _____ ft
 Length of Water Column _____ ft
 TOC Elevation _____ ft amsl Groundwater Elevation _____ ft amsl

Standing Well Volume _____ gal
 2-in: Multiply length of column by 0.163 Immiscible Layer (yes/no) _____
 4-in: Multiply length of column by 0.653
 6-in: Multiply length of column by 1.47

Began Purging (time) _____ Ended Purging (time) _____
 Volume Purged _____ gal
 Purged Dry (yes/no) _____

Well Sampling Method Bailed (check one): Pumped (check one): Other (describe):
 Teflon _____ Submersible _____
 PVC _____ Bladder _____
 Stainless _____ Peristaltic _____

Groundwater Quality Parameter Measurements for Stabilization							
Parameter	1	2	3	4	5	6	7
Time (24 hr)							
pH (std. Units)							
Conductivity (uS/cm)							
Temperature (F)							
Turbidity (NTU)							
Other							

Instruments used in measuring groundwater quality parameters: _____

Note any visual observations relevant to the site, monitoring well, or groundwater quality that may be useful in analyzing the groundwater sampling data: _____

SOP APPROVAL FORM

TETRA TECH, INC.

EMI OPERATING UNIT

ENVIRONMENTAL STANDARD OPERATING PROCEDURE

PACKAGING AND SHIPPING SAMPLES

SOP NO. 019

REVISION NO. 8

Last Reviewed: August 2020



Quality Assurance Approved

August 11, 2020

Date

1.0 BACKGROUND

In any sampling program, the integrity of a sample must be ensured from its point of collection to its final disposition. This standard operating procedure (SOP) describes procedures for packaging and shipping samples. Steps in the procedures should be followed to ensure sample integrity and to protect the welfare of persons involved in shipping and receiving samples.

1.1 PURPOSE

This SOP establishes the requirements and procedures for packaging and shipping nonhazardous environmental samples. It has been prepared in accordance with the U.S. Environmental Protection Agency (EPA) “Contract Laboratory Program Guidance for Field Samplers.” Procedures described in this SOP should be followed for all routine sample packaging and shipping of nonhazardous samples. If procedures are to be modified for particular contract- or laboratory-specific requirements, modified procedures should be clearly described in site-specific plans such as work plans, field sampling plans (FSP), or quality assurance project plans (QAPP). Deviations from the procedures in this SOP must be documented in a field logbook. This SOP assumes that samples are already in the appropriate sample jars and that the sample jars are labeled.

This SOP does not cover the packaging and shipment of Dangerous Goods or Hazardous Materials.

The shipment of Dangerous Goods (by air) and Hazardous Materials (by ground) requires specialized training. If you have NOT received this training in the last 2 years, you are NOT qualified to package or ship these materials and may be personally liable for any damages or fines. Contact one of Tetra Tech’s shipping experts for assistance. Instructions to access the training course, shipping experts, and health and safety (H&S) contacts, and general information on packaging and shipping hazardous substances and dangerous goods can be obtained by checking the links provided in [Section 1.4](#) (References) and communicating with appropriate Tetra Tech H&S contacts listed on the EMI Operating unit internal H&S web site.

1.2 SCOPE

This SOP applies to packaging and shipping of environmental and nonhazardous samples. This SOP does not address shipping dangerous goods or hazardous materials.

1.3 DEFINITIONS

Airbill: An airbill is a shipping form (such as a FedEx shipping form) acquired from the commercial shipper and is used to document shipment of the samples from the sampler to the designated analytical laboratory (see [Figure 1](#)).

Blank: A blank is any sample that is used to assess cross-contamination from sampling and sample management procedures. A typical blank sample will consist of distilled or deionized (DI) water (water sampling) or an air filter cartridge (air sampling) that is then analyzed by the laboratory to evaluate whether cross-contamination has been introduced. Each blank is assigned its own unique sample number. Blanks collected in the field include trip blanks, field blanks, and equipment blanks, all intended to assess potential cross-contamination. For example, a trip blank checks for contamination during sample handling, storage, and shipment from the field to the laboratory. Field blanks assess the contamination of water or soil from ambient air. Equipment blanks (also known as rinse blanks) assess contamination from incomplete decontamination procedures.

Chain-of-Custody form: A chain-of-custody form is used to document the transfer of custody of samples from the field to the designated analytical laboratory (see [Figure 2](#)). The chain-of-custody form is critical to the chain-of-custody process and is used to identify the samples in each shipping container to be shipped or delivered to the laboratory for chemical or physical (geotechnical) analysis. A copy of the chain-of-custody form is shipped with the samples and accompanies them from sampler to laboratory (see [Figure 3](#)).

Custody seal: A custody seal is a tape-like seal and is used to indicate that samples are intact and have not been disturbed during shipping or transport after the samples have been released from the sampler to the shipper (see [Figure 4](#)). The custody seal is part of the chain-of-custody process and is used to prevent tampering with samples after they have been packaged for shipping (see [Figure 5](#)).

Environmental samples: Environmental samples include drinking water, groundwater, surface water, soil, sediment, treated municipal and industrial wastewater effluent, indoor and ambient air, nonhazardous bulk materials, soil gas, dust, asbestos, and biological specimens. Environmental samples typically contain low concentrations of contaminants and, when handled, require only limited precautionary procedures.

Nonhazardous samples: Nonhazardous samples are those samples that do not meet the definition of a hazardous sample AND do not need to be packaged and shipped in accordance with the International Air Travel Association's (IATA) "Dangerous Goods Regulations" (DGR) or U.S. Department of Transportation's "Hazardous Materials Regulations" defined in Title 49 *Code of Federal Regulations* (CFR).

The following definitions are provided to further distinguish environmental and nonhazardous samples from dangerous goods and hazardous samples:

Dangerous goods: Dangerous goods are articles or substances that can pose a significant risk to health, safety, or property when transported by air; they are classified as defined in Section 3 of the DGR (IATA 2020).

Hazardous samples: Hazardous samples include dangerous goods and hazardous substances. Hazardous samples shipped by air should be packaged and labeled in accordance with procedures specified by the DGR; ground shipments should be packaged and labeled in accordance with the Hazardous Material Regulations.

Hazardous substance: A hazardous substance is any material, including its mixtures and solutions, that is listed in 49 CFR 172.101 and its quantity, in one package, equals or exceeds the reportable quantity listed in Table 1 to Appendix A of 49 CFR 172.101.

1.4 REFERENCES

General Awareness, H&S Contacts, and Course Training Information (Tetra Tech, Inc., EMI Operating Unit. Intranet) On-line address: <https://int.tetrattech.com/sites/EMI/hs/Pages/Dangerous-Goods-Shipping.aspx>

International Air Transport Association (IATA). 2020. "Dangerous Goods Regulations. 2020." For sale at: <https://www.iata.org/en/publications/dgr/>. Updated annually, with new edition available late in year.

U.S. Environmental Protection Agency (EPA). 40 CFR, 763 Subpart F, Asbestos Hazards Emergency Response Act (AHERA).

EPA. 2014. "Contract Laboratory Program Guidance for Field Samplers." EPA 540-R-014-013. October. On-line address: https://www.epa.gov/sites/production/files/2015-03/documents/samplers_guide.pdf.

EPA. 2020. "Packing, Marking, Labeling and Shipping of Environmental and Waste Samples." EPA Region 4, LSASDPROC-209-R4. February 23. On-line address: <https://www.epa.gov/sites/production/files/2015-06/documents/Shipping-Environmental-and-Waste-Samples.pdf>

1.5 REQUIREMENTS AND RESOURCES

The procedures for packaging and shipping samples require the following:

- Coolers (insulated ice chest) or other shipping containers appropriate to sample type
- Ice
- Bubble wrap or similar cushioning material
- Chain-of-custody forms and seals
- Airbills

- Resealable plastic bags for sample jars and ice
- Tape (strapping and clear)
- Large plastic garbage bags for lining the cooler
- Temperature blank sample bottle filled with distilled water can be included in the cooler if appropriate to sample type
- Trip blank samples used to check for volatile contamination during sample handling in the field should accompany sample containers during shipment from laboratory to field (empty containers) and from field to laboratory (filled containers). It should remain in the cooler with sample containers during the sampling event. Trip blanks should be requested from the laboratory when containers are initially ordered.

2.0 PROCEDURES

The following procedures apply to packaging and shipping nonhazardous and environmental samples.

2.1 PACKAGING SAMPLES

After they have been appropriately containerized and labeled, environmental samples should be packaged as described in this section. This section covers procedures for packing samples for delivery by commercial carrier (air or ground) and hand delivery of environmental samples (by employee or courier), as well as shipping asbestos and air quality samples. Note that these instructions are general; samplers also should be aware of client-specific requirements concerning the placement of custody seals or other packaging provisions.

2.1.1 Packaging Samples for Delivery by Commercial Carrier (Air or Ground)

Samples shipped by commercial carriers should be packed for shipment using the following procedures and in compliance with all carrier requirements:

Preparing the sample:

1. Allow a small amount of headspace in all bottles, or as instructed by the laboratory (except volatile organic compound [VOC] containers with a septum seal) to compensate for any changes in pressure and temperature during transfer.
2. Be sure the lids on all bottles are tight (will not leak). Lids maybe taped or sealed with custody seals as added protection or as required. For any sample containers that are not marked with a tare weight by the laboratory, cover the completed sample label on the container with clear tape to protect the label.
3. Place sample containers in resealable plastic bags.

Preparing the cooler:

1. Secure and tape the drain plug of the cooler with fiber or duct tape.
2. Line the cooler with a large plastic garbage bag before samples, ice, and absorbent packing material are placed in the cooler.
3. Wrap the sample containers in bubble wrap or line the cooler (bottom and sides) with a cushioning material to prevent breakage of bottles or jars during shipment.
4. If required by the laboratory for the analytical method, add a sufficient quantity of ice to the cooler to cool samples to 4 °C (± 2 °C). Ice should be double bagged in resealable plastic bags to prevent the melted ice from leaking out. If required, include one temperature blank (a sample bottle filled with distilled water) per cooler.

5. For VOC samples only, include one trip blank for VOC analysis per shipment matrix in each cooler.
6. Fill all remaining space between the bottles or jars with bubble wrap.
7. As each container is placed in the cooler, verify the sample information on the chain-of-custody form. The samples listed on the chain-of-custody form must match exactly with the contents of the cooler.
8. Securely fasten the top of the large garbage bag with tape (preferably plastic electrical tape).
9. If more than one cooler is being shipped, mark each cooler as “1 of 2,” “2 of 2,” and so forth.
10. Place the chain-of-custody forms (see [Figure 2](#)) into a resealable plastic bag, and tape the bag to the inner side of the cooler lid (see [Figure 3](#)). If you are shipping more than one cooler, copy the chain-of-custody form so that there is one copy of all forms in each cooler. The samples listed on the chain-of-custody form must match exactly with the contents of the cooler. Tape any instructions for returning the cooler to the inside of the lid.
11. Close the lid of the cooler and tape it shut by wrapping strapping tape around both ends and hinges of the cooler at least once.
12. Place two signed custody seals (see [Figure 4](#)) on opposite sides of the cooler, ensuring that each one covers the cooler lid and side of the cooler (see [Figure 5](#); note that in contrast to the figure, the seals should be placed on the opposite sides of the cooler and offset from each other, rather than directly across from each other as shown in [Figure 5](#)). Place clear plastic tape over the custody seals so that the cooler cannot be opened without breaking the seal.
13. Shipping containers should be marked “THIS END UP.” Arrow labels, which indicate the proper upward position of the container, may also be affixed to the container. As appropriate, the containers should also be labeled for Saturday delivery or other special requirements.
14. Ship samples overnight using a commercial carrier such as FedEx. As a best practice, electronic sample shipping labels should be prepared by the shipping agency’s employees, at the direction of Tetra Tech employees or sampling personnel. This allows the sampling personnel to confirm special shipping requirements, such as Saturday delivery, and verify that samples will be shipped that day (that is, the last shipment of the day has not already occurred). If this is not possible, the airbill can be prepared by hand (see [Figure 1](#)), but samples should still be handed over directly to shipping agency employees and shipping details should be verified. The shipping label should be placed on the outside of the container.
15. A copy of the receipt with sample tracking number should be retained by the sampling personnel and delivery should be verified the next day.

2.1.2 Hand Delivery of Environmental Samples (by Employee or Courier)

Samples hand-delivered to the laboratory should be packed for shipment using the following procedures:

Preparing the sample:

1. Bottles can be filled completely with sample (required for VOC containers with a septum seal).

2. Be sure the lids on all bottles are tight (will not leak).

Preparing the cooler:

1. Secure and tape the drain plug of the cooler with fiber or duct tape.
2. Wrap the sample containers in bubble wrap or line the cooler (bottom and sides) with a cushioning material to prevent breakage of bottles or jars during shipment.
3. As each container is placed in the cooler, verify the sample information on the chain-of-custody form. The samples listed on the chain-of-custody form must match exactly with the contents of the cooler.
4. If required for by the laboratory for the analytical method, add a sufficient quantity of ice to the cooler to cool samples to 4 °C. Ice should be double bagged in resealable plastic bags to prevent the melted ice from leaking out. If required, include one temperature blank (a sample bottle filled with distilled water) per cooler.
5. For VOC samples only, include one trip blank for VOC analysis per shipment matrix in each cooler.
6. If more than one cooler is being shipped, mark each cooler as “1 of 2,” “2 of 2,” and so forth.
7. Place the chain-of-custody form (see [Figure 2](#)) in a resealable plastic bag and tape to the inside of the cooler lid (see [Figure 3](#)), close the lid, and seal with custody seals (see [Figure 5](#); note that in contrast to the figure, the seals should be placed on the opposite sides of the cooler and offset from each other, rather than directly across from each other as shown in [Figure 5](#)). Place clear plastic tape over the custody seals so that the cooler cannot be opened without breaking the seal. Transfer the cooler to the courier. When samples will be delivered directly to the laboratory, it is sufficient to close the cooler and hand-deliver it with the chain-of-custody form.
8. Include any instructions for returning the cooler to the inside of the lid.
9. If the cooler is being transferred to a courier, the shipping containers should be marked “THIS END UP,” and arrow labels, which indicate the proper upward position of the container should be affixed to the container.

2.1.3 Shipping Asbestos Samples

Asbestos samples shipped by commercial carriers should be packed for shipment using the following procedures and in compliance with all carrier requirements:

1. Place each asbestos sample in a small resealable plastic bag or Whirl-pak sealable bag. Seal the bags carefully and place the sample bags in a larger resealable plastic bag.
2. Select a rigid shipping container and pack the samples upright in a noncontaminating, nonfibrous medium such as a bubble pack to minimize excessive movement during shipping.
3. Avoid using expanded polystyrene because of its static charge potential. Also avoid using particle-based packaging materials because of possible contamination.

4. Affix custody seals to the samples or outer sample bag so that the bags cannot be opened without breaking the seal.
5. Insert the chain-of-custody form in the box. Include a shipping bill and a detailed listing of samples shipped, their descriptions and all identifying numbers or marks, sampling data, shipper's name, and contact information.
6. Ship bulk samples in a separate container from air samples. Bulk samples and air samples delivered to the analytical laboratory in the same container will be rejected.
7. For each sample set, designate which are the ambient samples, which are the abatement area samples, which are the field blanks, and which is the sealed blank if sequential analysis is to be performed.
8. Hand-carry samples to the laboratory in an upright position if possible; otherwise, choose that mode of transportation least likely to shake the samples in transit.
9. Address the package to the laboratory sample coordinator by name when known and alert him or her of the package description, shipment mode, and anticipated arrival as part of the chain-of-custody and sample tracking procedures. This information will also help the laboratory schedule timely analysis for the samples when they are received.

2.1.4 Shipping Air Samples

Packaging and shipping requirements for air samples vary depending on the media used to collect the samples and the analyses required. Sampling media typically include Summa canisters and Tedlar bags for whole air samples, filters for metals and particulate matter, and sorbent tubes for organic contaminants. This section of the SOP provides general guidelines for packaging and shipping air samples collected using these media. The project FSP or QAPP should also be reviewed for any additional project-specific requirements or instructions.

Summa Canister Samples

1. Close the canister valve by tightening the knob clockwise or flipping the toggle switch. Replace the brass cap on the canister inlet.
2. If a flow controller was used to collect the air sample over a specified time interval, the flow controller should be removed before replacing the brass cap.
3. Fill out the sample tag on the canister with the sample number and the date and time of collection. Include the identification number of the flow controller on the sample tag if one was used. Make sure the information on the sample tag matches the chain-of-custody form.
4. Complete the chain-of-custody form. In addition to the information normally included, the form should include the following data: sample start and stop dates and times; initial and final Summa canister vacuum readings; Summa canister identification number; and flow controller identification number.

5. Package the Summa canister (and flow controller) in its original shipping box with the original packaging material. Tape the box shut and apply custody seals if required. Note: Summa canisters should never be packaged with ice.
6. Summa canister shipments typically include several canisters, and may include more than one shipping box. The chain-of-custody form for the shipment should be sealed within one of the shipping boxes. If more than one box is being shipped, mark each box as “1 of 2,” “2 of 2,” and so forth.
7. Ship the samples by a method that will meet the holding time. Summa canister samples should be analyzed within 30 days of sample collection.

Tedlar Bag Samples

1. Before removing it from the sample port, close the Tedlar bag by tightening the valve clockwise. The bag should only be approximately half-full to allow for pressure changes during shipping and handling of the sample. Keep the Tedlar bag out of direct sunlight to preserve the sample.
2. Fill out the label on the bag with the sample number and the date and time of sample collection. Make sure the information on the label matches the chain-of-custody form.
3. Complete the chain-of-custody form.
4. Package the Tedlar bag in a shipping box with appropriate packing material to prevent the bag from being punctured or damaged. Multiple bags can be packaged in the same box. Tape the box shut and apply custody seals if required. Note: Tedlar bag samples should not be cooled or packaged with ice, although they can be shipped in an ice chest to protect the samples.
5. Tedlar bag shipments may include more than one shipping box. The chain-of-custody form for the shipment should be sealed within one of the shipping boxes. If more than one box is being shipped, mark each box as “1 of 2,” “2 of 2,” and so forth.
6. Ship the samples using priority overnight delivery. Tedlar bag samples should be analyzed within 3 days of sample collection.

Filter Cassette Samples

1. Disconnect the filter cassette from the air sampling pump and replace the plastic caps on the inlet and outlet openings.
2. Attach a label to the sample that includes the sample number and the date and time of sample collection. Make sure the information on the label matches the chain-of-custody form.
3. Complete the chain-of-custody form. In addition to the information normally included, the form should include the following data: sample start and stop dates and times; initial and final air flow rates (or average flow rate); volume of air sampled; and sampling pump identification number.
4. Package the filter cassettes in a shipping box (such as a FedEx box). Use an appropriate packing material (such as bubble wrap) to separate the samples and prevent damage.
5. Place the chain-of-custody form within the box, seal the box, and apply custody seals if required. Filter cassette samples typically do not need to be cooled, but check the field sampling plan (FSP) or Quality Assurance Project Plan (QAPP) for project-specific requirements.

6. Ship the samples by a method that will meet the holding time.

Sorbent Tube Samples

1. Disconnect the sample tube from the air sampling pump and seal both ends of the tube with plastic caps.
2. Complete a sample label that includes the sample number and the date and time of sample collection. Make sure the information on the label matches the chain-of-custody form.
3. If the tube is small and the label cannot be attached to the tube, the tube can be placed in a small resealable plastic bag and the label can be attached to the bag or placed inside the bag with the tube.
4. Complete the chain-of-custody form. In addition to the information normally included, the form should include the following data: sample start and stop dates and times; initial and final air flow rates (or average flow rate); volume of air sampled; and sampling pump identification number.
5. Packaging requirements for the sample tubes will depend on the analysis required, and the sampler should check the FSP or QAPP for project-specific requirements (for example, tubes may need to be wrapped in aluminum foil to prevent exposure to light). Packaging containers and methods include (1) shipping boxes (as described under filter cassette samples), (2) small sample coolers filled with double-bagged ice, and (3) small sample coolers filled with blue (reusable) ice.
6. Place the chain-of-custody form within the box or container, seal the box or container, and apply a custody seal if required.
7. If coolers are used for shipping, tape instructions for returning the cooler to the inside of the lid.
8. Ship the samples by a method that will meet the holding time.

Polyurethane Foam (PUF) Tube Samples

1. Disconnect the PUF tube from the air sampling pump and wrap the tube in aluminum foil.
2. Attach a label to the wrapped sample tube that includes the sample number and the date and time of sample collection. Make sure the information on the label matches the chain-of-custody form.
3. Wrap the PUF tube in bubble wrap and place the tube in a glass shipping jar.
4. Complete the chain-of-custody form. In addition to the information normally included, the form should include the following data: sample start and stop dates and times; initial and final air flow rates (or average flow rate); volume of air sampled; and sampling pump identification number.
5. Package the PUF tube jars in a cooler that is filled with double-bagged ice. Use bubble wrap or other cushioning material to separate the samples and prevent breakage.
6. Place the chain-of-custody form within the cooler, seal the cooler, and apply a custody seal if required.
7. If coolers are used for shipping, tape instructions for returning the cooler to the inside of the lid.
8. Ship the samples by a method that will meet the holding time. Samples collected in PUF tubes typically must be extracted within 7 days of collection.

2.2 SHIPPING DOCUMENTATION FOR SAMPLES

Airbills, chain-of-custody forms, and custody seals must be completed for each shipment of nonhazardous environmental samples.

Field staff collecting samples should also review their field work plans to confirm what documentation must be completed during each sampling event, including client-specific requirements. For example, some EPA programs have a specific requirement to use Scribe software, an environmental data management system, to create sample documentation, electronically input information into Traffic Report or chain-of-custody forms, and enter other data.

- The Scribe software can be accessed from the EPA Environmental Response Team (ERT) at the following address: http://www.ertsupport.org/scribe_home.htm
- The ERT User Manual for Scribe, reference, and training materials can be accessed from the Scribe Support Web site at the following address: <http://www.epaosc.org/scribe>

Note that some laboratories must routinely return sample shipping coolers within 14 calendar days after the shipment has been received. Therefore, the sampler should also include instructions for returning the cooler with each shipment, when possible. The sampler (not the laboratory) is responsible for paying for return of the cooler and should include shipping airbills bearing the sampler's shipping account number, as well as a return address to allow for return of the cooler. Samplers should use the least expensive option possible for returning coolers.

2.3 SHIPMENT DELIVERY AND NOTIFICATION

A member of the field sampling team must contact the laboratory to confirm it accepts deliveries on any given day, especially Saturdays. In addition, samplers should ensure the laboratory has been notified in advance of the pending shipment and notify any additional parties as required. The sampler needs to know the laboratory's contact name, address, and telephone number and be aware of the laboratory's requirements for receiving samples.

In addition, samplers should be aware of the sample holding times, shipping company's hours of operation, shipping schedule, and pick-up and drop-off requirements to avoid delays in analytical testing.

Priority Overnight Delivery

Priority overnight delivery is typically the best method for shipment. Delays caused by longer shipment times may cause the sample temperature to rise above the acceptable range of 4° C ($\pm 2^\circ$ C) and technical holding time may expire, which in turn may compromise sample integrity and require recollection of

samples. If sample delivery procedures are to be modified for particular contract- or laboratory-specific requirements, the procedures should be clearly described in site-specific plans such as work plans, FSPs, or QAPPs.

Saturday Delivery

If planning to ship samples for Saturday delivery, the laboratory must be contacted in advance to confirm it will accept deliveries on Saturdays or arrange for them to be accepted. In addition, samplers should ensure the laboratory has been notified in advance of the pending shipment and notify any additional parties as required.

2.4 HEALTH AND SAFETY CONSIDERATIONS

In addition to the procedures outlined in this SOP, all field staff must be aware of and follow the health and safety practices that result from the Activity Hazard Analyses (AHA) for the project. The AHAs include critical safety procedures, required controls, and minimum personal protective equipment necessary to address potential hazards. The hazards specific to project tasks must be identified and controlled to the extent practicable and communicated to all project personnel via the approved, project-specific health and safety plan (HASP).

3.0 POTENTIAL PROBLEMS

The following potential problems may occur during sample shipment:

- Leaking package. If a package leaks (either from broken sample containers or melting ice), the carrier may open the package and return the package. Special care should be taken during sample packaging to minimize potential leaks.
- Improper labeling and marking of package. If mistakes are made in labeling and marking the package, the carrier will most likely notice the mistakes and return the package to the shipper, thus delaying sample shipment. A good practice is to have labels, forms, and container markings double checked by a member of the field team.
- Bulk samples and air samples delivered to the analytical laboratory in the same container. If samples are combined in this way, they will be rejected. Always ship bulk samples in separate containers from air samples.
- Issues in packing asbestos samples. When asbestos samples are shipped, avoid using expanded polystyrene because of its static charge potential. Also avoid using particle-based packaging materials with asbestos samples because of possible contamination.
- Improper, misspelled, or missing information on the shipper's declaration. The carrier will most likely notice these errors as well and return the package to the shipper. A good practice is to have another field team member double check this information.
- Missed drop off time or wrong location. Missing the drop off time or having the wrong location identified for drop off will delay delivery to the laboratory and may cause technical holding times to expire. Establish the time requirements in advance of completing the field effort and be sure and provide some contingency time for potential delays such as traffic or checking and redoing paperwork.
- Incorrectly packaging samples for analysis at multiple laboratories. For example, inorganic samples may be shipped to one laboratory for analysis, while organic samples may need to be shipped to another laboratory. All field staff should be aware which samples are to be shipped to which laboratory when they package samples for multiple types of analysis.
- Holidays or weather-related delays. Be aware of holidays and weather forecasts that could cause delays in delivery. Delays caused by longer shipping times may cause technical holding times to expire, which in turn may compromise sample integrity or require recollection of samples.
- Not noting field variances in field logbook. Field variances should be noted in the field logbook and the project manager notified. Common field variances include:
 - Less sample volume collected than planned. Notify appropriate staff and the laboratory to ensure there is an adequate amount for analysis.
 - Sample collected into incorrect jar because of broken or missing bottle-ware. Notify appropriate laboratory staff to ensure there is no confusion regarding the analysis of the sample.

FIGURE 1

EXAMPLE OF A FEDEX US AIRBILL FOR LOW-LEVEL ENVIRONMENTAL SAMPLES

FedEx Package US Airbill

1 **From** Please print and press hard.
 Date: 3/1/20
 Sender's FedEx Account Number: 1234 5678 9010
 Sender's Name: Tyler Hanlon
 Phone: 662 | 555-1812
 Company:
 Address: 1234 Main Street
 City: Phoenix State: AZ ZIP: 85034

2 **Your Internal Billing Reference**
 FedEx customers will appear as follows:

3 **To**
 Recipient's Name: Liam Riley
 Phone: 405 | 555-8300
 Company: Ridgeway Design
 Address: 2020 Vision Street
 City: Atlanta State: GA ZIP: 30305

4 **Express Package Service** *To most locations.
 Packages up to 150 lbs.
 As packages over 150 lbs., use the FedEx Express Freight Airbill.

5 **Packaging** *Declared value limit \$500.
 FedEx Envelope* FedEx Flat* FedEx Box* FedEx Tube* ☒ Other

6 **Special Handling and Delivery Signature Options** *You may apply for the FedEx Signature Guarantee.
 Saturday Delivery: ☐ ☒ No Signature Required: ☐ ☒ Direct Signature: ☐ Indirect Signature: ☐
 Does this shipment contain dangerous goods? ☒ No ☐ Yes ☐ Yes (check box for description of dangerous goods)
 7 **Payment** Bill to: ☒ Sender ☐ Recipient ☐ Third Party
 Total Packages: 1 Total Weight: 1 Total Declared Value: 450
 Tracking Number: 644

Filling Out the FedEx US Airbill

- The sender *must complete* the following fields on the pre-printed airbill:
 - Section 1: Date
 - Section 1: Sender's FedEx Account Number (available from your office administrator)
 - Section 1: Sender's Name, Company, Address, and Phone Number
 - Section 2: Internal Billing Reference (Project Number) (this field may not be present on newer airbills)
 - Section 3: Recipient's Name, Company, Address, and Phone Number
 - Section 4: Express Package or Freight Services (Priority Overnight)
 - Section 5: Packaging (usually "Other," your own packaging)
 - Section 6: Special Handling (Saturday delivery if prearranged with receiving laboratory; "No" dangerous goods contained in shipment)
 - Section 7: Payment ("Bill to Sender")
 - Section 7: Total Number of Packages
 - Section 7: Total Weight (completed by FedEx employee)
 - Section 8: Delivery Signature Options ("No Signature Required")

Completing a Sample Chain-of-Custody Form (See Also Section 2.2 on SCRIBE for Forms)

After samples have been collected, they will be maintained under chain-of-custody procedures. These procedures are used to document the transfer of custody of the samples from the field to the designated

analytical laboratory. The same chain-of-custody procedures will be used for the transfer of samples from one laboratory to another, if required.

The field sampling personnel will complete a Chain-of-Custody and Request for Analysis (CC/RA) form for each separate container of samples to be shipped or delivered to the laboratory for chemical or physical (geotechnical) analysis. These forms are often triplicate, carbonless forms. Care should be taken when completing the form that all copies are legible—PRESS FIRMLY WHEN WRITING. Information on the form will include:

1. Project identification (ID) (for example, contract and task order number);
2. Project Contract Task Order (CTO) number;
3. Laboratory Project Order (PO) number;
4. Tetra Tech Technical Contact;
5. Tetra Tech Project Manager;
6. Laboratory name;
7. Field sampler names;
8. Field sampler signature;
9. Sample ID;
10. Date and time of sampling;
11. Sample matrix type;
12. Sample preservation method; note “NONE” if no preservatives;
13. Number and types of containers per sample;
14. Sample hazards (if any);
15. Requested analysis;
16. Requested sample turnaround time or any special remarks (for example, possible presence of free product or high screening concentrations);
17. Page __ of __;
18. Method of shipment;
19. Carrier/waybill number (if any);
20. Signature, name, and company of the person relinquishing the samples and the person receiving the samples when custody is transferred;

21. Date and time of sample custody transfer;
22. Condition of samples when they are received by the laboratory.

The sample collector will cross out any blank space on the CC/RA form below the last sample number listed on the part of the form where samples are listed.

The sampling personnel whose signature appears on the CC/RA form is responsible for the custody of a sample from time the sample is collected until the custody of the sample is transferred to a designated laboratory, a courier, or to another Tetra Tech employee for transporting a sample to the designated laboratory. A sample is considered to be in custody when the custodian: (1) has direct possession of it; (2) has plain view of it; or (3) has securely locked it in a restricted access area.

Custody is transferred when both parties to the transfer complete the portion of the CC/RA form under “Relinquished by” and “Received by” or a sample is left at a FedEx facility pending shipment. Signatures, printed names, company names, and date and time of custody transfer are required. When custody is transferred, the Tetra Tech sampling personnel who relinquished the samples will retain the third sheet (pink copy) of the CC/RA form. When the samples are shipped by a common carrier, a Bill of Lading supplied by the carrier will be used to document the sample custody, and its identification number will be entered on the CC/RA form. Receipts of Bills of Lading will be retained as part of the permanent documentation in the Tetra Tech project file.

FIGURE 2

EXAMPLE OF A CHAIN-OF-CUSTODY FORM (WHITE COPY)



Tetra Tech EM Inc.
 Oakland Office
 1999 Harrison Street, Suite 500
 Oakland, CA 94612
 510.302.6300 Phone
 510.433.0830 Fax

Chain of Custody Record No. 9814 13G175 Page 1 of 1

Lab PO#: <u>130AK 27</u>		Lab: <u>EMAX</u>		No./Container Types		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="10">Preservative Added</th> </tr> <tr> <td><u>NONE</u></td><td><u>NONE</u></td><td><u>NONE</u></td><td><u>NONE</u></td><td><u>NONE</u></td><td><u>NONE</u></td><td><u>NONE</u></td><td><u>NONE</u></td><td><u>NONE</u></td><td><u>NONE</u></td> </tr> </table>										Preservative Added										<u>NONE</u>	<u>NONE</u>	<u>NONE</u>	<u>NONE</u>	<u>NONE</u>	<u>NONE</u>	<u>NONE</u>	<u>NONE</u>	<u>NONE</u>	<u>NONE</u>
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Project name: <u>Concord RA RW1</u>		TEMI technical contact: <u>Sara Woolley</u>		Field samplers: <u>Sandy Jack</u> <u>Rebecca Johnson</u>		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="10">Analysis Required</th> </tr> <tr> <td>☐</td><td>☐</td><td>☐</td><td>☐</td><td>☐</td><td>☐</td><td>☐</td><td>☐</td><td>☐</td><td>☐</td> </tr> </table>										Analysis Required										☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
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Project (CTO) number: <u>1036H59029</u>		TEMI project manager: <u>Steve DeHonne</u>		Field samplers' signatures: <u>[Signature]</u> <u>[Signature]</u>																															
Sample ID	Point ID/Depth	Date	Time	Matrix	MS / MSD	40 ml VOA	1 liter Amber	500 ml Poly	Sieve	Glass Jar	250 ml Poly	Encore	VOA	SVOA	Pest	Metals	TPH Purgeables	TPH Extractables	PCB																
1 0295RE SSØ1		7/22/13	1240	Soil						2			X	X	X	X	X	X																	
2 0295RE SSØ2		7/22/13	1245	I						2			X	X	X	X	X	X																	
3 0295C3 DSSØ1		7/24/13	1208								1			X	X	X	X	X																	
4 029C3D SSØ2			1215								1			X	X	X	X	X																	
5 029C3D SSØ3			1230								1			X	X	X	X	X																	
6 029C3D SSØ4			1245							1			X	X	X	X	X	X																	

Relinquished by:	Name (print)	Company Name	Date	Time
<u>[Signature]</u>	<u>Rebecca Johnson</u>	<u>Tetra Tech</u>	<u>7/20/13</u>	<u>1630</u>
<u>[Signature]</u>	<u>Rebecca Johnson</u>	<u>EMAX</u>	<u>7/30/13</u>	<u>0930</u>
Relinquished by:				
Received by:				
Relinquished by:				
Received by:				

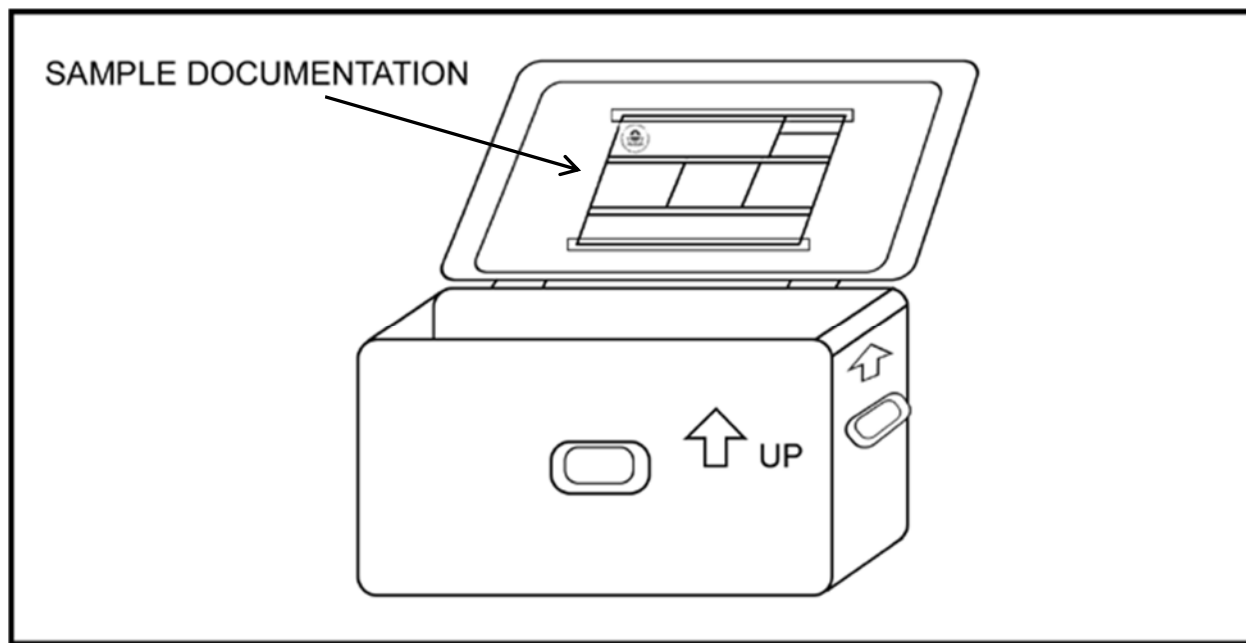
Turnaround time/remarks: Standard TAT Temp - 20°C

Priority: SVOCs, TPH-e on 029C3DSSØ1 → Ø4 then metals

Fed Ex #: 8612 4667 7215

FIGURE 3

EXAMPLE OF A SAMPLE COOLER WITH ATTACHED DOCUMENTATION



Source: U.S. Environmental Protection Agency. 2014.

Place the necessary paperwork (chain-of-custody form, cooler return instructions, and associated paperwork) in the shipping cooler or acceptable container. All paperwork must be placed in a plastic bag or pouch and then secured to the underside of the shipping container lid.

FIGURE 4

EXAMPLE OF A CUSTODY SEAL

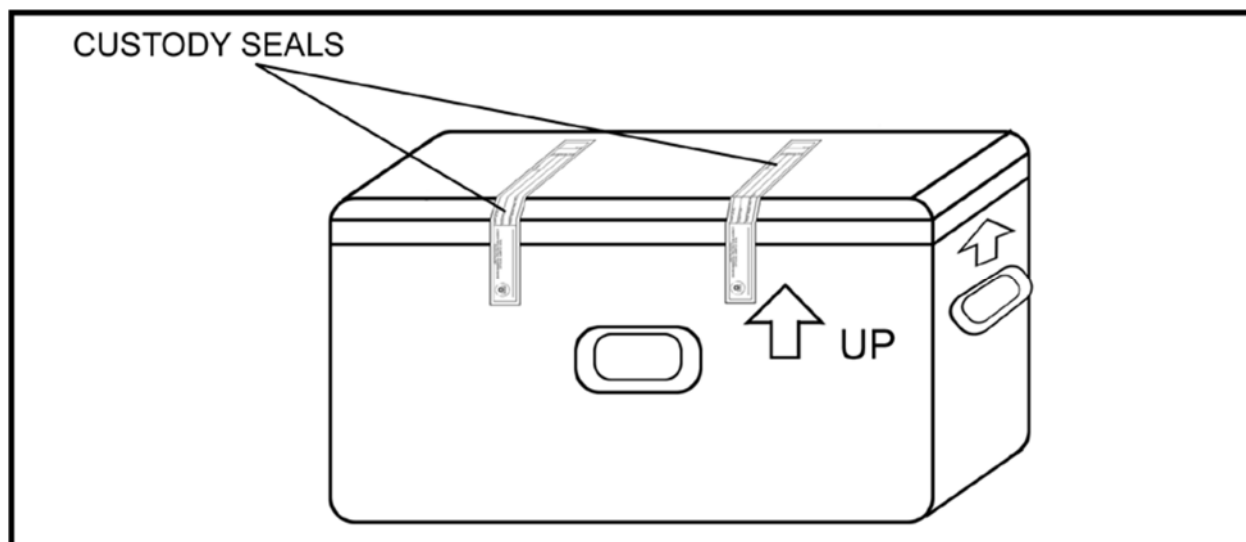
Custody Seal

DATE

SIGNATURE

FIGURE 5

EXAMPLE OF SHIPPING COOLER WITH CUSTODY SEALS



Source: U.S. Environmental Protection Agency. 2014.

Please note that the two seals typically are affixed to opposite sides of the cooler and offset from each other, although the offset is not depicted on the EPA figure above.

SOP APPROVAL FORM

TETRA TECH, INC.

EMI OPERATING UNIT

ENVIRONMENTAL STANDARD OPERATING PROCEDURE

RECORDING NOTES IN FIELD LOGBOOKS

SOP NO. 024

REVISION NO. 3

Last Reviewed: July 2020



Quality Assurance Approved

July 2, 2020

Date

1.0 BACKGROUND

Complete and accurate field documentation is critical to a successful project and the field logbook is an important tool to support field documentation needs. The field logbook should include detailed records of all field activities, document interviews with people, and record observations of conditions at a site. Entries should be described in a level of detail to allow personnel to reconstruct, after the fact, activities and events that occurred during their field assignments. Furthermore, entries should be limited to facts. Avoid speculation related to field events and do not record hearsay or unfounded information that may be presented by other parties during field activities. For example, do not record theories regarding the presence or absence of contamination when you are collecting field screening data or speculation regarding the reasons for a property owner's refusal to grant access for sampling.

Field logbooks are considered accountable documents in enforcement proceedings and may be subject to review. Therefore, the entries in the logbook must be accurate and detailed, but should not contain speculative information that could conflict with information presented in subsequent project deliverables and correspondence. Also be aware that the field logbooks for a site may be a primary source of information for depositions and other legal proceedings that may occur months or years after field work is complete and long after our memories have faded. The accuracy, neatness, and completeness of field logbooks are essential for recreating a meaningful account of events.

Field notes may also be recorded digitally, using a variety of software programs. The requirements and use of digital recording programs is not addressed in this standard operating procedure (SOP) because many items are unique to the selected software system. However, many of the principles discussed in this SOP will apply to the digital recording of field notes.

1.1 PURPOSE

The purpose of this SOP is to provide guidance to ensure that field logbook documentation collected during field activities meets all requirements for its later use. Among other things, field logbooks may be used for:

- Identifying, locating, labeling, and tracking samples
- Recording site activities and the whereabouts of field personnel throughout the day
- Documenting any deviations from the project approach, work plans, quality assurance project plans, health and safety plans, sampling plans, and any changes in project personnel
- Recording arrival and departure times for field personnel each morning and evening and weather conditions each day

- Describing photographs taken during the project.

In addition, the data recorded in the field logbook may later assist in the interpretation of analytical results. A complete and accurate logbook also aids in maintaining quality control, because it can verify adherence to project scope and requirements.

1.2 SCOPE

This SOP establishes the general requirements and procedures for documenting site activities in the field logbook.

1.3 DEFINITIONS

None.

1.4 REFERENCES

Compton, R.R. 1985. *Geology in the Field*. John Wiley and Sons. New York, NY.

1.5 REQUIREMENTS AND RESOURCES

The following items are required for field notation:

- Bound (sewn) notebooks
- Ballpoint pens or Sharpies with permanent waterproof ink
- 6-inch ruler (optional)

Field logbooks should be bound (sewn) with water-resistant and acid-proof covers, and each page should have preprinted lines or grids and numbered pages. They should be approximately 7¹/₂ by 4¹/₂ inches or 8¹/₂ by 11 inches in size. Loose-leaf sheets are not acceptable for use as a field logbook, although logs and field forms used to record field measurements and data are acceptable as loose-leaf sheets maintained in a three-ring binder with numbered pages, as a supplement to the logbook. If notes are written on loose paper, they must be transcribed as soon as possible into a bound field logbook by the same person who recorded the notes originally.

Ideally, distribution of logbooks should be controlled by a designated person in each office. This person assigns a document control number to each logbook, and records the assignment of each logbook distributed (name of person, date distributed, and project number). The purpose of this procedure is to ensure the integrity of the logbook before its use in the field, and to document each logbook assigned to a

project. In the event that more than one logbook is assigned to a project, this process will ensure that all logbooks are accounted for at project closeout.

2.0 PROCEDURES

The following subsections provide general guidelines and formatting requirements for field logbooks, and detailed procedures for completing field logbooks.

2.1 GENERAL GUIDELINES

- A separate field logbook must be maintained for each project. If a site consists of multiple subsites (or operable units), designate a separate field logbook for each subsite. Similarly, if multiple activities are occurring simultaneously requiring more than one task leader (for example, well installation, private well sampling, or geophysical survey), each task leader should maintain a separate field logbook to ensure that each activity is documented in sufficient detail.
- At larger sites, a general field log may be kept at the site trailer or designated field office to track site visitors, document daily safety meetings, and record overall site issues or occurrences.
- Data from multiple subsites may be entered into one logbook that contains only one type of information for special tasks, such as periodic well water-level measurements.
- All logbooks must be bound and contain consecutively numbered pages. If the pages are not pre-numbered, the sequential page number should be written at the top of each page.
- No pages can be removed from the logbook for any purpose.
- All information must be entered using permanent, waterproof ink, either a traditional ballpoint pen or a permanent marker. Do not use pens with water-based ink (typically identified as rollerball or gel ink pens) because the ink may wash out if the paper gets wet. Pencils are not permissible for field notes because information can be erased. The entries should be written dark enough so that the logbook can be easily photocopied.
- Be sure that all entries are legible. Use print rather than cursive writing and keep the logbook pages free of dirt and moisture to the extent possible.
- Set apart critical information such as sample numbers by circling or drawing a box around the critical data.
- Do not enter information in the logbook that is not related to the project. The language used in the logbook should be factual and objective. Avoid speculation that could conflict with information presented in subsequent project deliverables and correspondence (see Section 1.0 above).
- Use military time, unless otherwise specified by the client. If a logbook entry is not related to a specific event, set it aside with the identification as a "NOTE."
- Include site sketches, as appropriate.
- Begin a new page for each day's notes.
- Include the date, project number, and location (if the project has multiple locations) at the top of each page.

- At the end of a day, draw a single diagonal line through any unused lines on the page, and sign at the bottom of the page. Note and implement any client-specific requirements (for example, some clients require each logbook page to be signed).
- Write notes on every line of the logbook. Do not skip any pages or parts of pages unless a day's activity ends in the middle of a page.
- If a line is left blank for some reason, cross it out (with a single line) and initial to prevent unauthorized entries.
- Cross out (with a single line) and initial any edits to the logbook entries. Note and implement any client-specific requirements (for example, some clients also require that edits be dated). Edits should only be made if the initial entry is illegible or erroneous. Do not make corrections for grammar or style.

2.2 LOGBOOK FORMAT

The layout and organization of each field logbook should be consistent and generally follow the format guidelines presented below. Some clients or contracts may have specific formatting guidelines that differ somewhat from this SOP; review client requirements at the start of the project to help ensure any client-specific guidelines are integrated.

2.2.1 Logbook Cover

Spaces are usually provided on the inside front cover (or the opening page in some logbooks) for the company name, address, contact names, and telephone numbers. If preprinted spaces for this information are not provided in the logbook, write the information on the first available page. Information to be included on the inside front cover or first page includes:

- Logbook document control number (assigned by issuer)
- "Book # of #" (determined by the project manager if there is more than one logbook for the project)
- Contract and task order numbers
- Name of the site and site location (city and state)
- Name of subsite (or operable unit), if applicable
- Type of activity, if the logbook is for a specific activity, such as well installation or indoor air sampling
- Beginning and ending dates of activities entered into the logbook

2.2.2 Inside Cover or First Page

Spaces are usually provided on the inside front cover (or the opening page in some logbooks) for the company name, address, contact names, and telephone numbers. If preprinted spaces for this information are not provided in the logbook, write the information on the first available page. Information to be included on the inside front cover or first page includes:

- Tetra Tech project manager and site manager names and telephone numbers
- Tetra Tech office address
- Client contact and telephone number
- Site safety officer and telephone number
- Emergency contact telephone number (911, if applicable, or nearest hospital)
- Subcontractor contacts and telephone numbers
- Site property owner or property manager contact information

Note—some clients prohibit the inclusion of personally identifiable information such as personal mobile telephone numbers on official project records.

2.3 ENTERING INFORMATION IN THE LOGBOOK

The following lists provide guidance on the types of information to be included in a typical field logbook. This guidance is general and is not intended to be all-inclusive. Certain projects or clients may specify logbook requirements that are beyond the elements presented in this SOP.

2.3.1 General Daily Entries

- Document what time field personnel depart the Tetra Tech office and arrive at the hotel or site. If permitted by the client to charge travel time for site work, document what time personnel leave and arrive at the hotel each day. (This information may be needed at remote sites where hotel accommodations are not near the site.)
- Indicate when all subcontractors arrive and depart the site.
- Note weather conditions at the time of arrival on site and any changes to the weather that might affect completion of project tasks during the day.
- Include the date and project number at the top of each page.
- Document that a site safety meeting was held and include the basic contents of the meeting.
- List the level of personal protection to be used for health and safety.

- Summarize the day's planned activities.
- Summarize which activities each field team member will be doing.

2.3.2 Field Activity Entries

- Refer to field data collection forms for details about field data collection activities (for example time, date, depth of samples, and field measurements). If separate field sampling sheets are not used, see Section 2.3.3 regarding logbook entries for sampling activities.
- Refer to well purge forms, well construction logs, and other activity-specific forms as applicable rather than including this type of information in the field logbook. These other forms allow the information to be more accessible at a later date.
- List any air monitoring instrumentation used, with readings and locations.
- Refer to instrument field logs for equipment calibration information.
- Summarize pertinent conversations with site visitors (agency representatives, property owners, client contacts, and local citizens).
- Summarize any problems or deviations from the quality assurance project plan (QAPP) or field sampling plan.
- Document the activities and whereabouts of each team member. (As indicated in Section 2.1, multiple logbooks may be required to ensure sufficient detail for contemporaneous activities).
- Indicate when utility clearances are completed, including which companies participated.
- Indicate when verbal access to a property is obtained.
- Include names, addresses, and telephone numbers of any pertinent site contacts, property owners, and any other relevant personnel.
- Document when lunch breaks or other work stoppages occur.
- Include approximate scale for all diagrams. If a scale is not available, write "not to scale" on the diagram. Indicate the north direction on all maps and cross-sections, and label features on each diagram.

2.3.3 Sampling Activity Entries

The following information should typically be on a sample collection log and referenced in the logbook. If the project does not use sample sheets as a result of project-specific requirements, this information should be included in the logbook.

- Location description
- Names of samplers
- Collection time

- Designation of sample as a grab or composite sample
- Identification of blind duplicates or split samples
- Type of sample (water, sediment, soil gas, or other medium)
- On-site measurement data (such as pH, temperature, and specific conductivity)
- Field observations (odors, colors, weather)
- Preliminary sample description
- Type of preservative used
- Instrument readings, if applicable

2.3.4 Closing Daily Entries

- Describe decontamination procedures (personnel and equipment).
- Describe handling and disposition of any investigation-derived wastes.
- Summarize which planned activities were completed and which ones were not.
- Note the times that personnel depart the site for the day.
- Summarize any activities conducted after departing the site (paperwork, sample packaging, etc.). This may be required to document billable time incurred after field activities were completed for the day.

2.3.5 Photographic Log Entries

- Before using a digital camera, ensure that the system date and time are correct. Verify whether the timestamp is being recorded on the image, if required.
- Indicate in the text that photographs were taken and the location where the photographs can be found (for example, in the project file) and identify the photographer.
- Begin a new photolog page for each new field day.
- Record the time of photograph so that the image can be generally identified when reviewing the digital files.
- Note the direction in which the photograph was taken, along with any relevant details that might not be understood when looking at the photograph.
- In the event that a film camera is used, the sequential number of the image should also be recorded, and the time from the logbook will be the recorded time for the photograph.

2.4 LOGBOOK STORAGE

Custody of logbooks must be maintained at all times. During field activities, field personnel must keep the logbooks in a secure place (locked car, trailer, or field office) when the logbook is not in personal possession. When the field work is over, the logbook should be included in the project file, which should be in a secured file cabinet; in addition, if directed by the project manager, scan logbook pages for electronic file management upon returning to the office. The logbook may be referenced in preparing subsequent reports and scanned logbook pages may be included as an appendix to a report. However, it is advisable to obtain direction directly from the client before including the logbook as a report appendix, because its inclusion may not be appropriate in all cases.

2.5 HEALTH AND SAFETY CONSIDERATIONS

In addition to the procedures outlined in this SOP, all field staff must be aware of and follow the health and safety practices that result from the Activity Hazard Analyses (AHA) for a project. The AHAs include critical safety procedures, required controls, and minimum personal protective equipment necessary to address potential hazards. The hazards specific to project tasks must be identified and controlled to the extent practicable and communicated to all project personnel via the approved, project-specific health and safety plan.

SOP APPROVAL FORM

TETRA TECH, INC.

EMI OPERATING UNIT

ENVIRONMENTAL STANDARD OPERATING PROCEDURE

ACTIVE SUBSURFACE GAS SAMPLING

SOP NO. 074

REVISION NO. 4

Last Reviewed:



Quality Assurance Approved

November 2021

Date

1.0 BACKGROUND

This standard operating procedure (SOP) addresses active subsurface gas sampling. It addresses: (1) installing soil gas and sub-slab gas probes, (2) evaluating the integrity of the probes, (3) collecting environmental samples, and (4) decommissioning the probes. The focus of the SOP is (1) soil gas probe installation using a manual slide hammer, rotary hammer drill, direct-push drill rig, or hollow-stem auger drill rig, (2) sub-slab gas probe installation, and (3) active soil gas and sub-slab gas sampling using Tedlar bags, syringes, stainless-steel SUMMA canisters, filter cartridges, and sorbent tubes. As with all SOPs, users should be aware of any client-, state-, or location-specific requirements related to collecting subsurface gas samples.

1.1 PURPOSE

The purpose of this SOP is to provide guidance for soil gas and sub-slab gas sampling from the installation of the probes through leak detection, purging, sampling, and decommissioning.

1.2 SCOPE

This SOP applies to all personnel collecting soil gas and sub-slab gas samples. Site-specific planning documents (for example, a health and safety plan, a quality assurance project plan [QAPP], and a field sampling plan [FSP] or sampling and analysis plan [SAP]) should be followed during soil gas and sub-slab gas sampling activities.

1.3 DEFINITIONS

Grout: Hydrated bentonite or bentonite/cement mixture used as a seal.

Sampling train: The tubing and all connections from the ground surface to, or including, the sample container or sampling media.

Soil gas: The gases or atmosphere filling the void spaces in soil and unconsolidated sediment. The soil gas composition may include components of natural origin with or without detectable quantities of contaminants or byproducts from human activity.

Sub-slab gas sampling: The collection of vapor from the zone just beneath the lowest floor slab of a building (that is, the slab that rests directly on the ground, regardless of whether the slab is at the ground surface of the surrounding area or below grade).

SUMMA canister: A stainless-steel canister that is treated to render the interior surface nearly chemically inert and non-reactive. The SUMMA canister is prepared for sampling by evacuating its contents to vacuum; the canister uses negative pressure to collect a gas sample.

1.4 REFERENCES

This section cites references used to support this SOP. On-line addresses are those active at the time this SOP was prepared.

- ASTM International (ASTM). 2012. ASTM Standard D7663-12, “Standard Practice for Active Soil Gas Sampling in the Vadose Zone for Vapor Intrusion Evaluations.” ASTM International, West Conshohocken, PA. Reapproved 2018. DOI: 10.1520/D7663-12R18E01.
- ASTM. 2018. ASTM Standard D7648/D7648M-18, “Standard Practice for Active Soil Gas Sampling for Direct Push or Manual-Driven Hand-Sampling Equipment.” ASTM International, West Conshohocken, PA. DOI: 10.1520/D7648_D7648M-18.
- California Environmental Protection Agency, Department of Toxic Substances Control (DTSC). 2012. “Advisory – Active Soil Gas Investigations.” April.
- DTSC. 2015. “Advisory – Active Soil Gas Investigations.” Final. July. On-line address: https://dtsc.ca.gov/wp-content/uploads/sites/31/2018/01/VI_ActiveSoilGasAdvisory_FINAL.pdf
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1.5 REQUIREMENTS AND RESOURCES

This section describes equipment and resource needs for installing soil gas and sub-slab gas probes, performing leak tests, purging probes, and collecting samples.

1.5.1 General Field Equipment

The following general equipment may be required for field procedures related to soil gas and sub-slab gas sampling:

- Logbook, field data sheets (see Figures 1, 2, and 3 for example field data sheets), or electronic recording devices (tablet, smartphone, computer, etc.)
- Digital camera
- Global Positioning System recording device with sub-meter accuracy
- Gloves
- Photoionization detector (PID), flame ionization detector (FID), or multiple-gas meter (if required by the site-specific FSP, SAP, or QAPP)
- Health and safety equipment indicated in the site-specific health and safety plan

1.5.2 Installation of Soil Gas Probes

Soil gas probe locations may be advanced to the proposed depth using a manual slide hammer, rotary hammer drill, direct-push equipment, or hollow-stem auger. Once the borehole is advanced to the proposed depth, additional equipment is used to complete installation of the soil gas probe. The following equipment may be included to accomplish these procedures:

- Manual slide hammer, rotary hammer drill, direct-push equipment, or hollow-stem auger
- Post-run tubing system (probe rod, threaded tubing adapter, expendable drive point holder, and expendable drive point)
- Soil gas implant system (probe rod, vapor sampling implant, expendable drive point holder, and expendable implant anchor)
- Inert tubing for gas sampling (made of nylon, polyether ether ketone [PEEK], Teflon, or other material, depending on the chemical of concern), with dimensions of ¼-inch outer diameter (OD) by 3/16-inch inner diameter (ID), or smaller; small lengths of silicone (¼-inch ID) or other flexible tubing may be used to complete connections to barbed fittings or other non-compression fittings
- Unions, tees, two-way and three-way valves or stopcocks, nuts, ferrules, and caps to connect tubing, as either compression fittings (for example, Swagelok), Luer fittings, quick-connecting fittings, hose barbs, or other means. NOTE: Each laboratory has its own type of fittings and connections.
- Wrenches to accommodate compression fittings, typically in the range ½-inch to 9/16-inch
- Sharp blade for cutting tubing
- Tape measure (length depends on potential sampling depths)
- Clean sand or glass beads
- Dry granular bentonite
- High-purity water for bentonite hydration
- Cement or concrete mix (for permanent installations)
- Well protective box or casing (for permanent installations)
- Protective bumpers or bollards surrounding probe (optional)

1.5.3 Installation of Sub-Slab Gas Probes

Two methods may be used when installing sub-slab gas probes: (1) permanent probe or (2) Vapor Pin. Equipment needed for each method is identified in the following subsections.

1.5.3.1 Permanent Sub-Slab Gas Probe

A permanent sub-slab gas probe typically uses a stainless-steel tube connected to stainless-steel or brass compression fittings (for example, Swagelok) (see Figure 4). Push-to-connect fittings (for example, Alpha fittings) can also be used (provided they are constructed of inert materials and do not contain greases or oils that may contact the soil gas sample). As needed, performance testing should be

conducted using equipment blank samples or absorption studies to verify materials do not introduce a positive or negative bias to measured concentrations. The probe is then placed through a vacant hole in the concrete slab and cemented in place. The following equipment may be used to install permanent sub-slab gas probes:

- Hammer drill or rotary hammer drill
- 3/8-inch and 1-inch hammer drill bits
- Portable wet/dry vacuum cleaner with high-efficiency particulate air (HEPA) filter
- Stainless steel vapor implant screen, such as Geoprobe soil vapor implants, or AMS, Inc. gas vapor implants
- Tape measure
- Tube or pipe cutter
- 1/4-inch OD stainless-steel tubing, pre-cleaned, instrument grade
- Two 9/16-inch wrenches or equivalent adjustable wrenches
- 1/4-inch hex wrench
- Teflon thread tape
- Teflon washer ID 1/4-inch, OD 3/4-inch, or modeling clay
- Disposable cup (less than 12-ounce); quick-setting cement; tap water; and mixing implement (that is, plastic fork, popsicle stick, or similar)
- Whenever possible, a valve should be installed on the top of the vapor implant to allow measurement of soil gas pressure with a digital manometer.

1.5.3.2 Vapor Pin

An alternative method for sub-slab gas probe installation uses a stainless-steel or brass barbed probe fitted with a silicon sleeve. The most-common of these is the Vapor Pin (<https://www.vaporpin.com/>). Other acceptable brands of similar sub-slab probes with a similar configuration are available; this SOP, however, will specifically address Vapor Pin installation.

The probe is placed in a vacant hole in the concrete slab and sealed using a silicon sleeve surrounding the probe (see Figure 5). The following equipment may be used to install the Vapor Pin.

- Hammer drill or rotary hammer drill

- 5/8-inch and 1 1/2-inch hammer drill bits
- Portable wet/dry vacuum cleaner with HEPA filter
- Bottle brush
- Assembled Vapor Pin with silicon sleeve
- Vapor Pin protective cap
- Vapor Pin installation/extraction tool
- Dead blow hammer
- Vapor Pin flush-mounted cover (optional)
- Disposable cups (less than 12-ounce); mixing implement (that is, plastic fork, popsicle stick, or similar); quick setting cement; and tap water (for decommissioning)

1.5.4 Leak Tests

Four types of leak detection tests may be performed to evaluate the integrity of the soil gas or sub-slab gas probe: shut-in, shroud, laboratory leak tracer, and water dam (sub-slab gas probes only).

1.5.4.1 Shut-in Leak Detection Test

The following items are needed to conduct a leak detection test on the sampling train before collecting a soil gas sample.

- Desired sampling media (Tedlar bags, syringes, stainless-steel SUMMA canisters, filter cartridges, or sorbent tubes)
- Additional tubing and fittings (compression/Luer/quick-connect/hose barbs/other) (see Section 1.5.2)
- Shut-in test system:
 - 3-way stopcock valve with appropriate fitting connections
 - 2-way valve with appropriate fitting connections
 - Integrated vacuum (negative pressure to -15 inches mercury or -200 inches water) gauge connected to a tee or other appropriate fitting enabling it to be installed in line (see Figure 6)
- Graduated syringe, air sampling pump, or peristaltic pump
- Stopwatch
- Wrenches to connect and tighten fittings, in the range 9/16-inch to 1/2-inch

1.5.4.2 Shroud Leak Detection Test

The following items are needed to conduct a leak detection test on the soil gas or sub-slab gas probe and sampling train prior to collecting a soil gas sample.

- Desired sampling media (Tedlar bags, syringes, stainless-steel SUMMA canisters, filter cartridges, or sorbent tubes)
- 3-way stopcock valve with appropriate fitting connections
- Shroud (hard plastic box with three openings or a plastic bag) (See Figure 7)
- Draft guard with heavy beads (if using a plastic bag as shroud)
- Additional tubing and fittings (compression/Luer/quick-connect/hose barbs/other) (see Section 1.5.2)
- Wrenches to connect and tighten fittings, in the range 9/16-inch to ½-inch
- Tedlar bag in vacuum chamber with pump and calibrator for pump, or graduated syringe.
- Helium gas supply and helium detector

1.5.4.3 Laboratory Leak Tracer Detection Test

A laboratory leak tracer detection test is performed by spraying a cloth or other absorbent material with a volatile liquid leak detection compound (tracer) and sequentially positioning the cloth near each joint or connection in the sampling system while collecting an actual soil gas or sub-slab gas sample. Alternately, one may inject a volatile leak detection compound (liquid or gas tracer) into a shroud covering the entire sampling system while collecting an actual soil gas or sub-slab gas sample. The tracer compound is then analyzed along with other target compounds during laboratory analysis of the sample. A disadvantage of this leak detection procedure is that the presence or absence of a leak (and the degree of leakage, if any) is not determined until samples have already been collected and analyzed. The following items are needed to conduct this leak detection test on the soil gas or sub-slab gas probe and sampling train:

- Desired sampling media (Tedlar bags, syringes, stainless-steel SUMMA canisters, filter cartridges, or sorbent tubes)
- Tubing and fittings (compression/Luer/quick-connect/hose barbs/other) (see Section 1.5.2)
- Liquid leak detection compound (hexane, pentane, difluoroethane, or isopropanol) or gas leak detection compound contained within a supply container (helium or sulfur hexafluoride)
- Cloth or absorbent material for absorbing the liquid leak detection compound

- Shroud (hard plastic box with at least one injection port, or plastic bag)
- Draft guard with heavy beads (if using a plastic bag as shroud)

1.5.4.4 Water Dam Leak Detection Test

A water dam leak detection test may be used to evaluate whether a sub-slab gas probe is leaking at the surface seal and possibly at the first connection off the probe. The following items are used to conduct the water dam leak test:

- High-purity water (organic- and inorganic-free)
- Tubing and fittings (compression/Luer/quick-connect/hose barbs/other) (see Section 1.5.2)
- Short length (about 2 inches long) of 2-inch diameter polyvinyl chloride (PVC) pipe
- Water-insoluble modeling clay free of volatile organic compounds (VOC)
- Wet/dry vacuum

1.5.5 Soil Gas and Sub-Slab Gas Probe Purging

The following items are involved with purging a soil gas or sub-slab gas probe and sampling train following installation:

- Desired sampling media (Tedlar bags, syringes, stainless-steel SUMMA canisters, filter cartridges, or sorbent tubes)
- Additional tubing and fittings (compression/Luer/quick-connect/hose barbs/other) (see Section 1.5.2)
- A three-way stopcock valve with appropriate fitting connections (if not already installed when leak testing)
- Wrenches to connect and tighten fittings, in the range 9/16-inch to ½-inch
- Graduated syringe or air sampling pump with flow calibrator
- Photoionization detector (PID), flame ionization detector (FID), or multiple gas meter (if required by site-specific FSP, SAP, or QAPP)
- Stopwatch

1.5.6 Soil Gas and Sub-Slab Gas Sampling Media

This section covers soil gas and sub-slab gas sampling using Tedlar bags, syringes, SUMMA canisters or, sorbent tubes and filter cartridges.

1.5.6.1 Tedlar Bags

When using Tedlar bags to collect soil gas and sub-slab gas samples, the following items are needed:

- A port in the sampling train to which the Tedlar bag can be connected
- Wrenches to connect and tighten fittings, in the range 9/16-inch to 1/2-inch
- Additional tubing and fittings (compression/Luer/quick-connect/hose barbs/other) (see Section 1.5.2)
- Tedlar bags or equivalent with appropriate fittings
- Air pump capable of a flow of 200 milliliters per minute (mL/min)
- Flow rate calibrator (for example, Bios DryCal or equivalent)
- Vacuum chamber for collecting samples using Tedlar bags, with a viewing window for observing the Tedlar bag as it fills
- Sampling tee (stainless steel, Teflon, or equivalent) for collecting field duplicate samples. For stainless-steel tees, the following parts may be useful: Swagelok tee (SS-400-3-4TMT) stainless-steel Swagelok tube fitting, male run tee [1/4-inch tube OD x 1/4-inch male National Pipe Thread (NPT) x 1/4-inch tube OD] or SS-400-3 stainless-steel Swagelok tube fitting, union tee [1/4-inch tube OD]).
- Stopwatch or watch

1.5.6.2 Syringes

When using syringes to collect soil gas and sub-slab gas samples, the following items are needed:

- A port in the sampling train to which the syringe can be connected
- Wrenches to connect and tighten fittings, in the range 9/16-inch to 1/2-inch
- Additional tubing and fittings (compression/Luer/quick-connect/hose barbs/other) (see Section 1.5.2)
- Clean, graduated laboratory-prepared syringes
- A two-way stopcock valve with appropriate fitting connections
- Stopwatch or watch
- Aluminum foil

1.5.6.3 SUMMA Canisters

When using SUMMA canisters to collect soil gas and sub-slab gas samples, the following items are needed:

- A port in the sampling train to which the SUMMA canister can be connected
- Wrenches to connect and tighten fittings (in the range 9/16-inch to ½-inch)
- Additional tubing and fittings (compression/Luer/quick-connect/hose barbs/other) (see Section 1.5.2)
- A supply of clean, evacuated SUMMA canisters
- For SUMMA canisters, (1) a pressure gauge to verify internal pressure and (2) a flow controller (a combined flow controller/pressure gauge may also be used)
- Sampling tee (stainless steel, Teflon, or equivalent) for collecting field duplicate samples. The laboratory supplying the SUMMA canisters should supply these fittings.
- Stopwatch or watch

1.5.6.4 Sorbent Tubes and Filter Cartridges

When using sorbent tubes and filter cartridges to collect soil gas and sub-slab gas samples, the following items are needed:

- A port in the sampling train to which the sorbent tube or filter cartridge can be connected.
- Wrenches to connect and tighten fittings, in the range 9/16-inch to ½-inch
- Additional tubing and fittings (compression/Luer/quick-connect/hose barbs/other) (see Section 1.5.2)
- Sorbent tubes or filter cartridges for the appropriate target compounds
- Air pump capable of a flow of 200 mL/min
- Flow rate calibrator (for example, Bios DryCal or equivalent)
- Sampling tee (stainless steel, Teflon, or equivalent) for collecting field duplicate samples. For stainless-steel tees, the following parts may be useful: Swagelok tee (SS-400-3-4TMT) stainless-steel Swagelok tube fitting, male run tee [¼-inch tube OD x ¼-inch male NPT x ¼-inch tube OD] or SS-400-3 stainless-steel Swagelok tube fitting, union tee [¼-inch tube OD]).
- Stopwatch or watch
- Aluminum foil (for wrapping sorbent tubes or filter cartridges, as required for sample preparation)

2.0 PROCEDURES

This section describes selecting soil gas sampling locations, installing soil gas probes and sub-slab gas probes, and preparing the probes for sampling (including probe equilibration, leak testing, and purging). This section also provides procedures for collecting samples using Tedlar bags, syringes, SUMMA canisters, sorbent tubes, and cartridges. Finally, this section discusses additional considerations for soil gas sampling—including collecting field duplicate and field blank samples, decontaminating soil gas sampling equipment, and decommissioning soil gas and sub-slab gas probes.

2.1 SAMPLING LOCATION SELECTION

Sampling locations should be selected and prepared for sampling as described in the site-specific QAPP and FSP or SAP. Soil gas samples may be collected from depths as shallow as 3 feet below ground surface (bgs) (although sampling shallower than 5 feet is not recommended because of atmospheric influences) or as deep as 50 feet bgs. The sampling depth depends on the objectives of the project, soil type encountered, depth to groundwater, and the type of drilling or probing equipment used. Soil gas probes should not be installed within or below the capillary fringe. The horizontal spacing of soil gas sampling points (grid size) can range from a few feet to over 500 feet. Again, probe depth and spacing are functions of project-specific objectives and site conditions. Sub-slab gas samples are collected from directly below a building's concrete slab. If possible, the location should be centrally located and at least 5 feet away from obvious cracks in the slab. Some states provide guidance and requirements for the number and spacing of sub-slab gas probes to be installed in residences, so it is important to consult each state's requirements when planning a sampling event. The site-specific QAPP and FSP or SAP should cite the state's guidance and the sub-slab sampling approach should reflect the guidance.

2.2 SOIL GAS PROBE INSTALLATION

The following three general sample probe advancement methods are used, depending on probe depth and length of service:

- A hand-driven (powered rotary hammer or manual slide hammer) probe or hand auger, typically good for shallow applications.
- A hydraulic-driven (direct-push) probe, good for shallow to moderately deep temporary and permanent applications.
- A drill rig-driven (hollow-stem auger) probe, typically good for deep, permanent applications including nested, multi-depth probe constructions.

Two methods of soil gas probe installation are described in this section: (1) using a post-run tubing (PRT) system where soil gas samples are collected through the end of a probe rod after it has been retracted from an expendable drive point, or (2) anchoring a permanent or semi-permanent soil gas implant to an expendable drive point, where soil gas is sampled through the implant after the probe rod is retracted partially or completely.

2.2.1 Post-Run Tubing System

The post-run tubing system is composed of a hollow probe rod with a threaded PRT adapter, expendable drive point holder, and an expendable drive point on the lead rod (Figure 8). Installation of a PRT system requires the following steps:

- Advance the PRT system to the target sample depth.
- Assemble the soil gas tubing with a threaded tubing adapter (see Section 1.5.2 for approved tubing types).
- Lower the soil gas sampling tubing with a threaded tubing adapter down to, and into, the threaded expendable drive point holder and twist until fully secured.
- Place a cap at the end of the tubing to prevent ambient air from infiltrating the subsurface.
- Retract the probe rod to expose the desired sampling interval.
- Place hydrated bentonite at the surface around the probe rod to create a seal.
- Because this is a temporary method, no sand pack (or glass beads), dry granular bentonite, Portland cement/bentonite grout or other sealant, or permanent casing is required. The top end of the probe rod should be low enough to the ground to perform leak detection testing.

2.2.2 Soil Gas Implant

A soil gas probe may be installed using a vapor sampling implant attached to an expendable implant anchor (Figure 9) or by placing a vapor sampling implant into an empty borehole (Figure 10). Implement the following steps:

- Drive the soil gas implant (vapor sampling implant) attached to the expendable implant anchor (that is, expendable drive point) to the proper depth or lower the pre-prepared soil gas implant down the pre-drilled borehole to the proper depth.
- Pour sand or glass beads through the probe rod or the vacant borehole to a depth that sufficiently covers the soil gas implant (typically 3 inches above the implant).
- Pour dry, granular bentonite to a thickness of 12 inches above the sand or glass beads.

- Install hydrated, granular bentonite above the dry granulated bentonite to a thickness of at least 36 inches. If only one soil gas implant will be installed, then this layer can extend to the ground surface (or near the ground surface to allow for a cement cap).
- Implants may be nested vertically in the same borehole, with each implant separated from the one below by 12 inches of dry granular bentonite and at least 36 inches of hydrated granular bentonite, as described in the bullets above. To install a second (or third, etc.) implant, simply repeat the steps in the preceding bullets.
- Depending on the use of the soil gas probe, the surface seal may be completed with cement and casing to further seal the system and protect the tubing.
- Place a sealed cap at the end of the tubing to prevent ambient air from infiltrating the subsurface.

2.2.3 Cautions During Installation of Permanent Soil Gas Probes

In all permanent soil gas implant installation scenarios, caution should be taken to avoid bridging (the creation of gaps or pockets within the material as it is poured) while installing the sand pack and bentonite seals. For deeper soil gas implants (greater than 15 feet), a tremie pipe may be used to minimize bridging and to segregate the bentonite from the sand pack. A minimum of 3 feet of bentonite should be placed above the soil gas probe. Cement may be used to complete the seal at the surface and to guide water away from the probe housing. To mitigate accidental damage or vandalism, a locking cover may be used to house the tubing. Guard posts may be installed in areas where accidental damage is likely to occur.

2.3 SUB-SLAB GAS PROBE INSTALLATION

Sub-slab probes are installed to investigate the gas composition within the substrate immediately beneath a concrete slab. A hole is drilled through the concrete slab and into the substrate material, and a probe is installed. Two types of probes are typically installed (1) a permanent sub-slab gas probe, or (2) a Vapor Pin. The subsections below provide installation instructions for both types of probes.

2.3.1 Permanent Sub-Slab Probe

Installation of a permanent sub-slab gas probe uses cement to seal the probe from aboveground ambient air. The following method was modified from Ohio EPA guidance and is consistent with most state and federal guidance. See Figure 4 for an illustration of the construction details. Implement the following steps:

- Check for buried obstacles and utilities (pipes, electrical lines, etc.) before beginning installation.
- Using a hammer drill or rotary hammer drill, drill a $\frac{3}{8}$ -inch diameter inner or pilot hole approximately 2 inches in depth, being careful not to puncture through the concrete slab. If the slab is less than 2 inches thick, stop drilling before puncturing the slab.

- Using the $\frac{3}{8}$ -inch diameter pilot hole as your center, drill a 1-inch diameter outer hole to a depth of approximately $1\frac{3}{8}$ inches. If the slab is less than $1\frac{3}{8}$ inches thick, stop drilling before puncturing the slab.
- Vacuum or brush any cuttings and concrete dust out of the holes.
- Resume drilling the $\frac{3}{8}$ -inch diameter pilot hole, completing it through the slab and extending a few inches into the sub-slab substrate material. Vacuum any cuttings and concrete dust from the hole.
- Determine the length of the stainless-steel tubing required to reach from the bottom of the outer hole through the slab and into the open cavity below the slab. Cut a piece of stainless-steel tubing equal to this length.
- Compression-fit one end of the stainless-steel tubing to the Swagelok end of the SS-400-7-4 stainless-steel Swagelok tube fitting. Follow tightening instructions provided with the compression fittings using two 9/16-inch wrenches or adjustable wrenches. If using stainless-steel fittings, wrap one layer of Teflon thread tape around the threads to minimize binding. Brass fittings do not require Teflon tape. Do not overtighten.
- Connect an SS-4-HP Swagelok stainless-steel pipe fitting, hollow hex plug, $\frac{1}{4}$ -inch male NPT to the NPT end of the SS-400-7-4 stainless-steel Swagelok tube fitting to prevent the interior of the tube fitting from getting contaminated.
- Slide the Teflon washer onto the stainless-steel tube. Alternatively, place rolled modeling clay around the $\frac{1}{4}$ -inch stainless-steel tubing below the Swagelok nut before sub-slab probe installation.
- Place the completed probe into the outer hole, with the tubing extending down into the pilot hole, to check fit and to ensure that the stainless-steel tubing is not in contact with the slab material.
- In the disposable cup, mix a small amount of quick-setting cement with water. The mixture should be stiff and moldable.
- With the probe assembly in place, put the quick-setting cement mixture into the outer hole around the assembly, making sure cement is filling any void space. The Teflon washer (or modeling clay) should prevent cement from entering the pilot hole.
- Allow the cement to cure before conducting any leak test.
- Prepare a sampling train that will connect to this sub-slab gas probe assembly by installing tubing (see Section 1.5.2 for approved tubing types) to the Swagelok SS-400-1-4 stainless-steel Swagelok tube fitting, male connector ($\frac{1}{4}$ -inch tube OD to $\frac{1}{4}$ -inch male NPT), using two 9/16-inch wrenches or adjustable wrenches.
- For field duplicate sampling, either (1) replace the Swagelok SS-400-1-4 fitting mentioned in the previous bullet with the SS-400-3-4TMT stainless-steel Swagelok tube fitting, male run tee ($\frac{1}{4}$ -inch tube OD x $\frac{1}{4}$ -inch male NPT x $\frac{1}{4}$ -inch tube OD), or (2) use a short stretch of tubing to attach the SS-400-3 stainless-steel Swagelok tube fitting, union tee ($\frac{1}{4}$ -inch tube OD) to the Swagelok SS-400-1-4 fitting.

2.3.2 Vapor Pin

Installation of the Vapor Pin is done in accordance with the manufacturer's (Cox-Colvin and Associates, Inc. 2016b) SOP as described below:

- Check for buried obstacles and utilities (pipes, electrical lines, etc.) before beginning installation.
- For a flush-mount installation, drill a 1½-inch diameter hole at least 1¾ inches into the slab using a hammer drill or rotary hammer drill. Vacuum any cuttings and concrete dust out of the hole while drilling. Be careful not to puncture the concrete slab with the 1½-inch diameter drill bit.
- Drill a ⅝-inch diameter hole, centered within the larger-diameter hole, through the concrete slab and extending about 1 inch into the sub-slab substrate material to form a void. Vacuum any cuttings and concrete dust out of the hole while drilling.
- Brush the hole with a bottle brush, and carefully vacuum any cuttings and concrete dust from the hole.
- Place the lower end of the Vapor Pin assembly with silicon sleeve, and fitted with the protective cap, into the ⅝-inch drilled hole. Place the installation/extraction tool over the Vapor Pin to protect the barb fitting and tap the Vapor Pin into place using a dead blow hammer. Make sure the installation/extraction tool is centered well and aligned parallel to the Vapor Pin to avoid damaging the barb fitting.
- For flush-mount installations, cover the Vapor Pin with a flush-mount cover using either a plastic cover or the Vapor Pin manufacturer's stainless-steel cover.
- Figure 5 presents a diagram of a completed Vapor Pin installation.

2.4 EQUILIBRIUM TIME

Subsurface conditions are disturbed during soil gas probe and sub-slab gas probe installations. The following equilibration times are recommended to allow disturbed subsurface conditions to equilibrate and return to normal conditions. After the appropriate equilibration time, the soil gas probe or sub-slab gas probe should be tested to ensure that there are no leaks between the aboveground atmosphere and the subsurface (through the surface seal), within the subsurface (through subsurface seals), and within the gas sampling train.

2.4.1 Soil Gas Probe

The following general equilibrium times should be allowed based on the soil gas probe installation method (also check for any state regulations for minimum soil gas equilibration time):

- A minimum of 30 minutes for soil gas probes installed by direct-push methods where the probe rod remains in the ground (PRT installation)

- 2 hours for temporary or permanent soil gas implants installed by direct-push methods
- 48 hours for soil gas probes installed by hollow-stem auger drilling methods

2.4.2 Sub-Slab Gas Probe

Approximately 2 hours should be allowed for the quick-setting cement to cure and subsurface conditions to return to equilibrium. However, site access limitations imposed by property owners may limit equilibration to a shorter time. In this case, the equilibrium time used should be noted along with an appropriate explanation on the field data sheet or field logbook.

2.5 LEAK DETECTION PROCEDURES

Leakage during soil gas and sub-slab gas sampling may dilute gas samples with ambient air or air from subsurface zones that are not the target of sampling; leakage may produce results that either underestimate or overestimate the actual contaminant concentrations. Four types of leak detection tests may be performed: (1) a shut-in leak detection test to evaluate whether a leak is occurring in the aboveground sampling train, (2 and 3) a shroud leak detection test or laboratory leak tracer detection test to assess whether a leak is occurring in the sampling train or through surface and subsurface seals, and (4) a water dam leak detection test to evaluate whether a sub-slab gas probe is leaking at the surface seal and possibly at the first connection off the probe. Shut-in and shroud tests are conducted before purging and sampling. A laboratory leak tracer detection test is conducted after purging but during sampling. A water dam test is performed on a sub-slab gas probe port before purging and sampling. Other general leak test considerations include:

- A leak test should always be performed on the sampling train before sampling.
- For soil gas sampling, a leak test should be performed at least once on the sampling train seals before sampling, although some state agencies may not require such testing if the desired soil gas sampling interval is more than 5 feet bgs. Therefore, state regulations should be consulted before sampling.
- Some sampling media may not be suitable for certain leak detection tests. For example, a laboratory may not be able to analyze for a leak check compound (for example, isopropyl alcohol) if samples are collected using mercury sorbent tubes. In these situations, the sampler should note the issue and proceed with the most appropriate leak detection test. Alternatively, the sampler can use a sampling medium to conduct the leak detection test, before switching to the sampling media targeting the contaminant(s) of interest.

Sections 2.5.1 through 2.5.4 provides procedures for each leak detection test.

2.5.1 Shut-In Leak Detection Test

A shut-in test is conducted by creating negative pressure within the aboveground portion of the sampling train to evaluate whether it is adequately sealed. A shut-in test should be performed as a precaution before performing a shroud test or other general leak test of the entire sampling system to prevent unwanted chemicals or gross contamination from entering the sampling system. The following procedures are used to conduct a shut-in test. See Figure 6 for an example of how a shut-in test may be set up. Implement the following steps:

- Ensure that the sampling medium is isolated from the sampling train (for example, sampling container valve is in the closed position or the sorbent tube is intact [not broken]). Some sampling media (for example, a syringe or filter cartridge) may need to be disconnected from the sampling train and the connection may need to be temporarily plugged with an appropriate fitting.
- Connect the soil gas or sub-slab gas tubing from the subsurface port to one port on a three-way stopcock valve.
- Connect one of the two remaining ports on the three-way stopcock valve to the assembled sampling train leading to the sampling media.
- Connect the last port on the three-way stopcock valve to tubing leading to a tee or other appropriate fitting that enables the vacuum gauge to be installed in line. The vacuum gauge then connects through tubing to a two-way valve. The two-way valve connects through additional tubing to a graduated syringe, air sampling pump, or peristaltic pump.
- Turn the three-way stopcock valve to close off the tubing going to the subsurface port, to prevent air from being drawn through the port from the subsurface.
- Use the syringe or pump to evacuate the system to a vacuum of about -200 inches of water or -15 inches of mercury, as measured on the vacuum gauge.
- After reaching the target level of vacuum, close the two-way valve to isolate the syringe or pump from the sampling train.
- Observe the vacuum gauge for at least 3 minutes. A stable gauge reading indicates a leak-free sampling train.
- Identify an acceptable rate of increase in pressure (drop in vacuum) in the sampling train (refer to project-specific data quality objectives). If more than 0.5 to 3 percent (again, depending on data quality objectives) of the vacuum is lost over the 3 or so minutes, check/tighten/replace connections and repeat the test until acceptable test results are achieved.

2.5.2 Shroud Leak Detection Test

The shroud test is used to evaluate whether ambient air is being introduced to the soil gas or sub-slab gas probe system through improper seals at the surface or within the subsurface or through fittings in the sampling train. Figure 7 shows a typical shroud leak detection test set up. A shroud test is performed by

placing a shroud (an inverted bag or box) on the ground over the gas probe and the sampling train and sample. Helium is then injected into a shroud. Sulfur hexafluoride may also be used; however, this gas and an appropriate gas detector are not as widely available. Therefore, helium is the preferred gas. A leak detection meter or air pump is then used to draw vapor from the sampling train and gas probe to assess whether a leak is infiltrating the system. The leak check compound (in this case, helium) used during a shroud test should be detected using a portable, on-site helium gas detection meter. If the shroud cannot cover the sampling train and sample, necessitating that the shroud test be applied only to test the surface and subsurface seals of the gas probe, then a shut-in leak detection test should be conducted on the aboveground portion of the sampling train in addition to the shroud test. See Section 2.5.1 and Figure 6 for information regarding the shut-in leak detection test. Implement the following steps:

- Ensure that the sampling medium is isolated from the sampling train (for example, sampling container valve is in the closed position or the sorbent tube is intact [not broken]). Some sampling media (for example, a syringe or filter cartridge) may need to be disconnected from the sampling train and the connection may need to be temporarily plugged with an appropriate fitting.
- Connect the soil gas or sub-slab gas tubing from the subsurface port to one port on a three-way stopcock valve. The three-way stopcock valve should be closed when assembling the shroud leak detection test equipment.
- Connect one of the two remaining ports on the three-way stopcock valve to the assembled sampling train leading to the sampling media.
- Connect to the last port on the three-way stopcock valve a piece of tubing that then passes through a fitting in the shroud, and on to either a Tedlar bag in a vacuum chamber with an air pump, or a graduated syringe. This tube will also connect to the helium detector at the appropriate time.
- Turn the three-way stopcock valve so that all three positions are open and gas flows unimpeded between the soil gas or sub-slab gas probe, the sampling train and sample, and the Tedlar bag in a vacuum chamber with an air pump, or graduated syringe.
- Place the shroud over the soil gas or sub-slab gas probe at its surface-subsurface seal (where the probe's sampling tubing meets the ground surface), sampling train, and sample.
- If using a plastic bag as a shroud, secure the bottom of the bag with a draft guard containing heavy beads.
- Connect a helium gas supply to a pass-through fitting in the shroud that allows the helium to flow into the shroud. Open the gas supply and inject the helium gas into the shroud.
- The shroud should have an additional pass-through fitting that is set in the open position to allow the shroud to be filled with helium, displacing the ambient air within it. Intermittently connect the helium gas detector to this fitting to measure the concentration of helium in the shroud. Fill the shroud with helium so that its concentration is at least 50 percent (indicated by the helium detector).

- After the concentration of helium is measured to be at least 50 percent within the shroud, pump vapor from the sampling system (soil gas or sub-slab gas probe, sampling train, and sample) using either the Tedlar bag in a vacuum chamber with an air pump, or the graduated syringe. The pumping rate should not exceed 200 mL/min. The Tedlar bag (or syringe) will also be used to collect a soil gas or sub-slab gas sample from the sampling system (see below). The helium detector might also be suitable for pumping vapor from the sampling system (possibly with a pump to pull vapor from the sampling system through to the helium leak detector).
- Follow the steps below to analyze the vapor within the sampling system consisting of the soil gas or sub-slab gas probe, the sampling train, and sample:
 - Disconnect the Tedlar bag in a vacuum chamber with an air pump, or the graduated syringe from the tubing that passes through the shroud and connects to the three-way stopcock valve.
 - Depending on the apparatus being used, connect the helium detector to: (1) the Tedlar bag, (2) the syringe, or (3) directly to the tubing that passes through the shroud and connects to the three-way stopcock valve.
 - The helium detector can then measure the concentration of helium within the vapor sample collected in the Tedlar bag or syringe or directly from the sampling system. A concentration of helium in the sample or sampling system that is no greater than 5 percent of the concentration of helium within the shroud, is typically acceptable. However, specific requirements will depend on the state agency and project-specific data quality objectives.
 - If the helium concentration ratio for the sampling system relative to the shroud is greater than 5 percent, an unacceptable leak exists. In this case, portions of the sampling system should be isolated, leak-checked, and tightened/repaired/replaced until the source of the leak(s) is found and eliminated. If a continuous leak is identified at the surface-subsurface interface or in the subsurface, the gas probe may need to be reinstalled or relocated.

2.5.3 Laboratory Leak Tracer Detection Test

A leak detection test may be performed using a volatile liquid leak detection compound (tracer) applied to a cloth or other absorbent material and sequentially positioning the cloth near each joint or connection in the sampling system while collecting an actual soil gas or sub-slab gas sample. During this procedure, the liquid leak detection compound should be near, but not on, connections in the sampling system; the liquid should never come into contact with, or be placed directly on, tubing or connections in the sampling system. Appropriate liquid leak detection compounds may include hexane, pentane, difluoroethane, and isopropanol (that is, greater than 99 percent isopropyl alcohol). Alternately, the leak detection test may be performed by covering the entire sampling system with a shroud and filling the shroud with the vapor of a leak detection compound (liquid or gas tracer) while collecting an actual soil gas or sub-slab gas sample. Appropriate gas leak detection compounds may include helium or sulfur hexafluoride. Other leak detection compounds may be appropriate if they are not target compounds and do not interfere with

the laboratory analysis of target compounds. A laboratory leak tracer detection test is performed after purging and while collecting the actual soil gas or sub-slab gas sample. Implement the following steps:

- Connect the soil gas or sub-slab gas tubing exiting the gas probe to the desired sampling media using appropriate connections, tubing, and fittings.
- Purge the soil gas or sub-slab gas probe (see Section 2.6).
- While collecting the soil gas or sub-slab gas sample from the gas probe, apply the volatile liquid leak detection compound to a cloth or other absorbent material and, in sequential fashion, place the cloth on the ground or hold it near to joints and connections in the sampling system (soil gas or sub-slab gas probe, the sampling train, and sample); do not place the liquid leak detection compound directly on any part of the sampling system.
- A laboratory leak tracer detection test may also be performed by placing a shroud over the entire sampling system (soil gas or sub-slab gas probe, sampling train, and sample). If using a plastic bag as a shroud, secure the bottom of the bag with a draft guard containing heavy beads. Then, while collecting the soil gas or sub-slab gas sample from the gas probe, inject a volatile gas or liquid leak detection compound into the shroud through a port (pass-through fitting) in the shroud. If a liquid leak detection compound is used, it may be introduced to the shroud by pouring a small quantity onto a shallow dish and placing the dish inside the shroud; be careful to prevent the liquid leak detection compound from coming into direct contact with any part of the sampling system.
- Submit the soil gas or sub-slab gas sample for analysis; analysis should include testing for the leak detection compound that was used.

2.5.4 Water Dam Leak Detection Test

A water dam leak detection test is performed to evaluate the integrity of the sub-slab probe by placing a water dam (a piece of cut PVC pipe) around the sub-slab probe and filling it with water. A decrease in water while purging and sampling from the probe indicates a leak in the surface seal of the sub-slab probe or possibly at the first connection off the probe (if this connection is submerged in the water). The water dam test can only assess the integrity of these seals; therefore, leak testing must be separately performed on the sampling train. The water dam leak test procedure provided below is based on the procedures provided by the manufacturer of the Vapor Pin sub-slab gas probe with some modifications; however, this procedure may be applied to testing for leaks in most types of sub-slab gas probes. Implement the following steps:

- For a flush-mounted sub-slab gas probe installation (where the probe port is recessed beneath the floor level), the 1- to 1½-inch depression surrounding the probe serves as the water dam.
- For an installation where the probe protrudes from the concrete slab above floor level, prepare a water dam as follows:

- Roll a 1-inch diameter ball of modeling clay between your gloved palms to form a “snake” approximately 7 inches long and press it around the circumference of one end of the 2-inch-long section of 2-inch-diameter PVC pipe.
- Make sure the slab surrounding the probe is clean and free of loose dust and dirt.
- Push the PVC pipe (clay side down) against the slab, centered around the probe, to form a seal between the PVC pipe and the concrete slab. Note that water-soluble clays such as Play-Doh should not be used as they may absorb enough water to interfere with interpreting the results of leak tests lasting for extended periods of time (for example, an hour or more).
- Connect the sampling train to the sub-slab probe’s first connection above the floor surface.
- Pour high-purity water into the water dam consisting of the probe’s flush-mount depression or the PVC and clay cylinder. Pour enough water to immerse the sub-slab gas probe surface seal and, if possible, the first connection to the sub-slab gas probe.
- Purge and sample the sub-slab gas probe as indicated in Sections 2.6 and 2.7. Note the initial level of the water in the water dam and observe the level as the purging and sampling procedures progress. A drop in the water level within the dam, the appearance of water in the sample tubing connected to the probe, or any other observations of leakage, indicates a failure in one or more seals. Note, however, that the water level might drop slightly because of water absorption into the concrete.
- If there is a leak, remove the water (a wet/dry vacuum may help with this). Check/tighten the first connection to the probe. If the sub-slab gas probe is a Vapor Pin, possibly remove and reinstall the Vapor Pin. Then, repeat the water dam test. Note that water leaks through the probe seal into the sub-slab may require probe decommissioning and reinstallation of the probe at another location.

2.6 PURGING THE SOIL GAS OR SUB-SLAB GAS PROBE

The sampling system (soil gas probe subsurface volume or the sub-slab gas probe’s disturbed space [that is, pore space of the sand filter pack] and the internal volume of the tubing and other fittings of the sampling train) should be purged of stagnant air to ensure that soil gas samples are representative of subsurface conditions. The probe should be purged after the leak detection test and before sampling (exceptions: the laboratory leak tracer detection test is performed after purging and during sampling; the water dam leak detection test is performed while purging and sampling). Implement the following steps:

- Ensure that the sampling medium is isolated from the sampling train (for example, sampling container valve is in the closed position or the sorbent tube is intact [not broken]). Some sampling media (for example, a syringe or filter cartridge) may need to be disconnected from the sampling train and the connection may need to be temporarily plugged with an appropriate fitting.
- Connect the soil gas or sub-slab gas tubing from the subsurface port to one port on a three-way stopcock valve.

- Connect one of the two remaining ports on the three-way stopcock valve to the assembled sampling train leading to the sampling media.
- Connect the last port on the three-way stopcock valve to tubing leading to a graduated syringe or air sampling pump.
- Set the three-way stopcock valve so that the valve is open.
- Using either a flow-calibrated vacuum pump or graduated syringe, remove a minimum of three volumes from the assembled sampling system (soil gas or sub-slab gas probe and sampling train). Note: site-specific planning documents (FSP, SAP, or QAPP) may specify different volumes. Refer to the table below for the formula used to calculate volumes and for some common reference volumes.
- The pumping rate should not exceed 200 mL/min as measured by the flow-calibrated air pump or syringe and stopwatch.
- If required by the site-specific FSP, SAP, or QAPP, collect PID, FID, and/or multiple-gas meter readings of the purged air using methods described in Tetra Tech SOP No. 003, Organic Vapor Monitoring.
- After the sampling system is purged but before pumping is stopped, close the three-way stopcock valve to isolate the air pump or graduated syringe from the sampling system. After the purged sampling system is sealed, the air pump should be turned off or pulling air into the syringe should be ceased.
- Sample collection can now proceed using the appropriate sampling media.

Volumes per Foot for Typical Soil Gas and Sub-Slab Gas Probe Constructions

	Outer Diameter	Inner Diameter	Volume per Foot Length of Tubing
Tubing	¼ inch	3/16 inch	5.43 mL
	¼ inch	⅛ inch	2.41 mL
	⅛ inch	0.078 inch	0.94 mL
Sand Pack (Typical direct-push borehole)	2.25 inches	NA	391 mL (assumes porosity of 0.30 for sand)
1 inch = 2.54 centimeters 1 centimeter ³ = 1 milliliter		Volume = π (Inner Diameter / 2) ² × Length	

Notes:

mL = milliliter

NA = not applicable

2.7 SAMPLE COLLECTION

Sample collection may proceed following leak detection tests and purging steps (exceptions: the laboratory leak tracer detection test is performed after purging and during sampling; the water dam leak detection test is performed while purging and sampling). This section includes sample collection procedures for the following media: Tedlar bags, syringes, stainless-steel SUMMA canisters, and sorbent tubes or filter cartridges. Syringes should only be used if gas samples will be analyzed on site. Sample

media, sample preservation methods, and holding times vary according to the analytical parameters and associated analytical methods; therefore, consult appropriate guidance documents, including the project-specific QAPP, FSP, and SAP, as well as the laboratory, for further details.

Note that each laboratory supplies its own Summa canisters and these may have different types of connections and fittings. Several days before the field sampling event, the project team should check the sampling containers and fittings to confirm that compatible fittings and connections are on hand for the sampling effort.

2.7.1 Sample Collection using Tedlar Bags

Soil gas or sub-slab gas can be collected for on-site or off-site chemical analysis in a Tedlar bag, which is a specially prepared bag that has an attached sampling port and valve, made for containing gas samples. Sampling using a Tedlar bag is accomplished by placing the evacuated bag in a specially prepared box with ports, within which a vacuum can be induced using an air pump. The bag is connected to tubing that extends through a port in the vacuum chamber to the soil gas or sub-slab gas probe. As a vacuum is induced inside the vacuum chamber, the Tedlar bag expands, pulling sample gas into its interior. The following procedures should be used for collecting Tedlar bag gas samples:

- Install gas sample tubing that connects from a port in the sampling train to the location where the vacuum chamber is situated. Check to make sure that the tubing (for example, 3/16-inch ID tubing) is compatible with the connection on the Tedlar bag. Use as short a length of sampling tubing as possible.
- Insert the tubing through the top of, and into, the vacuum chamber. It may be necessary to connect the tubing to a pass-through port connection on the outside of the vacuum chamber, and then connect another short stretch of tubing to the inner side of the port. Connect the tubing inside the vacuum chamber to the Tedlar bag. Up to this point, the valve on the bag should be closed with the bag evacuated. Open the valve on the Tedlar bag and place the bag into the body of the vacuum chamber.
- Secure the top onto, or otherwise close, the vacuum chamber.
- Using a flow rate calibrator, set the flow of the air pump to near, but not higher than, 200 mL/min.
- Connect the free end of the tubing attached to the vacuum chamber's evacuation port to the air pump.
- If the sampling train has a three-way stopcock valve that was used during leak testing, open it to allow vapor to flow from the soil gas or sub-slab gas probe to the Tedlar bag. Any other port in the three-way stopcock valve should be closed.

- Turn on the air pump. This will create a vacuum in the chamber, and the Tedlar bag should fill at a rate of approximately 200 mL/min. You can confirm the approximate fill rate of the bag by comparing how the bag is observed to be filling (as seen through the vacuum chamber viewing window) against the time it would take to fully fill it at a flow rate of 200 mL/min. For example, a 500-mL bag would fill up in 2.5 minutes at that flow rate. The rate at which the bag fills will depend on the porosity and permeability of the soil and may be lower than the desired fill rate.
- The minimum amount of soil gas or sub-slab gas needed for analysis is approximately 0.25 liter. Do not fill the Tedlar bag to more than two-thirds of its maximum capacity.
- After the soil gas sample is collected in the Tedlar bag, turn off the pump, slowly vent the vacuum chamber to atmospheric pressure, and remove the top of, or otherwise open, the vacuum chamber.
- Close the valve on the Tedlar bag, disconnect the sampling tubing from the bag, and either close off the end of the sample tubing with a cap or close the three-way stopcock valve (or both) to isolate the gas probe from the aboveground sampling train.
- Document the sample collection procedures on a field data sheet or in the field logbook.
- Fill out the chain-of-custody form and pack and ship samples to the laboratory for analysis using Tetra Tech SOP No. 019, Packaging and Shipping Samples (other custody, packaging, and shipping requirements may also apply – see the project-specific QAPP, FSP, and SAP).

2.7.2 Sample Collection Using Syringes

Soil gas and sub-slab gas samples can also be collected for on-site chemical analysis using a graduated syringe. The sample is collected using the following procedures:

- Connect the opening of the syringe to the two-way stopcock valve (this may be unnecessary because the laboratory that supplies the syringe may provide a syringe with a two-way valve).
- Install gas sample tubing that connects from a port in the sampling train to the syringe through the syringe's two-way stopcock valve. Check to make sure that the tubing (for example, 3/16-inch ID tubing) is compatible with the connection on the syringe. Use as short a length of sampling tubing as possible. A Luer fitting may be required at the end of the sample tubing to obtain connection with the syringe; regardless of the type of fitting, prepare the tubing so that it can connect to the syringe.
- If the sampling train has a three-way stopcock valve that was used during leak testing, open it to allow vapor to flow from the soil gas or sub-slab gas probe to the syringe. Any other port in the three-way stopcock valve should be closed.
- Turn the two-way stopcock valve at the opening of the syringe to the open position and collect a gas sample by pulling on the syringe piston to extract the desired volume at a rate of no greater than 200 mL/min.
- Close the two-way stopcock valve, disconnect the sampling tubing from the syringe, cap the syringe, and either close off the end of the sample tubing with a cap or close the three-way stopcock valve (or both) to isolate the gas probe from the aboveground sampling train.

- Wrap the syringe in aluminum foil to protect the collected sample from photo-degradation.
- Document the sample collection procedures on a field data sheet or in the field logbook.
- Fill out the chain-of-custody form and pack and ship samples to the laboratory for analysis using Tetra Tech SOP No. 019, Packaging and Shipping Samples (other custody, packaging, and shipping requirements may also apply – see the project-specific QAPP, FSP, and SAP).

2.7.3 Sample Collection Using SUMMA Canisters

Soil gas and sub-slab gas samples can be collected for chemical analysis in an inert evacuated stainless-steel canister (SUMMA canister). When this method is used, the sampling train is connected directly to the evacuated canister by compression fittings. Both grab and time-integrated sampling can be accomplished with SUMMA canisters. The sampling duration is controlled by one of several flow controllers, including using a mass flow controller or a critical orifice device. To obtain the desired sampling duration, the user must contact the supplier of the canister for the appropriate apparatus.

Below is a general procedure for sampling using a SUMMA canister. Alternatively, procedures provided by the laboratory may be used in place of, or in addition to, the procedure provided below. For example, see the website at: http://www.eurofinsus.com/media/161448/guide-to-air-sampling-analysis-2014-06-27_revised-logos.pdf. Implement the following procedure:

- Confirm the sampling canister's valve is closed. Remove the compression cap at the opening to the valve.
- If a flow controller (preferably with a built-in pressure gauge) is to be used, attach it to the valve; then attach a compression cap to the open end of the flow controller.
- If the flow controller does not have a built-in pressure gauge, attach a pressure gauge to the open end of the flow controller; then attach a compression cap to the open end of the pressure gauge.
- If a flow controller will not be used, attach a pressure gauge directly to the canister's valve; then attach a compression cap to the open end of the pressure gauge.
- Conduct a leak test of this assembly according to instructions provided by the supplier of the canister. The assembly should pass this leak test before it is used to collect a soil gas or sub-slab gas sample. If leaks are detected, corrective actions should be taken to eliminate them; the leak test should be repeated to confirm that the leaks have been sealed.
- Record the initial vacuum of the canister in a field logbook or field data sheet. The initial canister vacuum should be less than -25 inches of mercury. If the vacuum is less than -25 inches mercury (that is, anywhere from 0 to -25 inches mercury), return the canister to the laboratory unused and use a different canister.
- Make sure the SUMMA canister's valve is closed. Remove any pressure gauge not built in to a flow controller from the canister. If a flow controller (with or without a built-in pressure gauge)

is to be used, leave it attached to the canister. Attach a compression cap either to the open end of the canister's valve (if no flow controller is used) or to the open end of the flow controller if one is attached.

- To collect a sample, remove the compression cap from the open end of the canister's valve (if no flow controller is used) or from the open end of the flow controller. If grab sampling is to be conducted (with no flow controller), you will likely attach a particulate filter to the open end of the canister's valve. Then, install gas sample tubing that connects from a port in the sampling train to either the open end of the particulate filter (if no flow controller is used) or to the open end of the flow controller. Check to make sure that the tubing is compatible with the connection on the SUMMA canister. Use as short a length of sampling tubing as possible.
- If the sampling train has a three-way stopcock valve that was used during leak testing, open it to allow vapor to flow from the soil gas or sub-slab gas probe to the SUMMA canister. Any other port in the three-way stopcock valve should be closed.
- When ready to collect a gas sample, open the SUMMA canister valve. This will allow the evacuated canister to begin drawing in soil gas or sub-slab gas. If a flow controller with a built-in pressure gauge is being used, immediately record the initial canister vacuum reading and time.
- If a grab sample is being collected, the canister will likely fill up within several minutes. After the sample has been collected, close the canister's valve. Record the time and measure the final vacuum reading for the canister; do this by temporarily reattaching a pressure gauge to the canister and repeating the steps used to obtain the initial vacuum reading.
- If an integrated sample is being collected, monitor sampling progress periodically by observing and recording the canister vacuum reading (as read from the flow controller's built-in pressure gauge) at appropriate time intervals. When the target sample collection time has been reached, close the canister's valve. Record the time and final vacuum reading for the canister. The canister vacuum at the end of the sampling period should ideally be near but no closer to atmospheric pressure than -5 inches mercury. If the final vacuum reading is 0 inches mercury, the sampler may not know when the canister reached this pressure and how long the actual sampling interval was; however, the canister will nonetheless contain a valid sample of soil gas or sub-slab gas from the site.
- Disconnect the sampling tubing from the SUMMA canister, and either close off the end of the sample tubing with a cap or close the three-way stopcock valve (or both) to isolate the gas probe from the aboveground sampling train.
- Remove the flow controller, particulate filter, and any other remaining parts from the valve opening on the canister and attach a compression cap to the opening of the valve.
- Document the sample collection procedures on a field data sheet or in the field logbook.
- Fill out the chain-of-custody form and pack and ship samples to the laboratory for analysis using Tetra Tech SOP No. 019, Packaging and Shipping Samples (other custody, packaging, and shipping requirements may also apply – see the project-specific QAPP, FSP, and SAP).

2.7.4 Sample Collection Using Sorbent Tubes and Filter Cartridges

Sorbent tubes or filter cartridges are typically provided by the laboratory, and selection of the sorbent tube or filter cartridge medium depends on the target compounds to be analyzed. The flow rate of the air pump used to pull soil gas or sub-slab gas through the sorbent tube or filter cartridge should be set before sampling begins to pull gas through the tube or cartridge at less than 200 mL/min; the flow rate should be measured and recorded both before and after actual gas sampling. The flow rate should be measured with the sampling medium installed, so that the flow resistance created by the sampling medium is accounted for. The actual flow rate required may depend on the type of sorbent tube or filter cartridge being used and the target compounds being collected for laboratory analysis; refer to sampling method guidance and the project-specific QAPP, FSP, and SAP. The following procedures are used to collect soil gas or sub-slab gas samples with sorbent tubes or filter cartridges:

- Install gas sample tubing that connects from a port in the sampling train to the sorbent tube or filter cartridge. Check to make sure that the tubing is compatible with the chemicals of concern and connects securely to the tube or cartridge. Use as short a length of sampling tubing as possible.
- Connect the outlet end of the sorbent tube or filter cartridge to the air pump using the appropriate tubing. Using the flow rate calibrator, briefly measure the flow rate through the sorbent tube or filter cartridge. Record this initial flow rate on a field data sheet or in the field logbook.
- Connect the inlet end of the sorbent tube or filter cartridge to the sample tubing on the sampling train.
- If the sampling train has a three-way stopcock valve that was used during leak testing, open it to allow vapor to flow from the soil gas or sub-slab gas probe to the sorbent tube or filter cartridge. Any other port in the three-way stopcock valve should be closed.
- Start the air pump and record the start time on a field data sheet or in the field logbook. After the desired sampling duration, stop the air pump and record the end time on a field data sheet or in the field logbook.
- Disconnect the inlet end of the sorbent tube or filter cartridge from the sample tubing on the sampling train. Using the flow rate calibrator, briefly measure the flow rate through the sorbent tube or filter cartridge. Record this final flow rate on a field data sheet or in the field logbook.
- Either close off the end of the sample tubing with a cap or close the three-way stopcock valve (or both) to isolate the gas probe from the aboveground sampling train.
- Disconnect the outlet end of the sorbent tube or cartridge from the tubing leading to the air pump, and place end plugs on both the inlet and outlet openings of the tube or cartridge.
- Document the sample collection procedures on a field data sheet or in the field logbook. Also, use the initial and final flow rates to calculate an average flow rate for the sampling period. Use this average flow rate with the sampling duration (as determined using the start and end times

recorded earlier) to calculate the total soil gas or sub-slab gas volume collected. Record the calculated average flow rate, sampling duration, and total gas volume collected on a field data sheet or in the field logbook; the gas volume should also be recorded on the chain-of-custody form.

- Many samples collected using sorbent tubes and filter cartridges must be stored and transported to the laboratory in a cooler with ice. Some sorbent tubes and filter cartridges also require that they be wrapped in aluminum foil during, or immediately after, sampling to protect the sample from photo-degradation. Consult with the laboratory, the analytical method, and the site-specific QAPP, FSP, or SAP for specific sample handling, preservation, and shipping requirements.
- Fill out the chain-of-custody form and pack and ship samples to the laboratory for analysis using Tetra Tech SOP No. 019, Packaging and Shipping Samples (other custody, packaging, and shipping requirements may also apply – see the project-specific QAPP, FSP, and SAP).

2.8 QUALITY CONTROL SAMPLE COLLECTION

This section discusses quality control for sampling, including field duplicates, field blanks, and equipment decontamination. Field duplicate soil gas and sub-slab gas samples and field blanks may be collected during a sampling event at the frequencies required by the laboratory analytical method or the site-specific QAPP, FSP, or SAP.

2.8.1 Field Duplicates

Field duplicate samples are collected to check precision in the laboratory and field procedures (and, for some applications, to check for temporal inhomogeneity). Field duplicate samples may be collected in Tedlar bags, syringes, SUMMA canisters, filter cartridges, and sorbent tubes, as described below.

Purging and gas sample collection will proceed as described in previous sections. After collection, one sample will be labeled as the environmental sample and the other as the field duplicate sample.

- A Tedlar bag field duplicate sample is collected using a sampling tee, one end of which is connected to the sampling tubing that is inserted through the top of the vacuum chamber. Two Tedlar bags are then attached, one to each of the remaining two ends end of the tee. Both bag samples are collected at the same time inside the vacuum chamber.
- When collecting gas samples using a syringe, field duplicate sampling is conducted as follows. Two gas samples are collected in succession (the second sample [field duplicate] collected immediately after the first).
- SUMMA canister field duplicate samples are also collected using a sampling tee that is installed in the sampling train so that two canisters can collect soil gas or sub-slab gas at the same time. The laboratory may provide the option for either installing a single flow controller/regulator in the sampling train upstream of the tee (between the probe and the tee) or installing separate flow controllers/regulators downstream of the tee (between the tee and each canister).

- Sorbent tube or filter cartridge field duplicate samples are collected using a sampling tee that is connected at the end of the sampling train. Each air pump should be calibrated so the combined flow rate through both tubes/cartridges does not exceed 200 mL/min.

2.8.2 Field Blanks

A field blank sample is collected to evaluate background concentrations of target compounds in the sampling media; to evaluate the potential for cross-contamination during sample collection, preservation, handling, and shipment; and to evaluate the potential for cross-contamination during sample processing and handling in the laboratory. Field blanks samples may be collected when sampling using Tedlar bags, sorbent tubes, and filter cartridges during soil gas and sub-slab gas sampling. Field blank samples are typically not collected when sampling using SUMMA canisters.

- Tedlar bag field blank samples are collected by filling the bag with zero air (contaminant-free calibration gas) at the start of environmental gas sample collection and shipping this sample to the laboratory along with the environmental gas samples.
- Sorbent tube or filter cartridge field blank samples are collected by briefly opening and closing/sealing the sorbent tube or filter cartridge and placing it the same controlled, non-hazardous field environment where the environmental gas samples are stored. No air is drawn through the field blank sample's sorbent tube or filter cartridge. Once environmental sampling is completed, the field blank sample is packaged and shipped to the laboratory with the environmental sample for analysis.

2.8.3 Decontamination

All manual slide hammer, rotary hammer drill, hydraulic-driven, and drill rig-driven equipment that penetrates the subsurface should be decontaminated before the first soil gas probe is installed and between soil gas probe sampling points. Decontamination procedures should follow standard decontamination for such equipment. Applicable regulatory guidance should be consulted to select the correct protocols. Decontamination may include use of a high-pressure steam cleaner. Requirements may also specify that equipment be decontaminated before first use and between uses using a non-phosphate detergent (for example, Liquinox or Luminox) and water; a tap water rinse; and finally, a high-purity, organic-free water rinse.

Both single-use parts used to install permanent sub-slab gas probes and reusable parts used to install Vapor Pin sub-slab gas probes also require decontamination before use. In accordance with manufacturer's instructions, Vapor Pin parts intended for re-use should be decontaminated by soaking in hot water and Liquinox/Luminox, rinsed, and then heated in an oven to a temperature of 265°F for 15 to 30 minutes. This procedure may also be used for single-use parts used to install permanent sub-slab gas probes. A high-purity, organic-free water rinse may also be required before the heating step, depending

on the target compounds involved and requirements provided in the project-specific QAPP, FSP, and SAP.

Aboveground soil gas and sub-slab gas sampling tubing should be used only if new and then disposed of after each sample. Stainless-steel and brass fittings and other parts, however, should be decontaminated before first use and between successive samples. At a minimum, the stainless-steel and brass parts should be visually cleaned of any dirt; flushed with zero air, inert gas, or clean ambient air; and heated until warm to the touch (at least 265°F for 15 to 30 minutes). If grossly contaminated, these parts may require decontamination using a non-phosphate detergent (for example, Liquinox or Luminex) and water; a tap water rinse; a high-purity, organic-free water rinse; before flushing with zero air, inert gas, or clean ambient air, and subsequent heating.

To the extent possible, sampling media (Tedlar bags, syringes, SUMMA canisters, filter cartridges, and sorbent tubes) should be procured pre-cleaned and certified contaminant-free, directly from the laboratory or vendor. If necessary, the media can be tested to document that they are contaminant-free by analyzing them using the appropriate analytical method.

2.9 DECOMMISSIONING

The decommissioning process should be completed following final gas sample collection to prevent the probe from becoming a preferential conduit for the migration of contaminants.

2.9.1 Soil Gas Implant

Soil gas implants should be decommissioned as described below.

- Pull the implant tubing to remove as much as possible from the borehole. The tubing usually breaks free from the implant below grade.
- Complete the surface location with native material, topsoil, asphalt, concrete, etc., to restore the probe location to a condition matching the surrounding area.

2.9.2 Sub-Slab Gas Probe

Sub-slab gas probes should be decommissioned as described below.

- Remove a permanent sub-slab gas probe by breaking its concrete seal using a concrete chisel. Then, remove all parts of the probe from the hole in the slab.
- Remove a reusable Vapor Pin sub-slab gas probe from the hole in the slab according to manufacturer's instructions using the appropriate tool included in the kit.

- Clean the vacant sub-slab and inter-slab hole of any larger debris and particles. Lightly spray the hole with water (optional).
- In a disposable cup, mix a small amount of quick-setting cement with water. The mixture should be stiff and moldable.
- Place the quick-setting grout mixture into the vacant sub-slab and inter-slab hole, making sure the cement fills all void spaces by tamping grout down into hole with a rod. For small-diameter holes, polyurethane caulk (such as Sikaflex) may be used instead of grout.
- Smooth the surface of the cement using a trowel or putty knife, to restore the former probe location to grade.

3.0 CAUTIONS AND CONSIDERATIONS

This section discusses several additional factors that should be considered when collecting soil gas and sub-slab gas samples.

3.1 SAMPLE TUBING

Some tubing materials may interact with certain chemicals entrained in soil gas or sub-slab gas (for example, hexane, pentane, naphthalene, etc.) through sorption or other processes. Therefore, sample tubing should be carefully selected based on the target compounds for the investigation, as well as any other non-target compounds that may be present, to prevent biased sampling results. Currently Teflon, nylon, and polyether ether ketone (PEEK) are acceptable for most types of soil gas and sub-slab gas sampling. Low-density polyethylene (LDPE) tubing should be avoided based on (1) the presence of hydrocarbons in this material and (2) poor recovery of target analytes observed during research. Check any state or local guidance documents for additional recommendations. The same considerations apply to all connections and fittings used in the sampling train.

3.2 LEAK CHECK COMPOUNDS

For the laboratory leak tracer detection test, check with the laboratory to identify whether the leak detection compound can be analyzed using the same method that will be applied to the collected soil gas or sub-slab gas samples. The leak detection compound should be included in the laboratory analyte list for the collected sample. Some leak detection compounds, such as helium, can be found at party supply stores but in grades that may contain traces of volatile organic compounds (VOCs). For this reason, only use high-purity helium or test the helium supply for the presence of VOCs. Some chemicals that have historically been used as leak detection compounds, such as shaving cream, may also contain trace amounts of VOCs. Consult with the laboratory to identify its preferred leak detection compound (for example, helium, sulfur hexafluoride, hexane, pentane, difluoroethane, or isopropanol) before conducting the laboratory leak tracer detection test. Extreme caution should be taken to ensure no gross leaks are present in the system before this leak test is implemented. If there is a significant leak, the tracer compound might produce such a large signal when the laboratory analyzes it that it interferes with detection of actual target compounds of interest. Furthermore, gross leaks may result in contamination of laboratory equipment. These circumstances may result in low-quality or unusable laboratory results for the sample.

3.3 CLIMATE CONDITIONS

Atmospheric pressure typically does not affect soil gas or sub-slab gas sampling from subsurface depths greater than 5 feet bgs. However, a major frontal system causing atmospheric pressure to fluctuate over a short timeframe may force ambient air farther into the subsurface.

Rain events are also unlikely to affect soil gas sampling from subsurface depths greater than 5 feet bgs. However, depending on soil type, rainwater may percolate downward far enough to influence the soil gas and cause biased results. State guidance for sampling following major rain events (typically considered ½ inch or more of rain within 24 hours) varies widely; for example, California requires not sampling for 5 days and Ohio requires not sampling for 1 day after the same intensity rain event. Most state guidance documents agree that soil gas sampling should not occur while it is raining.

3.4 LIGHT SENSITIVITY

Tedlar bags, syringes, and some sorbent tubes and filter cartridges are transparent or translucent. Light passing through these units can impact target compounds that are susceptible to photo-degradation from exposure to sunlight or even artificial light. Consequently, any transparent or translucent sample media should be stored in a dark place, such as a cooler, and analyzed as quickly as possible. Sampling media such as syringes, sorbent tubes, and filter cartridges can also be wrapped in aluminum foil after collection to minimize exposure to light.

FIGURE 1
SOIL GAS INSTALLATION FORM

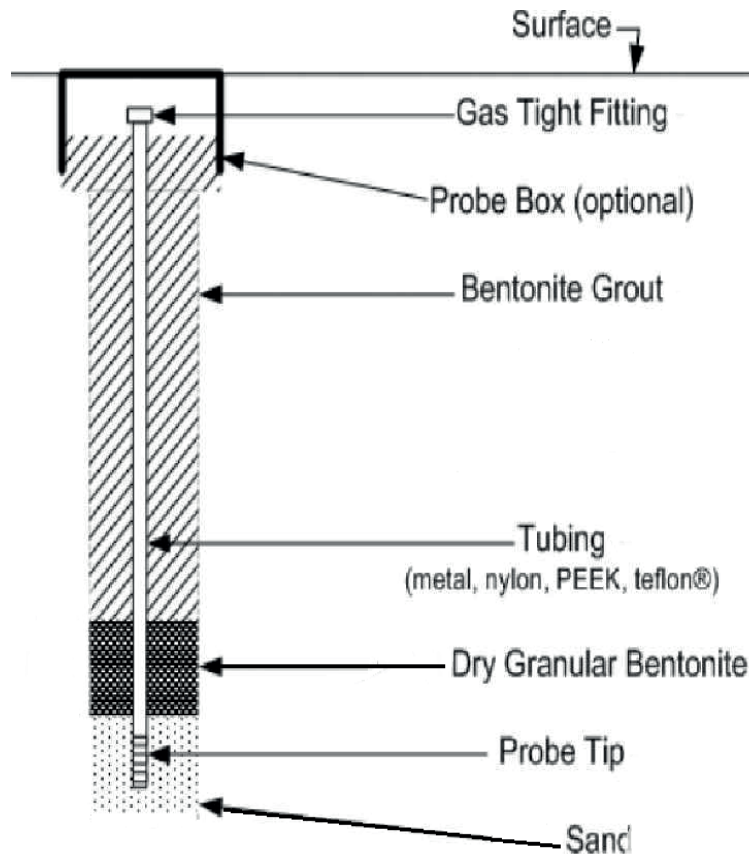
Site/Facility Name: _____ Date: _____

Project No.: _____

Sample Location: _____

Latitude: _____ Longitude: _____

Drilling Method: _____

**Total Depth Interval of Probe (feet)**

From: _____ To: _____

Bentonite Grout

Composition: _____

Depth Interval of Grout (feet)

From: _____ To: _____

Dry Bentonite

Type of Material: _____

Depth Interval of Bentonite (feet)

From: _____ To: _____

Tubing

Type of Material: _____

Total Tubing (feet): _____

Outer/Inner Diameters (inches): _____

Filter Pack

Type of Material: _____

Depth Interval of Sand (feet)

From: _____ To: _____

Probe

Type: _____

Depth of Probe Screen (feet)

From: _____ To: _____

Note: Above diagram modified from DTSC 2012

Installation:

Date: _____ Time: _____

Leak Detection Test:

Date: _____ Time: _____

Equilibrium Time:

Minutes: _____

Leak Detection Test:

Type of leak test on port: _____

Pass or Fail: _____

Purge Volume:

Method used to purge probe: _____

Total volume removed: _____

Additional Comments: (add a location map on the reverse, as necessary)

FIGURE 2
SUB-SLAB GAS INSTALLATION FORM

Site/Facility Name: _____ Date: _____

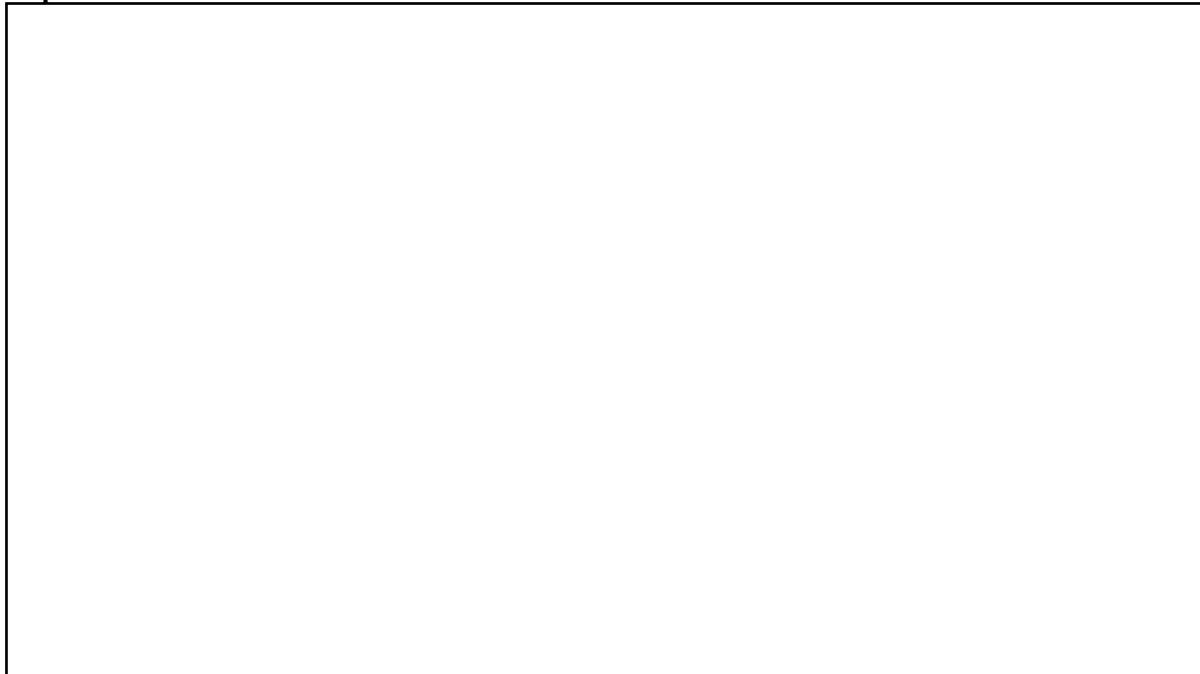
Project No.: _____

Sample Location: _____

Construction Type (for example, permanent or Vapor Pin): _____

Thickness of Concrete Slab (inches): _____ Flush Mount (yes or no): _____

Total probe length (inches): _____

Map of Location

Note: map not to scale

Installation:

Date: _____ Time: _____

Leak Detection Test:

Date: _____ Time: _____

Equilibrium Time:

Minutes: _____

Leak Detection Test:

Type of leak test on port: _____ Pass or Fail: _____

Purge Volume:

Method used to purge probe: _____ Total volume removed: _____

Additional Comments:

FIGURE 3
SOIL GAS AND SUB-SLAB
FIELD DATA SHEET

Site/Facility Name: _____ **Date:** _____

Project No.: _____

Sample Location: _____

Sampled By: _____

Sample ID: _____ **Field Duplicate :** _____

Sample Information:
Pump Type and No. _____ **Sample Media:** _____

Container ID: _____ **Flow Regulator ID:** _____

Weather Conditions:
Temperature: _____ **Precipitation:** _____

Atmospheric Pressure: _____ **Wind Speed/Direction:** _____

Leak Test/Purge/Sample Readings:
Leak Test Type: _____ **Pass or Fail:** _____

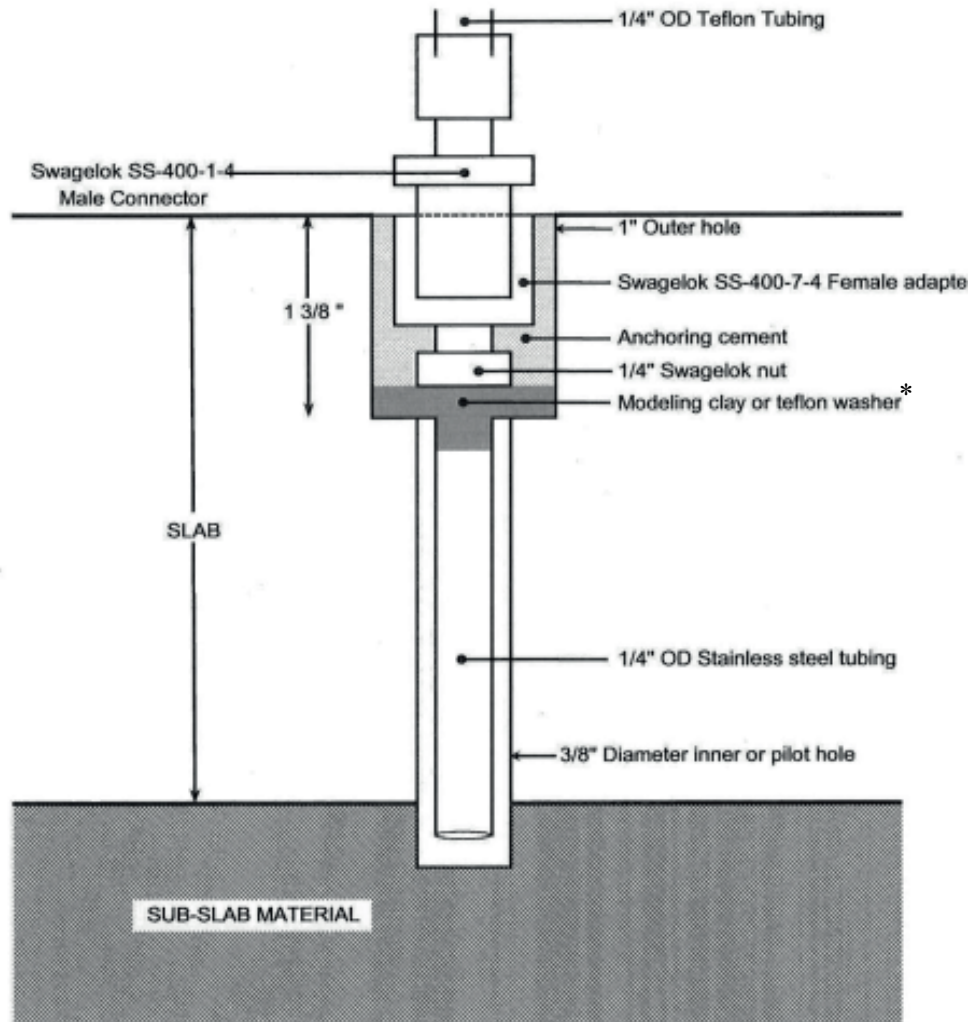
Purge Volume: _____ **FID, PID or multimeter Results:** _____

Start Time:		End Time:	
Start Pressure/Flow:		End Pressure/Flow:	
Volume Gas Extracted:			

Time	Flow (mL/min)	Pressure	Comments

Additional Comments:

FIGURE 4
TYPICAL SUB-SLAB GAS PROBE CONSTRUCTION DETAILS
(From OHIO EPA 2020)



* Stainless steel tubing passes through the modeling clay or Teflon washer to create an airtight seal between the outer hole and inner/pilot hole.

FIGURE 5
VAPOR PIN CONSTRUCTION DETAILS
(From COX COLVIN AND ASSOCIATES, INC. 2013)

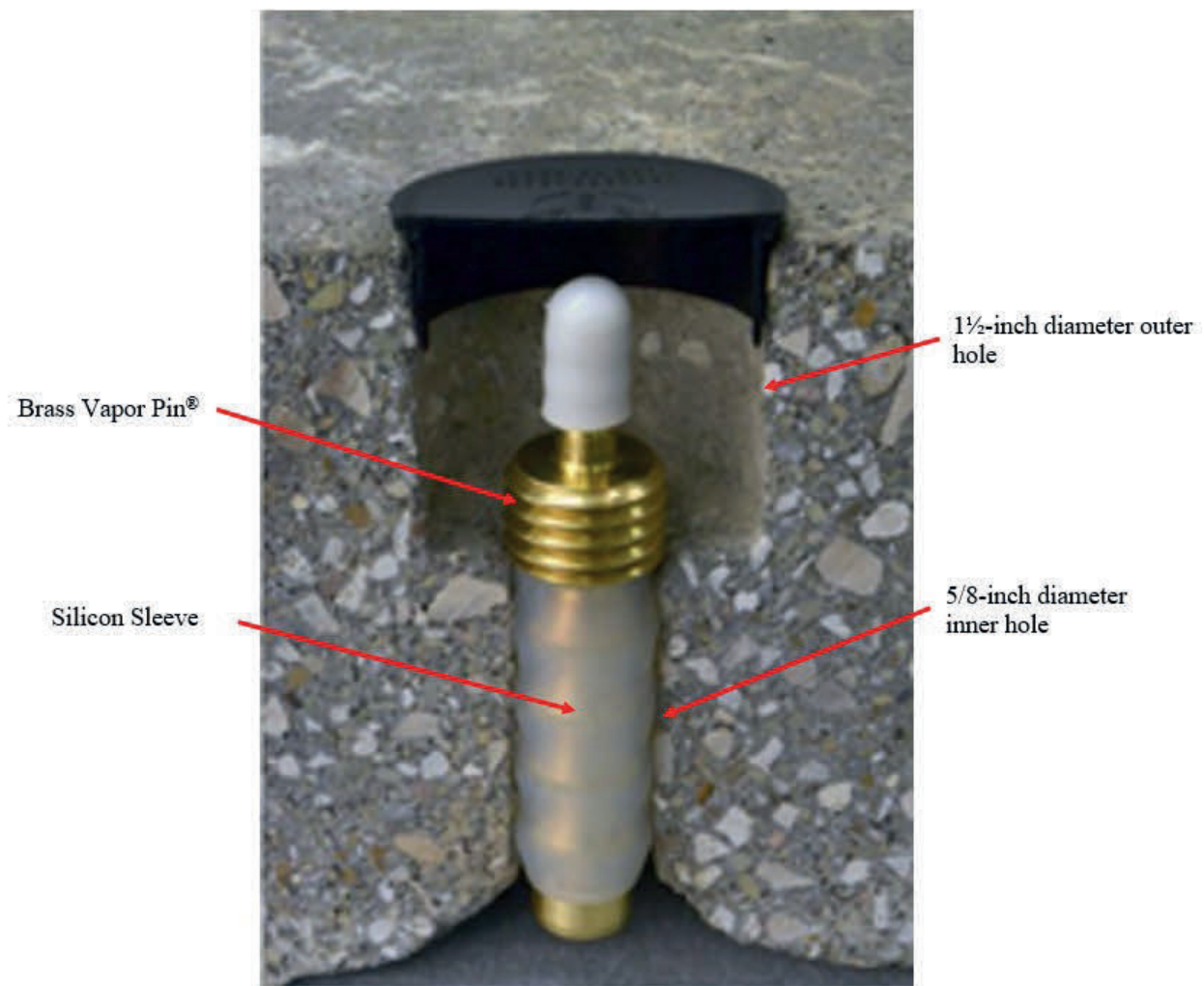


FIGURE 6
SHUT-IN LEAK DETECTION TEST

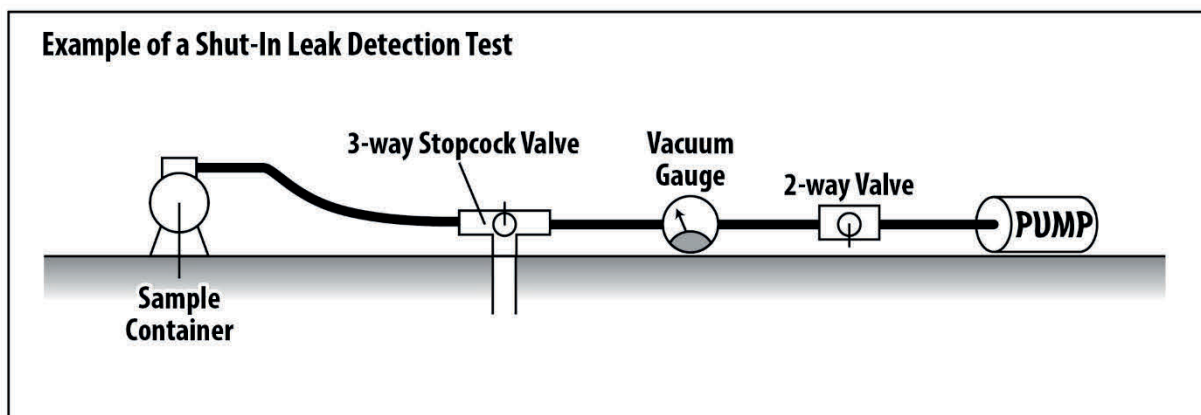


FIGURE 7
SHROUD LEAK DETECTION TEST

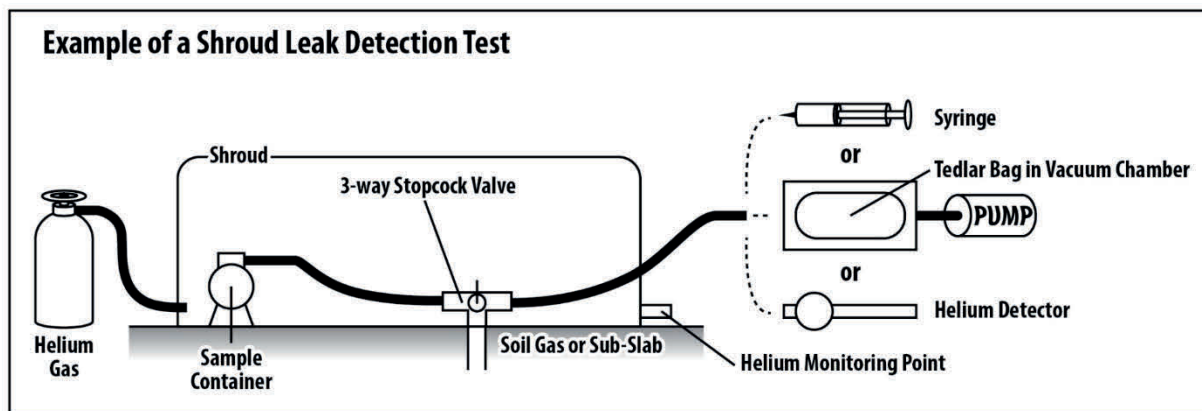


FIGURE 8
POST-RUN TUBING SYSTEM
(From ASTM D7663-12)

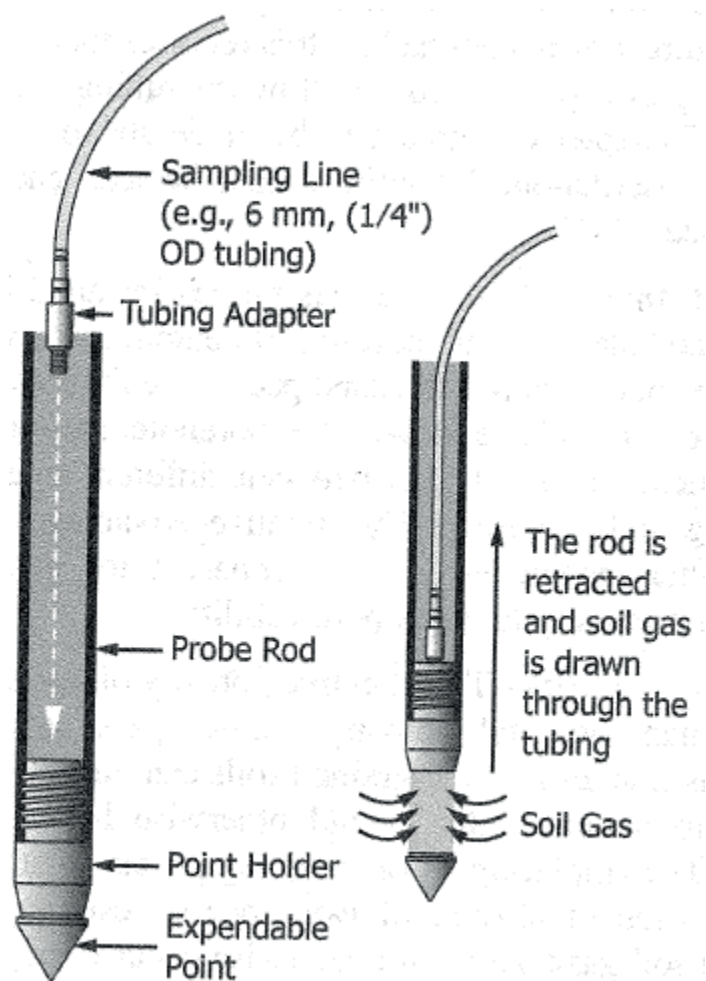
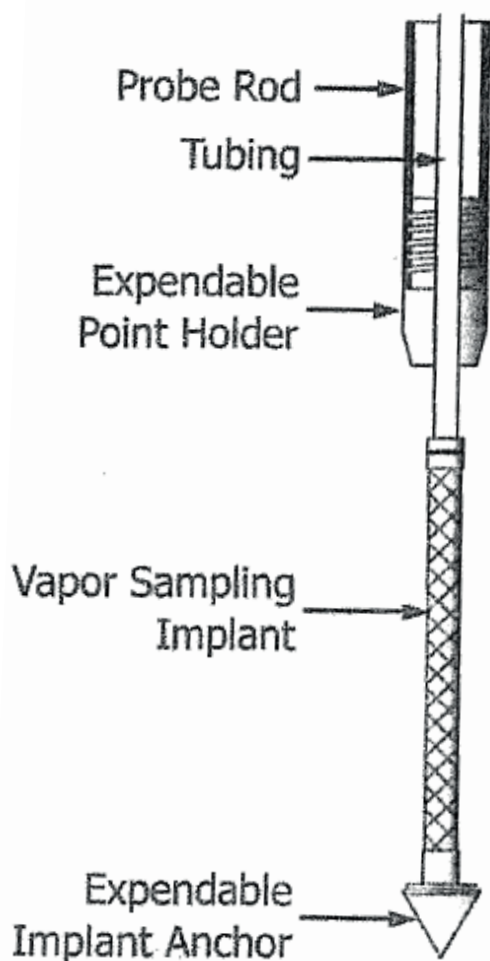
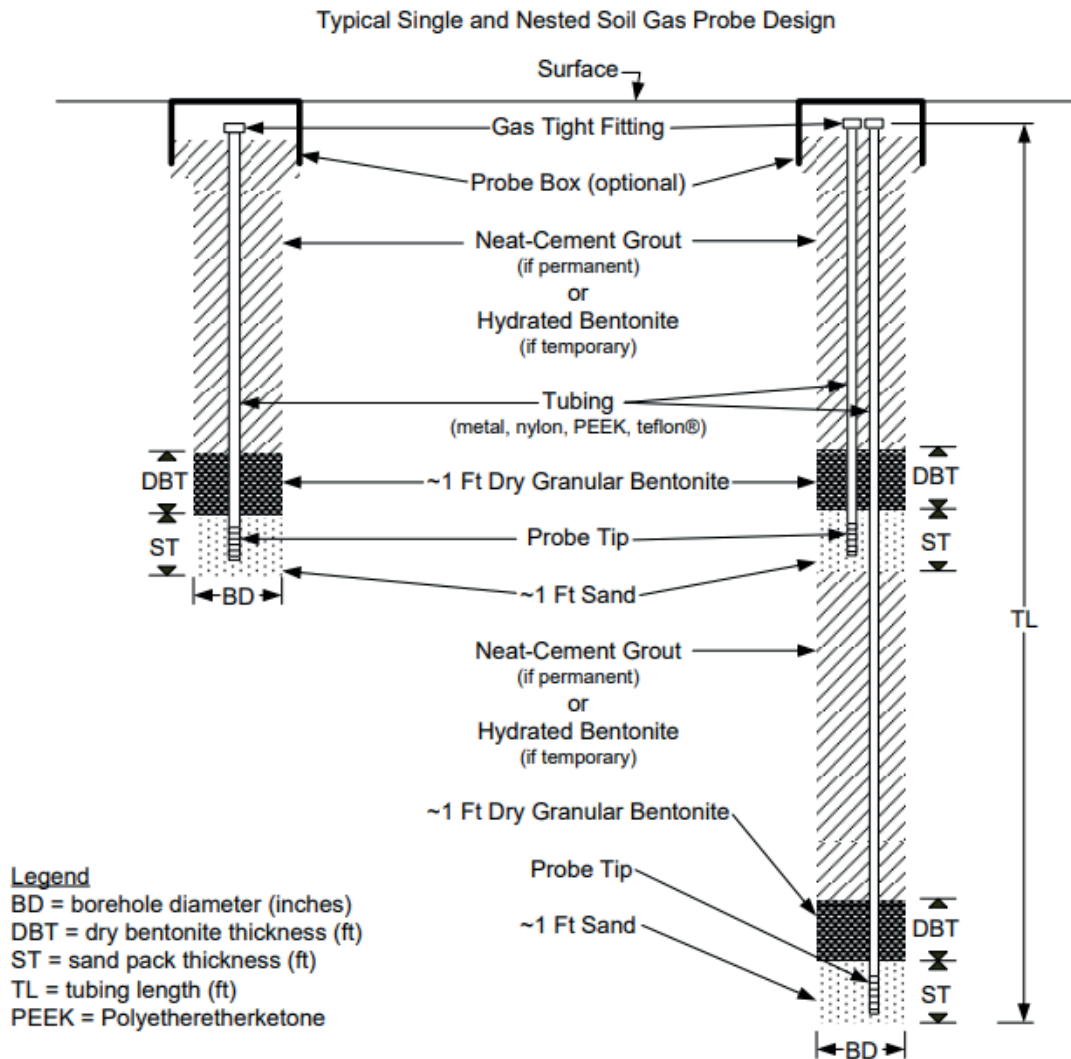


FIGURE 9
SOIL GAS IMPLANT INSTALLATION USING DIRECT-PUSH
(From ASTM D7663-12)



After the implant is secured at the desired depth, driller's sand or glass beads are poured down through rod to surround implant. Bentonite is then added to provide a seal above the implant.

FIGURE 10
TYPICAL SINGLE AND NESTED SOIL GAS PROBE DESIGN
(From DTSC 2015)



Neat-Cement Grout means a mixture in the proportion of 94 pounds of Portland cement and not more than 6 gallons of water. Bentonite up to 5 percent by weight of cement (4.7 pounds of bentonite per 94 pounds of Portland cement) may be used to reduce shrinkage.

ATTACHMENT 1

TEXAS RISK REDUCTION PROGRAM TIER 1 PROTECTIVE CONCENTRATION LEVELS

Last Revised: March 1, 2022**Summary of Updates to the Tables Accompanying the Texas Risk Reduction Program (TRRP) Rule¹**

Date of Change	Change Made
3/1/2022	Glyphosate: RfDo revised
3/1/2022	Thallium: CAS corrected from 7791-12-0 to 7440-28-0 in Toxicity Factors, Chem/Phys Properties, and ABS _{GI} /ABS.d tables.
1/6/2021	Amino-2,6-dinitrotoluene, 4-: SFo and RfDo revised
1/6/2021	Amino-2,6-dinitrotoluene, 2-: SFo and RfDo revised
1/6/2021	Bis (2-chloro-1-methyl) ether: Name corrected to Bis (2-chloro-1-methylethyl) ether
1/6/2021	Bromodichloromethane: RfDo revised
1/6/2021	Bromomethane: RfC revised
1/6/2021	Dichlorophenoxyacetic acid, 2,4- (2,4-D): RfDo revised
1/6/2021	Ethylene oxide: Class, URF revised
1/6/2021	Hexanone, 2-: RfDo revised
1/6/2021	Lithium: RfDo revised
1/6/2021	Nitropropane, 2-: URF revised
1/6/2021	Perfluorooctane sulfonamide (1-Octanesulfonamide, heptadecafluoro-): Name corrected to Perfluorooctane sulfonamide (1-Octanesulfonamide, heptadecafluoro-)
1/6/2021	Perfluorooctanoic sulfonic acid (1-Octanesulfonic acid, heptadecafluoro-1-): Name corrected to Perfluorooctane sulfonic acid (1-Octanesulfonic acid, heptadecafluoro-1-)
1/6/2021	PFAS (All): The common acronym for each compound was added
1/6/2021	Phosphorotriethioic acid, S,S,S-tributyl ester: RfDo revised
1/6/2021	Propanol, 1-: RfDo revised
1/6/2021	Tetrachloroethylene: The common acronym (PCE) was added
1/6/2021	Trichloroethylene: The common acronym (TCE) was added
11/8/2019	Benzo(j)fluoranthene: SFo and URF revised
11/8/2019	Bis (2-chloroisopropyl) ether: Name changed to Bis (2-chloro-1-methyl) ether
11/8/2019	Bromodichloromethane: ^{GW} GW _{Ing} PCLs were replaced with the MCL for total trihalomethanes in Table 3, ^{GW} Soil _{Ing} PCLs were revised in Tables 1 and 2, and footnote for total trihalomethanes was revised in Tables 1, 2 and 3.
11/8/2019	Bromoform: ^{GW} GW _{Ing} PCLs were replaced with the MCL for total trihalomethanes in Table 3, ^{GW} Soil _{Ing} PCLs were revised in Tables 1 and 2, and footnote for total trihalomethanes was revised in Tables 1, 2 and 3.
11/8/2019	Chloroform: ^{GW} GW _{Ing} PCLs were replaced with the MCL for total trihalomethanes in Table 3, ^{GW} Soil _{Ing} PCLs were revised in Tables 1 and 2, and footnote for total trihalomethanes was revised in Tables 1, 2 and 3.
11/8/2019	Cyclotrimethylenetrinitramine (RDX): Class, SFo and RfD revised
11/8/2019	Dibromochloromethane: ^{GW} GW _{Ing} PCLs were replaced with the MCL for total trihalomethanes in Table 3, ^{GW} Soil _{Ing} PCLs were revised in Tables 1 and 2, and footnote for total trihalomethanes was revised in Tables 1, 2 and 3.
11/8/2019	Dichloroethane, 1,2-: RfD revised
11/8/2019	Diethanolamine: RfC added
11/8/2019	Dodecylphenol, 4-: Duplicate rows were eliminated
11/8/2019	Nitrate: ^{GW} Soil _{Ing} PCLs removed (see footnote in PCL tables)
11/8/2019	Nonylphenol, 4-n-: Duplicate rows were eliminated
11/8/2019	Potassium: CAS revised
11/8/2019	Toxaphene: RfD added
11/8/2019	Triethanolamine: RfC added

Last Revised: March 1, 2022**Summary of Updates to the Tables Accompanying the Texas Risk Reduction Program (TRRP) Rule¹**

Date of Change	Change Made
4/27/2018	Chlorine: RfC revised
4/27/2018	Cobalt: URF and RfC revised
4/27/2018	Ethylene dibromide (dibromoethane, 1,2-): Class, URF and RfC revised
4/27/2018	Manganese: RfC revised
4/27/2018	Transformer Mineral Oil: Added back into tables (accidentally left out in previous years)
3/31/2017	Benz(a)anthracene : Class, Sfo and URF revised
3/31/2017	Benzo-a-pyrene : Class, Sfo and URF revised; RfD and RfC added
3/31/2017	Benzo-b-fluoranthene : Class, Sfo and URF revised
3/31/2017	Benzo-k-fluoranthene : Class, Sfo and URF revised
3/31/2017	Cadmium : Class, URF and RfC revised
3/31/2017	Chromium (VI) : Class and RfD revised
3/31/2017	Chrysene : Class, Sfo and URF revised
3/31/2017	Dibenz-a,h-anthracene : Class, Sfo and URF revised
3/31/2017	Dichloroethane, 1,2- : URF and RfC revised
3/31/2017	Dichloropropane, 1,2- : Class, Sfo, and RfD revised and URF added
3/31/2017	Dimethylformamide, N,N- : NEW
3/31/2017	Ethanol, 2-amino- : RfC added
3/31/2017	Ethylene oxide : Class and URF revised
3/31/2017	Heptane, n- : RfC revised
3/31/2017	Hexachloropropylene : Sfo and RfD revised, URF removed and RfC added
3/31/2017	Indeno-1,2,3-cd-pyrene : Class, Sfo and URF revised
3/31/2017	Mercuric chloride : Chemical listing removed from tables. Mercury toxicity factors apply to all inorganic forms of mercury.
3/31/2017	Nitrate : name revised to Nitrate-N to be consistent with MCLs. Laboratories should report results in nitrate as nitrogen (Nitrate-N). If a laboratory reports the results in nitrate as nitrate (Nitrate-NO ₃), the conversion is Nitrate-N = 0.2259 x Nitrate-NO ₃ .
3/31/2017	Nitrite : name revised to Nitrite-N to be consistent with MCLs. Laboratories should report results in nitrite as nitrogen (Nitrite-N). If a laboratory reports the results in nitrite as nitrite (Nitrite-NO ₂), the conversion is Nitrite-N = 0.3045 x Nitrite-NO ₂ .
3/31/2017	Pentane : RfD revised
3/31/2017	Phenol, 4-tert-butyl- : RfD revised
3/31/2017	Thallium and compounds : name revised to Thallium and RfD revised
3/31/2017	Triaminotrinitrobenzene (TATB) : Sfo removed
3/31/2017	Trichloro-1,2,2-trifluoroethane, 1,1,2- : RfC revised
3/31/2017	Trimethylbenzene, 1,2,3- : RfD and RfC revised
3/31/2017	Trimethylbenzene, 1,2,4- : RfD and RfC revised
3/31/2017	Trimethylbenzene, 1,3,5- : RfD and RfC revised
3/4/2016	Asbestos, removed from all tables: URF removed in 2011. Contact your TCEQ project manager if asbestos may be a chemical of concern.
3/4/2016	Chlordane, gamma : name revised to Chlordane, trans- (gamma chlordane)
3/4/2016	Dimethyl-2-nitrobenzene, 1,3- : NEW
3/4/2016	Dimethyl-3-nitrobenzene, 1,2- : NEW
3/4/2016	Dimethyl-4-nitrobenzene, 1,2- : NEW
3/4/2016	Dimethyl-5-nitrobenzene, 1,3- : NEW
3/4/2016	Ethoxy ethanol, 2- : Henry's Law Constant revised
3/4/2016	Perfluorooctanoic sulfonic acid (1-Octanesulfonic acid, heptadecafluoro-1-) : RfC revised
3/4/2016	Perfluoropentanoic acid (Pentanoic acid, nonafluoro-) : RfD revised
3/4/2016	Perfluorohexanoic acid (Hexanoic acid, undecafluoro-) : RfD revised

Last Revised: March 1, 2022**Summary of Updates to the Tables Accompanying the Texas Risk Reduction Program (TRRP) Rule¹**

Date of Change	Change Made
3/4/2016	Perfluorododecanoic acid (Dodecanoic acid, tricosafuoro-) : RfC revised
3/4/2016	Perfluorodecanoic acid (Decanoic acid, nonadecafluoro-) : RfC revised
3/4/2016	Perfluorohexane sulfonic acid (1-Hexanesulfonic acid, triddecafluoro-) : RfD and RfC revised
3/4/2016	Perfluorobutyric acid (Butanoic acid, heptafluoro-) : RfC revised
3/4/2016	Perfluorobutane sulfonic acid (1-Butanesulfonic acid, nonafluoro-) : RfC revised
12/16/2015	Ammonia: Class and RfC revised
12/16/2015	Chromium (VI): URF and RfC revised
12/16/2015	Dicyclopentadiene: Class and RfD revised and RfC was removed
12/16/2015	Ethyl acrylate: RfD and RfC added
12/16/2015	Isopropyl alcohol: RfD revised and RfC added
12/16/2015	Methyl-5-nitroaniline, 2- (5-nitro-o-toluidine): Chemical removed from PCL Tables because Sfo removed in 2014 and the chemical has no other toxicity factors
12/16/2015	Perfloro Acids (All): RfDs revised
12/16/2015	Phenol: Class revised and RfC added
12/16/2015	Triethylene glycol: Class and RfD revised
12/16/2015	Tungsten (as sodium tungstate dihydride): NEW
11/12/2014	Aluminum and Silver: Correction for error in Comm/Ind Groundwater PCL
11/12/2014	Arsenic: calculation error
11/12/2014	Cadmium: calculation error
11/12/2014	Dimethylaminoazobenzene, p: calculation error
11/12/2014	Perfluoro Acids (All): calculation error
9/10/2014	Acenaphthene: Class revised
9/10/2014	Acetone cyanohydrin: Class revised
9/10/2014	Acrolein: RfC revised
9/10/2014	Arsenic: URF updated
9/10/2014	Biphenyl, 1,1: Class revised
9/10/2014	Biphenyl, 1,1: RfD revised
9/10/2014	Butanal (butyraldehyde): RfC added
9/10/2014	Butene, 1: RfC revised
9/10/2014	Butene, cis-2: RfC revised
9/10/2014	Butene, trans-2: RfC revised
9/10/2014	Butyl acetate: RfC revised
9/10/2014	Butylbenzene, sec-: Class revised
9/10/2014	Butylbenzene, tert-: Class revised
9/10/2014	Cadmium: RfC added
9/10/2014	Chloroethanol, 2- :Class and RfD revised
9/10/2014	Chloromethane (methyl chloride): RfD added
9/10/2014	Chloromethane: Class revised
9/10/2014	Cobalt: RfD revised
9/10/2014	Copper: RfD revised
9/10/2014	Desethylatrazine: NEW
9/10/2014	Dibenzothiophene: Class and RfD revised
9/10/2014	Dichlorobenzene, 1,4- RfC revised
9/10/2014	Dinitrotoluene, 2,6- RfD reference revised
9/10/2014	Di-n-octyl phthalate: Class and RfD revised
9/10/2014	Dioxane, 1,4: RfC revised; URF added

Last Revised: March 1, 2022**Summary of Updates to the Tables Accompanying the Texas Risk Reduction Program (TRRP) Rule¹**

Date of Change	Change Made
9/10/2014	Ethoxy ethanol, 2: RfD revised
9/10/2014	Ethyl acetate: Class and RfD revised; RfC added
9/10/2014	Fenuron: NEW
9/10/2014	Fluoranthene: Class revised
9/10/2014	Isobutylene (2-methyl-1-propene): RfD added
9/10/2014	Manganese: RfC revised
9/10/2014	Methacrylonitrile: Class and RfD revised; RfC added
9/10/2014	Methanol: RfD revised
9/10/2014	Methoxyethanol, 2: RfD revised
9/10/2014	Methyl acrylate: Class revised; RfC added
9/10/2014	Methyl cyclohexane: Class revised
9/10/2014	Methyl-5-nitroaniline, 2- (5-nitro-o-toluidine): Sfo removed
9/10/2014	Methylene chloride (dichloromethane): Sfo and RfD revised
9/10/2014	Perfluorobutane sulfonic acid (1-Butanesulfonic acid, nonafluoro-): NEW
9/10/2014	Perfluorobutyric acid (Butanoic acid, heptafluoro-): NEW
9/10/2014	Perfluorodecane sulfonic acid (1-Decanesulfonic acid, heneicosafluoro-): NEW
9/10/2014	Perfluorodecanoic acid (Decanoic acid, nonadecafluoro-):NEW
9/10/2014	Perfluorododecanoic acid (Dodecanoic acid, tricosafuoro-): NEW
9/10/2014	Perfluoroheptanoic acid (Heptanoic acid, tridecafluoro-): NEW
9/10/2014	Perfluorohexane sulfonic acid (1-Hexanesulfonic acid, tridecafluoro-): NEW
9/10/2014	Perfluorohexanoic acid (Hexanoic acid, undecafluoro-): NEW
9/10/2014	Perfluorononanoic acid (Nonanoic acid, heptadecafluoro-): NEW
9/10/2014	Perfluorooctane sulfonamide (1-Octanesulfonamide, hetpadecafluoro-): NEW
9/10/2014	Perfluorooctanoic acid (Octanoic acid, pentadecafluoro-): NEW
9/10/2014	Perfluorooctanoic sulfonic acid (1-Octanesulfonic acid, heptadecafluoro-1-): NEW
9/10/2014	Perfluoropentanoic acid (Pentanoic acid, nonafluoro-): NEW
9/10/2014	Perfluorotetradecanoic acid (Tetradecanoic acid, heptacosafuoro-): NEW
9/10/2014	Perfluorotridecanoic acid (Tridecanoic acid, pentacosafuoro-): NEW
9/10/2014	Perfluoroundecanoic acid (Undecanoic acid, uncosafluoro-): NEW
9/10/2014	Phenothiazine: RfD revised
9/10/2014	Prometryn: NEW
9/10/2014	Tetrachloroethylene: RfD revised
9/10/2014	Toluidine, o: Class and Sfo revised
9/10/2014	Toluidine, p: Class and Sfo revised
9/10/2014	Trinitrophenylmethylnitramine (tetryl; nitramine): RfD revised
9/10/2014	Uranium (soluble salts): RfC revised
6/29/2012	Benzenethiol: RfD revised
6/29/2012	Chloro-1,3-butadiene, 2-:Class, URF, and RfC revised
6/29/2012	Diisopropyl ether (2,2'-oxybis-propane): RfC revised
6/29/2012	Dioxins/furans, polychlorinated; (reported as 2,3,7,8-TCDD TEQ): RfD was revised by USEPA; however, the TRRP rule sets the critical PCL at all 3 tiers for dioxin in soil [30 TAC 350.76(e)(3)] so the PCLs did not change.
6/29/2012	Ethyl-2-methyl benzene, 1-: RfD revised
6/29/2012	Ethyl-4-methyl benzene: RfD revised
6/29/2012	Hexachloroethane: Class, Sfo, RfD, URF, and RfC revised
6/29/2012	Methoxyethanol, 2-: RfD revised
6/29/2012	Methyl-5-nitroaniline, 2- (5-nitro-o-toluidine): Class and Sfo revised

Last Revised: March 1, 2022

Summary of Updates to the Tables Accompanying the Texas Risk Reduction Program (TRRP) Rule¹

Date of Change	Change Made
6/29/2012	Methylene chloride (dichloromethane): Class, Sfo, RfD, URF, and RfC revised
6/29/2012	Nickel and compounds: Class, URF, and RfC revised
6/29/2012	Pentane: RfC revised
6/29/2012	Phenothiazine: RfD revised
6/29/2012	Sulfolane: RfD revised
6/29/2012	Tetrachloroethylene: Class, Sfo, and RfD revised
6/29/2012	Tetrahydrofuran: Class, RfD, and RfC revised
6/29/2012	Trichloroethane, 1,1,1: Class and RfC revised
6/29/2012	Trichloroethylene: Class, Sfo, RfD, URF, and RfC revised
6/29/2012	Vanadium: RfD and RfC revised
6/29/2012	Added: Cyclohexene, 4-ethenyl-(aka 4-vinylcyclohexene); Isopentane; Cyclopentane; Methylstyrene, alpha-; Morpholine, 4-butyl
5/24/2011	Asbestos : URF (Unit Risk Factors) and soil PCLs removed. Contact your TCEQ Project Manager if asbestos may be a chemical of concern.
5/24/2011	Glyphosate : chemical/physical properties revised. Ionizing Koc data under review. Contact your TCEQ Project Manager if glyphosate may be a chemical of concern.
5/24/2011	TCDD, 2,3,7,8: (dioxin) : named revised to Dioxins/furans, polychlorinated; (reported as 2,3,7,8:TCDD TEQ)
5/24/2011	See list on next sheet for additional toxicity factors changes. For questions on toxicity factors, contact the Toxicology Section at 877-992-8370.
5/24/2011	Added: Leptophos, Ethanol, 2-(methylamino)-, Hexene, cis-2-, Pentadiene, cis-1,3-, Cyclopentene, Pentene, 2.
3/31/2010	Acrylamide : Sfo, RfD, URF and RfC revised
3/31/2010	Benzyl alcohol : RfD revised
3/31/2010	Bromobenzene : RfD and RfC revised
3/31/2010	Butanol, 2-: RfD and RfC revised
3/31/2010	Chromium (III) : RfC revised
3/31/2010	Chromium (Total) : RfC revised
3/31/2010	Diethylene glycol monobutyl ether : RfD and RfC revised
3/31/2010	Fluorine : RfC revised
3/31/2010	Hexanone, 2-: RfD and RfC revised
3/31/2010	Hydrazine : RfC revised
3/31/2010	Hydroquinone : Sfo revised
3/31/2010	Kepone (chlordecone) : Sfo and RfD revised
3/31/2010	Pentane : RfC revised
3/31/2010	Titanium : RfD revised
3/31/2010	Trichlorobenzene, 1,2,4- : Sfo and RfC revised
3/31/2010	Trichloropropane, 1,2,3- : Sfo, RfD, and RfC revised
3/31/2010	Vanadium : RfD revised
3/31/2010	Added : Hexanedinitrile
3/25/2009	Allyl Alcohol : RfC revised.
3/25/2009	Benzyl chloride: RfD and RfC revised.
3/25/2009	Bromobenzene: RfD and RfC revised.
3/25/2009	Butadiene, 1,3- : URF and RfC revised.
3/25/2009	Butyl benzyl phthalate : Sfo revised.
3/25/2009	Chloroaniline, p- : Sfo revised.
3/25/2009	Chloronitrobenzene, p- (1-chloro-4-nitrobenzene) : Sfo revised.
3/25/2009	Cobalt : RfD and RfC revised.
3/25/2009	Dibromo-3-chloropropane, 1,2-: URF revised.

Last Revised: March 1, 2022**Summary of Updates to the Tables Accompanying the Texas Risk Reduction Program (TRRP) Rule¹**

Date of Change	Change Made
3/25/2009	Dichloro-2-butene, 1,4-:URF revised.
3/25/2009	Dichloro-2-butene, trans-1,4- :URF revised.
3/25/2009	Dichlorobenzene, 1,4- : RfC revised.
3/25/2009	Dichloroethane, 1,2-: RfD revised.
3/25/2009	Dimethylbenzidine, 3,3'-: SFo revised.
3/25/2009	Dinitrobenzene, 1,3- (dinitrobenzene, 2,4-) : RfD revised.
3/25/2009	Formaldehyde : URF and RfC revised.
3/25/2009	Formic acid : RfC revised.
3/25/2009	Hydroquinone: SFo and RfD revised.
3/25/2009	Isobutylene : RfC revised.
3/25/2009	Lithium : RfD revised.
3/25/2009	Methylene-bis (2-chloroaniline) 4,4'- : SFo revised.
3/25/2009	Methylnaphthalene, 1- : SFo revised.
3/25/2009	Nitroaniline, 4- :SFo, RfD, and RfC revised.
3/25/2009	Nitrobenzene : RfD, URF, and RfC revised.
3/25/2009	Nitrosodimethylamine, N-: RfC revised.
3/25/2009	Nitrotoluene, o- (2-nitrotoluene) : SFo and RfD revised.
3/25/2009	Propanal (propionaldehyde) : RfC revised.
3/25/2009	Propylene glycol : RfD revised.
3/25/2009	Styrene : RfC revised.
3/25/2009	Tetrachloroethane, 1,1,2,2- : RfD revised.
3/25/2009	Tetrachloroethylene (PCE) : URF and RfC revised.
3/25/2009	Toluene : RfC revised.
3/25/2009	Toluenediamine, 2,6-: RfD revised.
3/25/2009	Trichloroethylene : SFo, URF and RfC revised.
3/25/2009	Trimethylbenzene, 1,2,4-: RfD revised.
3/25/2009	Vinyl Chloride : URF and RfC revised.
3/25/2009	Xylenes, Xylene, m-, Xylene, o-, and Xylene, p- : RfC revised.
3/25/2009	Chemicals added this year: Hexene, 1-, Diisopropylbenzene, p-
4/23/2008	Trichloroethane, 1,1,1- :RfC and RfD revised.
4/23/2008	Benzene : RfC and URF revised.
4/23/2008	Butoxy ethanol, 2- : RfC revised.
4/23/2008	Dichloroethylene, 1,1- : RfC revised.
4/23/2008	Hexane, n- : RfC revised.
4/23/2008	Methyl amyl ketone (2:heptanone) : RfC revised.
4/23/2008	Aluminum : RfD revised.
4/23/2008	Bis (2-chloroethoxy) methane : RfD revised.
4/23/2008	Chlorotoluene, p- (4-chlorotoluene) : RfD revised.
4/23/2008	Dicyclopentadiene : RfC and RfD revised.
4/23/2008	Dinitro-2-methylphenol, 4,6- (dinitro-o-cresol, 4, 6-) : RfD revised.
4/23/2008	Hexachlorobutadiene : RfD revised.
4/23/2008	Malononitrile : RfD revised.
4/23/2008	Nitroglycerin : RfD and SFo revised.
4/23/2008	Nitrosodimethylamine, N-:RfD revised.
4/23/2008	Nitrotoluene, p- : RfD and SFo revised.
4/23/2008	Trichlorophenol, 2,4,6- : RfD revised.

Last Revised: March 1, 2022

Summary of Updates to the Tables Accompanying the Texas Risk Reduction Program (TRRP) Rule¹

Date of Change	Change Made
4/23/2008	Chloronitrobenzene, p- (1-chloro-4-nitrobenzene) : RfC revised.
4/23/2008	Dichloroethylene, trans-1,2 :RfC revised.
4/23/2008	Diisopropyl ether (2,2'-oxybis-propane) : RfC revised.
4/23/2008	Trimethylbenzene, 1,2,4- : RfC revised.
4/23/2008	Dibromo-3-chloropropane, 1,2- : Sfo revised.
4/23/2008	Pentachloroethane : Sfo revised.
4/23/2008	Chemicals added this year : Phosphorotrithioic acid, S,S,s-tributyl ester; Biphenyl, 1,1'-, 2-phenoxy-; Hexanediamine, 1,6-; Ethanol, 2-(2-aminoethoxy)-
3/30/2007	Acetone cyanohydrin : RfD and RfC revised.
3/30/2007	Adipic acid (hexanedioic acid) : RfD revised.
3/30/2007	Aluminum : RfD revised.
3/30/2007	Benzyl alcohol : RfD revised.
3/30/2007	Bromobenzene : RfC revised.
3/30/2007	Cacodylic acid : RfD revised.
3/30/2007	Chlorobenzene : RfC revised.
3/30/2007	Chloroform : RfC revised.
3/30/2007	Chloronitrobenzene, p- (1-chloro-4-nitrobenzene) : Sfo revised and RfD added.
3/30/2007	Cobalt : RfD and RfC revised and URF added.
3/30/2007	Dibromo-3-chloropropane, 1,2- : RfD added.
3/30/2007	Dichloroethane, 1,1- : RfD revised.
3/30/2007	Dichloropropane, 1,3- : RfD revised.
3/30/2007	Diethylene glycol monobutyl ether : RfD revised.
3/30/2007	Diisopropyl ether (2,2'-oxybis-propane) : RfC revised.
3/30/2007	Dimethylbenzidine, 3,3': Sfo revised.
3/30/2007	Dinitrobenzene, 1,4- : RfD revised.
3/30/2007	Dinitro-2-methylphenol, 4,6- (dinitro-o-cresol, 4, 6-) : RfD revised.
3/30/2007	Di:n:octyl phthalate : RfD revised.
3/30/2007	Epichlorohydrin : RfD revised.
3/30/2007	Ethylenediamine : RfD revised.
3/30/2007	Formic acid : RfC revised.
3/30/2007	Hexane, n- : RfD and RfC revised.
3/30/2007	Hexanoic acid : RfD revised.
3/30/2007	Hydroquinone : Sfo added.
3/30/2007	Kepone (chlordecone) : Sfo and RfD revised.
3/30/2007	Malononitrile : RfD revised.
3/30/2007	Methylene-bis (2-chloroaniline) 4,4'- : RfD revised.
3/30/2007	Nitroaniline, 2 : RfD and RfC revised.
3/30/2007	Nitroaniline, 3- :Sfo revised.
3/30/2007	Nitroaniline, 4- :Sfo and RfC revised.
3/30/2007	Nitrosodimethylamine, N- : RfD added.
3/30/2007	Nitrosodiphenylamine, N- :RfD added.
3/30/2007	Nitrotoluene, m- :RfD revised.
3/30/2007	Nitrotoluene, o- :Sfo added.
3/30/2007	Nitrotoluene, p- : Sfo added.
3/30/2007	Propylene glycol : RfD and RfC revised.
3/30/2007	Tetrachloroethane, 1,1,2,2- : RfD revised.

Last Revised: March 1, 2022

Summary of Updates to the Tables Accompanying the Texas Risk Reduction Program (TRRP) Rule¹

Date of Change	Change Made
3/30/2007	Trichlorobenzene, 1,2,4- : RfC revised.
3/30/2007	Trichloroethane, 1,1,1- : RfC revised.
3/30/2007	Trinitrophenylmethyl nitramine (tetryl; nitramine) : RfD revised.
3/30/2007	Xylene, m- : RfC revised.
3/30/2007	Xylene, o- : RfC revised.
3/30/2007	Xylene, p- : RfC revised.
3/30/2007	>8-10 C aliphatics (TPH) : RfC revised.
3/30/2007	>10-12 C aliphatics (TPH) : RfC revised.
3/30/2007	>12-16 C aliphatics (TPH) : RfC revised.
3/30/2007	Chemicals added this year : 1,2-benzenedicarboxylic acid, disodecyl ester, Butyl methacrylate, Ethanol, 2-amino-, ethanol, 2-(2-ethoxyethoxy)-, Nonene, 1-n-, tetraoxadodecane, 2,5,8,11-
3/31/2006	Barium : RfD was revised.
3/31/2006	Benzene : RfD corrected.
3/31/2006	Di-n-octyl phthalate : RfC was revised.
3/31/2006	Ethylene dibromide : URF was revised.
3/31/2006	Hexane : RfC was revised.
3/31/2006	Hexanoic acid : RfD revised.
3/31/2006	Nonyphenol : RfD revised.
3/31/2006	Tert-amyl-methyl-ether (TAME) : RfC was revised.
3/31/2006	Toluene : RfD and RfC were revised.
3/31/2006	Chemicals added this year : Hydrocaproic acid, 6-, Monocrotophos, Nonylphenol ethoxylate, Prothiofos, Sodium hypochlorite, Sulprofos, Tert-amyl-ethyl ether (TAEE), Tetrachlorvinphose (Stiropfos), Tetraethyl pyrophosphate (TEPP)
3/21/2005	Boron : Carcinogenic classification and RfD were revised.
3/21/2005	Cobalt : RfC was revised.
3/21/2005	Dioxane, 1,4- : RfD was revised.
3/21/2005	Ethylene dibromide : Sfo, and URF were revised. RfD and RfC were added.
3/21/2005	Perchlorate : RfD was revised.
3/21/2005	Chemicals added this year : Acetate, 2-ethoxyethanol, Acetate, isoamyl, Acetate, isobutyl, Acetate, sec-butyl, Benzenedicarbonitrile, 1,3-, Benzo-j-fluoranthene, Benzophenone, Benzoyl peroxide, Bromacil, Butadiene, 2-methyl-1,3- (isoprene), Butane, 2,3-dimethyl-, Butanol, 2-, Butanol, 2-methyl-2-, Butene, 1-, Butene, cis-2-, Butene, trans-2-, Cyclopentane, methyl-, Dibenzo(a,e)pyrene, Dibenzo(a,h)pyrene, Dibenzo(a,i)pyrene, Dichlormid, Dichlorofluoromethane, Dipropylene glycol, Hexanal, 2-ethyl-, Hydroquinone, Isoamyl alcohol, Isodecanol, Pentane, 2-methyl-, Pentane, 3-methyl-, Pentanol, 1-, Pentanol, 4-methyl-2-, Phenol, 4-tert-butyl-, Phenothiazine, and Tetraethylene glycol.
3/31/2004	Acetone : RfD was revised.
3/31/2004	Acrolein : RfD and carcinogenic classification were revised.
3/31/2004	Adipic acid : RfD was revised; RfC was removed; RS-ESL was added.
3/31/2004	Benzene : RfD and RfC were revised.
3/31/2004	Cyclohexane : RfC was revised.
3/31/2004	Diisopropyl ether : RS-ESL was revised.
3/31/2004	Disodium Iminodiacetate : RfD was revised.
3/31/2004	Mercury: Much higher PCLs may be obtained using a pH-dependent Kd based on site-specific information (see Figure:30 TAC §350.73(e)(1)(C)).
3/31/2004	Methyl Ethyl Ketone : RfC was revised.
3/31/2004	Methyl isobutyl ketone : RfC was added (previously used a RS-ESL).
3/31/2004	MTBE : reference for toxicity factors was revised.
3/31/2004	Nickel : RfC was revised.

Last Revised: March 1, 2022**Summary of Updates to the Tables Accompanying the Texas Risk Reduction Program (TRRP) Rule¹**

Date of Change	Change Made
3/27/2003	Table containing K _{oc} values for ionizing organic COCs as a function of pH was added.
3/27/2003	Adipic acid : RfD was revised; RfC was added; RS-ESL was removed.
3/27/2003	Aminobiphenyl, 4- : SFo was revised; RfD and URF were removed.
3/27/2003	Ammonium sulfate entry was changed to ammonium salts.
3/27/2003	Aniline : RfD was added.
3/27/2003	Arsenic : refer to TRRP website for November 12, 2002 memorandum regarding implementation of new MCL.
3/27/2003	Bis (2-chloroethoxy) methane : SFo and URF were revised.
3/27/2003	Boron : RfC was added.
3/27/2003	Bromobenzene : reference for RfD was revised; RfC was revised.
3/27/2003	Bromodichloromethane : MCL was removed; note was added regarding MCL for total trihalomethanes
3/27/2003	Bromoform : MCL was removed; note was added regarding MCL for total trihalomethanes
3/27/2003	Butadiene, 1,3: URF and carcinogenic classification were revised; RfC was added (previously used a RS:ESL).
3/27/2003	Butyric acid : RfD was revised; RfC was added; RS-ESL was removed.
3/27/2003	Chloral hydrate : references for carcinogenic classification and RfD were revised.
3/27/2003	Chloroform : MCL was removed; note was added regarding MCL for total trihalomethanes
3/27/2003	Cyclohexane : RS-ESL was revised.
3/27/2003	Cyclohexanol : RS-ESL was revised.
3/27/2003	Dibenz-a,h-acridine : carcinogenic classification was revised.
3/27/2003	Dibromochloromethane : MCL was removed; note was added regarding MCL for total trihalomethanes
3/27/2003	Dichlorobenzene, 1,2: RfC was revised.
3/27/2003	Dichloroethylene, 1,1: SFo and URF were removed; RfD was revised; RfC was added.
3/27/2003	Diethylhexyl adipate : MCL was added.
3/27/2003	Hexanoic acid : RfD and RfC were revised.
3/27/2003	Kepone : carcinogenic classification was revised.
3/27/2003	Lithium : RfD was revised.
3/27/2003	Mercury : CAS number for mercuric chloride was added to entry.
3/27/2003	MTBE : URF was revised.
3/27/2003	Nitroglycerin : SFo was added.
3/27/2003	Nitrosopiperidine, N: carcinogenic classification was revised.
3/27/2003	Perylene : RfD was revised.
3/27/2003	Phenol : RfD was revised.
3/27/2003	Picloram : reference for RfD was revised.
3/27/2003	Safarole : carcinogenic classification was revised.
3/27/2003	Tetrachloroethylene : reference for carcinogenic classification was revised.
3/27/2003	Toluenediamine, 2,6: LogKoc was revised.
3/27/2003	Trichloroethylene : reference for carcinogenic classification was revised.
3/27/2003	Uranium : MCL was revised.
3/27/2003	Valeric acid : RfD and RfC were revised.
3/27/2003	Xylenes : RfD was revised; RfC was added (previously used a RS:ESL).
3/28/2002	References for some tox values were revised.
3/28/2002	Arsenic : MCL was revised. Note that this change is significant enough for the executive director to require use of the new arsenic MCL, even if the SIN or RAP has already been submitted.
3/28/2002	Nitrophenol, 3: RS-ESL was revised.

Last Revised: March 1, 2022**Summary of Updates to the Tables Accompanying the Texas Risk Reduction Program (TRRP) Rule¹**

Date of Change	Change Made
3/28/2002	Triaminotrinitrobenzene - H_unitless was corrected to reflect a value.
12/19/2001	**Note: As discussed in the guidance document Toxicity Factors and Chemical/Physical Parameters (RG-366/TRRP-19), updates to the tables to reflect changes in toxicity factors or chemical/physical data will now be made annually in March. Exceptions to this schedule include a change that has been of such a magnitude that the PCLs previously developed for a COC would not be adequately protective of human health and the environment.
12/19/2001	Several compounds were added to the tables which are not of human health concern but for which other criteria may apply. These are noted in the tables and an additional information table is referenced.
12/19/2001	Ammonia : taste and odor value for groundwater was added to the secondary MCL column.
12/19/2001	Benzaldehyde : RS-ESL was revised.
12/19/2001	Bis (2-chloroethoxy) methane : chemical/physical parameters were added.
12/19/2001	Chlordane, gamma : chemical/physical parameters were added.
12/19/2001	Chloroform : SFO was removed.
12/19/2001	Chloromethane : RfC and carcinogenic classification were revised.
12/19/2001	Cyclohexane : RS-ESL was revised.
12/19/2001	Diethylene glycol monobutyl ether : RfC was revised.
12/19/2001	Hexachlorocyclopentadiene : RfD, RfC, and carcinogenic classification were revised.
12/19/2001	Methyl acetate : RfD was revised.
12/19/2001	Methyl cyclohexane : RfC was revised.
12/19/2001	Perchlorate : RfD was revised. Note that this change is significant enough for the executive director to require use of the new perchlorate RfD, even if the SIN or RAP has already been submitted.
12/19/2001	Quinoline : Carcinogenic classification and SFO were revised.
12/19/2001	Triaminotrinitrobenzene : chemical/physical parameters were revised.
3/15/2001	**Note: Updates to the tables will be made approximately once every six months. Exceptions to the six month schedule include a change that has been of such a magnitude that the PCLs previously developed for a contaminant would not be adequately protective of human health and the environment.
3/15/2001	Please note that several COCs were added to the tables. New COCs added since the last publication of the tables are identified in the chemical/physical properties table and the ABS.d/ABS.gi table.
3/15/2001	Based on conversations with ATSDR, it was determined that the MRL list provided on ATSDR's website (http://www.atsdr.cdc.gov/mrls.html) lists official, more up-to-date MRLs than the May 23, 1996 FR version which were previously used for the tables. Many of the toxicity factors additions and revisions noted below were due to transitioning to this new source for MRL values.
3/15/2001	The reference to the 1995 MADEP document was removed and replaced by TNRCC-derived values. This only affected the RfD for one noncarcinogenic PAH (2-methylnaphthalene), which is noted below.
3/15/2001	Acetaldehyde : RfD was added.
3/15/2001	Benzene : SFO was revised.
3/15/2001	Cadmium : ABS.d was changed to 0.001; RfC was removed.
3/15/2001	Chloral : RfD was revised.
3/15/2001	Chlordane : CAS number was corrected.
3/15/2001	Chlorobenzene : RfC was added.
3/15/2001	Chloromethane : RfC was revised.
3/15/2001	Chlorotoluene, o: LogKoc and Dair were added to match Figure: 30 TAC §350.73(e) of the TRRP rule; Dwat was also added.
3/15/2001	Cyanide : Henry's Law Constant was added.
3/15/2001	Dibenzofuran : chemical/physical parameters were revised.

Last Revised: March 1, 2022

Summary of Updates to the Tables Accompanying the Texas Risk Reduction Program (TRRP) Rule¹

Date of Change	Change Made
3/15/2001	Dichlorobenzene, 1,3: chemical/physical parameters were corrected to match Figure: 30 TAC §350.73(e) of the TRRP rule.
3/15/2001	Dichloroethane, 1,2: RfC was revised.
3/15/2001	Dichloropropene, 1,3- (mixed isomers) : RfD, SFO, and URF were revised.
3/15/2001	Dimethylphthalate : chemical/physical parameters were corrected to match Figure: 30 TAC §350.73(e) of the TRRP rule.
3/15/2001	Dinitro-2-methylphenol, 4,6- chemical/physical parameters were revised.
3/15/2001	Endothall : Dair and Dwat were added.
3/15/2001	Endrin : Dair and Dwat were added.
3/15/2001	Ethion : Dair and Dwat were added.
3/15/2001	Ethyl-2-methyl benzene, 1- and ethyl-4-methyl benzene, 1- MCLs were removed (had previously used toluene's MCL).
3/15/2001	Formaldehyde : RfC was added (previously used a RS-ESL).
3/15/2001	Hexachlorocyclohexane, alpha : RfD was added.
3/15/2001	Hexanone, 2: chemical/physical parameters were added.
3/15/2001	Kepone : SFO and URF were added.
3/15/2001	Mercury : a second entry was added to include Kds (and PCLs) at two different soil pHs; LogKd was revised to match Figure: 30 TAC §350.73(e) of the TRRP rule.
3/15/2001	Methylnaphthalene, 1: RfD was revised.
3/15/2001	Methylnaphthalene, 2: RfD was revised.
3/15/2001	MTBE : SFO was revised.
3/15/2001	Naled : Dair value was added.
3/15/2001	Nickel : RfC was added.
3/15/2001	Nitrate : LogKoc and Henry's Law Constant were added.
3/15/2001	Nitroaniline, 3- and nitroaniline, 4: chemical/physical parameters were revised.
3/15/2001	Nitrophenol, 2- and nitrophenol, 4: RS-ESLs were added; chemical/physical parameters were revised.
3/15/2001	t (exposure interval) was corrected to match Figure: 30 TAC §350.75(b)(1) of the TRRP rule (value changed slightly).
3/15/2001	Tetrachloroethane, 1,1,2,2: RfD was revised.
3/15/2001	Tetraethyl lead was removed as a COC for the vegetable ingestion pathway (was previously considered to be a metal).
3/15/2001	Tetrahydrofuran : chemical/physical parameters were revised.
3/15/2001	Thallium : LogKd was added.
3/15/2001	Toluenediamine, 2,6: LogKoc was added.
3/15/2001	Trimethylbenzene, 1,2,3: MCL was removed (had previously used toluene's MCL).
3/15/2001	Uranium : RfC was added.
3/15/2001	Vinyl chloride : SFO, RfD, URF, and RfC were revised.
9/16/1999	Original TRRP tables available.

Footnote

¹ As discussed in TRRP §350.73(a) and in the accompanying guidance document entitled Toxicity Factors and Chemical/Physical Parameters (RG-366/TRRP-19), persons are required to use the most current toxicity factors as of the date of submittal of the Self-Implementation Notice (SIN) or the Response Action Plan (RAP). The TCEQ provides toxicity factors on the agency's website as a convenience to users of the tables. However, since the tables are typically updated on an annual basis, it is the person's responsibility to ensure that they are using the most current toxicity factors according to the hierarchy described in §350.73(a). TCEQ project managers will verify that toxicity factors are current at the time of submittal of the SIN or RAP. Note that if the executive director determines during the review of the Response Action Completion Report (RACR) that a change in a toxicity factor since the submittal of the SIN or RAP has been of such a magnitude that the PCLs previously developed for a COC would clearly not be protective of human health and the environment, the adequacy of the response action must be reevaluated.

This table contains a list of all edits and additions to the TRRP PCL tables from 1999-January 6, 2021
end of worksheet

Table 1
Tier 1 Residential Soil PCLs¹

Last Revised: March 1, 2022

Chemical of Concern	CAS	0.5 acre source area											30 acre source area											
		² Soil _{Comb} (mg/kg)	³ note	² Soil _{Ing} (mg/kg)	³ note	³ Soil _{Class} (mg/kg)	³ note	⁴ Air _{Soil_{Inh-V}} (mg/kg)	³ note	⁴ Air _{GW-Soil_{Inh-V}} (mg/kg)	³ note	² Soil _{for Secondary MCL} (mg/kg)	² Soil _{Comb} (mg/kg)	³ note	² Soil _{Ing} (mg/kg)	³ note	³ Soil _{Class} (mg/kg)	³ note	⁴ Air _{Soil_{Inh-V}} (mg/kg)	³ note	⁴ Air _{GW-Soil_{Inh-V}} (mg/kg)	³ note	² Soil _{for Secondary MCL} (mg/kg)	
Acenaphthene	83-32-9	3.0E+03	n	2.4E+02	n	2.4E+04	n >S	—	—	—	—	—	3.0E+03	n	1.2E+02	n	1.2E+04	n >S	—	—	—	—	—	—
Acenaphthylene	208-96-8	3.8E+03	n	4.1E+02	n	4.1E+04	n >S	—	—	—	—	—	3.8E+03	n	2.0E+02	n	2.0E+04	n >S	—	—	—	—	—	—
Acetaldehyde	75-07-0	1.4E+02	n	5.0E+00	n	5.0E+02	n	1.4E+02	n	4.8E+03	n	—	7.3E+01	n	2.5E+00	n	2.5E+02	n	7.4E+01	n	3.1E+02	n	—	—
Acetate, 2-ethoxyethanol	111-15-9	3.5E+03	n	5.3E+00	n	5.3E+02	n	6.0E+03	n	9.8E+05	n >S	—	2.3E+03	n	2.7E+00	n	2.7E+02	n	3.1E+03	n	6.3E+04	n	—	—
Acetate, isoamyl	123-92-2	5.9E+03	n	8.7E+00	n	8.7E+02	n	—	—	—	—	—	5.9E+03	n	4.4E+00	n	4.4E+02	n	—	—	—	—	—	—
Acetate, isobutyl	110-19-0	3.9E+03	n	3.7E+00	n	3.7E+02	n	—	—	—	—	—	3.9E+03	n	1.8E+00	n	1.8E+02	n	—	—	—	—	—	—
Acetate, sec-butyl	105-46-4	3.9E+03	n	4.0E+00	n	4.0E+02	n	—	—	—	—	—	3.9E+03	n	2.0E+00	n	2.0E+02	n	—	—	—	—	—	—
Acetic acid*	64-19-7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Acetone (2-propanone)	67-64-1	6.6E+04	n	4.3E+01	n	4.3E+03	n	6.0E+05	n	1.0E+06	n >S	—	5.9E+04	n	2.1E+01	n	2.1E+03	n	3.1E+05	n	9.7E+05	n >S	—	—
Acetone cyanohydrin	75-86-5	1.9E+02	n	1.4E-01	n	1.4E+01	n	4.3E+03	n	6.6E+05	n	—	1.8E+02	n	7.1E-02	n	7.1E+00	n	2.2E+03	n	4.3E+04	n	—	—
Acetonitrile	75-05-8	8.7E+02	n	1.5E+00	n	1.5E+02	n	1.3E+03	n	6.2E+04	n	—	5.3E+02	n	7.6E-01	n	7.6E+01	n	6.7E+02	n	4.0E+03	n	—	—
Acetophenone	98-86-2	6.7E+03	n	8.2E+00	n	8.2E+02	n	—	—	—	—	—	6.7E+03	n	4.1E+00	n	4.1E+02	n	—	—	—	—	—	—
Acetylaminofluorene, 2-	53-96-3	1.2E+00	c	4.5E-03	c	4.5E-01	c	1.9E+01	c	1.2E+04	c >S	—	1.1E+00	c	2.3E-03	c	2.3E-01	c	9.5E+00	c	9.9E+02	c >S	—	—
Acifluorfen, sodium	62476-59-9	8.7E+02	n	2.0E+00	n	2.0E+02	n	—	—	—	—	—	8.7E+02	n	1.0E+00	n	1.0E+02	n	—	—	—	—	—	—
Acridine	260-94-6	2.0E+02	n	7.5E+00	n	7.5E+02	n	—	—	—	—	—	2.0E+02	n	3.8E+00	n	3.8E+02	n	—	—	—	—	—	—
Acrolein	107-02-8	3.2E+01	n	2.4E-02	n	2.4E+00	n	1.5E+02	n	1.8E+04	n	—	2.7E+01	n	1.2E-02	n	1.2E+00	n	7.8E+01	n	1.2E+03	n	—	—
Acrylamide	79-06-1	7.0E+00	c	3.5E-03	c	3.5E-01	c	2.8E+01	c	7.2E+03	c	—	5.7E+00	c	1.8E-03	c	1.8E-01	c	1.4E+01	c	4.8E+02	c	—	—
Acrylic acid	79-10-7	1.2E+02	n	2.4E+01	n	2.4E+03	n	1.2E+02	n	3.0E+04	n	—	6.2E+01	n	1.2E+01	n	1.2E+03	n	6.2E+01	n	1.9E+03	n	—	—
Acrylonitrile	107-13-1	3.6E+00	c	3.3E-03	c	3.3E-01	c	5.3E+00	c	1.1E+02	c	—	2.2E+00	c	1.7E-03	c	1.7E-01	c	2.7E+00	c	7.4E+00	c	—	—
Adipic acid (hexanedioic acid)	124-04-9	1.3E+05	n	9.4E+01	n	9.4E+03	n	—	—	—	—	—	1.3E+05	n	4.7E+01	n	4.7E+03	n	—	—	—	—	—	—
Alachlor	15972-60-8	5.9E+01	c	1.9E-02	m	1.9E+00	m	—	—	—	—	—	5.9E+01	c	9.5E-03	m	9.5E-01	m	—	—	—	—	—	—
Aldicarb	116-06-3	6.7E+01	n	1.8E-02	m	1.8E+00	m	—	—	—	—	—	6.7E+01	n	8.9E-03	m	8.9E-01	m	—	—	—	—	—	—
Aldicarb sulfone	1646-88-4	6.7E+01	n	1.4E-02	m	1.4E+00	m	—	—	—	—	—	6.7E+01	n	6.9E-03	m	6.9E-01	m	—	—	—	—	—	—
Aldrin	309-00-2	5.0E-02	c	1.0E-01	c	1.0E+01	c	8.3E+00	c	8.5E+03	c >S	—	5.0E-02	c	5.1E-02	c	5.1E+00	c	4.3E+00	c	5.5E+02	c >S	—	—
Allyl alcohol	107-18-6	5.6E+00	n	2.5E-01	n	2.5E+01	n	5.7E+00	n	6.1E+02	n	—	2.9E+00	n	1.3E-01	n	1.3E+01	n	2.9E+00	n	3.9E+01	n	—	—
Allyl chloride	107-05-1	1.5E+01	n	1.0E+00	n	1.0E+02	n	1.5E+01	n	3.8E+01	n	—	7.8E+00	n	5.1E-01	n	5.1E+01	n	7.9E+00	n	2.5E+00	n	—	—
Aluminum	7429-90-5	6.5E+04	n	1.7E+05	n >S	1.0E+06	n >S	—	—	—	—	1400	6.4E+04	n	8.6E+04	n >S	1.0E+06	n >S	—	—	—	—	710	—
Ametryn	834-12-8	6.0E+02	n	7.2E+00	n	7.2E+02	n	—	—	—	—	—	6.0E+02	n	3.6E+00	n	3.6E+02	n	—	—	—	—	—	—
Amino-2,6-dinitrotoluene, 4-	19406-51-0	3.3E+01	n	2.0E-01	n	2.0E+01	n	—	—	—	—	—	3.3E+01	n	1.0E-01	n	1.0E+01	n	—	—	—	—	—	—
Amino-4,6-dinitrotoluene, 2-	35572-78-2	3.3E+01	n	3.0E-01	n	3.0E+01	n	—	—	—	—	—	3.3E+01	n	1.5E-01	n	1.5E+01	n	—	—	—	—	—	—
Aminobiphenyl, 4- (1,1-biphenyl-4-amine)	92-67-1	7.7E-01	c	1.1E-02	c	1.1E+00	c	—	—	—	—	—	7.7E-01	c	5.4E-03	c	5.4E-01	c	—	—	—	—	—	—
Aminopyridine, 4-	504-24-5	1.3E+00	n	9.5E-04	n	9.5E-02	n	—	—	—	—	—	1.3E+00	n	4.7E-04	n	4.7E-02	n	—	—	—	—	—	—
Ammonia ⁹	7664-41-7	4.9E+03	n	—	—	—	—	4.9E+03	n	1.8E+04	n	3.1	2.5E+03	n	—	—	—	—	2.5E+03	n	1.2E+03	n	1.6	—
Ammonium polyphosphate*	6833-79-9	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Ammonium salts*	AMMONIUM	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Aniline	62-53-3	1.0E+02	n	3.7E-01	c	3.7E+01	c	1.3E+02	n	2.5E+04	n	—	5.9E+01	n	1.8E-01	c	1.8E+01	c	6.7E+01	n	1.6E+03	n	—	—
Anthracene	120-12-7	1.8E+04	n	6.9E+03	n >S	6.9E+05	n >S	—	—	—	—	—	1.8E+04	n	3.4E+03	n >S	3.4E+05	n >S	—	—	—	—	—	—
Anthraquinone, 9,10-	84-65-1	1.2E+02	c	1.1E+00	c	1.1E+02	c >S	—	—	—	—	—	1.2E+02	c	5.7E-01	c	5.7E+01	c >S	—	—	—	—	—	—
Antimony	7440-36-0	1.5E+01	n	5.4E+00	m >S	5.4E+02	m >S	—	—	—	—	—	1.5E+01	n	2.7E+00	m >S	2.7E+02	m >S	—	—	—	—	—	—
Aramite	140-57-8	1.1E+02	c	—	—	—	—	—	—	—	—	—	1.1E+02	c	—	—	—	—	—	—	—	—	—	—
Arsenic	7440-38-2	2.4E+01	n	5.0E+00	m >S	5.0E+02	m >S	—	—	—	—	—	2.4E+01	n	2.5E+00	m >S	2.5E+02	m >S	—	—	—	—	—	—
Arsine	7784-42-1	7.7E-01	n	—	—	—	—	7.7E-01	n	—	—	—	3.9E-01	n	—	—	—	—	3.9E-01	n	—	—	—	—
Atrazine	1912-24-9	2.1E+01	c	2.5E-02	m	2.5E+00	m	—	—	—	—	—	2.1E+01	c	1.2E-02	m	1.2E+00	m	—	—	—	—	—	—
Azinphos-methyl (guthion)	86-50-0	1.0E+02	n	4.4E-01	n	4.4E+01	n >S	—	—	—	—	—	1.0E+02	n	2.2E-01	n	2.2E+01	n >S	—	—	—	—	—	—
Azobenzene	103-33-3	3.7E+01	c	1.8E+01	c	1.8E+03	c	1.4E+03	c	1.0E+06	c >S	—	3.6E+01	c	8.8E+00	c	8.8E+02	c	7.1E+02	c	9.4E+04	c >S	—	—
Barium	7440-39-3	8.1E+03	n	4.4E+02	m >S	4.4E+04	m >S	—	—	—	—	—	8.1E+03	n	2.2E+02	m >S	2.2E+04	m >S	—	—	—	—	—	—
Bayleton	43121-43-3	2.0E+03	n	7.4E+00	n	7.4E+02	n >S	—	—	—	—	—	2.0E+03	n	3.7E+00	n	3.7E+02	n >S	—	—	—	—	—	—
Benefin (benfluralin)	1861-40-1	1.9E+04	n	4.9E+04	n >S	1.0E+06	n >S	—	—	—	—	—	1.9E+04	n	2.4E+04	n >S	1.0E+06	n >S	—	—	—	—	—	—
Benomyl	17804-35-2	3.3E+03	n	3.1E+00	n	3.1E+02	n >S	—	—	—	—	—	3.3E+03	n	1.5E+00	n	1.5E+02	n >S	—	—	—	—	—	—
Benz-a-anthracene	56-55-3	4.1E+01	c	1.3E+02	c	1.3E+04	c >S	5.5E+03	c	1.0E+06	c >S	—	4.1E+01	c	6.5E+01	c	6.5E+03	c >S	2.8E+03	c	1.0E+06	c >S	—	—
Benzaldehyde	100-52-7	8.2E+03	n	1.1E+01	n	1.1E+03	n	—	—	—	—	—	8.2E+03	n	5.3E+00	n	5.3E+02	n	—	—	—	—	—	—
Benzene	71-43-2	1.2E+02	c	2.6E-02	m	2.6E+00	m	1.6E+02	c	9.2E+02	c	—	6.9E+01	c	1.3E-02	m	1.3E+00	m	8.4E+01	c	6.0E+01	c	—	—

Table 1
Tier 1 Residential Soil PCLs¹

Last Revised: March 1, 2022

Chemical of Concern	CAS	0.5 acre source area										30 acre source area											
		¹ Soil _{Comb} ² (mg/kg)	note ³	¹ Soil _{Ing} (mg/kg)	note ³	¹ Soil _{Class 3} (mg/kg)	note ³	¹ Soil _{Inh-V} ⁴ (mg/kg)	note ³	¹ GW-Soil _{Inh-V} (mg/kg)	note ³	¹ Soil _{Comb} ² (mg/kg)	note ³	¹ Soil _{Ing} (mg/kg)	note ³	¹ Soil _{Class 3} (mg/kg)	note ³	¹ Soil _{Inh-V} ⁴ (mg/kg)	note ³	¹ GW-Soil _{Inh-V} (mg/kg)	note ³	¹ Soil _{Comb} ² (mg/kg)	
Benzenedicarbonitrile, 1,3-	626-17-5	4.0E+02	n	3.3E-01	n	3.3E+01	n	—	—	—	—	—	4.0E+02	n	1.6E-01	n	1.6E+01	n	—	—	—	—	—
Benzenedicarboxylic acid, 1,2-disodecyl ester	26761-40-0	2.7E+03	n	1.0E+06	n >S	1.0E+06	n >S	1.0E+06	n	1.0E+06	n >S	—	2.6E+03	n	1.0E+06	n >S	1.0E+06	n >S	1.0E+06	n	1.0E+06	n >S	—
Benzenethiol	108-98-5	8.2E+01	n	6.8E-02	n	6.8E+00	n	—	—	—	—	—	8.2E+01	n	3.4E-02	n	3.4E+00	n	—	—	—	—	—
Benzidine	92-87-5	1.5E-02	c	1.1E-05	c	1.1E-03	c	6.3E-02	c	1.4E+01	c	—	1.3E-02	c	5.5E-06	c	5.5E-04	c	3.2E-02	c	1.2E+00	c	—
Benzo-a-pyrene	50-32-8	4.1E+00	c	7.6E+00	m	7.6E+02	m >S	6.4E+01	n	1.0E+06	n >S	—	4.1E+00	c	3.8E+00	m	3.8E+02	m >S	3.3E+01	n	7.2E+04	n >S	—
Benzo-b-fluoranthene	205-99-2	4.2E+01	c	4.4E+02	c >S	4.4E+04	c >S	9.0E+03	c	1.0E+06	c >S	—	4.1E+01	c	2.2E+02	c >S	2.2E+04	c >S	4.6E+03	c	1.0E+06	c >S	—
Benzo-e-pyrene	192-97-2	1.8E+03	n	1.1E+05	n >S	1.0E+06	n >S	—	—	—	—	—	1.8E+03	n	5.7E+04	n >S	1.0E+06	n >S	—	—	—	—	—
Benzo-g,h,i-perylene	191-24-2	1.8E+03	n	4.6E+04	n >S	1.0E+06	n >S	—	—	—	—	—	1.8E+03	n	2.3E+04	n >S	1.0E+06	n >S	—	—	—	—	—
Benzoic acid	65-85-0	2.7E+05	n	1.9E+02	n	1.9E+04	n >S	—	—	—	—	—	2.7E+05	n	9.5E+01	n	9.5E+03	n >S	—	—	—	—	—
Benzo-j-fluoranthene	205-82-3	3.9E+01	c	1.9E+02	c >S	1.9E+04	c >S	4.7E+03	c	1.0E+06	c >S	—	3.9E+01	c	9.6E+01	c >S	9.6E+03	c >S	2.4E+03	c	1.0E+06	c >S	—
Benzo-k-fluoranthene	207-08-9	4.2E+02	c	4.5E+03	c >S	4.5E+05	c >S	2.2E+05	c	1.0E+06	c >S	—	4.2E+02	c	2.2E+03	c >S	2.2E+05	c >S	1.1E+05	c	1.0E+06	c >S	—
Benzophenone	119-61-9	4.5E+02	n	1.7E+01	n	1.7E+03	n	—	—	—	—	—	4.5E+02	n	8.5E+00	n	8.5E+02	n	—	—	—	—	—
Benzotrichloride	98-07-7	3.6E-01	c	4.2E-03	c	4.2E-01	c	—	—	—	—	—	3.6E-01	c	2.1E-03	c	2.1E-01	c	—	—	—	—	—
Benzoyl peroxide	94-36-0	3.3E+03	n	5.4E+01	n	5.4E+03	n >S	—	—	—	—	—	3.3E+03	n	2.7E+01	n	2.7E+03	n >S	—	—	—	—	—
Benzyl alcohol	100-51-6	6.7E+03	n	5.9E+00	n	5.9E+02	n	—	—	—	—	—	6.7E+03	n	2.9E+00	n	2.9E+02	n	—	—	—	—	—
Benzyl chloride	100-44-7	2.6E+01	n	5.0E-02	c	5.0E+00	c	3.1E+01	n	9.3E+02	n	—	1.4E+01	n	2.5E-02	c	2.5E+00	c	1.6E+01	n	6.0E+01	n	—
Benzyl dichloride	98-87-3	2.8E+01	c	6.3E-02	c	6.3E+00	c	5.5E+01	n	2.3E+03	n	—	2.3E+01	n	3.2E-02	c	3.2E+00	c	2.8E+01	n	1.5E+02	n	—
Beryllium	7440-41-7	3.8E+01	n	1.8E+00	m >S	1.8E+02	m >S	—	—	—	—	—	3.8E+01	n	9.2E-01	m >S	9.2E+01	m >S	—	—	—	—	—
Biphenyl, 1,1-	92-52-4	1.2E+04	n	2.5E+03	n >S	2.5E+05	n >S	—	—	—	—	—	1.2E+04	n	1.3E+03	n >S	1.3E+05	n >S	—	—	—	—	—
Biphenyl, 1,1', 2-phenoxy-	6738-04-1	3.2E+03	n	7.5E+04	n >S	1.0E+06	n >S	—	—	—	—	—	3.2E+03	n	3.7E+04	n >S	1.0E+06	n >S	—	—	—	—	—
Biquinoline, 2,2'-	119-91-5	1.8E+02	n	2.7E+01	n	2.7E+03	n >S	—	—	—	—	—	1.8E+02	n	1.3E+01	n	1.3E+03	n >S	—	—	—	—	—
Bis (2-chloroethoxy) methane	111-91-1	3.1E+00	c	1.2E-02	c	1.2E+00	c	1.1E+01	c	1.1E+03	c	—	2.5E+00	c	5.9E-03	c	5.9E-01	c	5.8E+00	c	7.4E+01	c	—
Bis (2-chloroethyl) ether	111-44-4	2.2E+00	c	2.1E-03	c	2.1E-01	c	3.6E+00	c	2.4E+02	c	—	1.4E+00	c	1.1E-03	c	1.1E-01	c	1.8E+00	c	1.5E+01	c	—
Bis (2-chloro-1-methylethyl) ether	108-60-1	5.1E+01	c	1.9E-01	c	1.9E+01	c	2.1E+02	c	1.3E+04	c	—	4.1E+01	c	9.5E-02	c	9.5E+00	c	1.1E+02	c	8.2E+02	c	—
Bis (2-chloromethyl) ether	542-88-1	4.8E-03	c	8.2E-06	c	8.2E-04	c	5.8E-03	c	1.7E-01	c	—	2.7E-03	c	4.1E-06	c	4.1E-04	c	3.0E-03	c	1.1E-02	c	—
Bis (2-ethyl-hexyl) phthalate	117-81-7	4.3E+01	c	1.6E+02	m	1.6E+04	m >S	—	—	—	—	—	4.3E+01	c	8.2E+01	m	8.2E+03	m >S	—	—	—	—	—
Bismuth	7440-69-9	3.7E+04	n	—	—	—	—	—	—	—	—	—	3.7E+04	n	—	—	—	—	—	—	—	—	—
Bisphenol A	80-05-7	3.3E+03	n	2.9E+01	n	2.9E+03	n	—	—	—	—	—	3.3E+03	n	1.5E+01	n	1.5E+03	n	—	—	—	—	—
Boron	7440-42-8	1.6E+04	n	—	—	—	—	—	—	—	—	—	1.6E+04	n	—	—	—	—	—	—	—	—	—
Bromacil	314-40-9	6.7E+03	n	1.7E+01	n	1.7E+03	n	—	—	—	—	—	6.7E+03	n	8.6E+00	n	8.6E+02	n	—	—	—	—	—
Bromo-2-chloroethane, 1-	107-04-0	3.3E+03	n	3.5E+00	n	3.5E+02	n	—	—	—	—	—	3.3E+03	n	1.7E+00	n	1.7E+02	n	—	—	—	—	—
Bromobenzene	108-86-1	3.9E+02	n	2.3E+00	n	2.3E+02	n	9.7E+02	n	2.7E+04	n >S	—	2.8E+02	n	1.2E+00	n	1.2E+02	n	5.0E+02	n	1.7E+03	n	—
Bromodichloromethane ⁸	75-27-4	9.8E+01	c	3.6E-01	m	3.6E+01	m	—	—	—	—	—	9.8E+01	c	1.8E-01	m	1.8E+01	m	—	—	—	—	—
Bromoform ⁹	75-25-2	4.0E+02	c	4.4E-01	m	4.4E+01	m	8.4E+02	c	2.8E+04	c >S	—	2.8E+02	c	2.2E-01	m	2.2E+01	m	4.3E+02	c	1.8E+03	c	—
Bromomethane	74-83-9	3.9E+01	n	1.3E-01	n	1.3E+01	n	6.0E+01	n	1.4E+02	n	—	2.4E+01	n	6.5E-02	n	6.5E+00	n	3.1E+01	n	8.9E+00	n	—
Bromophenyl phenylether, 4-	101-55-3	2.8E-01	c	3.5E-01	c	3.5E+01	c	9.8E+00	c	9.2E+03	c >S	—	2.7E-01	c	1.8E-01	c	1.8E+01	c	5.0E+00	c	5.9E+02	c	—
Butadiene, 1,3-	106-99-0	5.1E+02	n	—	—	—	—	5.1E+02	n	5.0E+02	n	—	2.6E+02	n	—	—	—	—	2.6E+02	n	3.2E+01	n	—
Butadiene, 2-methyl-1,3- (isoprene)	78-79-5	4.8E+03	n	1.1E+01	n	1.1E+03	n	2.8E+05	n	6.2E+05	n >S	—	4.7E+03	n	5.5E+00	n	5.5E+02	n	1.4E+05	n	4.0E+04	n >S	—
Butanal (butyraldehyde)	123-72-8	1.2E+03	n	3.2E+00	n	3.2E+02	n	1.5E+03	n	4.3E+04	n	—	6.8E+02	n	1.6E+00	n	1.6E+02	n	7.9E+02	n	2.8E+03	n	—
Butane, 2,3-dimethyl-	79-29-8	4.8E+03	n	2.8E+02	n	2.8E+04	n >S	2.8E+05	n	4.6E+05	n >S	—	4.7E+03	n	1.4E+02	n	1.4E+04	n >S	1.4E+05	n	3.0E+04	n >S	—
Butanoic acid (butyric acid)	107-92-6	1.3E+02	n	2.3E+01	n	2.3E+03	n	1.3E+02	n	3.6E+04	n	—	6.6E+01	n	1.2E+01	n	1.2E+03	n	6.6E+01	n	2.4E+03	n	—
Butanol, 2-	78-92-2	1.5E+05	n	1.0E+02	n	1.0E+04	n	1.0E+06	n	1.0E+06	n >S	—	1.3E+05	n	5.2E+01	n	5.2E+03	n	7.2E+05	n	1.0E+06	n >S	—
Butanol, 2-methyl-1-	137-32-6	8.2E+02	n	6.0E-01	n	6.0E+01	n	—	—	—	—	—	8.2E+02	n	3.0E-01	n	3.0E+01	n	—	—	—	—	—
Butanol, 2-methyl-2-	75-85-4	8.2E+02	n	5.9E-01	n	5.9E+01	n	—	—	—	—	—	8.2E+02	n	2.9E-01	n	2.9E+01	n	—	—	—	—	—
Butanol, n-	71-36-3	8.2E+03	n	5.3E+00	n	5.3E+02	n	—	—	—	—	—	8.2E+03	n	2.6E+00	n	2.6E+02	n	—	—	—	—	—
Butene, 1-	106-98-9	4.6E+03	n	4.4E+01	n	4.4E+03	n	8.1E+04	n	8.8E+04	n >S	—	4.4E+03	n	2.2E+01	n	2.2E+03	n	4.2E+04	n	5.7E+03	n >S	—
Butene, cis-2-	590-18-1	4.1E+03	n	3.2E+01	n	3.2E+03	n	2.5E+04	n	2.8E+04	n >S	—	3.5E+03	n	1.6E+01	n	1.6E+03	n	1.3E+04	n	1.8E+03	n	—
Butene, trans-2-	624-64-6	4.1E+03	n	3.2E+01	n	3.2E+03	n	2.5E+04	n	2.8E+04	n >S	—	3.5E+03	n	1.6E+01	n	1.6E+03	n	1.3E+04	n	1.8E+03	n	—
Butoxy ethanol, 2- (Ethylene glycol monobutyl ether; EGBE)	111-76-2	6.5E+03	n	5.9E+00	n	5.9E+02	n	2.9E+05	n	1.0E+06	n >S	—	6.4E+03	n	2.9E+00	n	2.9E+02	n	1.5E+05	n	1.0E+06	n >S	—
Butyl acetate	123-86-4	1.0E+04	n	1.0E+01	n	1.0E+03	n	8.4E+04	n	1.0E+06	n >S	—	9.1E+03	n	5.1E+00	n	5.1E+02	n	4.3E+04	n	1.4E+05	n >S	—
Butyl acrylate	141-32-2	7.4E+02	n	1.0E+00	n	1.0E+02	n	—	—	—	—	—											

Table 1
Tier 1 Residential Soil PCLs¹

Last Revised: March 1, 2022

Chemical of Concern	CAS	0.5 acre source area										30 acre source area											
		TotalSoil _{Comb} ² (mg/kg) note ³	GWSoil _{Ing} (mg/kg) note ³	GWSoil _{Class 3} (mg/kg) note ³	AirSoil _{Inh-V} ⁴ (mg/kg) note ³	AirGW-Soil _{Inh-V} (mg/kg) note ³	GWSoil for Secondary MCL (mg/kg)	TotalSoil _{Comb} ² (mg/kg) note ³	GWSoil _{Ing} (mg/kg) note ³	GWSoil _{Class 3} (mg/kg) note ³	AirSoil _{Inh-V} ⁴ (mg/kg) note ³	AirGW-Soil _{Inh-V} (mg/kg) note ³	GWSoil for Secondary MCL (mg/kg)										
Butyl benzyl phthalate	85-68-7	1.6E+03	c	2.6E+02	c	2.6E+04	c >S	—	—	—	—	1.6E+03	c	1.3E+02	c	1.3E+04	c >S	—	—	—	—	—	—
Butyl ether, n- (dibutyl ether)	142-96-1	8.2E+03	n	4.3E+01	n	4.3E+03	n	—	—	—	—	8.2E+03	n	2.2E+01	n	2.2E+03	n	—	—	—	—	—	—
Butyl methacrylate	97-88-1	3.4E+03	n	2.6E+01	n	2.6E+03	n	—	—	—	—	3.4E+03	n	1.3E+01	n	1.3E+03	n	—	—	—	—	—	—
Butylate	2008-41-5	3.3E+03	n	8.5E+00	n	8.5E+02	n >S	—	—	—	—	3.3E+03	n	4.3E+00	n	4.3E+02	n >S	—	—	—	—	—	—
Butylbenzene, n-	104-51-8	3.3E+03	n	1.5E+02	n	1.5E+04	n >S	—	—	—	—	3.3E+03	n	7.6E+01	n	7.6E+03	n >S	—	—	—	—	—	—
Butylbenzene, sec-	135-98-8	3.3E+03	n	8.5E+01	n	8.5E+03	n >S	—	—	—	—	3.3E+03	n	4.2E+01	n	4.2E+03	n >S	—	—	—	—	—	—
Butylbenzene, tert-	98-06-6	3.3E+03	n	1.0E+02	n	1.0E+04	n >S	—	—	—	—	3.3E+03	n	5.0E+01	n	5.0E+03	n >S	—	—	—	—	—	—
Cacodylic acid	75-60-5	2.0E+02	n	1.5E-01	n	1.5E+01	n	—	—	—	—	2.0E+02	n	7.4E-02	n	7.4E+00	n	—	—	—	—	—	—
Cadmium	7440-43-9	5.2E+01	n	1.5E+00	m >S	1.5E+02	m >S	—	—	—	—	5.1E+01	n	7.5E-01	m >S	7.5E+01	m >S	—	—	—	—	—	—
Calcium*	7440-70-2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Caprolactam	105-60-2	3.3E+04	n	4.7E+01	n	4.7E+03	n	—	—	—	—	3.3E+04	n	2.3E+01	n	2.3E+03	n	—	—	—	—	—	—
Captan	133-06-2	1.3E+03	c	6.7E+01	c	6.7E+03	c >S	—	—	—	—	1.3E+03	c	3.4E+01	c	3.4E+03	c >S	—	—	—	—	—	—
Carbaryl	63-25-2	6.7E+03	n	2.8E+01	n	2.8E+03	n >S	—	—	—	—	6.7E+03	n	1.4E+01	n	1.4E+03	n >S	—	—	—	—	—	—
Carbazole	86-74-8	2.3E+02	c	4.6E+00	c	4.6E+02	c >S	—	—	—	—	2.3E+02	c	2.3E+00	c	2.3E+02	c >S	—	—	—	—	—	—
Carbofuran	1563-66-2	3.3E+02	n	1.2E-01	m	1.2E+01	m	—	—	—	—	3.3E+02	n	6.2E-02	m	6.2E+00	m	—	—	—	—	—	—
Carbon disulfide	75-15-0	4.6E+03	n	1.4E+01	n	1.4E+03	n	1.1E+04	n	2.7E+04	n >S	—	3.3E+03	n	6.8E+00	n	6.8E+02	n	5.5E+03	n	1.7E+03	n	—
Carbon tetrachloride	56-23-5	3.5E+01	c	6.2E-02	m	6.2E+00	m	6.0E+01	c	2.4E+02	c	—	2.3E+01	c	3.1E-02	m	3.1E+00	m	3.1E+01	c	1.6E+01	c	—
Carbophenothion	786-19-6	8.2E+02	n	1.5E+03	n	1.5E+05	n >S	—	—	—	—	8.2E+02	n	7.4E+02	n	7.4E+04	n >S	—	—	—	—	—	—
Carbosulfan	55285-14-8	4.3E+02	n	2.5E+02	n	2.5E+04	n >S	—	—	—	—	4.3E+02	n	1.3E+02	n	1.3E+04	n >S	—	—	—	—	—	—
Carboxin	5234-68-4	6.7E+03	n	8.7E+01	n	8.7E+03	n >S	—	—	—	—	6.7E+03	n	4.4E+01	n	4.4E+03	n >S	—	—	—	—	—	—
Chloral	75-87-6	8.2E+03	n	5.3E+00	n	5.3E+02	n	—	—	—	—	8.2E+03	n	2.7E+00	n	2.7E+02	n	—	—	—	—	—	—
Chloral hydrate (1,1-ethanediol, 2,2-trichloro-)	302-17-0	6.7E+03	n	5.2E+00	n	5.2E+02	n	—	—	—	—	6.7E+03	n	2.6E+00	n	2.6E+02	n	—	—	—	—	—	—
Chloramben (amiben; 3-amino-2,5-dichlorobenzoic acid)	133-90-4	1.0E+03	n	3.8E+00	n	3.8E+02	n	—	—	—	—	1.0E+03	n	1.9E+00	n	1.9E+02	n	—	—	—	—	—	—
Chlordane (technical)	12789-03-6	6.0E+00	c	9.6E+00	m	9.6E+02	m >S	1.2E+03	c	1.0E+06	c >S	—	5.9E+00	c	4.8E+00	m	4.8E+02	m >S	6.4E+02	c	2.4E+05	c >S	—
Chlordane, cis- (alpha chlordane)	5103-71-9	1.3E+01	c	7.4E+02	c	7.4E+04	c >S	4.1E+03	c	1.0E+06	c >S	—	1.3E+01	c	3.7E+02	c	3.7E+04	c >S	2.1E+03	c	1.0E+06	c >S	—
Chlordane, trans- (gamma chlordane)	5103-74-2	7.4E+00	c	4.1E+01	c	4.1E+03	c >S	9.7E+02	c	1.0E+06	c >S	—	7.3E+00	c	2.1E+01	c	2.1E+03	c >S	5.0E+02	c	1.6E+05	c >S	—
Chlorfenvinphos	470-90-6	1.4E+01	n	9.1E-01	n	9.1E+01	n	3.1E+01	n	—	—	—	9.6E+00	n	4.6E-01	n	4.6E+01	n	1.6E+01	n	—	—	—
Chloride*	16887-00-6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Chlorine	7782-50-5	1.3E+02	n	—	—	—	—	1.3E+02	n	—	—	—	6.8E+01	n	—	—	—	—	6.9E+01	n	—	—	—
Chloro-1,3-butadiene, 2-	126-99-8	1.2E+00	c	—	—	—	—	1.2E+00	c	2.6E+00	c	—	6.1E-01	c	—	—	—	—	6.1E-01	c	1.7E-01	c	—
Chloro-2-propanol, 1-	127-00-4	1.6E+03	n	1.1E+00	n	1.1E+02	n	—	—	—	—	1.6E+03	n	5.3E-01	n	5.3E+01	n	—	—	—	—	—	—
Chloro-3-methylphenol, 4-	59-50-7	3.3E+02	n	4.5E+00	n	4.5E+02	n	—	—	—	—	3.3E+02	n	2.3E+00	n	2.3E+02	n	—	—	—	—	—	—
Chloroaniline, p-	106-47-8	2.3E+01	c	2.1E-02	c	2.1E+00	c	—	—	—	—	2.3E+01	c	1.0E-02	c	1.0E+00	c	—	—	—	—	—	—
Chlorobenzene	108-90-7	5.2E+02	n	1.1E+00	m	1.1E+02	m	7.7E+02	n	1.3E+04	n >S	—	3.2E+02	n	5.5E-01	m	5.5E+01	m	3.9E+02	n	8.2E+02	n	—
Chlorobenzilate	510-15-6	1.7E+01	c	1.1E-01	c	1.1E+01	c	3.5E+02	c	2.4E+05	c >S	—	1.6E+01	c	5.7E-02	c	5.7E+00	c	1.8E+02	c	1.5E+04	c >S	—
Chlorobromomethane (bromochloromethane)	74-97-5	3.3E+03	n	3.0E+00	n	3.0E+02	n	—	—	—	—	3.3E+03	n	1.5E+00	n	1.5E+02	n	—	—	—	—	—	—
Chlorodifluoromethane	75-45-6	7.7E+05	n	—	—	—	—	7.7E+05	n	8.9E+05	n >S	—	3.9E+05	n	—	—	—	—	3.9E+05	n	5.8E+04	n >S	—
Chloroethane (ethyl chloride)	75-00-3	2.7E+04	n	3.1E+01	n	3.1E+03	n	1.5E+05	n	3.7E+05	n >S	—	2.3E+04	n	1.5E+01	n	1.5E+03	n	7.9E+04	n	2.4E+04	n	—
Chloroethanol, 2-	107-07-3	1.6E+03	n	9.7E-01	n	9.7E+01	n	—	—	—	—	1.6E+03	n	4.9E-01	n	4.9E+01	n	—	—	—	—	—	—
Chloroethoxy ethene, 2- (2-chloroethylvinylether)	110-75-8	4.5E+00	n	2.9E-03	c	2.9E-01	c	4.6E+00	n	6.8E+01	n	—	2.3E+00	n	1.4E-03	c	1.4E-01	c	2.4E+00	n	4.4E+00	n	—
Chloroform ⁸	67-66-3	1.6E+01	c	3.3E-01	m	3.3E+01	m	1.6E+01	c	8.3E+01	c	—	8.0E+00	c	1.7E-01	m	1.7E+01	m	8.0E+00	c	5.4E+00	c	—
Chlorohexane, 1-	544-10-5	2.7E+03	n	3.9E+01	n	3.9E+03	n >S	1.5E+04	n	2.9E+05	n >S	—	2.3E+03	n	2.0E+01	n	2.0E+03	n >S	7.9E+03	n	1.9E+04	n >S	—
Chloromethane (methyl chloride)	74-87-3	1.4E+02	c	4.1E-01	c	4.1E+01	c	2.0E+02	c	2.1E+02	c	—	8.4E+01	c	2.0E-01	c	2.0E+01	c	1.0E+02	c	1.4E+01	c	—
Chloronaphthalene, 1- (Chloronaphthalene, alpha-)	90-13-1	4.6E+03	n	7.4E+02	n	7.4E+04	n >S	—	—	—	—	4.6E+03	n	3.7E+02	n	3.7E+04	n >S	—	—	—	—	—	—
Chloronaphthalene, 2- (chloronaphthalene, beta)	91-58-7	5.0E+03	n	6.7E+02	n	6.7E+04	n >S	—	—	—	—	5.0E+03	n	3.3E+02	n	3.3E+04	n >S	—	—	—	—	—	—
Chloronitrobenzene, p- (1-chloro-4-nitrobenzene)	100-00-5	3.2E+01	n	1.5E-01	n	1.5E+01	n	6.3E+01	n	4.8E+03	n >S	—	2.2E+01	n	7.6E-02	n	7.6E+00	n	3.2E+01	n	3.1E+02	n	—
Chlorophenol, 2-	95-57-8	4.1E+02	n	1.6E+00	n	1.6E+02	n	—	—	—	—	4.1E+02	n	8.2E-01	n	8.2E+01	n	—	—	—	—	—	—
Chlorophenol, 3-	108-43-0	3.3E+02	n	7.8E-01	n	7.8E+01	n	—	—	—	—	3.3E+02	n	3.9E-01	n	3.9E+01	n	—	—	—	—	—	—
Chlorophenol, 4-	106-48-9	3.3E+02	n	8.4E-01	n	8.4E+01	n	—	—	—	—	3.3E+02	n	4.2E-01	n	4.2E+01	n	—	—	—	—	—	—
Chlorophenyl phenylether, 4-	7005-72-3	1.6E-01	c	3.2E-02	c	3.2E+00	c	2.5E+00	c	6.5E+02	c	—	1.5E-01	c	1.6E-02	c	1.6E+00	c	1.3E+00	c	4.2E+01	c	—
Chloropropane, 2-	75-29-6	9.4E+02	n	5.4E+00	n	5.4E+02	n	1.5E+03	n	3.5E+03	n	—	6.0E+02	n	2.7E+00	n	2.7E+02	n	7.9E+02	n	2.2E+02	n	—
Chlorothalonil	1897-45-6	4.3E+02	c	8.1E+00	c	8.1E+02	c	—	—	—	—	4.3E+02	c	4.1E+00	c	4.1E+02	c	—	—	—	—	—	—

Table 1
Tier 1 Residential Soil PCLs¹

Last Revised: March 1, 2022

Chemical of Concern	CAS	0.5 acre source area										30 acre source area											
		TotalSoil _{Comb} ² (mg/kg) note ³	GWSoil _{Ing} (mg/kg) note ³	GWSoil _{Class 3} (mg/kg) note ³	AirSoil _{Inh-V} ⁴ (mg/kg) note ³	AirGW-Soil _{Inh-V} (mg/kg) note ³	GWsoil for Secondary MCL (mg/kg)	TotalSoil _{Comb} ² (mg/kg) note ³	GWSoil _{Ing} (mg/kg) note ³	GWSoil _{Class 3} (mg/kg) note ³	AirSoil _{Inh-V} ⁴ (mg/kg) note ³	AirGW-Soil _{Inh-V} (mg/kg) note ³	GWsoil for Secondary MCL (mg/kg)										
Chlorotoluene, o- (2-chlorotoluene)	95-49-8	1.2E+03	n	9.1E+00	n	9.1E+02	n	1.3E+04	n	4.4E+05	n >S	—	1.1E+03	n	4.5E+00	n	4.5E+02	n	6.8E+03	n	2.8E+04	n >S	—
Chlorotoluene, p- (4-chlorotoluene)	106-43-4	1.6E+03	n	1.1E+01	n	1.1E+03	n	—	—	—	—	—	1.6E+03	n	5.4E+00	n	5.4E+02	n	—	—	—	—	—
Chlorpyrifos	2921-88-2	1.3E+02	n	1.5E+01	n	1.5E+03	n >S	—	—	—	—	—	1.3E+02	n	7.4E+00	n	7.4E+02	n >S	—	—	—	—	—
Chromium (III)	16065-83-1	3.3E+04	n	2.4E+03	m >S	2.4E+05	m >S	—	—	—	—	—	2.7E+04	n	1.2E+03	m >S	1.2E+05	m >S	—	—	—	—	—
Chromium (total)	7440-47-3	3.3E+04	n	2.4E+03	m >S	2.4E+05	m >S	—	—	—	—	—	2.7E+04	n	1.2E+03	m >S	1.2E+05	m >S	—	—	—	—	—
Chromium (VI)	18540-29-9	1.2E+02	n	2.8E+01	m >S	2.8E+03	m >S	—	—	—	—	—	1.2E+02	n	1.4E+01	m >S	1.4E+03	m >S	—	—	—	—	—
Chrysene	218-01-9	4.1E+03	c	1.1E+04	c >S	1.0E+06	c >S	8.7E+05	c	1.0E+06	c >S	—	4.1E+03	c	5.6E+03	c >S	5.6E+05	c >S	4.5E+05	c	1.0E+06	c >S	—
Cobalt	7440-48-4	6.8E+02	n	2.2E+02	n >S	2.2E+04	n >S	—	—	—	—	—	6.8E+02	n	1.1E+02	n >S	1.1E+04	n >S	—	—	—	—	—
Copolymer acrylamide	69418-26-4	1.3E+01	n	9.4E-03	n	9.4E-01	n	—	—	—	—	—	1.3E+01	n	4.7E-03	n	4.7E-01	n	—	—	—	—	—
Copper	7440-50-8	1.3E+03	n	1.0E+03	e >S	1.0E+05	e >S	—	—	—	—	800	1.3E+03	n	5.2E+02	e >S	5.2E+04	e >S	—	—	—	—	400
Coronene	191-07-1	1.3E+02	n	5.6E+04	n >S	1.0E+06	n >S	—	—	—	—	—	1.3E+02	n	2.8E+04	n >S	1.0E+06	n >S	—	—	—	—	—
Coumaphos	56-72-4	4.3E+02	n	1.1E+02	n	1.1E+04	n >S	—	—	—	—	—	4.3E+02	n	5.5E+01	n	5.5E+03	n >S	—	—	—	—	—
Cresol	1319-77-3	3.3E+03	n	6.6E+00	n	6.6E+02	n	—	—	—	—	—	3.3E+03	n	3.3E+00	n	3.3E+02	n	—	—	—	—	—
Cresol, m- (3-methylphenol)	108-39-4	3.3E+03	n	6.6E+00	n	6.6E+02	n	—	—	—	—	—	3.3E+03	n	3.3E+00	n	3.3E+02	n	—	—	—	—	—
Cresol, o- (2-methylphenol)	95-48-7	3.3E+03	n	7.1E+00	n	7.1E+02	n	—	—	—	—	—	3.3E+03	n	3.6E+00	n	3.6E+02	n	—	—	—	—	—
Cresol, p- (4-methylphenol)	106-44-5	3.3E+02	n	6.3E-01	n	6.3E+01	n	—	—	—	—	—	3.3E+02	n	3.2E-01	n	3.2E+01	n	—	—	—	—	—
Crotonaldehyde	123-73-9	3.2E+00	c	9.5E-04	c	9.5E-02	c	—	—	—	—	—	3.2E+00	c	4.8E-04	c	4.8E-02	c	—	—	—	—	—
Cumene (isopropylbenzene)	98-82-8	4.3E+03	n	3.5E+02	n	3.5E+04	n >S	9.2E+03	n	6.2E+05	n >S	—	3.0E+03	n	1.7E+02	n	1.7E+04	n >S	4.8E+03	n	4.0E+04	n >S	—
Cyanazine	21725-46-2	5.6E+00	c	4.2E-03	c	4.2E-01	c	—	—	—	—	—	5.6E+00	c	2.1E-03	c	2.1E-01	c	—	—	—	—	—
Cyanide	57-12-5	4.5E+01	n	4.0E+01	m	4.0E+03	m	7.2E+02	n	—	—	—	4.3E+01	n	2.0E+01	m	2.0E+03	m	3.7E+02	n	—	—	—
Cyanogen	460-19-5	1.1E+01	n	6.1E-02	n	6.1E+00	n	1.2E+01	n	1.8E+01	n	—	5.9E+00	n	3.0E-02	n	3.0E+00	n	6.3E+00	n	1.2E+00	n	—
Cycloate	1134-23-2	3.7E+03	n	1.5E+02	n	1.5E+04	n >S	—	—	—	—	—	3.7E+03	n	7.6E+01	n	7.6E+03	n >S	—	—	—	—	—
Cyclohexane	110-82-7	7.5E+04	n	5.9E+03	n >S	5.9E+05	n >S	9.2E+04	n	2.9E+05	n >S	—	4.2E+04	n	2.9E+03	n >S	2.9E+05	n >S	4.7E+04	n	1.8E+04	n >S	—
Cyclohexanol	108-93-0	3.3E+05	n	2.9E+02	n >S	2.9E+04	n >S	—	—	—	—	—	3.3E+05	n	1.5E+02	n >S	1.5E+04	n >S	—	—	—	—	—
Cyclohexanone	108-94-1	3.2E+04	n	2.6E+02	n	2.6E+04	n	3.5E+04	n	1.0E+06	n >S	—	1.7E+04	n	1.3E+02	n	1.3E+04	n	1.8E+04	n	1.9E+05	n >S	—
Cyclohexene, 1-methanol-3-	1679-51-2	1.3E+03	n	3.8E+00	n	3.8E+02	n	—	—	—	—	—	1.3E+03	n	1.9E+00	n	1.9E+02	n	—	—	—	—	—
Cyclohexene, 4-vinyl-1-	100-40-3	1.3E+03	n	3.1E+01	n	3.1E+03	n >S	5.1E+03	n	6.2E+04	n >S	—	1.1E+03	n	1.5E+01	n	1.5E+03	n >S	2.6E+03	n	4.0E+03	n >S	—
Cyclopentane	287-92-3	4.8E+03	n	2.8E+01	n	2.8E+03	n	3.7E+05	n	7.0E+05	n >S	—	4.8E+03	n	1.4E+01	n	1.4E+03	n	1.9E+05	n	4.6E+04	n >S	—
Cyclopentane, methyl-	96-37-7	5.3E+03	n	1.4E+02	n	1.4E+04	n >S	1.5E+04	n	3.8E+04	n >S	—	4.0E+03	n	6.8E+01	n	6.8E+03	n >S	7.9E+03	n	2.5E+03	n >S	—
Cyclopentene	142-29-0	4.1E+05	n	1.1E+03	n	1.1E+05	n >S	—	—	—	—	—	4.1E+05	n	5.3E+02	n	5.3E+04	n >S	—	—	—	—	—
Cyclotetramethylenetetranitramine (HMX)	2691-41-0	1.6E+03	n	2.3E+00	n	2.3E+02	n	—	—	—	—	—	1.6E+03	n	1.2E+00	n	1.2E+02	n	—	—	—	—	—
Cyclotrimethylenetrinitramine (RDX)	121-82-4	5.9E+01	c	5.1E-02	c	5.1E+00	c	—	—	—	—	—	5.9E+01	c	2.5E-02	c	2.5E+00	c	—	—	—	—	—
Cymene (isopropyltoluene)	99-87-6	8.2E+03	n	2.3E+02	n	2.3E+04	n >S	—	—	—	—	—	8.2E+03	n	1.2E+02	n	1.2E+04	n >S	—	—	—	—	—
Cymoxanil	57966-95-7	8.7E+02	n	6.1E-01	n	6.1E+01	n	—	—	—	—	—	8.7E+02	n	3.0E-01	n	3.0E+01	n	—	—	—	—	—
Dacthal (DCPA)	1861-32-1	6.2E+02	n	4.5E+02	n >S	4.5E+04	n >S	—	—	—	—	—	6.2E+02	n	2.3E+02	n >S	2.3E+04	n >S	—	—	—	—	—
Dalapon, sodium salt (2,2-dichloropropanoic acid)	75-99-0	2.0E+03	n	5.8E-01	m	5.8E+01	m	—	—	—	—	—	2.0E+03	n	2.9E-01	m	2.9E+01	m	—	—	—	—	—
DDD	72-54-8	1.4E+01	c	1.3E+01	c	1.3E+03	c >S	—	—	—	—	—	1.4E+01	c	6.5E+00	c	6.5E+02	c >S	—	—	—	—	—
DDE	72-55-9	1.0E+01	c	1.2E+01	c	1.2E+03	c >S	—	—	—	—	—	1.0E+01	c	5.9E+00	c	5.9E+02	c >S	—	—	—	—	—
DDT	50-29-3	5.4E+00	c	1.5E+01	c	1.5E+03	c >S	1.2E+03	c	1.0E+06	c >S	—	5.4E+00	c	7.4E+00	c	7.4E+02	c >S	6.2E+02	c	2.2E+05	c >S	—
Demeton	8065-48-3	2.7E+00	n	1.2E-02	n	1.2E+00	n	—	—	—	—	—	2.7E+00	n	6.2E-03	n	6.2E-01	n	—	—	—	—	—
Desethylatrazine	6190-65-4	2.3E+03	n	4.0E+00	n	4.0E+02	n	—	—	—	—	—	2.3E+03	n	2.0E+00	n	2.0E+02	n	—	—	—	—	—
Diacetone alcohol (4-hydroxy-4-methyl-2-pentanone)	123-42-2	2.7E+03	n	1.9E+00	n	1.9E+02	n	—	—	—	—	—	2.7E+03	n	9.7E-01	n	9.7E+01	n	—	—	—	—	—
Diallate	2303-16-4	3.8E+01	c	1.2E+00	c	1.2E+02	c	—	—	—	—	—	3.8E+01	c	5.8E-01	c	5.8E+01	c	—	—	—	—	—
Diazinon	333-41-5	3.1E+01	n	1.6E-01	n	1.6E+01	n	6.5E+01	n	2.9E+04	n >S	—	2.1E+01	n	7.9E-02	n	7.9E+00	n	3.3E+01	n	1.9E+03	n >S	—
Dibenz(a,h)acridine	226-36-8	3.7E+00	c	5.8E+01	c >S	5.8E+03	c >S	1.5E+04	c	1.0E+06	c >S	—	3.7E+00	c	2.9E+01	c >S	2.9E+03	c >S	7.9E+03	c	1.0E+06	c >S	—
Dibenz(a,i)acridine	224-42-0	5.8E+00	c	1.1E+02	c >S	1.1E+04	c >S	2.1E+04	c	1.0E+06	c >S	—	5.8E+00	c	5.6E+01	c >S	5.6E+03	c >S	1.1E+04	c	1.0E+06	c >S	—
Dibenz-a,h-anthracene	53-70-3	4.0E+00	c	1.5E+01	m4	1.5E+03	m >S	2.9E+03	c	1.0E+06	c >S	—	4.0E+00	c	7.6E+00	m4	7.6E+02	m >S	1.5E+03	c	1.0E+06	c >S	—
Dibenzo(a,e)pyrene	192-65-4	6.1E-01	c	1.3E+02	c >S	1.3E+04	c >S	7.2E+03	c	1.0E+06	c >S	—	6.1E-01	c	6.5E+01	c >S	6.5E+03	c >S	3.7E+03	c	1.0E+06	c >S	—
Dibenzo(a,h)pyrene	189-64-0	6.1E-02	c	1.2E+01	c	1.2E+03	c >S	7.0E+02	c	1.0E+06	c >S	—	6.1E-02	c	6.0E+00	c	6.0E+02	c >S	3.6E+02	c	1.0E+06	c >S	—
Dibenzo(a,i)pyrene	189-55-9	6.1E-02	c	1.2E+01	c	1.2E+03	c >S	7.0E+02	c	1.0E+06	c >S	—	6.1E-02	c	6.0E+00	c	6.0E+02	c >S	3.6E+02	c	1.0E+06	c >S	—
Dibenzofuran	132-64-9	2.7E+02	n</																				

Table 1
Tier 1 Residential Soil PCLs¹

Last Revised: March 1, 2022

Chemical of Concern	CAS	0.5 acre source area										30 acre source area											
		^{Tot} Soil _{Comb} ² (mg/kg)	note ³	^{GW} Soil _{Inq} (mg/kg)	note ³	^{GW} Soil _{Class 3} (mg/kg)	note ³	^{Air} Soil _{Inh-V} ⁴ (mg/kg)	note ³	^{Air} GW-Soil _{Inh-V} (mg/kg)	note ³	^{GW} Soil for Secondary MCL (mg/kg)	^{Tot} Soil _{Comb} ² (mg/kg)	note ³	^{GW} Soil _{Inq} (mg/kg)	note ³	^{GW} Soil _{Class 3} (mg/kg)	note ³	^{Air} Soil _{Inh-V} ⁴ (mg/kg)	note ³	^{Air} GW-Soil _{Inh-V} (mg/kg)	note ³	^{GW} Soil for Secondary MCL (mg/kg)
Dibromo-3-chloropropane, 1,2-	96-12-8	1.5E-01	c	1.7E-03	m	1.7E-01	m	1.6E-01	c	5.4E+00	c	—	8.0E-02	c	8.7E-04	m	8.7E-02	m	8.1E-02	c	3.5E-01	c	—
Dibromochloromethane (chlorodibromomethane) ⁸	124-48-1	7.2E+01	c	3.6E-01	m	3.6E+01	m	—	—	—	—	—	7.2E+01	c	1.8E-01	m	1.8E+01	m	—	—	—	—	—
Dibromofluoromethane	1868-53-7	1.6E+04	n	1.6E+01	n	1.6E+03	n	—	—	—	—	—	1.6E+04	n	7.8E+00	n	7.8E+02	n	—	—	—	—	—
Dicamba	1918-00-9	2.0E+03	n	1.5E+00	n	1.5E+02	n	—	—	—	—	—	2.0E+03	n	7.3E-01	n	7.3E+01	n	—	—	—	—	—
Dichlormid	37764-25-3	1.7E+03	n	2.6E+00	n	2.6E+02	n	—	—	—	—	—	1.7E+03	n	1.3E+00	n	1.3E+02	n	—	—	—	—	—
Dichloro-2-butene, 1,4-	764-41-0	2.0E-01	c	—	—	—	—	2.0E-01	c	6.2E+00	c	—	1.0E-01	c	—	—	—	—	1.0E-01	c	4.0E-01	c	—
Dichloro-2-butene, 1,4- trans	110-57-6	2.0E-01	c	—	—	—	—	2.0E-01	c	6.6E+00	c	—	1.1E-01	c	—	—	—	—	1.1E-01	c	4.3E-01	c	—
Dichlorobenzene, 1,2-	95-50-1	7.2E+02	n	1.8E+01	m	1.8E+03	m	8.0E+02	n	3.5E+04	n >S	—	3.9E+02	n	8.9E+00	m	8.9E+02	m	4.1E+02	n	2.2E+03	n	—
Dichlorobenzene, 1,3-	541-73-1	1.2E+02	n	6.7E+00	n	6.7E+02	n	1.2E+02	n	1.7E+03	n >S	—	6.2E+01	n	3.4E+00	n	3.4E+02	n	6.3E+01	n	1.1E+02	n	—
Dichlorobenzene, 1,4-	106-46-7	2.5E+02	c	2.1E+00	m	2.1E+02	m	1.2E+04	n	4.8E+05	n >S	—	2.5E+02	c	1.1E+00	m	1.1E+02	m	6.1E+03	n	3.1E+04	n >S	—
Dichlorobenzidine, 3,3-	91-94-1	1.0E+01	c	6.3E-02	c	6.3E+00	c	—	—	—	—	—	1.0E+01	c	3.1E-02	c	3.1E+00	c	—	—	—	—	—
Dichlorobutane, 2,3-	7581-97-7	9.5E+01	n	2.6E+00	n	2.6E+02	n	1.1E+02	n	1.5E+03	n	—	5.2E+01	n	1.3E+00	n	1.3E+02	n	5.5E+01	n	9.9E+01	n	—
Dichlorodifluoromethane	75-71-8	1.4E+03	n	2.4E+02	n	2.4E+04	n >S	1.5E+03	n	2.9E+03	n	—	7.5E+02	n	1.2E+02	n	1.2E+04	n >S	7.9E+02	n	1.9E+02	n	—
Dichloroethane, 1,1-	75-34-3	1.1E+04	n	1.8E+01	n	1.8E+03	n	3.7E+04	n	1.6E+05	n >S	—	8.8E+03	n	9.2E+00	n	9.2E+02	n	1.9E+04	n	1.1E+04	n >S	—
Dichloroethane, 1,2-	107-06-2	4.1E+01	c	1.4E-02	m	1.4E+00	m	1.1E+02	c	6.9E+02	c	—	3.0E+01	c	6.9E-03	m	6.9E-01	m	5.4E+01	c	4.5E+01	c	—
Dichloroethylene, 1,1-	75-35-4	2.3E+03	n	5.0E-02	m	5.0E+00	m	5.2E+03	n	1.2E+04	n	—	1.6E+03	n	2.5E-02	m	2.5E+00	m	2.7E+03	n	7.7E+02	n	—
Dichloroethylene, cis-1,2-	156-59-2	1.4E+02	n	2.5E-01	m	2.5E+01	m	9.2E+02	n	4.4E+03	n	—	1.2E+02	n	1.2E-01	m	1.2E+01	m	4.7E+02	n	2.8E+02	n	—
Dichloroethylene, trans-1,2	156-60-5	5.9E+02	n	4.9E-01	m	4.9E+01	m	9.2E+02	n	3.8E+03	n	—	3.7E+02	n	2.5E-01	m	2.5E+01	m	4.7E+02	n	2.4E+02	n	—
Dichlorofluoromethane	75-43-4	1.6E+04	n	1.4E+01	n	1.4E+03	n	—	—	—	—	—	1.6E+04	n	7.1E+00	n	7.1E+02	n	—	—	—	—	—
Dichlorophenol, 2,3-	576-24-9	2.0E+02	n	5.4E-01	n	5.4E+01	n	—	—	—	—	—	2.0E+02	n	2.7E-01	n	2.7E+01	n	—	—	—	—	—
Dichlorophenol, 2,4-	120-83-2	2.0E+02	n	3.5E-01	n	3.5E+01	n	—	—	—	—	—	2.0E+02	n	1.8E-01	n	1.8E+01	n	—	—	—	—	—
Dichlorophenol, 2,5-	583-78-8	2.0E+02	n	5.0E-01	n	5.0E+01	n	—	—	—	—	—	2.0E+02	n	2.5E-01	n	2.5E+01	n	—	—	—	—	—
Dichlorophenol, 2,6-	87-65-0	6.7E+01	n	6.9E-02	n	6.9E+00	n	—	—	—	—	—	6.7E+01	n	3.4E-02	n	3.4E+00	n	—	—	—	—	—
Dichlorophenol, 3,4-	95-77-2	2.0E+02	n	2.0E+00	n	2.0E+02	n	—	—	—	—	—	2.0E+02	n	1.0E+00	n	1.0E+02	n	—	—	—	—	—
Dichlorophenol, 3,5-	591-35-5	2.0E+02	n	1.3E+00	n	1.3E+02	n	—	—	—	—	—	2.0E+02	n	6.6E-01	n	6.6E+01	n	—	—	—	—	—
Dichlorophenoxy, 2,4- butyric acid, 4- (2,4-DB)	94-82-6	5.3E+02	n	3.9E-01	n	3.9E+01	n	—	—	—	—	—	5.3E+02	n	1.9E-01	n	1.9E+01	n	—	—	—	—	—
Dichlorophenoxyacetic acid, 2,4- (2,4-D)	94-75-7	1.5E+04	n	2.6E+00	m	2.6E+02	m	—	—	—	—	—	1.5E+04	n	1.3E+00	m	1.3E+02	m	—	—	—	—	—
Dichloroprop (2-(2,4-dichlorophenoxy) propanoic acid)	120-36-5	6.7E+02	n	4.7E-01	n	4.7E+01	n	—	—	—	—	—	6.7E+02	n	2.3E-01	n	2.3E+01	n	—	—	—	—	—
Dichloropropane, 1,2-	78-87-5	6.1E+01	n	2.3E-02	m	2.3E+00	m	6.1E+01	n	5.3E+02	n	—	3.1E+01	n	1.1E-02	m	1.1E+00	m	3.2E+01	n	3.4E+01	n	—
Dichloropropane, 1,3-	142-28-9	3.6E+01	c	6.4E-02	c	6.4E+00	c	9.0E+01	c	1.8E+03	c	—	2.6E+01	c	3.2E-02	c	3.2E+00	c	4.6E+01	c	1.2E+02	c	—
Dichloropropane, 2,2-	594-20-7	6.1E+01	n	1.2E-01	c	1.2E+01	c	6.1E+01	n	5.1E+02	n	—	3.1E+01	n	6.0E-02	c	6.0E+00	c	3.2E+01	n	3.3E+01	n	—
Dichloropropanol, 2,3-	616-23-9	2.0E+02	n	2.4E-01	n	2.4E+01	n	—	—	—	—	—	2.0E+02	n	1.2E-01	n	1.2E+01	n	—	—	—	—	—
Dichloropropene, 1,1-	563-58-6	3.6E+01	c	1.3E-01	c	1.3E+01	c	9.0E+01	c	2.8E+02	c	—	2.6E+01	c	6.7E-02	c	6.7E+00	c	4.6E+01	c	1.8E+01	c	—
Dichloropropene, 1,3- (mixed isomers)	542-75-6	3.6E+01	c	3.9E-02	c	3.9E+00	c	9.0E+01	c	7.7E+02	c	—	2.6E+01	c	2.0E-02	c	2.0E+00	c	4.6E+01	c	5.0E+01	c	—
Dichloropropene, cis 1,3-	10061-01-5	8.0E+00	n	6.6E-03	c	6.6E-01	c	3.1E+02	n	2.7E+03	n	—	7.8E+00	n	3.3E-03	c	3.3E-01	c	1.6E+02	n	1.8E+02	n	—
Dichloropropene, trans 1,3-	10061-02-6	3.6E+01	c	3.6E-02	c	3.6E+00	c	9.0E+01	c	7.5E+02	c	—	2.6E+01	c	1.8E-02	c	1.8E+00	c	4.6E+01	c	4.8E+01	c	—
Dichlorvos	62-73-7	1.6E+01	c	4.9E+05	c	1.0E+06	c	1.0E+06	n	1.0E+06	n	—	1.6E+01	c	2.4E+05	c	1.0E+06	c	6.2E+05	n	1.0E+06	n	—
Dicrotophos (bidrin)	141-66-2	6.7E+00	n	4.7E-03	n	4.7E-01	n	—	—	—	—	—	6.7E+00	n	2.3E-03	n	2.3E-01	n	—	—	—	—	—
Dicyclopentadiene	77-73-6	6.6E+03	n	—	—	—	—	—	—	—	—	—	6.6E+03	n	—	—	—	—	—	—	—	—	—
Dieldrin	60-57-1	1.5E-01	c	4.9E-02	c	4.9E+00	c	3.2E+01	c	1.1E+05	c >S	—	1.5E-01	c	2.4E-02	c	2.4E+00	c	1.6E+01	c	7.0E+03	c >S	—
Diethanolamine	111-42-2	3.3E+01	n	2.3E-02	n	2.3E+00	n	3.5E+03	n	1.0E+06	n	—	3.3E+01	n	1.2E-02	n	1.2E+00	n	1.8E+03	n	9.6E+05	n	—
Diethyldithiocarbamate, sodium salt	148-18-5	2.2E+01	c	—	—	—	—	—	—	—	—	—	2.2E+01	c	—	—	—	—	—	—	—	—	—
Diethyl phthalate	84-66-2	5.3E+04	n	1.6E+02	n	1.6E+04	n >S	—	—	—	—	—	5.3E+04	n	7.8E+01	n	7.8E+03	n >S	—	—	—	—	—
Diethylene glycol	111-46-6	1.3E+05	n	9.4E+01	n	9.4E+03	n	—	—	—	—	—	1.3E+05	n	4.7E+01	n	4.7E+03	n	—	—	—	—	—
Diethylene glycol monobutyl ether	112-34-5	2.0E+01	n	1.6E+00	n	1.6E+02	n	2.0E+01	n	6.9E+03	n	—	1.0E+01	n	7.8E-01	n	7.8E+01	n	1.0E+01	n	4.4E+02	n	—
Diethylhexyl adipate	103-23-1	3.9E+03	c	6.1E+03	m >S	6.1E+05	m >S	—	—	—	—	—	3.9E+03	c	3.0E+03	m >S	3.0E+05	m >S	—	—	—	—	—
Diethylstilbestrol	56-53-1	7.1E-04	c	5.8E-04	c	5.8E-02	c	—	—	—	—	—	7.1E-04	c	2.9E-04	c	2.9E-02	c	—	—	—	—	—
Diisobutylene (trimethyl-1-pentene, 2,4,4-)	107-39-1	1.9E+03	n	6.1E+02	n	6.1E+04	n >S	3.1E+03	n	9.5E+03	n >S	—	1.2E+03	n	3.0E+02	n	3.0E+04	n >S	1.6E+03	n	6.1E+02	n	—
Diisopropylbenzene, p-	100-18-5	6.7E+02	n	9.5E+01	n	9.5E+03	n >S	—	—	—	—	—	6.7E+02	n	4.7E+01	n	4.7E+03	n >S	—	—	—	—	—
Diisopropyl ether (2,2'-oxybis-propane)	108-20-3	4.6E+03	n	1.2E+01	n	1.2E+03	n	1.1E+04	n	9.6E+04	n >S	—	3.3E+03	n	6.0E+00	n	6.0E+02	n	5.5E+03	n	6.2E+03	n	—
Dimethenamid	87674-68-8	1.0E+03	n	1.0E+00	n	1.0E+02	n	—	—	—	—	—	1.0E+03	n	5.2E-01	n	5.2E+01	n	—	—	—	—	—
Dimethoate	60-51-5	1.3E+01	n	1.0E-02	n	1.0E+00	n	—	—	—	—	—	1.3E+01	n	5.1E-03	n	5.1E-01	n	—	—	—	—	—

Table 1
Tier 1 Residential Soil PCLs¹

Last Revised: March 1, 2022

Chemical of Concern	CAS	0.5 acre source area										30 acre source area											
		TotSoil _{Comb} ² (mg/kg)	note ³	GWSoil _{Ing} (mg/kg)	note ³	GWSoil _{Class 3} (mg/kg)	note ³	AirSoil _{Inh-V} ⁴ (mg/kg)	note ³	AirGW-Soil _{Inh-V} (mg/kg)	note ³	GWSoil for Secondary MCL (mg/kg)	TotSoil _{Comb} ² (mg/kg)	note ³	GWSoil _{Ing} (mg/kg)	note ³	GWSoil _{Class 3} (mg/kg)	note ³	AirSoil _{Inh-V} ⁴ (mg/kg)	note ³	AirGW-Soil _{Inh-V} (mg/kg)	note ³	GWSoil for Secondary MCL (mg/kg)
Dimethoxybenzidine, 3,3'-	119-90-4	3.4E+02	c	2.8E-01	c	2.8E+01	c	—	—	—	—	—	3.4E+02	c	1.4E-01	c	1.4E+01	c	—	—	—	—	—
Dimethyl-2-nitrobenzene, 1,3-	81-20-9	1.3E+02	n	2.2E+00	n	2.2E+02	n	2.8E+03	n	4.9E+05	n >S	—	1.2E+02	n	1.1E+00	n	1.1E+02	n	1.4E+03	n	3.2E+04	n >S	—
Dimethyl-3-nitrobenzene, 1,2-	83-41-0	1.3E+02	n	1.4E+00	n	1.4E+02	n	2.4E+03	n	3.9E+05	n >S	—	1.2E+02	n	7.1E-01	n	7.1E+01	n	1.2E+03	n	2.5E+04	n >S	—
Dimethyl-4-nitrobenzene, 1-2-	99-51-4	1.3E+02	n	1.4E+00	n	1.4E+02	n	2.5E+03	n	4.2E+05	n >S	—	1.2E+02	n	7.0E-01	n	7.0E+01	n	1.3E+03	n	2.7E+04	n >S	—
Dimethyl-5-nitrobenzene, 1,3-	99-12-7	1.3E+02	n	1.6E+00	n	1.6E+02	n	2.2E+03	n	3.2E+05	n >S	—	1.2E+02	n	8.2E-01	n	8.2E+01	n	1.1E+03	n	2.1E+04	n >S	—
Dimethylphenethylamine, alpha, alpha-	122-09-8	1.3E+02	n	3.8E-01	n	3.8E+01	n	—	—	—	—	—	1.3E+02	n	1.9E-01	n	1.9E+01	n	—	—	—	—	—
Dimethyl phenol, 2,4-	105-67-9	1.3E+03	n	3.2E+00	n	3.2E+02	n	—	—	—	—	—	1.3E+03	n	1.6E+00	n	1.6E+02	n	—	—	—	—	—
Dimethylaminoazobenzene, p-	60-11-7	6.4E-01	n	1.1E+00	n	1.1E+02	n	—	—	—	—	—	6.4E-01	n	5.6E-01	n	5.6E+01	n	—	—	—	—	—
Dimethylbenz-a-anthracene, 7,12-	57-97-6	1.7E-02	c	1.2E+00	c	1.2E+02	c	1.4E+02	c	1.0E+06	c >S	—	1.7E-02	c	6.2E-01	c	6.2E+01	c	7.3E+01	c	7.3E+05	c >S	—
Dimethylbenzidine, 3,3'-	119-93-7	4.3E-01	c	8.2E-04	c	8.2E-02	c	—	—	—	—	—	4.3E-01	c	4.1E-04	c	4.1E-02	c	—	—	—	—	—
Dimethylformamide, N,N-	68-12-2	2.3E+03	n	4.7E+00	n	4.7E+02	n	3.2E+03	n	7.2E+05	n	—	1.4E+03	n	2.4E+00	n	2.4E+02	n	1.6E+03	n	4.7E+04	n	—
Dimethylnaphthalene, 1,3-	575-41-7	2.3E+03	n	7.9E+02	n	7.9E+04	n >S	—	—	—	—	—	2.3E+03	n	3.9E+02	n	3.9E+04	n >S	—	—	—	—	—
Dimethylphthalate	131-11-3	5.3E+04	n	6.2E+01	n	6.2E+03	n	—	—	—	—	—	5.3E+04	n	3.1E+01	n	3.1E+03	n	—	—	—	—	—
Di-n-butyl phthalate	84-74-2	6.2E+03	n	3.3E+03	n	3.3E+05	n >S	—	—	—	—	—	6.2E+03	n	1.7E+03	n	1.7E+05	n >S	—	—	—	—	—
Dinitro-2-methylphenol, 4,6- (dinitro-o-cresol, 4, 6-)	534-52-1	6.7E+00	n	4.7E-03	n	4.7E-01	n	—	—	—	—	—	6.7E+00	n	2.3E-03	n	2.3E-01	n	—	—	—	—	—
Dinitrobenzene, 1,3- (dinitrobenzene, 2,4-)	99-65-0	6.7E+00	n	7.6E-03	n	7.6E-01	n	—	—	—	—	—	6.7E+00	n	3.8E-03	n	3.8E-01	n	—	—	—	—	—
Dinitrobenzene, 1,4-	100-25-4	6.7E+00	n	7.2E-03	n	7.2E-01	n	—	—	—	—	—	6.7E+00	n	3.6E-03	n	3.6E-01	n	—	—	—	—	—
Dinitrophenol, 2,4-	51-28-5	1.3E+02	n	9.4E-02	n	9.4E+00	n	—	—	—	—	—	1.3E+02	n	4.7E-02	n	4.7E+00	n	—	—	—	—	—
Dinitrophenol, 2,5-	329-71-5	1.3E+02	n	9.6E-02	n	9.6E+00	n	—	—	—	—	—	1.3E+02	n	4.8E-02	n	4.8E+00	n	—	—	—	—	—
Dinitrotoluene, 2,4-	121-14-2	6.9E+00	c	5.3E-03	c	5.3E-01	c	—	—	—	—	—	6.9E+00	c	2.7E-03	c	2.7E-01	c	—	—	—	—	—
Dinitrotoluene, 2,6-	606-20-2	6.9E+00	c	4.8E-03	c	4.8E-01	c	—	—	—	—	—	6.9E+00	c	2.4E-03	c	2.4E-01	c	—	—	—	—	—
Di-n-octyl phthalate	117-84-0	6.4E+02	n	8.1E+05	n >S	1.0E+06	n >S	—	—	—	—	—	6.4E+02	n	4.1E+05	n >S	1.0E+06	n >S	—	—	—	—	—
Dinoseb	88-85-7	6.7E+01	n	3.5E-01	m	3.5E+01	m	—	—	—	—	—	6.7E+01	n	1.8E-01	m	1.8E+01	m	—	—	—	—	—
Dioxane 1,4-	123-91-1	4.5E+01	c	1.8E-02	c	1.8E+00	c	1.8E+02	c	1.5E+04	c	—	3.7E+01	c	8.8E-03	c	8.8E-01	c	9.3E+01	c	9.7E+02	c	—
Dioxin (as 2,3,7,8-TCDD toxicity equivalent quotients (TEQs))	1746-01-6	1.0E-03	e	1.7E-02	m	1.7E+00	m	—	—	—	—	—	1.0E-03	e	8.5E-03	m	8.5E-01	m	—	—	—	—	—
Diphenyl ether	101-84-8	3.8E+02	n	9.2E+01	n	9.2E+03	n >S	—	—	—	—	—	3.8E+02	n	4.6E+01	n	4.6E+03	n >S	—	—	—	—	—
Diphenylamine	122-39-4	1.7E+03	n	9.6E+00	n	9.6E+02	n	—	—	—	—	—	1.7E+03	n	4.8E+00	n	4.8E+02	n	—	—	—	—	—
Diphenylhydrazine, 1,2-	122-66-7	5.6E+00	c	3.2E-02	c	3.2E+00	c	1.4E+02	c	1.1E+05	c >S	—	5.4E+00	c	1.6E-02	c	1.6E+00	c	7.2E+01	c	7.0E+03	c	—
Dipropylene glycol	110-98-5	8.0E+03	n	5.7E+00	n	5.7E+02	n	—	—	—	—	—	8.0E+03	n	2.8E+00	n	2.8E+02	n	—	—	—	—	—
Diquat	85-00-7	1.5E+02	n	2.0E-01	m	2.0E+01	m	—	—	—	—	—	1.5E+02	n	1.0E-01	m	1.0E+01	m	—	—	—	—	—
Disodium iminodiacetate (iminodiacetic acid, disodium salt)	142-73-4	6.7E+02	n	4.7E-01	n	4.7E+01	n	—	—	—	—	—	6.7E+02	n	2.3E-01	n	2.3E+01	n	—	—	—	—	—
Disulfoton	298-04-4	2.7E+00	n	3.5E-01	n	3.5E+01	n	—	—	—	—	—	2.7E+00	n	1.8E-01	n	1.8E+01	n	—	—	—	—	—
Diuron	330-54-1	1.3E+02	n	9.3E-01	n	9.3E+01	n	—	—	—	—	—	1.3E+02	n	4.6E-01	n	4.6E+01	n	—	—	—	—	—
Dodecylphenol, 4-	104-43-8	3.3E+03	n	1.0E+06	n >S	1.0E+06	n >S	—	—	—	—	—	3.3E+03	n	1.0E+06	n >S	1.0E+06	n >S	—	—	—	—	—
Endosulfan	115-29-7	4.0E+02	n	4.6E+00	n	4.6E+02	n >S	—	—	—	—	—	4.0E+02	n	2.3E+00	n	2.3E+02	n >S	—	—	—	—	—
Endosulfan I	959-98-8	9.1E+01	n	3.1E+01	n	3.1E+03	n >S	—	—	—	—	—	9.1E+01	n	1.5E+01	n	1.5E+03	n >S	—	—	—	—	—
Endosulfan II	33213-65-9	2.7E+02	n	9.2E+01	n	9.2E+03	n >S	—	—	—	—	—	2.7E+02	n	4.6E+01	n	4.6E+03	n >S	—	—	—	—	—
Endosulfan sulfate	1031-07-8	3.8E+02	n	4.7E+03	n >S	4.7E+05	n >S	—	—	—	—	—	3.8E+02	n	2.3E+03	n >S	2.3E+05	n >S	—	—	—	—	—
Endothall	145-73-3	1.3E+03	n	5.3E-01	m	5.3E+01	m	—	—	—	—	—	1.3E+03	n	2.7E-01	m	2.7E+01	m	—	—	—	—	—
Endrin	72-20-8	9.0E+00	n	7.5E-01	m	7.5E+01	m	—	—	—	—	—	9.0E+00	n	3.8E-01	m	3.8E+01	m	—	—	—	—	—
Endrin aldehyde	7421-93-4	1.9E+01	n	6.3E+02	n	6.3E+04	n >S	—	—	—	—	—	1.9E+01	n	3.1E+02	n	3.1E+04	n >S	—	—	—	—	—
Endrin ketone	53494-70-5	1.9E+01	n	5.1E+01	n	5.1E+03	n	—	—	—	—	—	1.9E+01	n	2.5E+01	n	2.5E+03	n	—	—	—	—	—
Epichlorohydrin	106-89-8	2.5E+01	n	1.8E-01	c	1.8E+01	c	2.6E+01	n	1.4E+03	n	—	1.3E+01	n	9.2E-02	c	9.2E+00	c	1.4E+01	n	9.1E+01	n	—
EPN (o-ethyl o-(4-nitrophenyl)phenylphosphonothioate)	2104-64-5	6.7E-01	n	5.5E-02	n	5.5E+00	n	—	—	—	—	—	6.7E-01	n	2.7E-02	n	2.7E+00	n	—	—	—	—	—
Esfenvalerate	66230-04-4	7.4E+01	n	1.2E+02	n >S	1.2E+04	n >S	—	—	—	—	—	7.4E+01	n	6.2E+01	n >S	6.2E+03	n >S	—	—	—	—	—
Ethalfuralin (sonolan)	55283-68-6	4.7E+01	c	2.5E+01	c	2.5E+03	c	—	—	—	—	—	4.7E+01	c	1.2E+01	c	1.2E+03	c	—	—	—	—	—
Ethanol	64-17-5	1.0E+06	n	1.6E+03	n	1.6E+05	n	—	—	—	—	—	1.0E+06	n	7.9E+02	n	7.9E+04	n	—	—	—	—	—
Ethanol, 2-amino-	141-43-5	1.1E+02	n	8.0E-02	n	8.0E+00	n	2.9E+03	n	8.1E+05	n	—	1.1E+02	n	4.0E-02	n	4.0E+00	n	1.5E+03	n	5.3E+04	n	—
Ethanol, 2-(2-aminoethoxy)-	929-06-6	3.3E+01	n	2.3E-02	n	2.3E+00	n	—	—	—	—	—	3.3E+01	n	1.2E-02	n	1.2E+00	n	—	—	—	—	—
Ethanol, 2-(2-ethoxyethoxy)-	111-90-0	1.3E+05	n	1.6E+02	n	1.6E+04	n	—	—	—	—	—	1.3E+05	n	8.2E+01	n	8.2E+03	n	—	—	—	—	—
Ethanol, 2-(methylamino)-	109-83-1	9.1E+02	n	7.5E-01	n	7.5E+01	n	6.4E+03	n	1.0E+06	n	—	8.1E+02	n	3.8E-01	n	3.8E+01	n	3.3E+03	n	1.3E+05	n	—
Ethion	563-12-2	2.7E+01	n	7.6E+00	n	7.6E+02	n >S	—	—	—	—	—	2.7E+01	n	3.8E+00	n	3.8E+02	n >S	—	—	—	—	—

Table 1
Tier 1 Residential Soil PCLs¹

Last Revised: March 1, 2022

Chemical of Concern	CAS	0.5 acre source area										30 acre source area														
		TotSoil _{Comb} ² (mg/kg) note ³		GWSoil _{Ing} (mg/kg) note ³		GWSoil _{Class 3} (mg/kg) note ³		AirSoil _{Inh-V} ⁴ (mg/kg) note ³		AirGW-Soil _{Inh-V} (mg/kg) note ³		GWSoil for Secondary MCL (mg/kg)		TotSoil _{Comb} ² (mg/kg) note ³		GWSoil _{Ing} (mg/kg) note ³		GWSoil _{Class 3} (mg/kg) note ³		AirSoil _{Inh-V} ⁴ (mg/kg) note ³		AirGW-Soil _{Inh-V} (mg/kg) note ³		GWSoil for Secondary MCL (mg/kg)		
Ethoprop	13194-48-4	6.7E+00	n	1.2E-01	n	1.2E+01	n	—	—	—	—	—	—	6.7E+00	n	6.2E-02	n	6.2E+00	n	—	—	—	—	—	—	—
Ethoxy ethanol, 2-	110-80-5	5.7E+03	n	4.3E+00	n	4.3E+02	n >S	2.5E+04	n	1.0E+06	n >S	—	—	4.7E+03	n	2.1E+00	n	2.1E+02	n >S	1.3E+04	n	4.2E+05	n >S	—	—	—
Ethyl acetate	141-78-6	3.5E+03	n	4.7E+01	n	4.7E+03	n	3.7E+03	n	1.1E+05	n	—	—	1.8E+03	n	2.4E+01	n	2.4E+03	n	1.9E+03	n	7.3E+03	n	—	—	—
Ethyl acrylate	140-88-5	1.3E+02	c	1.2E-01	c	1.2E+01	c	2.4E+02	n	6.8E+03	n	—	—	9.6E+01	n	5.9E-02	c	5.9E+00	c	1.2E+02	n	4.4E+02	n	—	—	—
Ethyl benzene	100-41-4	6.4E+03	n	7.6E+00	m	7.6E+02	m	2.9E+04	n	3.2E+05	n >S	—	—	5.3E+03	n	3.8E+00	m	3.8E+02	m	1.5E+04	n	2.1E+04	n >S	—	—	—
Ethyl dipropylthiocarbamate, S-	759-94-4	1.7E+03	n	7.0E+00	n	7.0E+02	n	—	—	—	—	—	—	1.7E+03	n	3.5E+00	n	3.5E+02	n	—	—	—	—	—	—	
Ethyl ether	60-29-7	1.6E+04	n	1.1E+01	n	1.1E+03	n	—	—	—	—	—	—	1.6E+04	n	5.6E+00	n	5.6E+02	n	—	—	—	—	—	—	
Ethyl methacrylate	97-63-2	3.6E+03	n	7.5E+00	n	7.5E+02	n	7.1E+03	n	1.9E+05	n >S	—	—	2.4E+03	n	3.8E+00	n	3.8E+02	n	3.6E+03	n	1.3E+04	n	—	—	—
Ethyl methanesulfonate	62-50-0	3.4E+01	c	1.8E-02	c	1.8E+00	c	1.2E+02	c	3.6E+04	c	—	—	2.7E+01	c	8.9E-03	c	8.9E-01	c	6.1E+01	c	2.3E+03	c	—	—	—
Ethyl tert-butyl ether (2-ethyl-2-ethoxypropane)	637-92-3	8.0E+01	n	8.9E-02	n	8.9E+00	n	4.6E+03	n	4.0E+04	n >S	—	—	7.9E+01	n	4.5E-02	n	4.5E+00	n	2.4E+03	n	2.6E+03	n	—	—	—
Ethyl-1-hexanol, 2-	104-76-7	1.0E+04	n	7.6E+01	n	7.6E+03	n	—	—	—	—	—	—	1.0E+04	n	3.8E+01	n	3.8E+03	n	—	—	—	—	—	—	
Ethyl-2-hexenal, 2-	645-62-5	1.2E+04	n	2.8E+01	n	2.8E+03	n	—	—	—	—	—	—	1.2E+04	n	1.4E+01	n	1.4E+03	n	—	—	—	—	—	—	
Ethyl-2-methyl benzene, 1-	611-14-3	2.8E+03	n	5.6E+01	n	5.6E+03	n >S	8.4E+03	n	4.2E+05	n >S	—	—	2.1E+03	n	2.8E+01	n	2.8E+03	n >S	4.3E+03	n	2.7E+04	n >S	—	—	—
Ethyl-4-methyl benzene, 1-	622-96-8	2.6E+03	n	6.0E+01	n	6.0E+03	n >S	7.2E+03	n	3.4E+05	n >S	—	—	1.9E+03	n	3.0E+01	n	3.0E+03	n >S	3.7E+03	n	2.2E+04	n >S	—	—	—
Ethylene*	74-85-1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Ethylene dibromide (dibromoethane, 1,2-)	106-93-4	2.5E+00	c	2.1E-04	m	2.1E-02	m	1.3E+01	c	3.1E+02	c	—	—	2.1E+00	c	1.0E-04	m	1.0E-02	m	6.8E+00	c	2.0E+01	c	—	—	—
Ethylene glycol	107-21-1	1.3E+05	n	9.4E+01	n	9.4E+03	n	—	—	—	—	—	—	1.3E+05	n	4.7E+01	n	4.7E+03	n	—	—	—	—	—	—	
Ethylene oxide	75-21-8	5.8E+00	c	1.8E-03	c	1.8E-01	c	2.6E+02	c	6.0E+03	c	—	—	5.7E+00	c	9.0E-04	c	9.0E-02	c	1.3E+02	c	3.9E+02	c	—	—	—
Ethylene thiourea	96-45-7	5.3E+00	n	3.8E-03	n	3.8E-01	n	—	—	—	—	—	—	5.3E+00	n	1.9E-03	n	1.9E-01	n	—	—	—	—	—	—	
Ethylenediamine	107-15-3	7.4E+03	n	4.6E+00	n	4.6E+02	n	—	—	—	—	—	—	7.4E+03	n	2.3E+00	n	2.3E+02	n	—	—	—	—	—	—	
Ethylenimine	151-56-4	5.5E-02	c	2.8E-05	c	2.8E-03	c	1.3E-01	c	2.8E+01	c	—	—	3.9E-02	c	1.4E-05	c	1.4E-03	c	6.8E-02	c	1.8E+00	c	—	—	—
Ethylhexyl acrylate, 2-	103-11-7	9.8E+01	c	7.7E+00	c	7.7E+02	c	—	—	—	—	—	—	9.8E+01	c	3.8E+00	c	3.8E+02	c	—	—	—	—	—	—	
Famphur	52-85-7	2.0E+00	n	1.8E-03	n	1.8E-01	n	—	—	—	—	—	—	2.0E+00	n	9.1E-04	n	9.1E-02	n	—	—	—	—	—	—	
Fensulfothion	115-90-2	6.7E+01	n	3.5E-01	n	3.5E+01	n	—	—	—	—	—	—	6.7E+01	n	1.8E-01	n	1.8E+01	n	—	—	—	—	—	—	
Fenthion	55-38-9	4.7E+00	n	7.9E-02	n	7.9E+00	n	—	—	—	—	—	—	4.7E+00	n	3.9E-02	n	3.9E+00	n	—	—	—	—	—	—	
Fenuron	101-42-8	4.7E+03	n	4.6E+00	n	4.6E+02	n	—	—	—	—	—	—	4.7E+03	n	2.3E+00	n	2.3E+02	n	—	—	—	—	—	—	
Fluoranthene	206-44-0	2.3E+03	n	1.9E+03	n >S	1.9E+05	n >S	—	—	—	—	—	—	2.3E+03	n	9.6E+02	n >S	9.6E+04	n >S	—	—	—	—	—	—	
Fluorene	86-73-7	2.3E+03	n	3.0E+02	n	3.0E+04	n >S	—	—	—	—	—	—	2.3E+03	n	1.5E+02	n	1.5E+04	n >S	—	—	—	—	—	—	
Fluorine (soluble fluoride)	7782-41-4	4.8E+03	n	—	—	—	—	—	—	—	—	—	—	4.8E+03	n	—	—	—	—	—	—	—	—	—	—	
Fluorochloridone	61213-25-0	5.0E+02	n	4.0E+00	n	4.0E+02	n	—	—	—	—	—	—	5.0E+02	n	2.0E+00	n	2.0E+02	n	—	—	—	—	—	—	
Fonofos	944-22-9	1.3E+02	n	7.1E+00	n	7.1E+02	n	—	—	—	—	—	—	1.3E+02	n	3.6E+00	n	3.6E+02	n	—	—	—	—	—	—	
Formaldehyde	50-00-0	9.3E+02	n	9.8E+00	n	9.8E+02	n	9.9E+02	n	1.7E+05	n	—	—	4.9E+02	n	4.9E+00	n	4.9E+02	n	5.1E+02	n	1.1E+04	n	—	—	
Formic acid	64-18-6	2.1E+02	n	4.2E+01	n	4.2E+03	n	2.1E+02	n	3.4E+04	n	—	—	1.1E+02	n	2.1E+01	n	2.1E+03	n	1.1E+02	n	2.2E+03	n	—	—	—
Furan	110-00-9	8.2E+01	n	8.1E-02	n	8.1E+00	n	—	—	—	—	—	—	8.2E+01	n	4.1E-02	n	4.1E+00	n	—	—	—	—	—	—	
Furfural	98-01-1	2.5E+02	n	1.5E-01	n	1.5E+01	n	—	—	—	—	—	—	2.5E+02	n	7.4E-02	n	7.4E+00	n	—	—	—	—	—	—	
Glycidylaldehyde	765-34-4	2.7E+01	n	2.2E-02	n	2.2E+00	n	1.5E+02	n	3.3E+04	n	—	—	2.3E+01	n	1.1E-02	n	1.1E+00	n	7.7E+01	n	2.1E+03	n	—	—	—
Glyphosate	1071-83-6	6.7E+04	n	2.9E+01	m	2.9E+03	m	—	—	—	—	—	—	6.7E+04	n	1.5E+01	m	1.5E+03	m	—	—	—	—	—	—	
Heptachlor	76-44-8	1.3E-01	c	1.9E-01	m	1.9E+01	m	9.1E+00	c	3.0E+03	c >S	—	—	1.3E-01	c	9.4E-02	m	9.4E+00	m	4.7E+00	c	1.9E+02	c >S	—	—	—
Heptachlor epoxide	1024-57-3	2.4E-01	c	5.8E-02	m	5.8E+00	m	2.4E+01	c	3.5E+04	c >S	—	—	2.4E-01	c	2.9E-02	m	2.9E+00	m	1.2E+01	c	2.2E+03	c >S	—	—	—
Heptane, n-	142-82-5	4.7E+03	n	7.2E+02	n	7.2E+04	n >S	1.4E+05	n	4.2E+05	n >S	—	—	4.6E+03	n	3.6E+02	n	3.6E+04	n >S	7.1E+04	n	2.7E+04	n >S	—	—	—
Heptanoic acid, n-	111-14-8	1.2E+02	n	2.4E+01	n	2.4E+03	n	1.2E+02	n	3.2E+04	n >S	—	—	6.3E+01	n	1.2E+01	n	1.2E+03	n	6.3E+01	n	2.1E+03	n >S	—	—	—
Hexachlorobenzene	118-74-1	1.1E+00	c	1.1E+00	m	1.1E+02	m >S	1.9E+01	c	6.4E+03	c >S	—	—	1.0E+00	c	5.6E-01	m	5.6E+01	m >S	9.8E+00	c	4.2E+02	c >S	—	—	—
Hexachlorobutadiene	87-68-3	2.0E+01	c	3.3E+00	c	3.3E+02	c	2.9E+01	c	2.5E+03	c >S	—	—	1.2E+01	c	1.6E+00	c	1.6E+02	c	1.5E+01	c	1.6E+02	c	—	—	—
Hexachlorocyclohexane, alpha (alpha-BHC)	319-84-6	2.6E-01	c	7.9E-03	c	7.9E-01	c	1.4E+01	c	8.4E+03	c >S	—	—	2.5E-01	c	4.0E-03	c	4.0E-01	c	7.2E+00	c	5.4E+02	c >S	—	—	—
Hexachlorocyclohexane, beta (beta-BHC)	319-85-7	9.3E-01	c	2.9E-02	c	2.9E+00	c	7.2E+01	c	6.6E+04	c >S	—	—	9.2E-01	c	1.4E-02	c	1.4E+00	c	3.7E+01	c	4.2E+03	c >S	—	—	—
Hexachlorocyclohexane, delta (delta-BHC)	319-86-8	2.9E+00	c	1.7E-01	c	1.7E+01	c	1.0E+02	c	1.2E+05	c >S	—	—	2.9E												

Table 1
Tier 1 Residential Soil PCLs¹

Last Revised: March 1, 2022

Chemical of Concern	CAS	0.5 acre source area										30 acre source area											
		TotSoil _{Comb} ² (mg/kg)	note ³	GWSoil _{Ing} (mg/kg)	note ³	GWSoil _{Class 3} (mg/kg)	note ³	AirSoil _{Inh-V} ⁴ (mg/kg)	note ³	AirGW-Soil _{Inh-V} (mg/kg)	note ³	GWSoil for Secondary MCL (mg/kg)	TotSoil _{Comb} ² (mg/kg)	note ³	GWSoil _{Ing} (mg/kg)	note ³	GWSoil _{Class 3} (mg/kg)	note ³	AirSoil _{Inh-V} ⁴ (mg/kg)	note ³	AirGW-Soil _{Inh-V} (mg/kg)	note ³	GWSoil for Secondary MCL (mg/kg)
Hexanal, 2-ethyl-	123-05-7	1.0E+04	n	2.6E+01	n	2.6E+03	n	—	—	—	—	—	1.0E+04	n	1.3E+01	n	1.3E+03	n	—	—	—	—	—
Hexane, n-	110-54-3	3.3E+03	n	2.0E+02	n	2.0E+04	n >S	1.0E+04	n	5.3E+03	n >S	—	2.5E+03	n	1.0E+02	n	1.0E+04	n >S	5.3E+03	n	3.4E+02	n	—
Hexanediamine, 1,6-	124-09-4	3.3E+02	n	2.5E-01	n	2.5E+01	n	—	—	—	—	—	3.3E+02	n	1.2E-01	n	1.2E+01	n	—	—	—	—	—
Hexanedinitrile	111-69-3	8.5E+01	n	6.8E-02	n	6.8E+00	n	9.8E+02	n	3.2E+05	n	—	7.9E+01	n	3.4E-02	n	3.4E+00	n	5.1E+02	n	2.1E+04	n	—
Hexanediol, 1,6-	629-11-8	3.0E+05	n	2.6E+02	n	2.6E+04	n	1.0E+06	n	1.0E+06	n >S	—	2.8E+05	n	1.3E+02	n	1.3E+04	n	1.0E+06	n	1.0E+06	n >S	—
Hexanoic acid	142-62-1	1.3E+02	n	3.0E+00	n	3.0E+02	n	1.4E+02	n	4.0E+04	n >S	—	6.9E+01	n	1.5E+00	n	1.5E+02	n	7.0E+01	n	2.6E+03	n	—
Hexanone, 2-	591-78-6	6.9E+02	n	3.2E+00	n	3.2E+02	n	8.3E+02	n	3.0E+04	n	—	3.8E+02	n	1.6E+00	n	1.6E+02	n	4.2E+02	n	2.0E+03	n	—
Hexazinone	51235-04-2	2.2E+03	n	2.7E+00	n	2.7E+02	n	—	—	—	—	—	2.2E+03	n	1.4E+00	n	1.4E+02	n	—	—	—	—	—
Hexene, 1-	592-41-6	1.6E+03	n	7.4E+02	n	7.4E+04	n >S	1.7E+03	n	3.1E+03	n >S	—	8.4E+02	n	3.7E+02	n	3.7E+04	n >S	8.7E+02	n	2.0E+02	n	—
Hexene, cis-2-	7688-21-3	1.6E+03	n	6.2E+02	n	6.2E+04	n >S	1.7E+03	n	3.7E+03	n >S	—	8.4E+02	n	3.1E+02	n	3.1E+04	n >S	8.7E+02	n	2.4E+02	n	—
Hexylene glycol (2-methyl-2,4-pentanediol)	107-41-5	2.0E+04	n	1.5E+01	n	1.5E+03	n	—	—	—	—	—	2.0E+04	n	7.4E+00	n	7.4E+02	n	—	—	—	—	—
Hydrazine	302-01-2	3.8E-01	c	5.8E-04	c	5.8E-02	c	4.6E-01	c	9.8E+01	c	—	2.1E-01	c	2.9E-04	c	2.9E-02	c	2.4E-01	c	6.4E+00	c	—
Hydrocaproic acid, 6- (6-hydroxyhexanoic acid)	1191-25-9	1.6E+02	n	3.0E+00	n	3.0E+02	n	1.6E+02	n	5.6E+04	n >S	—	8.1E+01	n	1.5E+00	n	1.5E+02	n	8.3E+01	n	4.1E+03	n	—
Hydrogen chloride (hydrochloric acid)*	7647-01-0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Hydroquinone	123-31-9	7.8E+01	c	3.1E-02	c	3.1E+00	c	—	—	—	—	—	7.8E+01	c	1.6E-02	c	1.6E+00	c	—	—	—	—	—
Indene	95-13-6	1.0E+02	n	7.1E+00	n	7.1E+02	n	1.1E+02	n	4.0E+03	n	—	5.6E+01	n	3.6E+00	n	3.6E+02	n	5.8E+01	n	2.6E+02	n	—
Indeno-1,2,3-cd-pyrene	193-39-5	4.2E+01	c	1.3E+03	c >S	1.3E+05	c >S	3.7E+04	c	1.0E+06	c >S	—	4.2E+01	c	6.3E+02	c >S	6.3E+04	c >S	1.9E+04	c	1.0E+06	c >S	—
Iron*	7439-89-6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Isoamyl alcohol	123-51-3	4.1E+02	n	3.2E-01	n	3.2E+01	n	—	—	—	—	—	4.1E+02	n	1.6E-01	n	1.6E+01	n	—	—	—	—	—
Isobutyl alcohol	78-83-1	2.5E+04	n	1.6E+01	n	1.6E+03	n	—	—	—	—	—	2.5E+04	n	7.9E+00	n	7.9E+02	n	—	—	—	—	—
Isobutylene (2-methyl-1-propene)	115-11-7	3.0E+02	n	2.7E+00	n	2.7E+02	n	1.0E+06	n	1.0E+06	n >S	—	3.0E+02	n	1.4E+00	n	1.4E+02	n	8.7E+05	n	1.2E+05	n >S	—
Isobutyric acid (2-methylpropanoic acid)	79-31-2	3.3E+04	n	2.3E+01	n	2.3E+03	n	—	—	—	—	—	3.3E+04	n	1.2E+01	n	1.2E+03	n	—	—	—	—	—
Isodecanol	25339-17-7	7.1E+01	n	3.0E+00	n	3.0E+02	n	—	—	—	—	—	7.1E+01	n	1.5E+00	n	1.5E+02	n	—	—	—	—	—
Isodrin	465-73-6	2.7E-02	c	1.5E+00	c	1.5E+02	c	1.7E+00	c	9.4E+03	c >S	—	2.7E-02	c	7.4E-01	c	7.4E+01	c	9.0E-01	c	6.1E+02	c	—
Isopentane	78-78-4	4.8E+03	n	2.7E+02	n	2.7E+04	n >S	3.7E+05	n	4.5E+05	n >S	—	4.8E+03	n	1.3E+02	n	1.3E+04	n >S	1.9E+05	n	2.9E+04	n >S	—
Isophorone	78-59-1	4.9E+03	c	3.0E+00	c	3.0E+02	c	—	—	—	—	—	4.9E+03	c	1.5E+00	c	1.5E+02	c	—	—	—	—	—
Isopropyl acetate	108-21-4	5.7E+03	n	4.0E+00	n	4.0E+02	n	—	—	—	—	—	5.7E+03	n	2.0E+00	n	2.0E+02	n	—	—	—	—	—
Isopropyl alcohol	67-63-0	9.1E+03	n	1.0E+02	n	1.0E+04	n	9.7E+03	n	8.7E+05	n >S	—	4.8E+03	n	5.0E+01	n	5.0E+03	n	5.0E+03	n	5.6E+04	n	—
Isosafrole	120-58-1	1.7E+01	c	1.3E-01	c	1.3E+01	c	9.1E+01	c	1.3E+04	c >S	—	1.5E+01	c	6.5E-02	c	6.5E+00	c	4.7E+01	c	8.6E+02	c	—
Kelthane (dicofol)	115-32-2	2.7E+02	n	7.4E+01	n	7.4E+03	n >S	—	—	—	—	—	2.7E+02	n	3.7E+01	n	3.7E+03	n >S	—	—	—	—	—
Kepone (chlordecone)	143-50-0	3.6E-01	c	9.9E-02	c	9.9E+00	c	4.9E+01	c	2.5E+05	c >S	—	3.5E-01	c	4.9E-02	c	4.9E+00	c	2.5E+01	c	1.6E+04	c >S	—
Lead (inorganic)	7439-92-1	5.0E+02	e	3.0E+00	e >S	3.0E+02	e >S	—	—	—	—	—	5.0E+02	e	1.5E+00	e >S	1.5E+02	e >S	—	—	—	—	—
Leptophos	21609-90-5	1.6E-01	n	6.4E-01	n	6.4E+01	n >S	3.3E+01	n	3.4E+05	n >S	—	1.6E-01	n	3.2E-01	n	3.2E+01	n >S	1.7E+01	n	2.2E+04	n >S	—
Limonene, d-*	5989-27-5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Lithium	7439-93-2	4.4E+02	n	—	—	—	—	—	—	—	—	—	4.4E+02	n	—	—	—	—	—	—	—	—	
Magnesium*	7439-95-4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Malathion	121-75-5	1.7E+02	n	6.6E+00	n	6.6E+02	n	2.0E+02	n	1.2E+05	n >S	—	9.6E+01	n	3.3E+00	n	3.3E+02	n	1.0E+02	n	8.0E+03	n >S	—
Maleic anhydride	108-31-6	6.7E+03	n	7.2E+00	n	7.2E+02	n	—	—	—	—	—	6.7E+03	n	3.6E+00	n	3.6E+02	n	—	—	—	—	—
Maleic hydrazide	123-33-1	3.3E+04	n	3.6E+01	n	3.6E+03	n	—	—	—	—	—	3.3E+04	n	1.8E+01	n	1.8E+03	n	—	—	—	—	—
Malononitrile	109-77-3	6.7E+00	n	5.2E-03	n	5.2E-01	n	—	—	—	—	—	6.7E+00	n	2.6E-03	n	2.6E-01	n	—	—	—	—	—
Mancozeb	8018-01-7	2.0E+03	n	1.8E+00	n	1.8E+02	n >S	—	—	—	—	—	2.0E+03	n	9.0E-01	n	9.0E+01	n >S	—	—	—	—	—
Manganese	7439-96-5	3.9E+03	n	1.2E+03	n >S	1.2E+05	n >S	—	—	—	—	50	3.9E+03	n	5.8E+02	n >S	5.8E+04	n >S	—	—	—	—	25
MCPA (4-(chloro-2-methylphenoxy) acetic acid)	94-74-6	3.3E+01	n	2.3E-02	n	2.3E+00	n	—	—	—	—	—	3.3E+01	n	1.2E-02	n	1.2E+00	n	—	—	—	—	—
MCPP (2-(4-chloro-2-methylphenoxy) propanoic acid)	93-65-2	6.7E+01	n	4.7E-02	n	4.7E+00	n	—	—	—	—	—	6.7E+01	n	2.3E-02	n	2.3E+00	n	—	—	—	—	—
Mercury (pH = 4.9) ⁵	7439-97-6	3.6E+00	n	7.8E-03	m	7.8E-01	m >S	4.6E+00	n	2.8E+01	n >S	—	2.1E+00	n	3.9E-03	m	3.9E-01	m >S	2.4E+00	n	1.8E+00	n >S	—
Mercury (pH=6.8) ⁵	7439-97-6	8.3E+00	n	2.1E+00	m	2.1E+02	m >S	1.6E+01	n	7.6E+03	n >S	—	5.5E+00	n	1.0E+00	m	1.0E+02	m >S	8.0E+00	n	4.9E+02	n >S	—
Merphos	150-50-5	2.0E+00	n	6.5E+00	n	6.5E+02	n >S	—	—	—	—	—	2.0E+00	n	3.2E+00	n	3.2E+02	n >S	—	—	—	—	—
Methacrylic acid (2-methyl-2-propenoic acid)	79-41-4	8.2E+02	n	4.7E-01	n	4.7E+01	n	—	—	—	—	—	8.2E+02	n	2.3E-01	n	2.3E+01	n	—	—	—	—	—
Methacrylonitrile	126-98-7	5.1E+02	n	2.5E+00	n	2.5E+02	n	5.8E+02	n	2.3E+04	n	—	2.8E+02	n	1.3E+00	n	1.3E+02	n	3.0E+02	n	1.5E+03	n	—
Methanol	67-56-1	1.1E+05	n	9.4E+01	n	9.4E+03	n	3.3E+05	n	1.0E+06	n >S	—	8.3E+04	n	4.7E+01	n	4.7E+03	n	1.7E+05	n	9.6E+05	n >S	—
Methapyrillene	91-80-5	1.0E+00	c	5.3E-04	c	5.3E-02	c	—	—	—	—	—	1.0E+00	c	2.6E-04	c	2.6E-02	c	—	—	—	—	—
Methomyl	16752-77-5	1.7E+03	n	5.1E+00	n	5.1E+02	n	—	—	—	—	—	1.7E+03	n	2.5E+00	n	2.5E+02	n	—	—	—	—	—

Table 1
Tier 1 Residential Soil PCLs¹

Last Revised: March 1, 2022

Chemical of Concern	CAS	0.5 acre source area										30 acre source area											
		TotSoil _{Comb} ² (mg/kg) note ³	GWSoil _{Ing} (mg/kg) note ³	GWSoil _{Class 3} (mg/kg) note ³	AirSoil _{Inh-V} ⁴ (mg/kg) note ³	AirGW-Soil _{Inh-V} (mg/kg) note ³	GWSoil for Secondary MCL (mg/kg)	TotSoil _{Comb} ² (mg/kg) note ³	GWSoil _{Ing} (mg/kg) note ³	GWSoil _{Class 3} (mg/kg) note ³	AirSoil _{Inh-V} ⁴ (mg/kg) note ³	AirGW-Soil _{Inh-V} (mg/kg) note ³	GWSoil for Secondary MCL (mg/kg)										
Methoxychlor	72-43-5	2.7E+02	n	1.2E+02	m	1.2E+04	m >S	—	—	—	—	2.7E+02	n	6.2E+01	m	6.2E+03	m >S	—	—	—	—	—	—
Methoxyethanol, 2-	109-86-4	2.7E+02	n	3.6E+00	n	3.6E+02	n >S	3.1E+02	n	4.5E+02	n >S	—	1.5E+02	n	1.8E+00	n	1.8E+02	n >S	1.6E+02	n	2.9E+01	n	—
Methyl acetate (acetic acid, methyl ester)	79-20-9	8.2E+04	n	4.9E+01	n	4.9E+03	n	—	—	—	—	—	8.2E+04	n	2.4E+01	n	2.4E+03	n	—	—	—	—	—
Methyl acrylate	96-33-3	1.1E+02	n	1.0E-01	n	1.0E+01	n	3.1E+02	n	5.7E+03	n	—	8.0E+01	n	5.2E-02	n	5.2E+00	n	1.6E+02	n	3.7E+02	n	—
Methyl amyl ketone (2-heptanone)	110-43-0	3.9E+03	n	4.7E+00	n	4.7E+02	n	1.1E+05	n	1.0E+06	n >S	—	3.8E+03	n	2.4E+00	n	2.4E+02	n	5.7E+04	n	2.8E+05	n >S	—
Methyl chrysene, 1-	3351-28-8	5.8E+02	c	2.2E+04	c >S	1.0E+06	c >S	1.0E+06	c	1.0E+06	c >S	—	5.8E+02	c	1.1E+04	c >S	1.0E+06	c >S	1.0E+06	c	1.0E+06	c >S	—
Methyl chrysene, 2-	3351-32-4	5.8E+02	c	2.2E+04	c >S	1.0E+06	c >S	1.0E+06	c	1.0E+06	c >S	—	5.8E+02	c	1.1E+04	c >S	1.0E+06	c >S	1.0E+06	c	1.0E+06	c >S	—
Methyl chrysene, 6-	1705-85-7	5.7E+01	c	1.8E+03	c >S	1.8E+05	c >S	2.3E+05	c	1.0E+06	c >S	—	5.7E+01	c	8.8E+02	c >S	8.8E+04	c >S	1.2E+05	c	1.0E+06	c >S	—
Methyl cyclohexane	108-87-2	4.1E+04	n	1.6E+04	n >S	1.0E+06	n >S	4.6E+04	n	1.8E+05	n >S	—	2.2E+04	n	7.8E+03	n >S	7.8E+05	n >S	2.4E+04	n	1.2E+04	n >S	—
Methyl ethyl ketone (2-butanone)	78-93-3	4.0E+04	n	2.9E+01	n	2.9E+03	n	2.0E+05	n	1.0E+06	n >S	—	3.3E+04	n	1.5E+01	n	1.5E+03	n	1.0E+05	n	6.2E+05	n >S	—
Methyl iodide (iodomethane)	74-88-4	1.1E+02	n	1.1E-01	n	1.1E+01	n	—	—	—	—	—	1.1E+02	n	5.7E-02	n	5.7E+00	n	—	—	—	—	—
Methyl isobutyl ketone (4-methyl-2-pentanone)	108-10-1	5.9E+03	n	4.9E+00	n	4.9E+02	n	5.8E+04	n	1.0E+06	n >S	—	5.4E+03	n	2.5E+00	n	2.5E+02	n	3.0E+04	n	1.1E+05	n >S	—
Methyl mercury	22967-92-6	8.0E+00	n	—	—	—	—	—	—	—	—	—	8.0E+00	n	—	—	—	—	—	—	—	—	—
Methyl methacrylate	80-62-6	9.8E+03	n	9.8E+01	n	9.8E+03	n	1.1E+04	n	2.3E+05	n >S	—	5.3E+03	n	4.9E+01	n	4.9E+03	n	5.5E+03	n	1.5E+04	n	—
Methyl methanesulfonate	66-27-3	3.3E+01	c	1.8E-02	c	1.8E+00	c	1.1E+02	c	3.2E+04	c	—	2.6E+01	c	8.9E-03	c	8.9E-01	c	5.7E+01	c	2.1E+03	c	—
Methyl parathion	298-00-0	1.7E+01	n	1.7E-01	n	1.7E+01	n	—	—	—	—	—	1.7E+01	n	8.5E-02	n	8.5E+00	n	—	—	—	—	—
Methyl-1-butene, 2-	563-46-2	4.8E+03	n	6.5E+01	n	6.5E+03	n >S	2.8E+05	n	3.4E+05	n >S	—	4.7E+03	n	3.2E+01	n	3.2E+03	n >S	1.4E+05	n	2.2E+04	n >S	—
Methyl-1-propanal, 2- (isobutyraldehyde)	78-84-2	3.3E+03	n	2.1E+00	n	2.1E+02	n	—	—	—	—	—	3.3E+03	n	1.0E+00	n	1.0E+02	n	—	—	—	—	—
Methyl-2-butene, 2-	513-35-9	4.8E+03	n	3.9E+01	n	3.9E+03	n	2.8E+05	n	4.0E+05	n >S	—	4.7E+03	n	1.9E+01	n	1.9E+03	n	1.4E+05	n	2.6E+04	n >S	—
Methyl-2-pentenal, 2-	623-36-9	3.2E+00	c	1.5E-03	c	1.5E-01	c	—	—	—	—	—	3.2E+00	c	7.3E-04	c	7.3E-02	c	—	—	—	—	—
Methylcholanthrene, 3-	56-49-5	1.9E-01	c	1.5E+01	c	1.5E+03	c >S	1.8E+03	c	1.0E+06	c >S	—	1.9E-01	c	7.6E+00	c	7.6E+02	c >S	9.0E+02	c	1.0E+06	c >S	—
Methylene bromide (dibromomethane)	74-95-3	8.1E+01	n	1.1E+00	c	1.1E+02	c	8.2E+01	n	2.2E+03	n	—	4.2E+01	n	5.6E-01	c	5.6E+01	c	4.2E+01	n	1.4E+02	n	—
Methylene chloride (dichloromethane)	75-09-2	1.6E+03	n	1.3E-02	m	1.3E+00	m	1.3E+04	c	5.6E+04	c >S	—	1.5E+03	n	6.5E-03	m	6.5E-01	m	6.6E+03	c	3.6E+03	c	—
Methylene-bis (2-chloroaniline) 4,4'-	101-14-4	4.6E+01	c	2.9E+00	c	2.9E+02	c	2.7E+03	c	1.0E+06	c >S	—	4.5E+01	c	1.4E+00	c	1.4E+02	c	1.4E+03	c	4.1E+05	c >S	—
Methylmercury hydroxide	1184-57-2	6.7E+00	n	4.8E-03	n	4.8E-01	n	—	—	—	—	—	6.7E+00	n	2.4E-03	n	2.4E-01	n	—	—	—	—	—
Methylnaphthalene, 1-	90-12-0	1.5E+02	c	2.9E+00	c	2.9E+02	c	—	—	—	—	—	1.5E+02	c	1.5E+00	c	1.5E+02	c	—	—	—	—	—
Methylnaphthalene, 2-	91-57-6	2.5E+02	n	1.7E+01	n	1.7E+03	n	—	—	—	—	—	2.5E+02	n	8.5E+00	n	8.5E+02	n	—	—	—	—	—
Methylpyrrolidone, N-	872-50-4	1.3E+03	n	9.6E-01	n	9.6E+01	n	—	—	—	—	—	1.3E+03	n	4.8E-01	n	4.8E+01	n	—	—	—	—	—
Methylstyrene, alpha-	98-83-9	2.8E+02	n	6.5E+00	n	6.5E+02	n	4.8E+02	n	2.1E+04	n >S	—	1.8E+02	n	3.3E+00	n	3.3E+02	n	2.5E+02	n	1.4E+03	n >S	—
Methyltetrahydrofuran, 2-	96-47-9	1.5E+02	c	2.7E-01	c	2.7E+01	c	1.9E+02	c	4.2E+03	c	—	8.6E+01	c	1.4E-01	c	1.4E+01	c	9.7E+01	c	2.7E+02	c	—
Methyltetrahydropyran, 2-	10141-72-7	1.7E+02	c	3.3E-01	c	3.3E+01	c	2.2E+02	c	5.7E+03	c	—	9.8E+01	c	1.6E-01	c	1.6E+01	c	1.1E+02	c	3.7E+02	c	—
Metolachlor	51218-45-2	1.0E+04	n	1.1E+02	n	1.1E+04	n	—	—	—	—	—	1.0E+04	n	5.5E+01	n	5.5E+03	n	—	—	—	—	—
Metribuzin	21087-64-9	1.7E+03	n	1.2E+00	n	1.2E+02	n	—	—	—	—	—	1.7E+03	n	6.1E-01	n	6.1E+01	n	—	—	—	—	—
Mirex	2385-85-5	1.3E+01	n	4.5E+03	n >S	4.5E+05	n >S	—	—	—	—	—	1.3E+01	n	2.2E+03	n >S	2.2E+05	n >S	—	—	—	—	—
Molinate	2212-67-1	1.3E+02	n	1.9E-01	n	1.9E+01	n	—	—	—	—	—	1.3E+02	n	9.6E-02	n	9.6E+00	n	—	—	—	—	—
Molybdenum	7439-98-7	1.6E+02	n	4.9E+01	n >S	4.9E+03	n >S	—	—	—	—	—	1.6E+02	n	2.5E+01	n >S	2.5E+03	n >S	—	—	—	—	—
Monocrotophos	2157-98-4	4.0E+01	n	2.9E-02	n	2.9E+00	n	—	—	—	—	—	4.0E+01	n	1.5E-02	n	1.5E+00	n	—	—	—	—	—
Morpholine	110-91-8	1.0E+06	n	2.4E+04	n	1.0E+06	n	—	—	—	—	—	1.0E+06	n	1.2E+04	n	9.8E+05	n	—	—	—	—	—
Morpholine, N-butyl-	1005-67-0	1.5E+02	n	2.3E-01	n	2.3E+01	n	—	—	—	—	—	1.5E+02	n	1.2E-01	n	1.2E+01	n	—	—	—	—	—
MTBE (methyl tert-butyl ether) ⁵	1634-04-4	8.0E+02	n	6.2E-01	n	6.2E+01	n	1.4E+03	c	1.0E+04	c	0.038	5.9E+02	c	3.1E-01	n	3.1E+01	n	7.1E+02	c	6.6E+02	c	0.019
Naled	300-76-5	1.3E+02	n	3.5E-01	n	3.5E+01	n >S	—	—	—	—	—	1.3E+02	n	1.8E-01	n	1.8E+01	n >S	—	—	—	—	—
Naphthalene	91-20-3	2.2E+02	n	3.1E+01	n	3.1E+03	n >S	2.7E+02	n	2.0E+04	n >S	—	1.2E+02	n	1.6E+01	n	1.6E+03	n >S	1.4E+02	n	1.3E+03	n >S	—
Naphthoquinone, 1,4-	130-15-4	4.7E+02	n	4.6E-01	n	4.6E+01	n	—	—	—	—	—	4.7E+02	n	2.3E-01	n	2.3E+01	n	—	—	—	—	—
Naphthylamine, 1-	134-32-7	1.3E+03	n	9.4E+00	n	9.4E+02	n	—	—	—	—	—	1.3E+03	n	4.7E+00	n	4.7E+02	n	—	—	—	—	—
Naphthylamine, 2-	91-59-8	2.6E+00	c	1.3E-02	c	1.3E+00	c	—	—	—	—	—	2.6E+00	c	6.4E-03	c	6.4E-01	c	—	—	—	—	—
Napropamide	15299-99-7	6.7E+03	n	5.5E+02	n	5.5E+04	n >S	—	—	—	—	—	6.7E+03	n	2.7E+02	n	2.7E+04	n >S	—	—	—	—	—
Neopentyl glycol	126-30-7	2.0E+04	n	1.5E+01	n	1.5E+03	n	—	—	—	—	—	2.0E+04	n	7.3E+00	n	7.3E+02	n	—	—	—	—	—
Nickel and compounds	7440-02-0	8.4E+02	n	1.6E+02	n >S	1.6E+04	n >S	—	—	—	—	—	8.4E+02	n	7.9E+01	n >S	7.9E+03	n >S	—	—	—	—	—
Nitrate-N ^{7,9}	14797-55-8	1.3E+05	n	—	—	—	—	—	—	—	—	—	1.3E+05	n	—	—	—	—	—	—	—	—	—
Nitrite-N ^{7,9}	14797-65-0	8.0E+03	n	—	—	—	—	—	—	—	—	—	8.0E+03	n	—	—	—	—	—	—	—	—	—
Nitroaniline, 2-	88-74-4	1.4E+01	n	2.2E-02	n	2.2E+00	n	4.8E+01	n	1.2E+04	n >S	—	1.1E+01	n	1.1E-02	n	1.1E+00	n	2.4E+0				

Table 1
Tier 1 Residential Soil PCLs¹

Last Revised: March 1, 2022

Chemical of Concern	CAS	0.5 acre source area										30 acre source area											
		TotSoil _{Comb} ² (mg/kg)	note ³	GWSoil _{Ing} (mg/kg)	note ³	GWSoil _{Class 3} (mg/kg)	note ³	AirSoil _{Inh-V} ⁴ (mg/kg)	note ³	AirGW-Soil _{Inh-V} (mg/kg)	note ³	GWSoil for Secondary MCL (mg/kg)	TotSoil _{Comb} ² (mg/kg)	note ³	GWSoil _{Ing} (mg/kg)	note ³	GWSoil _{Class 3} (mg/kg)	note ³	AirSoil _{Inh-V} ⁴ (mg/kg)	note ³	AirGW-Soil _{Inh-V} (mg/kg)	note ³	GWSoil for Secondary MCL (mg/kg)
Nitroaniline, 4-	100-01-6	2.2E+02	n	1.1E-01	c	1.1E+01	c	1.2E+03	n	3.4E+05	n >S	—	1.9E+02	n	5.4E-02	c	5.4E+00	c	6.2E+02	n	2.2E+04	n >S	—
Nitrobenzene	98-95-3	6.6E+01	c	3.5E-01	n	3.5E+01	n	6.6E+01	c	5.2E+03	c	—	3.4E+01	c	1.8E-01	n	1.8E+01	n	3.4E+01	c	3.4E+02	c	—
Nitroglycerin	55-63-0	6.7E+00	n	1.4E-02	n	1.4E+00	n	—	—	—	—	—	6.7E+00	n	6.9E-03	n	6.9E-01	n	—	—	—	—	—
Nitrophenol, 2-	88-75-5	1.3E+02	n	1.3E-01	n	1.3E+01	n	—	—	—	—	—	1.3E+02	n	6.7E-02	n	6.7E+00	n	—	—	—	—	—
Nitrophenol, 3-	554-84-7	1.3E+02	n	2.3E-01	n	2.3E+01	n	—	—	—	—	—	1.3E+02	n	1.1E-01	n	1.1E+01	n	—	—	—	—	—
Nitrophenol, 4-	100-02-7	1.3E+02	n	1.0E-01	n	1.0E+01	n	—	—	—	—	—	1.3E+02	n	5.0E-02	n	5.0E+00	n	—	—	—	—	—
Nitropropane, 2-	79-46-9	6.2E-01	c	7.1E-03	n	7.1E-01	n	6.2E-01	c	1.7E+01	c	—	3.2E-01	c	3.5E-03	n	3.5E-01	n	3.2E-01	c	1.1E+00	c	—
Nitroquinoline-N-oxide, 4-	56-57-5	4.0E-01	c	2.3E-04	c	2.3E-02	c	1.9E+00	c	2.7E+04	c	—	3.3E-01	c	1.2E-04	c	1.2E-02	c	9.7E-01	c	1.3E+04	c	—
Nitrosodiethanolamine	1116-54-7	1.7E+00	c	6.6E-04	c	6.6E-02	c	—	—	—	—	—	1.7E+00	c	3.3E-04	c	3.3E-02	c	—	—	—	—	—
Nitrosodiethylamine, n-	55-18-5	2.5E-02	c	1.2E-05	c	1.2E-03	c	6.6E-02	c	1.5E+01	c	—	1.8E-02	c	6.2E-06	c	6.2E-04	c	3.4E-02	c	9.7E-01	c	—
Nitrosodimethylamine, n-	62-75-9	7.4E-02	c	3.7E-05	c	3.7E-03	c	2.0E-01	c	4.2E+01	c	—	5.5E-02	c	1.8E-05	c	1.8E-03	c	1.0E-01	c	2.7E+00	c	—
Nitrosodi-n-butylamine, n-	924-16-3	4.7E-01	c	1.9E-03	c	1.9E-01	c	1.0E+00	c	5.2E+01	c	—	3.3E-01	c	9.4E-04	c	9.4E-02	c	5.3E-01	c	3.4E+00	c	—
Nitrosodi-n-propylamine, n-	621-64-7	4.0E-01	c	3.5E-04	c	3.5E-02	c	—	—	—	—	—	4.0E-01	c	1.8E-04	c	1.8E-02	c	—	—	—	—	—
Nitrosodiphenylamine	86-30-6	5.7E+02	c	2.8E+00	c	2.8E+02	c	—	—	—	—	—	5.7E+02	c	1.4E+00	c	1.4E+02	c	—	—	—	—	—
Nitroso-methyl-ethyl-amine, n-	10595-95-6	2.8E-01	c	1.1E-04	c	1.1E-02	c	—	—	—	—	—	2.8E-01	c	5.7E-05	c	5.7E-03	c	—	—	—	—	—
Nitrosomorpholine, N-	59-89-2	5.0E-01	c	2.6E-04	c	2.6E-02	c	1.7E+00	c	5.2E+02	c	—	3.9E-01	c	1.3E-04	c	1.3E-02	c	8.8E-01	c	3.4E+01	c	—
Nitroso-n-ethylurea, n-	759-73-9	3.4E-02	c	2.1E-05	c	2.1E-03	c	—	—	—	—	—	3.4E-02	c	1.0E-05	c	1.0E-03	c	—	—	—	—	—
Nitrosopiperidine, N-	100-75-4	3.6E-01	c	2.1E-04	c	2.1E-02	c	1.3E+00	c	3.5E+02	c	—	2.9E-01	c	1.0E-04	c	1.0E-02	c	6.9E-01	c	2.3E+01	c	—
Nitrosopyrrolidine, n-	930-55-2	1.6E+00	c	8.4E-04	c	8.4E-02	c	5.8E+00	c	1.9E+03	c	—	1.3E+00	c	4.2E-04	c	4.2E-02	c	3.0E+00	c	1.2E+02	c	—
Nitrotoluene, m-	99-08-1	6.7E+02	n	1.8E+00	n	1.8E+02	n	—	—	—	—	—	6.7E+02	n	9.2E-01	n	9.2E+01	n	—	—	—	—	—
Nitrotoluene, o-	88-72-2	2.1E+01	c	3.1E-02	c	3.1E+00	c	—	—	—	—	—	2.1E+01	c	1.6E-02	c	1.6E+00	c	—	—	—	—	—
Nitrotoluene, p-	99-99-0	2.7E+02	n	4.3E-01	c	4.3E+01	c	—	—	—	—	—	2.7E+02	n	2.2E-01	c	2.2E+01	c	—	—	—	—	—
Nonachlor, cis-	5103-73-1	5.6E+00	c	1.3E+01	c	1.3E+03	c >S	1.2E+03	c	1.0E+06	c >S	—	5.6E+00	c	6.3E+00	c	6.3E+02	c >S	6.4E+02	c	2.4E+05	c >S	—
Nonachlor, trans-	39765-80-5	5.6E+00	c	1.3E+01	c	1.3E+03	c >S	1.2E+03	c	1.0E+06	c >S	—	5.6E+00	c	6.3E+00	c	6.3E+02	c >S	6.4E+02	c	2.4E+05	c >S	—
Nonanal	124-19-6	1.3E+04	n	1.5E+02	n	1.5E+04	n >S	—	—	—	—	—	1.3E+04	n	7.4E+01	n	7.4E+03	n >S	—	—	—	—	—
Nonene, 1-n	124-11-8	8.2E+03	n	3.3E+03	n >S	3.3E+05	n >S	—	—	—	—	—	8.2E+03	n	1.6E+03	n >S	1.6E+05	n >S	—	—	—	—	—
Nonylphenol, 4-n-	104-40-5	6.5E+03	n	3.0E+05	n >S	1.0E+06	n >S	—	—	—	—	—	6.5E+03	n	1.5E+05	n >S	1.0E+06	n >S	—	—	—	—	—
Nonylphenol ethoxylate	9016-45-9	6.5E+03	n	7.5E+05	n >S	1.0E+06	n >S	—	—	—	—	—	6.5E+03	n	3.7E+05	n >S	1.0E+06	n >S	—	—	—	—	—
Octamethylpyrophosphoramide	152-16-9	1.3E+02	n	9.4E-02	n	9.4E+00	n	—	—	—	—	—	1.3E+02	n	4.7E-02	n	4.7E+00	n	—	—	—	—	—
Octanone	106-68-3	4.9E+03	n	1.1E+01	n	1.1E+03	n	9.0E+05	n	1.0E+06	n >S	—	4.9E+03	n	5.5E+00	n	5.5E+02	n	4.6E+05	n	1.0E+06	n >S	—
Oxamyl	23135-22-0	1.7E+03	n	4.2E-01	m	4.2E+01	m	—	—	—	—	—	1.7E+03	n	2.1E-01	m	2.1E+01	m	—	—	—	—	—
Oxychlordane	27304-13-8	5.6E+00	c	1.3E+01	c	1.3E+03	c >S	1.2E+03	c	1.0E+06	c >S	—	5.6E+00	c	6.3E+00	c	6.3E+02	c >S	6.4E+02	c	2.4E+05	c >S	—
Paraquat	1910-42-5	3.0E+02	n	2.1E-01	n	2.1E+01	n	—	—	—	—	—	3.0E+02	n	1.1E-01	n	1.1E+01	n	—	—	—	—	—
Parathion (ethyl parathion)	56-38-2	4.0E+02	n	3.3E+01	n	3.3E+03	n >S	—	—	—	—	—	4.0E+02	n	1.7E+01	n	1.7E+03	n >S	—	—	—	—	—
Pebulate	1114-71-2	3.3E+03	n	2.3E+01	n	2.3E+03	n >S	—	—	—	—	—	3.3E+03	n	1.2E+01	n	1.2E+03	n >S	—	—	—	—	—
Pendimethalin	40487-42-1	2.5E+03	n	7.5E+03	n >S	7.5E+05	n >S	—	—	—	—	—	2.5E+03	n	3.7E+03	n >S	3.7E+05	n >S	—	—	—	—	—
Pentachlorobenzene	608-93-5	5.3E+01	n	2.5E+01	n	2.5E+03	n >S	—	—	—	—	—	5.3E+01	n	1.2E+01	n	1.2E+03	n >S	—	—	—	—	—
Pentachloroethane	76-01-7	3.9E+01	c	9.7E-02	c	9.7E+00	c	9.4E+01	c	2.8E+03	c	—	2.8E+01	c	4.8E-02	c	4.8E+00	c	4.8E+01	c	1.8E+02	c	—
Pentachloronitrobenzene	82-68-8	1.0E+01	c	1.8E+00	c	1.8E+02	c >S	—	—	—	—	—	1.0E+01	c	9.2E-01	c	9.2E+01	c >S	—	—	—	—	—
Pentachlorophenol	87-86-5	7.3E-01	c	1.8E-02	m	1.8E+00	m	—	—	—	—	—	7.3E-01	c	9.2E-03	m	9.2E-01	m	—	—	—	—	—
Pentadiene, 1,3-cis-	1574-41-0	4.8E+03	n	1.9E+01	n	1.9E+03	n	2.8E+05	n	5.5E+05	n >S	—	4.7E+03	n	9.4E+00	n	9.4E+02	n	1.4E+05	n	3.6E+04	n >S	—
Pentadiene, 1,3-trans-	2004-70-8	4.8E+03	n	1.3E+01	n	1.3E+03	n	2.8E+05	n	6.7E+05	n >S	—	4.7E+03	n	6.5E+00	n	6.5E+02	n	1.4E+05	n	4.3E+04	n >S	—
Pentaerythritol tetranitrate (PETN)	78-11-5	1.3E+02	n	1.2E+01	n	1.2E+03	n	—	—	—	—	—	1.3E+02	n	6.2E+00	n	6.2E+02	n	—	—	—	—	—
Pentane	109-66-0	4.8E+03	n	3.5E+02	n	3.5E+04	n >S	3.7E+05	n	8.1E+04	n >S	—	4.8E+03	n	1.7E+02	n	1.7E+04	n >S	1.9E+05	n	5.2E+03	n >S	—
Pentane, 2-methyl-	107-83-5	4.8E+03	n	3.8E+02	n	3.8E+04	n >S	2.8E+05	n	4.5E+05	n >S	—	4.7E+03	n	1.9E+02	n	1.9E+04	n >S	1.4E+05	n	2.9E+04	n >S	—
Pentane, 3-methyl-	96-14-0	4.8E+03	n	3.1E+02	n	3.1E+04	n >S	2.8E+05	n	4.7E+05	n >S	—	4.7E+03	n	1.6E+02	n	1.6E+04	n >S	1.4E+05	n	3.1E+04	n >S	—
Pentanediol, 1,5-	111-29-5	3.0E+05	n	2.4E+02	n	2.4E+04	n	1.0E+06	n	1.0E+06	n >S	—	2.7E+05	n	1.2E+02	n	1.2E+04	n	1.0E+06	n	9.9E+05	n >S	—
Pentanol, 1-	71-41-0	2.7E+03	n	2.3E+00	n	2.3E+02	n	—	—	—	—	—	2.7E+03	n	1.1E+00	n	1.1E+02	n	—	—	—	—	—
Pentanol, 4-methyl-2-	108-11-2	2.1E+03	n	1.8E+00	n	1.8E+02	n	—	—	—	—	—	2.1E+03	n	8.8E-01	n	8.8E+01	n	—	—	—	—	—
Pentanone, 2-	107-87-9	3.3E+03	n	2.2E+00	n	2.2E+02	n	—	—	—	—	—	3.3E+03	n	1.1E+00	n	1.1E+02	n	—	—	—	—	—
Pentene, 2-	109-68-2	4.8E+03	n	4.7E+01	n	4.7E+03	n	2.8E+05	n	4.5E+05	n >S	—	4.7E+03	n	2.3E+01	n	2.3E+03	n	1.4E+05	n	2.9E+04	n >S	—
Pentyne, 1-	627-19-																						

Table 1
Tier 1 Residential Soil PCLs¹

Last Revised: March 1, 2022

Chemical of Concern	CAS	0.5 acre source area										30 acre source area												
		Soil _{Comb} ² (mg/kg)		Soil _{Ing} (mg/kg)		Soil _{Class 3} (mg/kg)		Soil _{Inh-V} ⁴ (mg/kg)		GW-Soil _{Inh-V} (mg/kg)		Soil for Secondary MCL (mg/kg)	Soil _{Comb} ² (mg/kg)		Soil _{Ing} (mg/kg)		Soil _{Class 3} (mg/kg)		Soil _{Inh-V} ⁴ (mg/kg)		GW-Soil _{Inh-V} (mg/kg)		Soil for Secondary MCL (mg/kg)	
Perchlorate	14797-73-0	5.1E+01	n	1.4E-01	n	1.4E+01	n	—	—	—	—	—	5.1E+01	n	7.0E-02	n	7.0E+00	n	—	—	—	—	—	—
Perfluorooctane sulfonic acid (1-Octanesulfonic acid, heptadecafluoro-1-) [PFOS]	1763-23-1	1.5E+00	n	5.0E-02	n	5.0E+00	n	1.5E+02	n	1.6E+05	n >S	—	1.5E+00	n	2.5E-02	n	2.5E+00	n	8.0E+01	n	1.1E+04	n	—	—
Perfluoroundecanoic acid (Undecanoic acid, uncosafluoro-) [PFUnDa]	2058-94-8	8.0E-01	n	1.8E-02	n	1.8E+00	n	—	—	—	—	—	8.0E-01	n	9.2E-03	n	9.2E-01	n	—	—	—	—	—	—
Perfluoropentanoic acid (Pentanoic acid, nonafluoro-) [PFPeA]	2706-90-3	2.5E-01	n	3.2E-04	n	3.2E-02	n	—	—	—	—	—	2.5E-01	n	1.6E-04	n	1.6E-02	n	—	—	—	—	—	—
Perfluorohexanoic acid (Hexanoic acid, undecafluoro-) [PFHxA]	307-24-4	2.5E-01	n	4.8E-04	n	4.8E-02	n	—	—	—	—	—	2.5E-01	n	2.4E-04	n	2.4E-02	n	—	—	—	—	—	—
Perfluorododecanoic acid (Dodecanoic acid, tricosaufluoro-) [PFDoA]	307-55-1	7.9E-01	n	3.4E-02	n	3.4E+00	n	6.9E+01	n	6.4E+04	n >S	—	7.8E-01	n	1.7E-02	n	1.7E+00	n	3.6E+01	n	4.1E+03	n >S	—	—
Perfluorooctanoic acid (Octanoic acid, pentadecafluoro-) [PFOA]	335-67-1	6.0E-01	n	3.0E-03	n	3.0E-01	n	2.4E+00	n	9.1E+02	n	—	4.9E-01	n	1.5E-03	n	1.5E-01	n	1.2E+00	n	5.9E+01	n	—	—
Perfluorodecanoic acid (Decanoic acid, nonadecafluoro-) [PFDA]	335-76-2	9.9E-01	n	2.2E-02	n	2.2E+00	n	8.6E+01	n	7.8E+04	n >S	—	9.8E-01	n	1.1E-02	n	1.1E+00	n	4.4E+01	n	5.0E+03	n >S	—	—
Perfluorodecane sulfonic acid (1-Decanesulfonic acid, heneicosaufluoro-) [PFDS]	335-77-3	8.0E-01	n	4.0E-02	n	4.0E+00	n	—	—	—	—	—	8.0E-01	n	2.0E-02	n	2.0E+00	n	—	—	—	—	—	—
Perfluorohexane sulfonic acid (1-Hexanesulfonic acid, tridecafluoro-) [PFHxS]	355-46-4	2.5E-01	n	2.0E-03	n	2.0E-01	n	1.1E+01	n	6.3E+03	n	—	2.4E-01	n	1.0E-03	n	1.0E-01	n	5.8E+00	n	6.2E+02	n	—	—
Perfluorobutyric acid (Butanoic acid, heptafluoro-) [PFBA]	375-22-4	1.8E+02	n	2.0E-01	n	2.0E+01	n	2.0E+03	n	1.0E+06	n >S	—	1.6E+02	n	9.8E-02	n	9.8E+00	n	1.0E+03	n	9.8E+05	n	—	—
Perfluorobutane sulfonic acid (1-Butanesulfonic acid, nonafluoro-) [PFBS]	375-73-5	8.6E+01	n	1.1E-01	n	1.1E+01	n	1.1E+03	n	1.0E+06	n >S	—	8.0E+01	n	5.3E-02	n	5.3E+00	n	5.8E+02	n	7.2E+05	n >S	—	—
Perfluoroheptanoic acid (Heptanoic acid, tridecafluoro-) [PFHpA]	375-85-9	1.5E+00	n	4.6E-03	n	4.6E-01	n	—	—	—	—	—	1.5E+00	n	2.3E-03	n	2.3E-01	n	—	—	—	—	—	—
Perfluorononanoic acid (Nonanoic acid, heptadecafluoro-) [PFNA]	375-95-1	7.6E-01	n	3.1E-03	n	3.1E-01	n	1.7E+01	n	6.8E+03	n >S	—	7.3E-01	n	1.5E-03	n	1.5E-01	n	8.9E+00	n	4.4E+02	n >S	—	—
Perfluorotetradecanoic acid (Tetradecanoic acid, heptacosaufluoro-) [PFTeDA]	376-06-7	5.1E-01	n	1.1E-01	n	1.1E+01	n >S	—	—	—	—	—	5.1E-01	n	5.6E-02	n	5.6E+00	n >S	—	—	—	—	—	—
Perfluorotridecanoic acid (Tridecanoic acid, pentacosaufluoro-) [PFTrDA]	72629-94-8	6.1E-01	n	6.1E-02	n	6.1E+00	n >S	—	—	—	—	—	6.1E-01	n	3.0E-02	n	3.0E+00	n >S	—	—	—	—	—	—
Perfluorooctane sulfonamide (1-Octanesulfonamide, heptadecafluoro-) [PFOSA]	754-91-6	5.8E-02	n	9.2E-01	n	9.2E+01	n	6.3E-02	n	1.7E-01	n	—	3.1E-02	n	4.6E-01	n	4.6E+01	n	3.2E-02	n	1.1E-02	n	—	—
Perylene	198-55-0	1.3E+03	n	7.6E+04	n >S	1.0E+06	n >S	—	—	—	—	—	1.3E+03	n	3.8E+04	n >S	1.0E+06	n >S	—	—	—	—	—	—
Phenacetin	62-44-2	1.8E+03	c	1.2E+00	c	1.2E+02	c	1.1E+04	c	1.0E+06	c >S	—	1.5E+03	c	6.2E-01	c	6.2E+01	c	5.6E+03	c	2.3E+05	c >S	—	—
Phenanthrene	85-01-8	1.7E+03	n	4.2E+02	n	4.2E+04	n >S	—	—	—	—	—	1.7E+03	n	2.1E+02	n	2.1E+04	n >S	—	—	—	—	—	—
Phenanthridine	229-87-8	2.0E+02	n	5.3E+00	n	5.3E+02	n	—	—	—	—	—	2.0E+02	n	2.6E+00	n	2.6E+02	n	—	—	—	—	—	—
Phenol	108-95-2	1.8E+03	n	1.9E+01	n	1.9E+03	n	1.9E+03	n	4.2E+05	n >S	—	9.5E+02	n	9.6E+00	n	9.6E+02	n	1.0E+03	n	2.7E+04	n	—	—
Phenol, 4-tert-butyl-	98-54-4	8.0E+03	n	1.1E+02	n	1.1E+04	n >S	—	—	—	—	—	8.0E+03	n	5.4E+01	n	5.4E+03	n >S	—	—	—	—	—	—
Phenothiazine	92-84-2	6.3E+01	n	8.0E+00	n >S	8.0E+02	n >S	—	—	—	—	—	6.3E+01	n	4.0E+00	n >S	4.0E+02	n >S	—	—	—	—	—	—
Phenyl mercuric acetate	62-38-4	5.3E+00	n	1.6E-02	n	1.6E+00	n	—	—	—	—	—	5.3E+00	n	8.1E-03	n	8.1E-01	n	—	—	—	—	—	—
Phenylene diamine, m-	108-45-2	4.0E+02	n	2.9E-01	n	2.9E+01	n	—	—	—	—	—	4.0E+02	n	1.4E-01	n	1.4E+01	n	—	—	—	—	—	—
Phenylene diamine, p-	106-50-3	1.3E+04	n	9.1E+00	n	9.1E+02	n	—	—	—	—	—	1.3E+04	n	4.6E+00	n	4.6E+02	n	—	—	—	—	—	—
Phorate	298-02-2	1.3E+01	n	1.1E+00	n	1.1E+02	n	—	—	—	—	—	1.3E+01	n	5.4E-01	n	5.4E+01	n	—	—	—	—	—	—
Phosalone	2310-17-0	1.3E+02	n	2.3E+00	n	2.3E+02	n	—	—	—	—	—	1.3E+02	n	1.2E+00	n	1.2E+02	n	—	—	—	—	—	—
Phosdrin (mevinphos)	7786-34-7	1.7E+00	n	1.2E-03	n	1.2E-01	n	—	—	—	—	—	1.7E+00	n	5.9E-04	n	5.9E-02	n	—	—	—	—	—	—
Phosmet	732-11-6	1.3E+03	n	4.1E+00	n	4.1E+02	n	—	—	—	—	—	1.3E+03	n	2.0E+00	n	2.0E+02	n	—	—	—	—	—	—
Phosphine	7803-51-2	3.8E+00	n	—	—	—	—	4.6E+00	n	—	—	—	2.1E+00	n	—	—	—	—	2.4E+00	n	—	—	—	—
Phosphorotrihoic acid, S,S,S-tributyl ester	78-48-8	3.2E+01	n	4.3E+02	c >S	4.3E+04	c >S	—	—	—	—	—	3.2E+01	n	2.2E+02	c >S	2.2E+04	c >S	—	—	—	—	—	—
Phosphorus, total*	7723-14-0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Phosphorus, white	7723-14-0	1.5E+00	n	2.3E-02	n	2.3E+00	n	—	—	—	—	—	1.5E+00	n	1.1E-02	n	1.1E+00	n	—	—	—	—	—	—
Phthalic anhydride	85-44-9	3.6E+04	n	2.5E+02	n	2.5E+04	n	5.0E+04	n	1.0E+06	n >S	—	2.1E+04	n	1.2E+02	n	1.2E+04	n	2.6E+04	n	1.0E+06	n >S	—	—
Picloram	1918-02-1	4.7E+03	n	9.8E-01	m	9.8E+01	m	—	—	—	—	—	4.7E+03	n	4.9E-01	m	4.9E+01	m	—	—	—	—	—	—
Picoline, 2- (2-methylpyridine)	109-06-8	7.4E+02	n	5.6E-01	n	5.6E+01	n	—	—	—	—	—	7.4E+02	n	2.8E-01	n	2.8E+01	n	—	—	—	—	—	—
Polybrominated biphenyls (PBBs)	67774-32-7	9.7E-03	c	9.0E-03	c	9.0E-01	c	—	—	—	—	—	9.7E-03	c	4.5E-03	c	4.5E-01	c	—	—	—	—	—	—
Polychlorinated biphenyls (PCBs)	1336-36-3	1.1E+00	n	1.1E+01	m	1.1E+03	m	5.4E+01	c	6.2E+04	c >S	—	1.1E+00	n	5.3E+00	m	5.3E+02	m	2.8E+01	c	4.0E+03	c >S	—	—
Potassium*	7440-09-7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Primene	68955-53-3	3.6E+02	n	5.4E+01	n	5.4E+03	n	—	—	—	—	—	3.6E+02	n	2.7E+01	n	2.7E+03	n	—	—	—	—	—	—
Prometon (pramitol)	1610-18-0	1.0E+03	n	9.6E+00	n	9.6E+02	n	—	—	—	—	—	1.0E+03	n	4.8E+00	n	4.8E+02	n	—	—	—	—	—	—
Prometryn	7287-19-6	2.7E+03	n	9.8E+01	n	9.8E+03	n >S	—	—	—	—	—	2.7E+03	n	4.9E+01	n	4.9E+03	n >S	—	—	—	—	—	—
Pronamide	23950-58-5	5.0E+03	n	1.8E+01	n	1.8E+03	n >S	—	—	—	—	—	5.0E+03	n	9.1E+00	n	9.1E+02	n >S	—	—	—	—	—	—
Propanal (propionaldehyde)	123-38-6	1.0E+02	n	3.9E-01	n	3.9E+01	n	1.2E+02	n	3.3E+03	n	—	5.8E+01	n	2.0E-01	n	2.0E+01	n	6.3E+01	n	2.1E+02	n	—	—

Table 1
Tier 1 Residential Soil PCLs¹

Last Revised: March 1, 2022

Chemical of Concern	CAS	0.5 acre source area										30 acre source area												
		TotSoil _{Comb} ² (mg/kg) note ³		GWSoil _{Ing} (mg/kg) note ³		GWSoil _{Class 3} (mg/kg) note ³		AirSoil _{Inh-V} ⁴ (mg/kg) note ³		AirGW-Soil _{Inh-V} (mg/kg) note ³		GWSoil for Secondary MCL (mg/kg)	TotSoil _{Comb} ² (mg/kg) note ³		GWSoil _{Ing} (mg/kg) note ³		GWSoil _{Class 3} (mg/kg) note ³		AirSoil _{Inh-V} ⁴ (mg/kg) note ³		AirGW-Soil _{Inh-V} (mg/kg) note ³		GWSoil for Secondary MCL (mg/kg)	
Propane, 1-bromo-	106-94-5	2.9E+03	n	3.4E+00	n	3.4E+02	n	—	—	—	—	—	2.9E+03	n	1.7E+00	n	1.7E+02	n	—	—	—	—	—	—
Propanil	709-98-8	3.3E+02	n	4.7E+00	n	4.7E+02	n	—	—	—	—	—	3.3E+02	n	2.3E+00	n	2.3E+02	n	—	—	—	—	—	—
Propanoic acid (propionic acid)	79-09-4	4.1E+04	n	2.3E+01	n	2.3E+03	n	—	—	—	—	—	4.1E+04	n	1.2E+01	n	1.2E+03	n	—	—	—	—	—	—
Propanol, 1-	71-23-8	1.6E+05	n	1.0E+02	n	1.0E+04	n	—	—	—	—	—	1.6E+05	n	5.0E+01	n	5.0E+03	n	—	—	—	—	—	—
Propargite	2312-35-8	1.3E+03	n	1.1E+02	n	1.1E+04	n >S	—	—	—	—	—	1.3E+03	n	5.5E+01	n	5.5E+03	n >S	—	—	—	—	—	—
Propargyl alcohol	107-19-7	1.6E+02	n	1.0E-01	n	1.0E+01	n	—	—	—	—	—	1.6E+02	n	5.2E-02	n	5.2E+00	n	—	—	—	—	—	—
Propazine	139-40-2	1.1E+02	c	9.5E-01	c	9.5E+01	c	—	—	—	—	—	1.1E+02	c	4.7E-01	c	4.7E+01	c	—	—	—	—	—	—
Propham	122-42-9	1.3E+03	n	1.9E+00	n	1.9E+02	n	—	—	—	—	—	1.3E+03	n	9.7E-01	n	9.7E+01	n	—	—	—	—	—	—
Propionitrile (propane nitrile)	107-12-0	3.3E+01	n	1.9E-02	n	1.9E+00	n	—	—	—	—	—	3.3E+01	n	9.7E-03	n	9.7E-01	n	—	—	—	—	—	—
Propyl acetate, n-	109-60-4	7.4E+03	n	5.3E+00	n	5.3E+02	n	—	—	—	—	—	7.4E+03	n	2.7E+00	n	2.7E+02	n	—	—	—	—	—	—
Propylbenzene, n-	103-65-1	2.2E+03	n	4.5E+01	n	4.5E+03	n >S	6.3E+03	n	2.8E+05	n >S	—	1.6E+03	n	2.2E+01	n	2.2E+03	n >S	3.3E+03	n	1.8E+04	n >S	—	—
Propylene glycol	57-55-6	3.7E+02	n	9.4E+02	n	9.4E+04	n	3.7E+02	n	9.6E+04	n	—	1.9E+02	n	4.7E+02	n	4.7E+04	n	1.9E+02	n	6.2E+03	n	—	—
Propylene glycol monomethyl ether	107-98-2	4.6E+04	n	3.3E+01	n	3.3E+03	n	2.3E+05	n	1.0E+06	n >S	—	3.9E+04	n	1.7E+01	n	1.7E+03	n	1.2E+05	n	9.7E+05	n >S	—	—
Propylene oxide	75-56-9	2.0E+01	c	7.5E-03	c	7.5E-01	c	9.7E+01	c	3.1E+03	c	—	1.7E+01	c	3.8E-03	c	3.8E-01	c	5.0E+01	c	2.0E+02	c	—	—
Propylene tetramer	6842-15-5	4.6E+03	n	2.5E+04	n >S	1.0E+06	n >S	1.5E+04	n	4.6E+05	n >S	—	3.6E+03	n	1.3E+04	n >S	1.0E+06	n >S	7.9E+03	n	2.9E+04	n >S	—	—
Prothiofos (Tokuthion)	34643-46-4	6.6E+00	n	2.4E+03	n	2.4E+05	n >S	—	—	—	—	—	6.6E+00	n	1.2E+03	n	1.2E+05	n >S	—	—	—	—	—	—
Pyrene	129-00-0	1.7E+03	n	1.1E+03	n >S	1.1E+05	n >S	—	—	—	—	—	1.7E+03	n	5.6E+02	n >S	5.6E+04	n >S	—	—	—	—	—	—
Pyridine	110-86-1	8.2E+01	n	6.9E-02	n	6.9E+00	n	—	—	—	—	—	8.2E+01	n	3.5E-02	n	3.5E+00	n	—	—	—	—	—	—
Quinoline	91-22-5	1.6E+00	c	7.5E-03	c	7.5E-01	c	—	—	—	—	—	1.6E+00	c	3.8E-03	c	3.8E-01	c	—	—	—	—	—	—
Ronnel	299-84-3	2.3E+03	n	4.2E+02	n	4.2E+04	n >S	—	—	—	—	—	2.3E+03	n	2.1E+02	n	2.1E+04	n >S	—	—	—	—	—	—
Safrole	94-59-7	1.6E+01	c	1.6E-01	c	1.6E+01	c	6.7E+01	c	7.5E+03	c >S	—	1.3E+01	c	8.2E-02	c	8.2E+00	c	3.4E+01	c	4.8E+02	c	—	—
Selenium	7782-49-2	3.1E+02	n	2.3E+00	m >S	2.3E+02	m >S	—	—	—	—	—	3.1E+02	n	1.1E+00	m >S	1.1E+02	m >S	—	—	—	—	—	—
Selenourea	630-10-4	4.1E+02	n	—	—	—	—	—	—	—	—	—	4.1E+02	n	—	—	—	—	—	—	—	—	—	—
Silver	7440-22-4	9.7E+01	n	4.8E-01	n >S	4.8E+01	n >S	—	—	—	—	0.39	9.7E-01	n	2.4E-01	n >S	2.4E+01	n >S	—	—	—	—	—	0.2
Simazine	122-34-9	3.9E+01	c	5.5E-02	m	5.5E+00	m	—	—	—	—	—	3.9E+01	c	2.8E-02	m	2.8E+00	m	—	—	—	—	—	—
Sodium*	7440-23-5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sodium hypochlorite	7681-52-9	1.5E+04	n	—	—	—	—	—	—	—	—	—	1.4E+04	n	—	—	—	—	—	—	—	—	—	—
Sodium polyacrylate	9003-04-7	1.2E+02	n	2.4E+01	n	2.4E+03	n	1.2E+02	n	3.0E+04	n	—	6.2E+01	n	1.2E+01	n	1.2E+03	n	6.2E+01	n	1.9E+03	n	—	—
Strontium	7440-24-6	4.4E+04	n	6.1E+02	n	6.1E+04	n	—	—	—	—	—	4.4E+04	n	3.1E+02	n	3.1E+04	n	—	—	—	—	—	—
Strychnine	57-24-9	2.0E+01	n	3.7E-02	n	3.7E+00	n	—	—	—	—	—	2.0E+01	n	1.9E-02	n	1.9E+00	n	—	—	—	—	—	—
Styrene	100-42-5	6.7E+03	n	3.3E+00	m	3.3E+02	m	1.1E+04	n	4.9E+05	n >S	—	4.3E+03	n	1.6E+00	m	1.6E+02	m	5.8E+03	n	3.2E+04	n >S	—	—
Sulfate*	14808-79-8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sulfide*	18496-25-8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sulfolane	126-33-0	4.3E+02	n	6.1E-01	n	6.1E+01	n	8.6E+02	n	2.5E+05	n >S	—	2.9E+02	n	3.1E-01	n	3.1E+01	n	4.4E+02	n	1.6E+04	n >S	—	—
Sulfur*	7704-34-9	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sulprofos (Bolstar)	35400-43-2	2.0E+02	n	7.5E+03	n >S	7.5E+05	n >S	—	—	—	—	—	2.0E+02	n	3.8E+03	n >S	3.8E+05	n >S	—	—	—	—	—	—
Tebuconazole	107534-96-3	2.0E+03	n	3.1E+01	n	3.1E+03	n >S	—	—	—	—	—	2.0E+03	n	1.6E+01	n	1.6E+03	n >S	—	—	—	—	—	—
Tebuthiuron	34014-18-1	4.7E+03	n	5.4E+00	n	5.4E+02	n	—	—	—	—	—	4.7E+03	n	2.7E+00	n	2.7E+02	n	—	—	—	—	—	—
Terbufos	13071-79-9	1.7E+00	n	3.4E-01	n	3.4E+01	n	—	—	—	—	—	1.7E+00	n	1.7E-01	n	1.7E+01	n	—	—	—	—	—	—
Tert-amyl ethyl ether (TAEE)	919-94-8	3.3E+03	n	9.5E+00	n	9.5E+02	n	—	—	—	—	—	3.3E+03	n	4.7E+00	n	4.7E+02	n	—	—	—	—	—	—
Tert-amyl-methyl ether (TAME)	994-05-8	3.3E+03	n	3.8E+00	n	3.8E+02	n	—	—	—	—	—	3.3E+03	n	1.9E+00	n	1.9E+02	n	—	—	—	—	—	—
Tert-butyl alcohol (2-methyl-2-propanol)	75-65-0	7.4E+03	n	4.6E+00	n	4.6E+02	n	—	—	—	—	—	7.4E+03	n	2.3E+00	n	2.3E+02	n	—	—	—	—	—	—
Tetrachlorobenzene, 1,2,3,4-	634-66-2	2.0E+01	n	1.2E+01	n	1.2E+03	n	—	—	—	—	—	2.0E+01	n	6.0E+00	n	6.0E+02	n	—	—	—	—	—	—
Tetrachlorobenzene, 1,2,3,5-	634-90-2	1.3E+01	n	1.9E+00	n	1.9E+02	n	—	—	—	—	—	1.3E+01	n	9.4E-01	n	9.4E+01	n	—	—	—	—	—	—
Tetrachlorobenzene, 1,2,4,5-	95-94-3	2.0E+01	n	4.8E-01	n	4.8E+01	n >S	—	—	—	—	—	2.0E+01	n	2.4E-01	n	2.4E+01	n >S	—	—	—	—	—	—
Tetrachloroethane, 1,1,1,2-	630-20-6	6.5E+01	c	1.4E+00	c	1.4E+02	c	9.1E+01	c	4.5E+03	c	—	3.9E+01	c	7.1E-01	c	7.1E+01	c	4.7E+01	c	2.9E+02	c	—	—
Tetrachloroethane, 1,1,2,2-	79-34-5	3.0E+01	c	2.3E-02	c	2.3E+00	c	—	—	—	—	—	3.0E+01	c	1.2E-02	c	1.2E+00	c	—	—	—	—	—	—
Tetrachloroethylene [PCE]	127-18-4	7.1E+02	c	5.0E-02	m	5.0E+00	m	9.4E+02	c	5.0E+03	c >S	—	4.2E+02	c	2.5E-02	m	2.5E+00	m	4.8E+02	c	3.2E+02	c	—	—
Tetrachlorophenol, 2,3,4,5-	4901-51-3	4.0E+02	n	1.5E+01	n	1.5E+03	n	—	—	—	—	—	4.0E+02	n	7.4E+00	n	7.4E+02	n	—	—	—	—	—	—
Tetrachlorophenol, 2,3,4,6-	58-90-2	1.8E+02	n	4.5E+00	n	4.5E+02	n	—	—	—	—	—	1.8E+02	n	2.2E+00	n	2.2E+02	n	—	—	—	—	—	—
Tetrachlorophenol, 2,3,5,6-	935-95-5	2.3E+01	n	2.2E+00	n	2.2E+02	n >S	—	—	—	—	—	2.3E+01	n	1.1E+00	n	1.1E+02	n >S	—	—	—	—	—	—
Tetrachlorvinphos (Stirophos)	22248-79-9	2.6E+03	n	2.4E+03	n	2.4E+05	n >S	—	—	—	—	—	2.6E+03	n	1.2E+03	n	1.2E+05	n >S	—	—	—	—	—	—

Table 1
Tier 1 Residential Soil PCLs¹

Last Revised: March 1, 2022

Chemical of Concern	CAS	0.5 acre source area										30 acre source area											
		TotSoil _{Comb} ² (mg/kg)	note ³	GWSoil _{Ing} (mg/kg)	note ³	GWSoil _{Class 3} (mg/kg)	note ³	AirSoil _{Inh-V} ⁴ (mg/kg)	note ³	AirGW-Soil _{Inh-V} (mg/kg)	note ³	GWSoil for Secondary MCL (mg/kg)	TotSoil _{Comb} ² (mg/kg)	note ³	GWSoil _{Ing} (mg/kg)	note ³	GWSoil _{Class 3} (mg/kg)	note ³	AirSoil _{Inh-V} ⁴ (mg/kg)	note ³	AirGW-Soil _{Inh-V} (mg/kg)	note ³	GWSoil for Secondary MCL (mg/kg)
Tetradifon	116-29-0	1.0E+03	n	8.7E+01	n	8.7E+03	n >S	—	—	—	—	—	1.0E+03	n	4.4E+01	n	4.4E+03	n >S	—	—	—	—	—
Tetraethyl dithiopyrophosphate (sulfotep)	3689-24-5	3.3E+01	n	3.9E-01	n	3.9E+01	n	—	—	—	—	—	3.3E+01	n	1.9E-01	n	1.9E+01	n	—	—	—	—	—
Tetraethyl lead	78-00-2	6.7E-03	n	5.0E-04	n	5.0E-02	n	—	—	—	—	—	6.7E-03	n	2.5E-04	n	2.5E-02	n	—	—	—	—	—
Tetraethyl pyrophosphate (TEPP)	107-49-3	7.3E-01	n	9.3E-03	n	9.3E-01	n	—	—	—	—	—	7.3E-01	n	4.6E-03	n	4.6E-01	n	—	—	—	—	—
Tetraethylene glycol	112-60-7	2.2E+04	n	1.6E+01	n	1.6E+03	n	—	—	—	—	—	2.2E+04	n	7.8E+00	n	7.8E+02	n	—	—	—	—	—
Tetrahydrofuran	109-99-9	1.5E+02	c	2.5E-01	c	2.5E+01	c	1.9E+02	c	4.6E+03	c	—	8.6E+01	c	1.2E-01	c	1.2E+01	c	9.7E+01	c	3.0E+02	c	—
Tetrahydropyran	142-68-7	1.6E+02	c	2.7E-01	c	2.7E+01	c	2.0E+02	c	5.9E+03	c	—	9.2E+01	c	1.4E-01	c	1.4E+01	c	1.0E+02	c	3.8E+02	c	—
Tetraoxadodecane, 2,5,8,11-	112-49-2	1.7E+03	n	1.7E+00	n	1.7E+02	n	—	—	—	—	—	1.7E+03	n	8.6E-01	n	8.6E+01	n	—	—	—	—	—
Thallium	7440-28-0	5.3E+00	n	1.7E+00	m	1.7E+02	m	—	—	—	—	—	5.3E+00	n	8.7E-01	m	8.7E+01	m	—	—	—	—	—
Thiofanox	39196-18-4	2.0E+01	n	3.1E-02	n	3.1E+00	n	—	—	—	—	—	2.0E+01	n	1.6E-02	n	1.6E+00	n	—	—	—	—	—
Thionazin	297-97-2	4.7E+00	n	1.1E-02	n	1.1E+00	n	—	—	—	—	—	4.7E+00	n	5.5E-03	n	5.5E-01	n	—	—	—	—	—
Thiophanate-methyl	23564-05-8	5.3E+03	n	4.5E+00	n	4.5E+02	n >S	—	—	—	—	—	5.3E+03	n	2.2E+00	n	2.2E+02	n >S	—	—	—	—	—
Thiram	137-26-8	3.3E+02	n	3.5E+00	n	3.5E+02	n	—	—	—	—	—	3.3E+02	n	1.8E+00	n	1.8E+02	n	—	—	—	—	—
Tin	7440-31-5	3.5E+04	n	3.7E+04	n >S	1.0E+06	n >S	—	—	—	—	—	3.5E+04	n	1.8E+04	n >S	1.0E+06	n >S	—	—	—	—	—
Titanium	7440-32-6	2.2E+05	n	—	—	—	—	—	—	—	—	—	2.2E+05	n	—	—	—	—	—	—	—	—	—
Toluene	108-88-3	5.9E+03	n	8.2E+00	m	8.2E+02	m	6.3E+04	n	5.2E+05	n >S	—	5.4E+03	n	4.1E+00	m	4.1E+02	m	3.2E+04	n	3.4E+04	n >S	—
Toluene diisocyanate, 2,4/2,6-	26471-62-5	1.5E+02	n	—	—	—	—	1.5E+02	n	1.7E+05	n	—	7.5E+01	n	—	—	—	—	7.5E+01	n	1.1E+04	n	—
Toluenediamine, 2,4-	95-80-7	1.5E+00	c	1.5E-02	c	1.5E+00	c	—	—	—	—	—	1.5E+00	c	7.6E-03	c	7.6E-01	c	—	—	—	—	—
Toluenediamine, 2,6-	823-40-5	2.0E+03	n	1.4E+00	n	1.4E+02	n	—	—	—	—	—	2.0E+03	n	7.2E-01	n	7.2E+01	n	—	—	—	—	—
Toluidine, o-	95-53-4	4.7E+01	c	5.8E-01	c	5.8E+01	c	1.4E+02	c	2.7E+04	c	—	3.5E+01	c	2.9E-01	c	2.9E+01	c	7.1E+01	c	1.7E+03	c	—
Toluidine, p-	106-49-0	7.1E+01	c	8.9E-02	c	8.9E+00	c	—	—	—	—	—	7.1E+01	c	4.4E-02	c	4.4E+00	c	—	—	—	—	—
Toxaphene	8001-35-2	1.2E+00	c	1.2E+01	m	1.2E+03	m	9.6E+02	c	1.0E+06	c >S	—	1.2E+00	c	5.8E+00	m	5.8E+02	m	4.9E+02	c	4.4E+05	c >S	—
TPH, TX1005, C6-C12	TPH-1005-1	1.6E+03	n	6.5E+01	n	6.5E+03	n >S	3.1E+03	n	1.2E+05	n >S	—	1.1E+03	n	3.3E+01	n	3.3E+03	n >S	1.6E+03	n	7.6E+03	n >S	—
TPH, TX1005, >C12-C28	TPH-1005-2	2.3E+03	n	2.0E+02	n	2.0E+04	n >S	1.5E+04	n	1.0E+06	n >S	—	2.0E+03	n	9.9E+01	n	9.9E+03	n >S	7.8E+03	n	9.8E+04	n >S	—
TPH, TX1005, >C12-C35	TPH-1005-3	2.3E+03	n	2.0E+02	n	2.0E+04	n >S	1.5E+04	n	1.0E+06	n >S	—	2.0E+03	n	9.9E+01	n	9.9E+03	n >S	7.8E+03	n	9.8E+04	n >S	—
TPH, TX1005, >C28-C35	TPH-1005-4	2.3E+03	n	2.0E+02	n	2.0E+04	n >S	1.5E+04	n	1.0E+06	n >S	—	2.0E+03	n	9.9E+01	n	9.9E+03	n >S	7.8E+03	n	9.8E+04	n >S	—
TP Silvex, 2,4,5-	93-72-1	5.3E+02	n	5.3E+00	m	5.3E+02	m	—	—	—	—	—	5.3E+02	n	2.6E+00	m	2.6E+02	m	—	—	—	—	—
Triadimenol	55219-65-3	2.0E+03	n	8.4E+00	n	8.4E+02	n	—	—	—	—	—	2.0E+03	n	4.2E+00	n	4.2E+02	n	—	—	—	—	—
Triallate	2303-17-5	3.2E+02	n	1.9E+01	n	1.9E+03	n >S	—	—	—	—	—	3.2E+02	n	9.5E+00	n	9.5E+02	n >S	—	—	—	—	—
Triaminotri(nitro)benzene (TATB)	3058-38-6	2.0E+02	n	1.5E-01	n	1.5E+01	n	—	—	—	—	—	2.0E+02	n	7.7E-02	n	7.7E+00	n	—	—	—	—	—
Tributyltin oxide	56-35-9	2.0E+01	n	—	—	—	—	—	—	—	—	—	2.0E+01	n	—	—	—	—	—	—	—	—	—
Trichloro-1,2,2-trifluoroethane, 1,1,2-	76-13-1	7.4E+04	n	8.0E+04	n >S	1.0E+06	n >S	7.7E+04	n	1.7E+05	n >S	—	3.9E+04	n	4.0E+04	n >S	1.0E+06	n >S	3.9E+04	n	1.1E+04	n	—
Trichlorobenzene, 1,2,3-	87-61-6	1.2E+02	n	2.6E+01	n	2.6E+03	n	3.0E+02	n	4.8E+04	n >S	—	8.7E+01	n	1.3E+01	n	1.3E+03	n	1.6E+02	n	3.1E+03	n >S	—
Trichlorobenzene, 1,2,4-	120-82-1	1.2E+02	n	4.8E+00	m	4.8E+02	m	1.5E+02	n	1.1E+04	n >S	—	7.0E+01	n	2.4E+00	m	2.4E+02	m	7.8E+01	n	6.9E+02	n	—
Trichlorobenzene, 1,3,5-	108-70-3	7.8E+01	n	7.5E+00	n	7.5E+02	n	1.3E+02	n	1.0E+04	n >S	—	4.9E+01	n	3.7E+00	n	3.7E+02	n	6.5E+01	n	6.7E+02	n	—
Trichloroethane, 1,1,1-	71-55-6	5.3E+04	n	1.6E+00	m	1.6E+02	m	7.8E+04	n	3.3E+05	n >S	—	3.2E+04	n	8.1E-01	m	8.1E+01	m	4.0E+04	n	2.1E+04	n >S	—
Trichloroethane, 1,1,2-	79-00-5	1.8E+01	c	2.0E-02	m	2.0E+00	m	2.2E+01	c	3.2E+02	c	—	1.0E+01	c	1.0E-02	m	1.0E+00	m	1.2E+01	c	2.1E+01	c	—
Trichloroethylene [TCE]	79-01-6	1.8E+01	n	3.4E-02	m	3.4E+00	m	3.1E+01	n	1.6E+02	n	—	1.1E+01	n	1.7E-02	m	1.7E+00	m	1.6E+01	n	1.0E+01	n	—
Trichlorofluoromethane	75-69-4	2.5E+04	n	1.3E+02	n	1.3E+04	n	—	—	—	—	—	2.5E+04	n	6.4E+01	n	6.4E+03	n	—	—	—	—	—
Trichloronate	327-98-0	1.4E+02	n	1.2E+02	n	1.2E+04	n >S	—	—	—	—	—	1.4E+02	n	6.2E+01	n	6.2E+03	n >S	—	—	—	—	—
Trichlorophenol, 2,3,4-	15950-66-0	6.7E+03	n	5.9E+01	n	5.9E+03	n	—	—	—	—	—	6.7E+03	n	3.0E+01	n	3.0E+03	n	—	—	—	—	—
Trichlorophenol, 2,3,5-	933-78-8	6.7E+03	n	2.8E+01	n	2.8E+03	n	—	—	—	—	—	6.7E+03	n	1.4E+01	n	1.4E+03	n	—	—	—	—	—
Trichlorophenol, 2,3,6-	933-75-5	5.3E+02	n	2.9E+01	n	2.9E+03	n >S	—	—	—	—	—	5.3E+02	n	1.4E+01	n	1.4E+03	n >S	—	—	—	—	—
Trichlorophenol, 2,4,5-	95-95-4	6.7E+03	n	3.4E+01	n	3.4E+03	n	—	—	—	—	—	6.7E+03	n	1.7E+01	n	1.7E+03	n	—	—	—	—	—
Trichlorophenol, 2,4,6-	88-06-2	6.7E+01	n	1.7E-01	n	1.7E+01	n	2.0E+03	c	3.5E+05	c >S	—	6.7E+01	n	8.7E-02	n	8.7E+00	n	1.0E+03	c	2.3E+04	c >S	—
Trichlorophenol, 3,4,5-	609-19-8	6.7E+03	n	3.3E+02	n	3.3E+04	n	—	—	—	—	—	6.7E+03	n	1.6E+02	n	1.6E+04	n	—	—	—	—	—
Trichlorophenoxyacetic acid, 2,4,5-	93-76-5	6.7E+02	n	9.9E-01	n	9.9E+01	n	—	—	—	—	—	6.7E+02	n	4.9E-01	n	4.9E+01	n	—	—	—	—	—
Trichloropropane, 1,1,2-	598-77-6	4.6E+00	n	1.5E+00	n	1.5E+02	n	4.6E+00	n	3.2E+01	n	—	2.4E+00	n	7.3E-01	n	7.3E+01	n	2.4E+00	n	2.1E+00	n	—
Trichloropropane, 1,2,3-	96-18-4	2.0E-01	c	5.3E-04	c	5.3E-02	c	1.4E+01	n	5.7E+02	n	—	2.0E-01	c	2.7E-04	c	2.7E-02	c	7.2E+00	n	3.7E+01	n	—
Triethanolamine	102-71-6	3.0E+03	n	9.4E+00	n	9.4E+02	n	3.9E+03	n	1.0E+06	n	—	1.7E+03	n	4.7E+00	n	4.7E+02	n	2.0E+03	n	9.6E+05	n	—
Triethylamine	121-44-8	1.1E+02	n	—	—	—	—	1.1E+02	n	1.6E+03	n	—	5.5E+01	n	—	—	—	—	5.5E+01	n	1.0E+02	n	

Table 1
Tier 1 Residential Soil PCLs¹

Last Revised: March 1, 2022

Chemical of Concern	CAS	0.5 acre source area										30 acre source area											
		TotSoil _{Comb} ² (mg/kg)	note ³	GWSoil _{Ing} (mg/kg)	note ³	GWSoil _{Class 3} (mg/kg)	note ³	AirSoil _{Inh-V} ⁴ (mg/kg)	note ³	AirGW-Soil _{Inh-V} (mg/kg)	note ³	GWSoil for Secondary MCL (mg/kg)	TotSoil _{Comb} ² (mg/kg)	note ³	GWSoil _{Ing} (mg/kg)	note ³	GWSoil _{Class 3} (mg/kg)	note ³	AirSoil _{Inh-V} ⁴ (mg/kg)	note ³	AirGW-Soil _{Inh-V} (mg/kg)	note ³	GWSoil for Secondary MCL (mg/kg)
Triethylphosphorothioate, O, O, O-	126-68-1	5.5E-01	n	4.4E-03	n	4.4E-01	n	—	—	—	—	—	5.5E-01	n	2.2E-03	n	2.2E-01	n	—	—	—	—	—
Trifluralin	1582-09-8	2.7E+02	c	6.5E+01	c	6.5E+03	c >S	—	—	—	—	—	2.7E+02	c	3.3E+01	c	3.3E+03	c >S	—	—	—	—	—
Trimethylamine	75-50-3	1.5E+02	n	—	—	—	—	1.5E+02	n	4.4E+03	n	—	7.6E+01	n	—	—	—	—	7.6E+01	n	2.8E+02	n	—
Trimethylbenzene, 1,2,3-	526-73-8	1.6E+03	n	2.1E+01	n	2.1E+03	n >S	3.6E+03	n	1.5E+05	n >S	—	1.1E+03	n	1.1E+01	n	1.1E+03	n >S	1.9E+03	n	9.4E+03	n >S	—
Trimethylbenzene, 1,2,4-	95-63-6	1.6E+03	n	3.3E+01	n	3.3E+03	n >S	4.0E+03	n	1.9E+05	n >S	—	1.2E+03	n	1.6E+01	n	1.6E+03	n >S	2.1E+03	n	1.3E+04	n >S	—
Trimethylbenzene, 1,3,5-	108-67-8	1.5E+03	n	3.6E+01	n	3.6E+03	n >S	3.5E+03	n	1.6E+05	n >S	—	1.1E+03	n	1.8E+01	n	1.8E+03	n >S	1.8E+03	n	1.1E+04	n >S	—
Trinitrobenzene, 1,3,5-	99-35-4	2.0E+03	n	1.8E+00	n	1.8E+02	n	—	—	—	—	—	2.0E+03	n	9.1E-01	n	9.1E+01	n	—	—	—	—	—
Trinitrophenylmethylnitramine (tetryl; nitramine)	479-45-8	1.5E+02	n	5.5E-01	n	5.5E+01	n	—	—	—	—	—	1.5E+02	n	2.8E-01	n	2.8E+01	n	—	—	—	—	—
Trinitrotoluene, 2,4,6-	118-96-7	3.3E+01	n	1.7E-01	n	1.7E+01	n	—	—	—	—	—	3.3E+01	n	8.6E-02	n	8.6E+00	n	—	—	—	—	—
Tungsten (as sodium tungstate dihydride)	7440-33-7	7.3E+01	n	8.1E+01	n	8.1E+03	n	—	—	—	—	—	7.3E+01	n	4.1E+01	n	4.1E+03	n	—	—	—	—	—
Uranium (soluble salts)	7440-61-1	2.2E+02	n	1.8E+03	m >S	1.8E+05	m >S	—	—	—	—	—	2.2E+02	n	8.9E+02	m >S	8.9E+04	m >S	—	—	—	—	—
Valeric acid (pentanoic acid)	109-52-4	1.3E+02	n	2.3E+01	n >S	2.3E+03	n >S	1.3E+02	n	3.8E+04	n >S	—	6.8E+01	n	1.2E+01	n >S	1.2E+03	n >S	6.8E+01	n	2.5E+03	n >S	—
Vanadium	7440-62-2	7.6E+01	n	8.8E+02	n >S	8.8E+04	n >S	—	—	—	—	—	7.5E+01	n	4.4E+02	n >S	4.4E+04	n >S	—	—	—	—	—
Vernam	1929-77-7	6.7E+01	n	2.7E+00	n	2.7E+02	n	—	—	—	—	—	6.7E+01	n	1.4E+00	n	1.4E+02	n	—	—	—	—	—
Vinyl acetate	108-05-4	3.0E+03	n	5.3E+01	n	5.3E+03	n	3.1E+03	n	3.1E+04	n	—	1.5E+03	n	2.7E+01	n	2.7E+03	n	1.6E+03	n	2.0E+03	n	—
Vinyl chloride	75-01-4	3.7E+00	c	2.2E-02	m	2.2E+00	m	4.3E+01	c	4.2E+01	c	—	3.4E+00	c	1.1E-02	m	1.1E+00	m	2.2E+01	c	2.7E+00	c	—
Vinylcyclohexane	695-12-5	4.1E+04	n	1.4E+03	n >S	1.4E+05	n >S	—	—	—	—	—	4.1E+04	n	7.1E+02	n >S	7.1E+04	n >S	—	—	—	—	—
Warfarin	81-81-2	2.0E+01	n	2.8E-01	n	2.8E+01	n	—	—	—	—	—	2.0E+01	n	1.4E-01	n	1.4E+01	n	—	—	—	—	—
Xylene, m-	108-38-3	8.9E+03	n	1.1E+02	m	1.1E+04	m >S	9.4E+03	n	1.1E+05	n >S	—	4.7E+03	n	5.3E+01	m	5.3E+03	m >S	4.8E+03	n	7.2E+03	n >S	—
Xylene, o-	95-47-6	4.8E+04	n	7.1E+01	m	7.1E+03	m >S	6.8E+04	n	1.0E+06	n >S	—	2.9E+04	n	3.5E+01	m	3.5E+03	m >S	3.5E+04	n	3.5E+05	n >S	—
Xylene, p-	106-42-3	8.9E+03	n	1.5E+02	m	1.5E+04	m >S	9.4E+03	n	1.4E+05	n >S	—	4.7E+03	n	7.5E+01	m	7.5E+03	m >S	4.8E+03	n	9.1E+03	n >S	—
Xylenes	1330-20-7	6.0E+03	n	1.2E+02	m	1.2E+04	m >S	9.4E+03	n	1.3E+05	n >S	—	3.7E+03	n	6.1E+01	m	6.1E+03	m >S	4.8E+03	n	8.1E+03	n >S	—
Zinc	7440-66-6	9.9E+03	n	2.4E+03	n >S	2.4E+05	n >S	—	—	—	—	1600	9.9E+03	n	1.2E+03	n >S	1.2E+05	n >S	—	—	—	—	800
6 C aliphatics (TPH) (>53% n-hexane content)	NA	3.3E+03	n	1.7E+02	n	1.7E+04	n >S	1.0E+04	n	1.2E+04	n >S	—	2.5E+03	n	8.6E+01	n	8.6E+03	n >S	5.3E+03	n	8.1E+02	n	—
6 C aliphatics (TPH) (<53% n-hexane content)	NA	4.8E+03	n	1.7E+02	n	1.7E+04	n >S	2.8E+05	n	3.4E+05	n >S	—	4.8E+03	n	8.6E+01	n	8.6E+03	n >S	1.5E+05	n	2.2E+04	n >S	—
>6-8 C aliphatics (TPH) (>53% n-hexane content)	NA	3.3E+03	n	4.2E+02	n	4.2E+04	n >S	1.0E+04	n	2.0E+04	n >S	—	2.5E+03	n	2.1E+02	n	2.1E+04	n >S	5.3E+03	n	1.3E+03	n >S	—
>6-8 C aliphatics (TPH) (<53% n-hexane content)	NA	4.8E+03	n	4.2E+02	n	4.2E+04	n >S	2.8E+05	n	5.6E+05	n >S	—	4.8E+03	n	2.1E+02	n	2.1E+04	n >S	1.5E+05	n	3.6E+04	n >S	—
>8-10 C aliphatics (TPH)	NA	4.0E+03	n	3.6E+03	n >S	3.6E+05	n >S	7.7E+03	n	4.8E+04	n >S	—	2.7E+03	n	1.8E+03	n >S	1.8E+05	n >S	3.9E+03	n	3.1E+03	n >S	—
>10-12 C aliphatics (TPH)	NA	3.6E+03	n	2.5E+04	n >S	1.0E+06	n >S	7.7E+03	n	2.3E+05	n >S	—	2.5E+03	n	1.3E+04	n >S	1.0E+06	n >S	3.9E+03	n	1.5E+04	n >S	—
>12-16 C aliphatics (TPH)	NA	4.3E+03	n	4.9E+05	n >S	1.0E+06	n >S	1.2E+04	n	1.0E+06	n >S	—	3.2E+03	n	2.5E+05	n >S	1.0E+06	n >S	6.2E+03	n	6.6E+04	n >S	—
>16-21 C aliphatics (TPH)	NA	1.3E+05	n	1.0E+06	n >S	1.0E+06	n >S	—	—	—	—	—	1.3E+05	n	1.0E+06	n >S	1.0E+06	n >S	—	—	—	—	—
>16-21 C aliphatics (TPH) (for transformer mineral oil releases only)	NA	1.1E+05	n	1.0E+06	n >S	1.0E+06	n >S	—	—	—	—	—	1.1E+05	n	1.0E+06	n >S	1.0E+06	n >S	—	—	—	—	—
>21-35 C aliphatics (TPH)	NA	1.3E+05	n	1.0E+06	n >S	1.0E+06	n >S	—	—	—	—	—	1.3E+05	n	1.0E+06	n >S	1.0E+06	n >S	—	—	—	—	—

Last Revised: March 1, 2022

end of worksheet

Table 2
Tier 1 Commercial/Industrial Soil PCLs¹

Last Revised: March 1, 2022

Chemical of Concern	CAS	0.5 acre source area										30 acre source area											
		TotSoil _{Comb} ² (mg/kg)	note ³	GWSoil _{mg} (mg/kg)	note ³	GWSoil _{Class 3} (mg/kg)	note ³	AirSoil _{1stb-V} ⁴ (mg/kg)	note ³	AirGW-Soil _{1stb-V} (mg/kg)	note ³	GWSoil for Secondary MCL (mg/kg)	TotSoil _{Comb} ² (mg/kg)	note ³	GWSoil _{mg} (mg/kg)	note ³	GWSoil _{Class 3} (mg/kg)	note ³	AirSoil _{1stb-V} ⁴ (mg/kg)	note ³	AirGW-Soil _{1stb-V} (mg/kg)	note ³	GWSoil for Secondary MCL (mg/kg)
Acenaphthene	83-32-9	3.7E+04	n	7.1E+02	n >S	7.1E+04	n >S	—	—	—	—	—	3.7E+04	n	3.5E+02	n >S	3.5E+04	n >S	—	—	—	—	—
Acenaphthylene	208-96-8	3.7E+04	n	1.2E+03	n >S	1.2E+05	n >S	—	—	—	—	—	3.7E+04	n	6.1E+02	n >S	6.1E+04	n >S	—	—	—	—	—
Acetaldehyde	75-07-0	2.0E+02	n	1.5E+01	n	1.5E+03	n	2.0E+02	n	6.7E+03	n	—	1.0E+02	n	7.4E+00	n	7.4E+02	n	1.0E+02	n	4.3E+02	n	—
Acetate, 2-ethoxyethanol	111-15-9	7.8E+03	n	1.6E+01	n	1.6E+03	n	8.4E+03	n	1.0E+06	n >S	—	4.2E+03	n	8.0E+00	n	8.0E+02	n	4.3E+03	n	8.9E+04	n	—
Acetate, isoamyl	123-92-2	7.4E+04	n	2.6E+01	n	2.6E+03	n	—	—	—	—	—	7.4E+04	n	1.3E+01	n	1.3E+03	n	—	—	—	—	—
Acetate, isobutyl	110-19-0	4.9E+04	n	1.1E+01	n	1.1E+03	n	—	—	—	—	—	4.9E+04	n	5.5E+00	n	5.5E+02	n	—	—	—	—	—
Acetate, sec-butyl	105-46-4	4.9E+04	n	1.2E+01	n	1.2E+03	n	—	—	—	—	—	4.9E+04	n	5.9E+00	n	5.9E+02	n	—	—	—	—	—
Acetic acid*	64-19-7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Acetone (2-propanone)	67-64-1	4.4E+05	n	1.3E+02	n	1.3E+04	n	8.4E+05	n	1.0E+06	n >S	—	2.9E+05	n	6.4E+01	n	6.4E+03	n	4.3E+05	n	9.7E+05	n >S	—
Acetone cyanohydrin	75-86-5	1.5E+03	n	4.3E-01	n	4.3E+01	n	6.1E+03	n	9.3E+05	n	—	1.2E+03	n	2.1E-01	n	2.1E+01	n	3.1E+03	n	6.0E+04	n	—
Acetonitrile	75-05-8	1.7E+03	n	4.5E+00	n	4.5E+02	n	1.8E+03	n	8.7E+04	n	—	9.1E+02	n	2.3E+00	n	2.3E+02	n	9.4E+02	n	5.6E+03	n	—
Acetophenone	98-86-2	6.8E+04	n	2.5E+01	n	2.5E+03	n	—	—	—	—	—	6.8E+04	n	1.2E+01	n	1.2E+03	n	—	—	—	—	—
Acetylaminofluorene, 2-	53-96-3	4.3E+00	c	1.0E-02	c	1.0E+00	c	3.1E+01	c	2.0E+04	c >S	—	3.8E+00	c	5.1E-03	c	5.1E-01	c	1.6E+01	c	1.7E+03	c >S	—
Acifluorfen, sodium	62476-59-9	8.9E+03	n	6.1E+00	n	6.1E+02	n	—	—	—	—	—	8.9E+03	n	3.1E+00	n	3.1E+02	n	—	—	—	—	—
Acridine	260-94-6	2.0E+03	n	2.3E+01	n	2.3E+03	n	—	—	—	—	—	2.0E+03	n	1.1E+01	n	1.1E+03	n	—	—	—	—	—
Acrolein	107-02-8	1.5E+02	n	7.1E-02	n	7.1E+00	n	2.1E+02	n	2.6E+04	n	—	9.0E+01	n	3.5E-02	n	3.5E+00	n	1.1E+02	n	1.7E+03	n	—
Acrylamide	79-06-1	2.1E+01	c	7.9E-03	c	7.9E-01	c	4.7E+01	c	1.2E+04	c	—	1.5E+01	c	3.9E-03	c	3.9E-01	c	2.4E+01	c	8.1E+02	c	—
Acrylic acid	79-10-7	1.7E+02	n	7.2E+01	n	7.2E+03	n	1.7E+02	n	4.1E+04	n	—	8.7E+01	n	3.6E+01	n	3.6E+03	n	8.7E+01	n	2.7E+03	n	—
Acrylonitrile	107-13-1	7.6E+00	c	7.5E-03	c	7.5E-01	c	8.8E+00	c	1.9E+02	c	—	4.2E+00	c	3.7E-03	c	3.7E-01	c	4.6E+00	c	1.2E+01	c	—
Adipic acid (hexanedioic acid)	124-04-9	1.0E+06	n	2.8E+02	n	2.8E+04	n	—	—	—	—	—	1.0E+06	n	1.4E+02	n	1.4E+04	n	—	—	—	—	—
Alachlor	15972-60-8	2.4E+02	c	1.9E-02	m	1.9E+00	m	—	—	—	—	—	2.4E+02	c	9.5E-03	m	9.5E-01	m	—	—	—	—	—
Aldicarb	116-06-3	6.8E+02	n	1.8E-02	m	1.8E+00	m	—	—	—	—	—	6.8E+02	n	8.9E-03	m	8.9E-01	m	—	—	—	—	—
Aldicarb sulfone	1646-88-4	6.8E+02	n	1.4E-02	m	1.4E+00	m	—	—	—	—	—	6.8E+02	n	6.9E-03	m	6.9E-01	m	—	—	—	—	—
Aldrin	309-00-2	1.0E+00	c	2.3E-01	c	2.3E+01	c	1.4E+01	c	1.4E+04	c >S	—	9.7E-01	c	1.2E-01	c	1.2E+01	c	7.2E+00	c	9.2E+02	c >S	—
Allyl alcohol	107-18-6	8.0E+00	n	7.5E-01	n	7.5E+01	n	8.0E+00	n	8.5E+02	n	—	4.1E+00	n	3.7E-01	n	3.7E+01	n	4.1E+00	n	5.5E+01	n	—
Allyl chloride	107-05-1	2.1E+01	n	3.0E+00	n	3.0E+02	n	2.1E+01	n	5.3E+01	n	—	1.1E+01	n	1.5E+00	n	1.5E+02	n	1.1E+01	n	3.4E+00	n	—
Aluminum	7429-90-5	6.2E+05	n	5.2E+05	n >S	1.0E+06	n >S	—	—	—	—	1400	5.7E+05	n	2.6E+05	n >S	1.0E+06	n >S	—	—	—	—	710
Ametryn	834-12-8	6.1E+03	n	2.1E+01	n	2.1E+03	n	—	—	—	—	—	6.1E+03	n	1.1E+01	n	1.1E+03	n	—	—	—	—	—
Amino-2,6-dinitrotoluene, 4-	19406-51-0	3.4E+02	n	6.0E-01	n	6.0E+01	n	—	—	—	—	—	3.4E+02	n	3.0E-01	n	3.0E+01	n	—	—	—	—	—
Amino-4,6-dinitrotoluene, 2-	35572-78-2	3.4E+02	n	8.9E-01	n	8.9E+01	n	—	—	—	—	—	3.4E+02	n	4.5E-01	n	4.5E+01	n	—	—	—	—	—
Aminobiphenyl, 4- (1,1-biphenyl-4-amine)	92-67-1	3.1E+00	c	2.4E-02	c	2.4E+00	c	—	—	—	—	—	3.1E+00	c	1.2E-02	c	1.2E+00	c	—	—	—	—	—
Aminopyridine, 4-	504-24-5	1.4E+01	n	2.8E-03	n	2.8E-01	n	—	—	—	—	—	1.4E+01	n	1.4E-03	n	1.4E-01	n	—	—	—	—	—
Ammonia ³	7664-41-7	6.9E+03	n	—	—	—	—	6.9E+03	n	2.5E+04	n	3.1	3.5E+03	n	—	—	—	—	3.5E+03	n	1.6E+03	n	1.6
Ammonium polyphosphate*	6833-79-9	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Ammonium salts*	AMMONIUM	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Aniline	62-53-3	1.8E+02	n	8.2E-01	c	8.2E+01	c	1.8E+02	n	3.6E+04	n	—	9.3E+01	n	4.1E-01	c	4.1E+01	c	9.4E+01	n	2.3E+03	n	—
Anthracene	120-12-7	1.9E+05	n	2.1E+04	n >S	1.0E+06	n >S	—	—	—	—	—	1.9E+05	n	1.0E+04	n >S	1.0E+06	n >S	—	—	—	—	—
Anthraquinone, 9,10-	84-65-1	4.9E+02	c	2.5E+00	c	2.5E+02	c >S	—	—	—	—	—	4.9E+02	c	1.3E+00	c	1.3E+02	c >S	—	—	—	—	—
Antimony	7440-36-0	3.1E+02	n	5.4E+00	m >S	5.4E+02	m >S	—	—	—	—	—	3.1E+02	n	2.7E+00	m >S	2.7E+02	m >S	—	—	—	—	—
Aramite	140-57-8	7.6E+02	c	—	—	—	—	—	—	—	—	—	7.6E+02	c	—	—	—	—	—	—	—	—	—
Arsenic	7440-38-2	2.0E+02	c	5.0E+00	m >S	5.0E+02	m >S	—	—	—	—	—	2.0E+02	c	2.5E+00	m >S	2.5E+02	m >S	—	—	—	—	—
Arsine	7784-42-1	1.1E+00	n	—	—	—	—	1.1E+00	n	—	—	—	5.5E-01	n	—	—	—	—	5.5E-01	n	—	—	—
Atrazine	1912-24-9	8.6E+01	c	2.5E-02	m	2.5E+00	m	—	—	—	—	—	8.6E+01	c	1.2E-02	m	1.2E+00	m	—	—	—	—	—
Azinphos-methyl (guthion)	86-50-0	1.0E+03	n	1.3E+00	n >S	1.3E+02	n >S	—	—	—	—	—	1.0E+03	n	6.6E-01	n >S	6.6E+01	n >S	—	—	—	—	—
Azobenzene	103-33-3	1.6E+02	c	4.0E+01	c	4.0E+03	c >S	2.3E+03	c	1.0E+06	c >S	—	1.5E+02	c	2.0E+01	c	2.0E+03	c >S	1.2E+03	c	1.6E+05	c >S	—
Barium	7440-39-3	1.2E+05	n	4.4E+02	m >S	4.4E+04	m >S	—	—	—	—	—	1.2E+05	n	2.2E+02	m >S	2.2E+04	m >S	—	—	—	—	—
Bayleton	43121-43-3	2.0E+04	n	2.2E+01	n	2.2E+03	n >S	—	—	—	—	—	2.0E+04	n	1.1E+01	n	1.1E+03	n >S	—	—	—	—	—
Benefin (benfluralin)	1861-40-1	2.0E+05	n	1.5E+05	n >S	1.0E+06	n >S	—	—	—	—	—	2.0E+05	n	7.3E+04	n >S	1.0E+06	n >S	—	—	—	—	—
Benomyl	17804-35-2	3.4E+04	n	9.1E+00	n >S	9.1E+02	n >S	—	—	—	—	—	3.4E+04	n	4.6E+00	n >S	4.6E+02	n >S	—	—	—	—	—
Benz-a-anthracene	56-55-3	1.7E+02	c	2.9E+02	c >S	2.9E+04	c >S	9.2E+03	c	1.0E+06	c >S	—	1.7E+02	c	1.5E+02	c >S	1.5E+04	c >S	4.7E+03	c	1.0E+06	c >S	—
Benzaldehyde	100-52-7	1.0E+05	n	3.1E+01	n	3.1E+03	n	—	—	—	—	—	1.0E+05	n	1.6E+01	n	1.6E+03	n	—	—	—	—	—

Table 2
Tier 1 Commercial/Industrial Soil PCLs¹

Last Revised: March 1, 2022

Chemical of Concern	CAS	0.5 acre source area										30 acre source area											
		TotSoil _{Comb} ² (mg/kg)	note ³	gWSoil _{mg} (mg/kg)	note ³	gWSoil _{class 3} (mg/kg)	note ³	AirSoil _{10th-V} ⁴ (mg/kg)	note ³	AirGW-Soil _{10th-V} (mg/kg)	note ³	gWSoil for Secondary MCL (mg/kg)	TotSoil _{Comb} ² (mg/kg)	note ³	gWSoil _{mg} (mg/kg)	note ³	gWSoil _{class 3} (mg/kg)	note ³	AirSoil _{10th-V} ⁴ (mg/kg)	note ³	AirGW-Soil _{10th-V} (mg/kg)	note ³	gWSoil for Secondary MCL (mg/kg)
Benzene	71-43-2	2.4E+02	c	2.6E-02	m	2.6E+00	m	2.7E+02	c	1.6E+03	c	—	1.3E+02	c	1.3E-02	m	1.3E+00	m	1.4E+02	c	1.0E+02	c	—
Benzenedicarbonitrile, 1,3-	626-17-5	4.1E+03	n	9.7E-01	n	9.7E+01	n	—	—	—	—	—	4.1E+03	n	4.9E-01	n	4.9E+01	n	—	—	—	—	—
Benzenedicarboxylic acid, 1,2-disodecyl ester	26761-40-0	2.7E+04	n	1.0E+06	n >S	1.0E+06	n >S	1.0E+06	n	1.0E+06	n >S	—	2.7E+04	n	1.0E+06	n >S	1.0E+06	n >S	1.0E+06	n	1.0E+06	n >S	—
Benzenethiol	108-98-5	1.0E+03	n	2.0E-01	n	2.0E+01	n	—	—	—	—	—	1.0E+03	n	1.0E-01	n	1.0E+01	n	—	—	—	—	—
Benzidine	92-87-5	4.7E-02	c	2.4E-05	c	2.4E-03	c	1.1E-01	c	2.3E+01	c	—	3.3E-02	c	1.2E-05	c	1.2E-03	c	5.4E-02	c	1.9E+00	c	—
Benzo-a-pyrene	50-32-8	1.7E+01	c	7.6E+00	m	7.6E+02	m >S	8.9E+01	n	1.0E+06	n >S	—	1.7E+01	c	3.8E+00	m	3.8E+02	m >S	4.6E+01	n	1.0E+05	n >S	—
Benzo-b-fluoranthene	205-99-2	1.7E+02	c	9.8E+02	c >S	9.8E+04	c >S	1.5E+04	c	1.0E+06	c >S	—	1.7E+02	c	4.9E+02	c >S	4.9E+04	c >S	7.8E+03	c	1.0E+06	c >S	—
Benzo-e-pyrene	192-97-2	1.9E+04	n	3.4E+05	n >S	1.0E+06	n >S	—	—	—	—	—	1.9E+04	n	1.7E+05	n >S	1.0E+06	n >S	—	—	—	—	—
Benzo-g,h,i-perylene	191-24-2	1.9E+04	n	1.4E+05	n >S	1.0E+06	n >S	—	—	—	—	—	1.9E+04	n	6.9E+04	n >S	1.0E+06	n >S	—	—	—	—	—
Benzoic acid	65-85-0	1.0E+06	n	5.7E+02	n	5.7E+04	n >S	—	—	—	—	—	1.0E+06	n	2.8E+02	n	2.8E+04	n >S	—	—	—	—	—
Benzo-j-fluoranthene	205-82-3	1.7E+02	c	4.3E+02	c >S	4.3E+04	c >S	7.9E+03	c	1.0E+06	c >S	—	1.7E+02	c	2.1E+02	c >S	2.1E+04	c >S	4.1E+03	c	1.0E+06	c >S	—
Benzo-k-fluoranthene	207-08-9	1.7E+03	c	1.0E+04	c >S	1.0E+06	c >S	3.8E+05	c	1.0E+06	c >S	—	1.7E+03	c	5.0E+03	c >S	5.0E+05	c >S	1.9E+05	c	1.0E+06	c >S	—
Benzophenone	119-61-9	4.6E+03	n	5.1E+01	n	5.1E+03	n >S	—	—	—	—	—	4.6E+03	n	2.5E+01	n	2.5E+03	n >S	—	—	—	—	—
Benzotrifluoride	98-07-7	1.5E+00	c	9.5E-03	c	9.5E-01	c	—	—	—	—	—	1.5E+00	c	4.7E-03	c	4.7E-01	c	—	—	—	—	—
Benzoyl peroxide	94-36-0	3.4E+04	n	1.6E+02	n	1.6E+04	n >S	—	—	—	—	—	3.4E+04	n	8.1E+01	n	8.1E+03	n >S	—	—	—	—	—
Benzyl alcohol	100-51-6	6.8E+04	n	1.7E+01	n	1.7E+03	n	—	—	—	—	—	6.8E+04	n	8.7E+00	n	8.7E+02	n	—	—	—	—	—
Benzyl chloride	100-44-7	4.2E+01	n	1.1E-01	c	1.1E+01	c	4.3E+01	n	1.3E+03	n	—	2.2E+01	n	5.6E-02	c	5.6E+00	c	2.2E+01	n	8.4E+01	n	—
Benzyl dichloride	98-87-3	7.3E+01	n	1.4E-01	c	1.4E+01	c	7.7E+01	n	3.3E+03	n >S	—	3.9E+01	n	7.1E-02	c	7.1E+00	c	4.0E+01	n	2.1E+02	n	—
Beryllium	7440-41-7	2.5E+02	n	1.8E+00	m >S	1.8E+02	m >S	—	—	—	—	—	2.5E+02	n	9.2E-01	m >S	9.2E+01	m >S	—	—	—	—	—
Biphenyl, 1,1'-	92-52-4	8.5E+04	n	7.6E+03	n >S	7.6E+05	n >S	—	—	—	—	—	8.5E+04	n	3.8E+03	n >S	3.8E+05	n >S	—	—	—	—	—
Biphenyl, 1,1'-, 2-phenoxy-	6738-04-1	3.4E+04	n	2.2E+05	n >S	1.0E+06	n >S	—	—	—	—	—	3.4E+04	n	1.1E+05	n >S	1.0E+06	n >S	—	—	—	—	—
Biquinoline, 2,2'-	119-91-5	2.0E+03	n	8.0E+01	n	8.0E+03	n >S	—	—	—	—	—	2.0E+03	n	4.0E+01	n	4.0E+03	n >S	—	—	—	—	—
Bis (2-chloroethoxy) methane	111-91-1	9.1E+00	c	2.6E-02	c	2.6E+00	c	1.9E+01	c	1.9E+03	c	—	6.2E+00	c	1.3E-02	c	1.3E+00	c	9.8E+00	c	1.2E+02	c	—
Bis (2-chloroethyl) ether	111-44-4	4.9E+00	c	4.7E-03	c	4.7E-01	c	6.0E+00	c	4.0E+02	c	—	2.8E+00	c	2.4E-03	c	2.4E-01	c	3.1E+00	c	2.6E+01	c	—
Bis (2-chloro-1-methylethyl) ether	108-60-1	1.5E+02	c	4.3E-01	c	4.3E+01	c	3.5E+02	c	2.1E+04	c	—	1.1E+02	c	2.1E-01	c	2.1E+01	c	1.8E+02	c	1.4E+03	c	—
Bis (2-chloromethyl) ether	542-88-1	9.0E-03	c	1.8E-05	c	1.8E-03	c	9.7E-03	c	2.8E-01	c	—	4.8E-03	c	9.2E-06	c	9.2E-04	c	5.0E-03	c	1.8E-02	c	—
Bis (2-ethyl-hexyl) phthalate	117-81-7	5.6E+02	c	1.6E+02	m	1.6E+04	m >S	—	—	—	—	—	5.6E+02	c	8.2E+01	m	8.2E+03	m >S	—	—	—	—	—
Bismuth	7440-69-9	4.1E+05	n	—	—	—	—	—	—	—	—	—	4.1E+05	n	—	—	—	—	—	—	—	—	—
Bisphenol A	80-05-7	3.4E+04	n	8.7E+01	n	8.7E+03	n	—	—	—	—	—	3.4E+04	n	4.4E+01	n	4.4E+03	n	—	—	—	—	—
Boron	7440-42-8	1.9E+05	n	—	—	—	—	—	—	—	—	—	1.9E+05	n	—	—	—	—	—	—	—	—	—
Bromacil	314-40-9	6.8E+04	n	5.1E+01	n	5.1E+03	n	—	—	—	—	—	6.8E+04	n	2.6E+01	n	2.6E+03	n	—	—	—	—	—
Bromo-2-chloroethane, 1-	107-04-0	4.1E+04	n	1.0E+01	n	1.0E+03	n	—	—	—	—	—	4.1E+04	n	5.2E+00	n	5.2E+02	n	—	—	—	—	—
Bromobenzene	108-86-1	1.2E+03	n	6.9E+00	n	6.9E+02	n	1.4E+03	n	3.7E+04	n >S	—	6.4E+02	n	3.4E+00	n	3.4E+02	n	7.0E+02	n	2.4E+03	n >S	—
Bromodichloromethane ⁸	75-27-4	4.6E+02	c	3.6E-01	m	3.6E+01	m	—	—	—	—	—	4.6E+02	c	1.8E-01	m	1.8E+01	m	—	—	—	—	—
Bromoform ⁸	75-25-2	1.0E+03	c	4.4E-01	m	4.4E+01	m	1.4E+03	c	4.7E+04	c >S	—	6.0E+02	c	2.2E-01	m	2.2E+01	m	7.2E+02	c	3.1E+03	c	—
Bromomethane	74-83-9	7.9E+01	n	3.9E-01	n	3.9E+01	n	8.4E+01	n	1.9E+02	n	—	4.2E+01	n	2.0E-01	n	2.0E+01	n	4.3E+01	n	1.2E+01	n	—
Bromophenyl phenylether, 4-	101-55-3	1.2E+00	c	7.9E-01	c	7.9E+01	c	1.6E+01	c	1.5E+04	c >S	—	1.1E+00	c	4.0E-01	c	4.0E+01	c	8.4E+00	c	1.0E+03	c	—
Butadiene, 1,3-	106-99-0	7.1E-02	n	—	—	—	—	7.1E+02	n	6.9E+02	n	—	3.6E+02	n	—	—	—	—	3.6E+02	n	4.5E+01	n	—
Butadiene, 2-methyl-1,3- (isoprene)	78-79-5	5.3E+04	n	3.3E+01	n	3.3E+03	n	3.9E+05	n	8.7E+05	n >S	—	4.7E+04	n	1.7E+01	n	1.7E+03	n	2.0E+05	n	5.6E+04	n >S	—
Butanal (butyraldehyde)	123-72-8	2.1E+03	n	9.4E+00	n	9.4E+02	n	2.1E+03	n	6.0E+04	n	—	1.1E+03	n	4.7E+00	n	4.7E+02	n	1.1E+03	n	3.9E+03	n	—
Butane, 2,3-dimethyl-	79-29-8	5.3E+04	n	8.5E+02	n	8.5E+04	n >S	3.9E+05	n	6.4E+05	n >S	—	4.7E+04	n	4.2E+02	n	4.2E+04	n >S	2.0E+05	n	4.1E+04	n >S	—
Butanoic acid (butyric acid)	107-92-6	1.8E+02	n	7.0E+01	n	7.0E+03	n	1.8E+02	n	5.1E+04	n	—	9.3E+01	n	3.5E+01	n	3.5E+03	n	9.3E+01	n	3.3E+03	n	—
Butanol, 2-	78-92-2	1.0E+06	n	3.1E+02	n	3.1E+04	n	1.0E+06	n	1.0E+06	n >S	—	6.8E+05	n	1.6E+02	n	1.6E+04	n	1.0E+06	n	1.0E+06	n >S	—
Butanol, 2-methyl-1-	137-32-6	1.0E+04	n	1.8E+00	n	1.8E+02	n	—	—	—	—	—	1.0E+04	n	8.9E-01	n	8.9E+01	n	—	—	—	—	—
Butanol, 2-methyl-2-	75-85-4	1.0E+04	n	1.8E+00	n	1.8E+02	n	—	—	—	—	—	1.0E+04	n	8.8E-01	n	8.8E+01	n	—	—	—	—	—
Butanol, n-	71-36-3	1.0E+05	n	1.6E+01	n	1.6E+03	n	—	—	—	—	—	1.0E+05	n	7.9E+00	n	7.9E+02	n	—	—	—	—	—
Butene, 1-	106-98-9	4.0E+04	n	1.3E+02	n	1.3E+04	n >S	1.1E+05	n	1.2E+05	n >S	—	3.0E+04	n	6.6E+01	n	6.6E+03	n >S	5.9E+04	n	8.0E+03	n >S	—
Butene, cis-2-	590-18-1	2.2E+04	n	9.6E+01	n	9.6E+03	n >S	3.4E+04	n	3.9E+04	n >S	—	1.4E+04	n	4.8E+01	n	4.8E+03	n >S	1.8E+04	n	2.5E+03	n	—
Butene, trans-2-	624-64-6	2.2E+04	n	9.6E+01	n	9.6E+03	n >S	3.4E+04	n	3.9E+04	n >S	—	1.4E+04	n	4.8E+01	n	4.8E+03	n >S	1.8E+04	n	2.5E+03	n	—
Butoxy ethanol, 2- (Ethylene glycol monobutyl ether; EGBE)	111-76-2	5.8E+04	n	1.8E+01	n	1.8E+03	n	4.1E+05	n	1.0E+06	n >S	—	5.2E+04	n	8.8E+00	n	8.8E+02	n	2.1E+05	n	1.0E+06	n >S	—

Table 2
Tier 1 Commercial/Industrial Soil PCLs¹

Last Revised: March 1, 2022

Chemical of Concern	CAS	0.5 acre source area										30 acre source area											
		TotSoil _{Comb} ² (mg/kg)	note ³	gWSoil _{mg} (mg/kg)	note ³	gWSoil _{class 3} (mg/kg)	note ³	AirSoil _{inh-V} ⁴ (mg/kg)	note ³	AirGW-Soil _{inh-V} (mg/kg)	note ³	gWSoil for Secondary MCL (mg/kg)	TotSoil _{Comb} ² (mg/kg)	note ³	gWSoil _{mg} (mg/kg)	note ³	gWSoil _{class 3} (mg/kg)	note ³	AirSoil _{inh-V} ⁴ (mg/kg)	note ³	AirGW-Soil _{inh-V} (mg/kg)	note ³	gWSoil for Secondary MCL (mg/kg)
Butyl acetate	123-86-4	6.4E+04	n	3.1E+01	n	3.1E+03	n	1.2E+05	n	1.0E+06	n >S	—	4.2E+04	n	1.5E+01	n	1.5E+03	n	6.0E+04	n	1.9E+05	n >S	—
Butyl acrylate	141-32-2	9.2E+03	n	3.1E+00	n	3.1E+02	n	—	—	—	—	—	9.2E+03	n	1.5E+00	n	1.5E+02	n	—	—	—	—	—
Butyl benzyl phthalate	85-68-7	1.0E+04	c	5.9E+02	c	5.9E+04	c >S	—	—	—	—	—	1.0E+04	c	3.0E+02	c	3.0E+04	c >S	—	—	—	—	—
Butyl ether, n- (dibutyl ether)	142-96-1	1.0E+05	n	1.3E+02	n	1.3E+04	n >S	—	—	—	—	—	1.0E+05	n	6.5E+01	n	6.5E+03	n >S	—	—	—	—	—
Butyl methacrylate	97-88-1	2.6E+04	n	7.8E+01	n	7.8E+03	n >S	—	—	—	—	—	2.6E+04	n	3.9E+01	n	3.9E+03	n >S	—	—	—	—	—
Butylate	2008-41-5	3.4E+04	n	2.5E+01	n	2.5E+03	n >S	—	—	—	—	—	3.4E+04	n	1.3E+01	n	1.3E+03	n >S	—	—	—	—	—
Butylbenzene, n-	104-51-8	3.4E+04	n	4.5E+02	n	4.5E+04	n >S	—	—	—	—	—	3.4E+04	n	2.3E+02	n	2.3E+04	n >S	—	—	—	—	—
Butylbenzene, sec-	135-98-8	4.1E+04	n	2.5E+02	n	2.5E+04	n >S	—	—	—	—	—	4.1E+04	n	1.3E+02	n	1.3E+04	n >S	—	—	—	—	—
Butylbenzene, tert-	98-06-6	4.1E+04	n	3.0E+02	n	3.0E+04	n >S	—	—	—	—	—	4.1E+04	n	1.5E+02	n	1.5E+04	n >S	—	—	—	—	—
Cacodylic acid	75-60-5	2.0E+03	n	4.4E-01	n	4.4E+01	n	—	—	—	—	—	2.0E+03	n	2.2E-01	n	2.2E+01	n	—	—	—	—	—
Cadmium	7440-43-9	8.1E+02	n	1.5E+00	m >S	1.5E+02	m >S	—	—	—	—	—	7.7E+02	n	7.5E-01	m >S	7.5E+01	m >S	—	—	—	—	—
Calcium*	7440-70-2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Caprolactam	105-60-2	3.4E+05	n	1.4E+02	n	1.4E+04	n	—	—	—	—	—	3.4E+05	n	7.0E+01	n	7.0E+03	n	—	—	—	—	—
Captan	133-06-2	5.5E+03	c	1.5E+02	c >S	1.5E+04	c >S	—	—	—	—	—	5.5E+03	c	7.5E+01	c >S	7.5E+03	c >S	—	—	—	—	—
Carbaryl	63-25-2	6.8E+04	n	8.2E+01	n	8.2E+03	n >S	—	—	—	—	—	6.8E+04	n	4.1E+01	n	4.1E+03	n >S	—	—	—	—	—
Carbazole	86-74-8	9.5E+02	c	1.0E+01	c	1.0E+03	c >S	—	—	—	—	—	9.5E+02	c	5.1E+00	c	5.1E+02	c >S	—	—	—	—	—
Carbofuran	1563-66-2	3.4E+03	n	1.2E-01	m	1.2E+01	m	—	—	—	—	—	3.4E+03	n	6.2E-02	m	6.2E+00	m	—	—	—	—	—
Carbon disulfide	75-15-0	1.3E+04	n	4.1E+01	n	4.1E+03	n	1.5E+04	n	3.8E+04	n >S	—	7.2E+03	n	2.0E+01	n	2.0E+03	n	7.7E+03	n	2.4E+03	n	—
Carbon tetrachloride	56-23-5	8.1E+01	c	6.2E-02	m	6.2E+00	m	1.0E+02	c	4.1E+02	c	—	4.6E+01	c	3.1E-02	m	3.1E+00	m	5.2E+01	c	2.6E+01	c	—
Carbophenothion	786-19-6	8.9E+03	n	4.4E+03	n	4.4E+05	n >S	—	—	—	—	—	8.9E+03	n	2.2E+03	n	2.2E+05	n >S	—	—	—	—	—
Carbosulfan	55285-14-8	6.8E+03	n	7.5E+02	n >S	7.5E+04	n >S	—	—	—	—	—	6.8E+03	n	3.8E+02	n >S	3.8E+04	n >S	—	—	—	—	—
Carboxin	5234-68-4	6.8E+04	n	2.6E+02	n	2.6E+04	n >S	—	—	—	—	—	6.8E+04	n	1.3E+02	n	1.3E+04	n >S	—	—	—	—	—
Chloral	75-87-6	1.0E+05	n	1.6E+01	n	1.6E+03	n	—	—	—	—	—	1.0E+05	n	7.9E+00	n	7.9E+02	n	—	—	—	—	—
Chloral hydrate (1,1-ethanediol, 2,2,2-trichloro-)	302-17-0	6.8E+04	n	1.6E+01	n	1.6E+03	n	—	—	—	—	—	6.8E+04	n	7.8E+00	n	7.8E+02	n	—	—	—	—	—
Chloramben (amiben; 3-amino-2,5-dichlorobenzoic acid)	133-90-4	1.0E+04	n	1.1E+01	n	1.1E+03	n	—	—	—	—	—	1.0E+04	n	5.6E+00	n	5.6E+02	n	—	—	—	—	—
Chlordane (technical)	12789-03-6	6.6E+01	c	9.6E+00	m	9.6E+02	m >S	2.1E+03	c	1.0E+06	c >S	—	6.4E+01	c	4.8E+00	m	4.8E+02	m >S	1.1E+03	c	4.0E+05	c >S	—
Chlordane, cis- (alpha chlordane)	5103-71-9	5.4E+01	c	1.7E+03	c	1.7E+05	c >S	6.9E+03	c	1.0E+06	c >S	—	5.4E+01	c	8.3E+02	c	8.3E+04	c >S	3.5E+03	c	1.0E+06	c >S	—
Chlordane, trans- (gamma chlordane)	5103-74-2	5.3E+01	c	9.2E+01	c	9.2E+03	c >S	1.6E+03	c	1.0E+06	c >S	—	5.1E+01	c	4.6E+01	c	4.6E+03	c >S	8.4E+02	c	2.6E+05	c >S	—
Chlorfenvinphos	470-90-6	3.9E+01	n	2.7E+00	n	2.7E+02	n	4.3E+01	n	—	—	—	2.1E+01	n	1.4E+00	n	1.4E+02	n	2.2E+01	n	—	—	—
Chloride*	16887-00-6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Chlorine	7782-50-5	1.9E+02	n	—	—	—	—	1.9E+02	n	—	—	—	9.6E+01	n	—	—	—	—	9.6E+01	n	—	—	—
Chloro-1,3-butadiene, 2-	126-99-8	2.0E+00	c	—	—	—	—	2.0E+00	c	4.4E+00	c	—	1.0E+00	c	—	—	—	—	1.0E+00	c	2.8E-01	c	—
Chloro-2-propanol, 1-	127-00-4	2.0E+04	n	3.2E+00	n	3.2E+02	n	—	—	—	—	—	2.0E+04	n	1.6E+00	n	1.6E+02	n	—	—	—	—	—
Chloro-3-methylphenol, 4-	59-50-7	3.4E+03	n	1.4E+01	n	1.4E+03	n	—	—	—	—	—	3.4E+03	n	6.8E+00	n	6.8E+02	n	—	—	—	—	—
Chloroaniline, p-	106-47-8	9.5E+01	c	4.7E-02	c	4.7E+00	c	—	—	—	—	—	9.5E+01	c	2.3E-02	c	2.3E+00	c	—	—	—	—	—
Chlorobenzene	108-90-7	1.0E+03	n	1.1E+00	m	1.1E+02	m	1.1E+03	n	1.8E+04	n >S	—	5.4E+02	n	5.5E-01	m	5.5E+01	m	5.5E+02	n	1.1E+03	n	—
Chlorobenzilate	510-15-6	6.3E+01	c	2.6E-01	c	2.6E+01	c	5.9E+02	c	4.0E+05	c >S	—	5.7E+01	c	1.3E-01	c	1.3E+01	c	3.0E+02	c	2.6E+04	c >S	—
Chlorobromomethane (bromochloromethane)	74-97-5	4.1E+04	n	9.1E+00	n	9.1E+02	n	—	—	—	—	—	4.1E+04	n	4.5E+00	n	4.5E+02	n	—	—	—	—	—
Chlorodifluoromethane	75-45-6	1.0E+06	n	—	—	—	—	1.0E+06	n	1.0E+06	n >S	—	5.5E+05	n	—	—	—	—	5.5E+05	n	8.1E+04	n >S	—
Chloroethane (ethyl chloride)	75-00-3	1.4E+05	n	9.2E+01	n	9.2E+03	n	2.1E+05	n	5.1E+05	n >S	—	8.7E+04	n	4.6E+01	n	4.6E+03	n	1.1E+05	n	3.3E+04	n >S	—
Chloroethanol, 2-	107-07-3	2.0E+04	n	2.9E+00	n	2.9E+02	n	—	—	—	—	—	2.0E+04	n	1.4E+00	n	1.4E+02	n	—	—	—	—	—
Chloroethoxy ethene, 2- (2-chloroethylvinylether)	110-75-8	6.4E+00	n	6.5E-03	c	6.5E-01	c	6.4E+00	n	9.5E+01	n	—	3.3E+00	n	3.2E-03	c	3.2E-01	c	3.3E+00	n	6.2E+00	n	—
Chloroform ⁸	67-66-3	2.6E+01	c	3.3E-01	m	3.3E+01	m	2.6E+01	c	1.4E+02	c	—	1.3E+01	c	1.7E-01	m	1.7E+01	m	1.3E+01	c	9.0E+00	c	—
Chlorohexane, 1-	544-10-5	1.4E+04	n	1.2E+02	n	1.2E+04	n >S	2.1E+04	n	4.1E+05	n >S	—	8.7E+03	n	5.9E+01	n	5.9E+03	n >S	1.1E+04	n	2.6E+04	n >S	—
Chloromethane (methyl chloride)	74-87-3	2.9E+02	c	9.1E-01	c	9.1E+01	c	3.3E+02	c	3.5E+02	c	—	1.6E+02	c	4.5E-01	c	4.5E+01	c	1.7E+02	c	2.3E+01	c	—
Chloronaphthalene, 1- (Chloronaphthalene, alpha-)	90-13-1	5.0E+04	n	2.2E+03	n	2.2E+05	n >S	—	—	—	—	—	5.0E+04	n	1.1E+03	n	1.1E+05	n >S	—	—	—	—	—
Chloronaphthalene, 2- (chloronaphthalene, beta)	91-58-7	5.0E+04	n	2.0E+03	n	2.0E+05	n >S	—	—	—	—	—	5.0E+04	n	1.0E+03	n	1.0E+05	n >S	—	—	—	—	—
Chloronitrobenzene, p- (1-chloro-4-nitrobenzene)	100-00-5	7.8E+01	n	4.6E-01	n	4.6E+01	n	8.8E+01	n	6.7E+03	n >S	—	4.2E+01	n	2.3E-01	n	2.3E+01	n	4.5E+01	n	4.3E+02	n	—
Chlorophenol, 2-	95-57-8	5.1E+03	n	4.9E+00	n	4.9E+02	n	—	—	—	—	—	5.1E+03	n	2.4E+00	n	2.4E+02	n	—	—	—	—	—
Chlorophenol, 3-	108-43-0	3.4E+03	n	2.3E+00	n	2.3E+02	n	—	—	—	—	—	3.4E+03	n	1.2E+00	n	1.2E+02	n	—	—	—	—	—

Table 2
Tier 1 Commercial/Industrial Soil PCLs¹

Last Revised: March 1, 2022

Chemical of Concern	CAS	0.5 acre source area										30 acre source area											
		TotSoil _{Comb} ² (mg/kg)	note ³	gWSoil _{mg} (mg/kg)	note ³	gWSoil _{class 3} (mg/kg)	note ³	AirSoil _{1inh-V} ⁴ (mg/kg)	note ³	AirGW-Soil _{1inh-V} (mg/kg)	note ³	gWSoil for Secondary MCL (mg/kg)	TotSoil _{Comb} ² (mg/kg)	note ³	gWSoil _{mg} (mg/kg)	note ³	gWSoil _{class 3} (mg/kg)	note ³	AirSoil _{1inh-V} ⁴ (mg/kg)	note ³	AirGW-Soil _{1inh-V} (mg/kg)	note ³	gWSoil for Secondary MCL (mg/kg)
Chlorophenol, 4-	106-48-9	3.4E+03	n	2.5E+00	n	2.5E+02	n	—	—	—	—	—	3.4E+03	n	1.2E+00	n	1.2E+02	n	—	—	—	—	—
Chlorophenyl phenylether, 4-	7005-72-3	9.8E-01	c	7.2E-02	c	7.2E+00	c	4.2E+00	c	1.1E+03	c >S	—	8.0E-01	c	3.6E-02	c	3.6E+00	c	2.2E+00	c	7.0E+01	c	—
Chloropropane, 2-	75-29-6	2.0E+03	n	1.6E+01	n	1.6E+03	n	2.1E+03	n	4.8E+03	n	—	1.1E+03	n	8.1E+00	n	8.1E+02	n	1.1E+03	n	3.1E+02	n	—
Chlorothalonil	1897-45-6	1.7E+03	c	1.8E+01	c	1.8E+03	c	—	—	—	—	—	1.7E+03	c	9.1E+00	c	9.1E+02	c	—	—	—	—	—
Chlorotoluene, o- (2-chlorotoluene)	95-49-8	7.8E+03	n	2.7E+01	n	2.7E+03	n	1.8E+04	n	6.1E+05	n >S	—	5.6E+03	n	1.4E+01	n	1.4E+03	n	9.5E+03	n	4.0E+04	n >S	—
Chlorotoluene, p- (4-chlorotoluene)	106-43-4	2.0E+04	n	3.2E+01	n	3.2E+03	n >S	—	—	—	—	—	2.0E+04	n	1.6E+01	n	1.6E+03	n >S	—	—	—	—	—
Chlorpyrifos	2921-88-2	2.0E+03	n	4.4E+01	n	4.4E+03	n >S	—	—	—	—	—	2.0E+03	n	2.2E+01	n	2.2E+03	n >S	—	—	—	—	—
Chromium (III)	16065-83-1	1.2E+05	n	2.4E+03	m >S	2.4E+05	m >S	—	—	—	—	—	7.5E+04	n	1.2E+03	m >S	1.2E+05	m >S	—	—	—	—	—
Chromium (total)	7440-47-3	1.2E+05	n	2.4E+03	m >S	2.4E+05	m >S	—	—	—	—	—	7.5E+04	n	1.2E+03	m >S	1.2E+05	m >S	—	—	—	—	—
Chromium (VI)	18540-29-9	1.0E+03	n	2.8E+01	m >S	2.8E+03	m >S	—	—	—	—	—	1.0E+03	n	1.4E+01	m >S	1.4E+03	m >S	—	—	—	—	—
Chrysene	218-01-9	1.7E+04	c	2.5E+04	c >S	1.0E+06	c >S	1.0E+06	c	1.0E+06	c >S	—	1.7E+04	c	1.3E+04	c >S	1.0E+06	c >S	7.5E+05	c	1.0E+06	c >S	—
Cobalt	7440-48-4	6.3E+03	c	6.6E+02	n >S	6.6E+04	n >S	—	—	—	—	—	3.3E+03	c	3.3E+02	n >S	3.3E+04	n >S	—	—	—	—	—
Copolymer acrylamide	69418-26-4	1.4E+02	n	2.8E-02	n	2.8E+00	n	—	—	—	—	—	1.4E+02	n	1.4E-02	n	1.4E+00	n	—	—	—	—	—
Copper	7440-50-8	9.4E+04	n	1.0E+03	e >S	1.0E+05	e >S	—	—	—	—	800	9.4E+04	n	5.2E+02	e >S	5.2E+04	e >S	—	—	—	—	400
Coronene	191-07-1	1.4E+03	n	1.7E+05	n >S	1.0E+06	n >S	—	—	—	—	—	1.4E+03	n	8.4E+04	n >S	1.0E+06	n >S	—	—	—	—	—
Coumaphos	56-72-4	4.8E+03	n	3.3E+02	n >S	3.3E+04	n >S	—	—	—	—	—	4.8E+03	n	1.6E+02	n >S	1.6E+04	n >S	—	—	—	—	—
Cresol	1319-77-3	3.4E+04	n	2.0E+01	n	2.0E+03	n	—	—	—	—	—	3.4E+04	n	9.9E+00	n	9.9E+02	n	—	—	—	—	—
Cresol, m- (3-methylphenol)	108-39-4	3.4E+04	n	2.0E+01	n	2.0E+03	n	—	—	—	—	—	3.4E+04	n	9.9E+00	n	9.9E+02	n	—	—	—	—	—
Cresol, o- (2-methylphenol)	95-48-7	3.4E+04	n	2.1E+01	n	2.1E+03	n	—	—	—	—	—	3.4E+04	n	1.1E+01	n	1.1E+03	n	—	—	—	—	—
Cresol, p- (4-methylphenol)	106-44-5	3.4E+03	n	1.9E+00	n	1.9E+02	n	—	—	—	—	—	3.4E+03	n	9.4E-01	n	9.4E+01	n	—	—	—	—	—
Crotonaldehyde	123-73-9	1.5E+01	c	2.1E-03	c	2.1E-01	c	—	—	—	—	—	1.5E+01	c	1.1E-03	c	1.1E-01	c	—	—	—	—	—
Cumene (isopropylbenzene)	98-82-8	1.1E+04	n	1.0E+03	n	1.0E+05	n >S	1.3E+04	n	8.7E+05	n >S	—	6.3E+03	n	5.2E+02	n	5.2E+04	n >S	6.7E+03	n	5.7E+04	n >S	—
Cyanazine	21725-46-2	2.3E+01	c	9.4E-03	c	9.4E-01	c	—	—	—	—	—	2.3E+01	c	4.7E-03	c	4.7E-01	c	—	—	—	—	—
Cyanide	57-12-5	3.7E+02	n	4.0E+01	m	4.0E+03	m	1.0E+03	n	—	—	—	2.8E+02	n	2.0E+01	m	2.0E+03	m	5.2E+02	n	—	—	—
Cyanogen	460-19-5	1.7E+01	n	1.8E-01	n	1.8E+01	n	1.7E+01	n	2.5E+01	n	—	8.8E+00	n	9.1E-02	n	9.1E+00	n	8.8E+00	n	1.6E+00	n	—
Cycloate	1134-23-2	3.7E+04	n	4.5E+02	n	4.5E+04	n >S	—	—	—	—	—	3.7E+04	n	2.3E+02	n	2.3E+04	n >S	—	—	—	—	—
Cyclohexane	110-82-7	1.3E+05	n	1.8E+04	n >S	1.0E+06	n >S	1.3E+05	n	4.0E+05	n >S	—	6.5E+04	n	8.8E+03	n >S	8.8E+05	n >S	6.6E+04	n	2.6E+04	n >S	—
Cyclohexanol	108-93-0	1.0E+06	n	8.8E+02	n >S	8.8E+04	n >S	—	—	—	—	—	1.0E+06	n	4.4E+02	n >S	4.4E+04	n >S	—	—	—	—	—
Cyclohexanone	108-94-1	4.9E+04	n	7.8E+02	n	7.8E+04	n >S	4.9E+04	n	1.0E+06	n >S	—	2.5E+04	n	3.9E+02	n	3.9E+04	n >S	2.5E+04	n	2.7E+05	n >S	—
Cyclohexene, 1-methanol-3-	1679-51-2	1.4E+04	n	1.1E+01	n	1.1E+03	n	—	—	—	—	—	1.4E+04	n	5.6E+00	n	5.6E+02	n	—	—	—	—	—
Cyclohexene, 4-vinyl-1-	100-40-3	5.4E+03	n	9.1E+01	n	9.1E+03	n >S	7.1E+03	n	8.7E+04	n >S	—	3.1E+03	n	4.6E+01	n	4.6E+03	n >S	3.6E+03	n	5.6E+03	n >S	—
Cyclopentane	287-92-3	5.5E+04	n	8.4E+01	n	8.4E+03	n >S	5.2E+05	n	9.9E+05	n >S	—	5.0E+04	n	4.2E+01	n	4.2E+03	n >S	2.7E+05	n	6.4E+04	n >S	—
Cyclopentane, methyl-	96-37-7	1.8E+04	n	4.1E+02	n	4.1E+04	n >S	2.1E+04	n	5.3E+04	n >S	—	1.0E+04	n	2.0E+02	n	2.0E+04	n >S	1.1E+04	n	3.4E+03	n >S	—
Cyclopentene	142-29-0	1.0E+06	n	3.2E+03	n	3.2E+05	n >S	—	—	—	—	—	1.0E+06	n	1.6E+03	n	1.6E+05	n >S	—	—	—	—	—
Cyclotetramethylenetetranitramine (HMX)	2691-41-0	1.2E+04	n	7.0E+00	n	7.0E+02	n	—	—	—	—	—	1.2E+04	n	3.5E+00	n	3.5E+02	n	—	—	—	—	—
Cyclotrimethylenetrinitramine (RDX)	121-82-4	2.4E+02	c	1.1E-01	c	1.1E+01	c	—	—	—	—	—	2.4E+02	c	5.7E-02	c	5.7E+00	c	—	—	—	—	—
Cymene (isopropyltoluene)	99-87-6	1.0E+05	n	6.9E+02	n	6.9E+04	n >S	—	—	—	—	—	1.0E+05	n	3.5E+02	n	3.5E+04	n >S	—	—	—	—	—
Cymoxanil	57966-95-7	8.9E+03	n	1.8E+00	n	1.8E+02	n	—	—	—	—	—	8.9E+03	n	9.1E-01	n	9.1E+01	n	—	—	—	—	—
Dacthal (DCPA)	1861-32-1	6.8E+03	n	1.4E+03	n >S	1.4E+05	n >S	—	—	—	—	—	6.8E+03	n	6.8E+02	n >S	6.8E+04	n >S	—	—	—	—	—
Dalapon, sodium salt (2,2-dichloropropanoic acid)	75-99-0	2.0E+04	n	5.8E-01	m	5.8E+01	m	—	—	—	—	—	2.0E+04	n	2.9E-01	m	2.9E+01	m	—	—	—	—	—
DDD	72-54-8	1.0E+02	c	2.9E+01	c	2.9E+03	c >S	—	—	—	—	—	1.0E+02	c	1.5E+01	c	1.5E+03	c >S	—	—	—	—	—
DDE	72-55-9	7.3E+01	c	2.6E+01	c	2.6E+03	c >S	—	—	—	—	—	7.3E+01	c	1.3E+01	c	1.3E+03	c >S	—	—	—	—	—
DDT	50-29-3	7.1E+01	c	3.3E+01	c >S	3.3E+03	c >S	2.0E+03	c	1.0E+06	c >S	—	6.8E+01	c	1.7E+01	c >S	1.7E+03	c >S	1.0E+03	c	3.7E+05	c >S	—
Demeton	8065-48-3	2.7E+01	n	3.7E-02	n	3.7E+00	n	—	—	—	—	—	2.7E+01	n	1.9E-02	n	1.9E+00	n	—	—	—	—	—
Desethylatrazine	6190-65-4	2.4E+04	n	1.2E+01	n	1.2E+03	n	—	—	—	—	—	2.4E+04	n	6.0E+00	n	6.0E+02	n	—	—	—	—	—
Diacetone alcohol (4-hydroxy-4-methyl-2-pentanone)	123-42-2	2.7E+04	n	5.8E+00	n	5.8E+02	n	—	—	—	—	—	2.7E+04	n	2.9E+00	n	2.9E+02	n	—	—	—	—	—
Diallate	2303-16-4	3.1E+02	c	2.6E+00	c	2.6E+02	c	—	—	—	—	—	3.1E+02	c	1.3E+00	c	1.3E+02	c	—	—	—	—	—
Diazinon	333-41-5	7.9E+01	n	4.7E-01	n	4.7E+01	n	9.1E+01	n	4.0E+04	n >S	—	4.3E+01	n	2.4E-01	n	2.4E+01	n	4.7E+01	n	2.6E+03	n >S	—
Dibenz(a,h)acridine	226-36-8	1.6E+01	c	1.3E+02	c >S	1.3E+04	c >S	2.6E+04	c	1.0E+06	c >S	—	1.6E+01	c	6.5E+01	c >S	6.5E+03	c >S	1.3E+04	c	1.0E+06	c >S	—
Dibenz(a,j)acridine	224-42-0	2.4E+01	c	2.5E+02	c >S	2.5E+04	c >S	3.5E+04	c	1.0E+06	c >S	—	2.4E+01	c	1.3E+02	c >S	1.3E+04	c >S	1.8E+04	c	1.0E+06	c >S	—

Table 2
Tier 1 Commercial/Industrial Soil PCLs¹

Last Revised: March 1, 2022

Chemical of Concern	CAS	0.5 acre source area										30 acre source area											
		TotSoil _{Comb} ² (mg/kg)	note ³	gWSoil _{mg} (mg/kg)	note ³	gWSoil _{class 3} (mg/kg)	note ³	AirSoil _{mg} ⁴ (mg/kg)	note ³	AirGW-Soil _{mg} ⁴ (mg/kg)	note ³	gWsoil for Secondary MCL (mg/kg)	TotSoil _{Comb} ² (mg/kg)	note ³	gWSoil _{mg} (mg/kg)	note ³	gWSoil _{class 3} (mg/kg)	note ³	AirSoil _{mg} ⁴ (mg/kg)	note ³	AirGW-Soil _{mg} ⁴ (mg/kg)	note ³	gWsoil for Secondary MCL (mg/kg)
Dibenz-a,h-anthracene	53-70-3	1.7E+01	c	1.6E+02	c >S	1.6E+04	c >S	4.8E+03	c	1.0E+06	c >S	—	1.7E+01	c	7.8E+01	c >S	7.8E+03	c >S	2.5E+03	c	1.0E+06	c >S	—
Dibenzo(a,e)pyrene	192-65-4	2.6E+00	c	2.9E+02	c >S	2.9E+04	c >S	1.2E+04	c	1.0E+06	c >S	—	2.6E+00	c	1.5E+02	c >S	1.5E+04	c >S	6.2E+03	c	1.0E+06	c >S	—
Dibenzo(a,h)pyrene	189-64-0	2.6E-01	c	2.7E+01	c >S	2.7E+03	c >S	1.2E+03	c	1.0E+06	c >S	—	2.6E-01	c	1.3E+01	c >S	1.3E+03	c >S	6.0E+02	c	1.0E+06	c >S	—
Dibenzo(a,i)pyrene	189-55-9	2.6E-01	c	2.7E+01	c	2.7E+03	c >S	1.2E+03	c	1.0E+06	c >S	—	2.6E-01	c	1.3E+01	c	1.3E+03	c >S	6.0E+02	c	1.0E+06	c >S	—
Dibenzofuran	132-64-9	2.7E+03	n	1.0E+02	n	1.0E+04	n >S	—	—	—	—	—	2.7E+03	n	5.0E+01	n	5.0E+03	n >S	—	—	—	—	—
Dibenzothiophene	132-65-0	3.8E+03	n	1.0E+03	n >S	1.0E+05	n >S	—	—	—	—	—	3.8E+03	n	5.0E+02	n >S	5.0E+04	n >S	—	—	—	—	—
Dibromo-3-chloropropane, 1,2-	96-12-8	2.6E-01	c	1.7E-03	m	1.7E-01	m	2.6E-01	c	9.0E+00	c	—	1.4E-01	c	8.7E-04	m	8.7E-02	m	1.4E-01	c	5.9E-01	c	—
Dibromochloromethane (chlorodibromomethane) ⁵	124-48-1	3.4E+02	c	3.6E-01	m	3.6E+01	m	—	—	—	—	—	3.4E+02	c	1.8E-01	m	1.8E+01	m	—	—	—	—	—
Dibromofluoromethane	1868-53-7	2.0E+05	n	4.7E+01	n	4.7E+03	n	—	—	—	—	—	2.0E+05	n	2.3E+01	n	2.3E+03	n	—	—	—	—	—
Dicamba	1918-00-9	2.0E+04	n	4.4E+00	n	4.4E+02	n	—	—	—	—	—	2.0E+04	n	2.2E+00	n	2.2E+02	n	—	—	—	—	—
Dichlormid	37764-25-3	1.7E+04	n	7.8E+00	n	7.8E+02	n	—	—	—	—	—	1.7E+04	n	3.9E+00	n	3.9E+02	n	—	—	—	—	—
Dichloro-2-butene, 1,4-	764-41-0	3.3E-01	c	—	—	—	—	3.3E-01	c	1.0E+01	c	—	1.7E-01	c	—	—	—	—	1.7E-01	c	6.7E-01	c	—
Dichloro-2-butene, 1,4- trans	110-57-6	3.4E-01	c	—	—	—	—	3.4E-01	c	1.1E+01	c	—	1.8E-01	c	—	—	—	—	1.8E-01	c	7.2E-01	c	—
Dichlorobenzene, 1,2-	95-50-1	1.1E+03	n	1.8E+01	m	1.8E+03	m	1.1E+03	n	4.8E+04	n >S	—	5.7E+02	n	8.9E+00	m	8.9E+02	m	5.7E+02	n	3.1E+03	n >S	—
Dichlorobenzene, 1,3-	541-73-1	1.7E+02	n	2.0E+01	n	2.0E+03	n >S	1.7E+02	n	2.4E+03	n >S	—	8.8E+01	n	1.0E+01	n	1.0E+03	n >S	8.8E+01	n	1.6E+02	n	—
Dichlorobenzene, 1,4-	106-46-7	1.2E+03	c	2.1E+00	m	2.1E+02	m	1.6E+04	n	6.8E+05	n >S	—	1.2E+03	c	1.1E+00	m	1.1E+02	m	8.5E+03	n	4.4E+04	n >S	—
Dichlorobenzidine, 3,3'-	91-94-1	4.2E+01	c	1.4E-01	c	1.4E+01	c	—	—	—	—	—	4.2E+01	c	7.0E-02	c	7.0E+00	c	—	—	—	—	—
Dichlorobutane, 2,3-	7581-97-7	1.5E+02	n	7.7E+00	n	7.7E+02	n	1.5E+02	n	2.1E+03	n	—	7.7E+01	n	3.8E+00	n	3.8E+02	n	7.7E+01	n	1.4E+02	n	—
Dichlorodifluoromethane	75-71-8	2.1E+03	n	7.2E+02	n	7.2E+04	n >S	2.1E+03	n	4.1E+03	n	—	1.1E+03	n	3.6E+02	n	3.6E+04	n >S	1.1E+03	n	2.7E+02	n	—
Dichloroethane, 1,1-	75-34-3	4.1E+04	n	5.5E+01	n	5.5E+03	n	5.2E+04	n	2.3E+05	n >S	—	2.3E+04	n	2.8E+01	n	2.8E+03	n	2.7E+04	n	1.5E+04	n >S	—
Dichloroethane, 1,2-	107-06-2	1.1E+02	c	1.4E-02	m	1.4E+00	m	1.8E+02	c	1.2E+03	c	—	7.1E+01	c	6.9E-03	m	6.9E-01	m	9.1E+01	c	7.5E+01	c	—
Dichloroethylene, 1,1-	75-35-4	6.4E+03	n	5.0E-02	m	5.0E+00	m	7.3E+03	n	1.7E+04	n	—	3.5E+03	n	2.5E-02	m	2.5E+00	m	3.8E+03	n	1.1E+03	n	—
Dichloroethylene, cis-1,2-	156-59-2	7.9E+02	n	2.5E-01	m	2.5E+01	m	1.3E+03	n	6.1E+03	n	—	5.0E+02	n	1.2E-01	m	1.2E+01	m	6.6E+02	n	3.9E+02	n	—
Dichloroethylene, trans-1,2	156-60-5	1.2E+03	n	4.9E-01	m	4.9E+01	m	1.3E+03	n	5.3E+03	n	—	6.4E+02	n	2.5E-01	m	2.5E+01	m	6.6E+02	n	3.4E+02	n	—
Dichlorofluoromethane	75-43-4	2.0E+05	n	4.2E+01	n	4.2E+03	n	—	—	—	—	—	2.0E+05	n	2.1E+01	n	2.1E+03	n	—	—	—	—	—
Dichlorophenol, 2,3-	576-24-9	2.0E+03	n	1.6E+00	n	1.6E+02	n	—	—	—	—	—	2.0E+03	n	8.1E-01	n	8.1E+01	n	—	—	—	—	—
Dichlorophenol, 2,4-	120-83-2	2.0E+03	n	1.1E+00	n	1.1E+02	n	—	—	—	—	—	2.0E+03	n	5.3E-01	n	5.3E+01	n	—	—	—	—	—
Dichlorophenol, 2,5-	583-78-8	2.0E+03	n	1.5E+00	n	1.5E+02	n	—	—	—	—	—	2.0E+03	n	7.5E-01	n	7.5E+01	n	—	—	—	—	—
Dichlorophenol, 2,6-	87-65-0	6.8E+02	n	2.0E-01	n	2.0E+01	n	—	—	—	—	—	6.8E+02	n	1.0E-01	n	1.0E+01	n	—	—	—	—	—
Dichlorophenol, 3,4-	95-77-2	2.0E+03	n	6.0E+00	n	6.0E+02	n	—	—	—	—	—	2.0E+03	n	3.0E+00	n	3.0E+02	n	—	—	—	—	—
Dichlorophenol, 3,5-	591-35-5	2.0E+03	n	4.0E+00	n	4.0E+02	n	—	—	—	—	—	2.0E+03	n	2.0E+00	n	2.0E+02	n	—	—	—	—	—
Dichlorophenoxy, 2,4- butyric acid, 4- (2,4-DB)	94-82-6	5.5E+03	n	1.2E+00	n	1.2E+02	n	—	—	—	—	—	5.5E+03	n	5.8E-01	n	5.8E+01	n	—	—	—	—	—
Dichlorophenoxyacetic acid, 2,4- (2,4-D)	94-75-7	1.6E+05	n	2.6E+00	m	2.6E+02	m	—	—	—	—	—	1.6E+05	n	1.3E+00	m	1.3E+02	m	—	—	—	—	—
Dichloroprop (2-(2,4-dichlorophenoxy) propanoic acid)	120-36-5	6.8E+03	n	1.4E+00	n	1.4E+02	n	—	—	—	—	—	6.8E+03	n	7.0E-01	n	7.0E+01	n	—	—	—	—	—
Dichloropropane, 1,2-	78-87-5	8.6E+01	n	2.3E-02	m	2.3E+00	m	8.6E+01	n	7.4E+02	n	—	4.4E+01	n	1.1E-02	m	1.1E+00	m	4.4E+01	n	4.8E+01	n	—
Dichloropropane, 1,3-	142-28-9	9.9E+01	c	1.4E-01	c	1.4E+01	c	1.5E+02	c	3.0E+03	c	—	6.1E+01	c	7.2E-02	c	7.2E+00	c	7.7E+01	c	2.0E+02	c	—
Dichloropropane, 2,2-	594-20-7	8.6E+01	n	2.7E-01	c	2.7E+01	c	8.6E+01	n	7.1E+02	n	—	4.4E+01	n	1.4E-01	c	1.4E+01	c	4.4E+01	n	4.6E+01	n	—
Dichloropropanol, 2,3-	616-23-9	2.0E+03	n	7.2E-01	n	7.2E+01	n	—	—	—	—	—	2.0E+03	n	3.6E-01	n	3.6E+01	n	—	—	—	—	—
Dichloropropene, 1,1-	563-58-6	9.9E+01	c	3.0E-01	c	3.0E+01	c	1.5E+02	c	4.8E+02	c	—	6.1E+01	c	1.5E-01	c	1.5E+01	c	7.7E+01	c	3.1E+01	c	—
Dichloropropene, 1,3- (mixed isomers)	542-75-6	9.9E+01	c	8.8E-02	c	8.8E+00	c	1.5E+02	c	1.3E+03	c	—	6.1E+01	c	4.4E-02	c	4.4E+00	c	7.7E+01	c	8.3E+01	c	—
Dichloropropene, cis 1,3-	10061-01-5	5.3E+01	c	1.5E-02	c	1.5E+00	c	4.3E+02	n	3.8E+03	n	—	5.3E+01	c	7.4E-03	c	7.4E-01	c	2.2E+02	n	2.5E+02	n	—
Dichloropropene, trans 1,3-	10061-02-6	9.9E+01	c	8.0E-02	c	8.0E+00	c	1.5E+02	c	1.3E+03	c	—	6.1E+01	c	4.0E-02	c	4.0E+00	c	7.7E+01	c	8.1E+01	c	—
Dichlorvos	62-73-7	6.6E+01	c	1.0E+06	c	1.0E+06	c	1.0E+06	n	1.0E+06	n	—	6.6E+01	c	5.5E+05	c	1.0E+06	c	8.7E+05	n	1.0E+06	n	—
Dicrotophos (bidrin)	141-66-2	6.8E+01	n	1.4E-02	n	1.4E+00	n	—	—	—	—	—	6.8E+01	n	7.0E-03	n	7.0E-01	n	—	—	—	—	—
Dicyclopentadiene	77-73-6	8.2E+04	n	—	—	—	—	—	—	—	—	—	8.2E+04	n	—	—	—	—	—	—	—	—	—
Dieldrin	60-57-1	1.2E+00	c	1.1E-01	c	1.1E+01	c	5.3E+01	c	1.8E+05	c >S	—	1.1E+00	c	5.5E-02	c	5.5E+00	c	2.7E+01	c	1.2E+04	c >S	—
Diethanolamine	111-42-2	3.2E+02	n	7.0E-02	n	7.0E+00	n	4.9E+03	n	1.0E+06	n	—	3.0E+02	n	3.5E-02	n	3.5E+00	n	2.5E+03	n	9.6E+05	n	—
Diethyldithiocarbamate, sodium salt	148-18-5	1.1E+02	c	—	—	—	—	—	—	—	—	—	1.1E+02	c	—	—	—	—	—	—	—	—	—
Diethyl phthalate	84-66-2	5.5E+05	n	4.7E+02	n	4.7E+04	n >S	—	—	—	—	—	5.5E+05	n	2.3E+02	n	2.3E+04	n >S	—	—	—	—	—
Diethylene glycol	111-46-6	1.0E+06	n	2.8E+02	n	2.8E+04	n	—	—	—	—	—	1.0E+06	n	1.4E+02	n	1.4E+04	n	—	—	—	—	—

Table 2
Tier 1 Commercial/Industrial Soil PCLs¹

Last Revised: March 1, 2022

Chemical of Concern	CAS	0.5 acre source area										30 acre source area											
		TotSoil _{Comb} ² (mg/kg)	note ³	GWSoil _{mg} (mg/kg)	note ³	GWSoil _{class 3} (mg/kg)	note ³	AirSoil _{10th-V} ⁴ (mg/kg)	note ³	AirGW-Soil _{10th-V} (mg/kg)	note ³	GWSoil for Secondary MCL (mg/kg)	TotSoil _{Comb} ² (mg/kg)	note ³	GWSoil _{mg} (mg/kg)	note ³	GWSoil _{class 3} (mg/kg)	note ³	AirSoil _{10th-V} ⁴ (mg/kg)	note ³	AirGW-Soil _{10th-V} (mg/kg)	note ³	GWSoil for Secondary MCL (mg/kg)
Diethylene glycol monobutyl ether	112-34-5	2.8E+01	n	4.7E+00	n	4.7E+02	n	2.8E+01	n	9.6E+03	n	—	1.5E+01	n	2.3E+00	n	2.3E+02	n	1.5E+01	n	6.2E+02	n	—
Diethylhexyl adipate	103-23-1	1.6E+04	c	6.1E+03	m >S	6.1E+05	m >S	—	—	—	—	—	1.6E+04	c	3.0E+03	m >S	3.0E+05	m >S	—	—	—	—	—
Diethylstilbestrol	56-53-1	4.1E-03	c	1.3E-03	c	1.3E-01	c	—	—	—	—	—	4.1E-03	c	6.5E-04	c	6.5E-02	c	—	—	—	—	—
Diisobutylene (trimethyl-1-pentene, 2,4,4-)	107-39-1	4.0E+03	n	1.8E+03	n >S	1.8E+05	n >S	4.3E+03	n	1.3E+04	n >S	—	2.1E+03	n	9.0E+02	n >S	9.0E+04	n >S	2.2E+03	n	8.6E+02	n >S	—
Diisopropylbenzene, p-	100-18-5	6.8E+03	n	2.8E+02	n	2.8E+04	n >S	—	—	—	—	—	6.8E+03	n	1.4E+02	n	1.4E+04	n >S	—	—	—	—	—
Diisopropyl ether (2,2'-oxybis-propane)	108-20-3	1.3E+04	n	3.6E+01	n	3.6E+03	n	1.5E+04	n	1.3E+05	n >S	—	7.2E+03	n	1.8E+01	n	1.8E+03	n	7.7E+03	n	8.7E+03	n >S	—
Dimethenamid	87674-68-8	1.0E+04	n	3.1E+00	n	3.1E+02	n	—	—	—	—	—	1.0E+04	n	1.5E+00	n	1.5E+02	n	—	—	—	—	—
Dimethoate	60-51-5	1.4E+02	n	3.0E-02	n	3.0E+00	n	—	—	—	—	—	1.4E+02	n	1.5E-02	n	1.5E+00	n	—	—	—	—	—
Dimethoxybenzidine, 3,3'-	119-90-4	1.4E+03	c	6.3E-01	c	6.3E+01	c	—	—	—	—	—	1.4E+03	c	3.2E-01	c	3.2E+01	c	—	—	—	—	—
Dimethyl-2-nitrobenzene, 1,3-	81-20-9	1.0E+03	n	6.7E+00	n	6.7E+02	n	3.9E+03	n	6.9E+05	n >S	—	8.1E+02	n	3.3E+00	n	3.3E+02	n	2.0E+03	n	4.5E+04	n >S	—
Dimethyl-3-nitrobenzene, 1,2-	83-41-0	9.7E+02	n	4.2E+00	n	4.2E+02	n	3.4E+03	n	5.4E+05	n >S	—	7.7E+02	n	2.1E+00	n	2.1E+02	n	1.7E+03	n	3.5E+04	n >S	—
Dimethyl-4-nitrobenzene, 1,2-	99-51-4	9.8E+02	n	4.2E+00	n	4.2E+02	n	3.5E+03	n	5.9E+05	n >S	—	7.8E+02	n	2.1E+00	n	2.1E+02	n	1.8E+03	n	3.8E+04	n >S	—
Dimethyl-5-nitrobenzene, 1,3-	99-12-7	9.4E+02	n	4.9E+00	n	4.9E+02	n	3.1E+03	n	4.5E+05	n >S	—	7.3E+02	n	2.5E+00	n	2.5E+02	n	1.6E+03	n	2.9E+04	n >S	—
Dimethylphenethylamine, alpha, alpha-	122-09-8	1.4E+03	n	1.1E+00	n	1.1E+02	n	—	—	—	—	—	1.4E+03	n	5.6E-01	n	5.6E+01	n	—	—	—	—	—
Dimethyl phenol, 2,4-	105-67-9	1.4E+04	n	9.7E+00	n	9.7E+02	n	—	—	—	—	—	1.4E+04	n	4.8E+00	n	4.8E+02	n	—	—	—	—	—
Dimethylaminoazobenzene, p-	60-11-7	6.8E+00	n	3.4E+00	n	3.4E+02	n	—	—	—	—	—	6.8E+00	n	1.7E+00	n	1.7E+02	n	—	—	—	—	—
Dimethylbenz-a-anthracene, 7,12-	57-97-6	6.9E-02	c	2.8E+00	c	2.8E+02	c	2.4E+02	c	1.0E+06	c >S	—	6.9E-02	c	1.4E+00	c	1.4E+02	c	1.2E+02	c	1.0E+06	c >S	—
Dimethylbenzidine, 3,3'-	119-93-7	1.7E+00	c	1.8E-03	c	1.8E-01	c	—	—	—	—	—	1.7E+00	c	9.2E-04	c	9.2E-02	c	—	—	—	—	—
Dimethylformamide, N,N-	68-12-2	4.3E+03	n	1.4E+01	n	1.4E+03	n	4.5E+03	n	1.0E+06	n	—	2.3E+03	n	7.1E+00	n	7.1E+02	n	2.3E+03	n	6.6E+04	n	—
Dimethylnaphthalene, 1,3-	575-41-7	2.5E+04	n	2.4E+03	n	2.4E+05	n >S	—	—	—	—	—	2.5E+04	n	1.2E+03	n	1.2E+05	n >S	—	—	—	—	—
Dimethylphthalate	131-11-3	5.5E+05	n	1.9E+02	n	1.9E+04	n >S	—	—	—	—	—	5.5E+05	n	9.3E+01	n	9.3E+03	n >S	—	—	—	—	—
Di-n-butyl phthalate	84-74-2	6.8E+04	n	9.9E+03	n	9.9E+05	n >S	—	—	—	—	—	6.8E+04	n	5.0E+03	n	5.0E+05	n >S	—	—	—	—	—
Dinitro-2-methylphenol, 4,6- (dinitro-o-cresol, 4, 6-)	534-52-1	6.8E+01	n	1.4E-02	n	1.4E+00	n	—	—	—	—	—	6.8E+01	n	7.0E-03	n	7.0E-01	n	—	—	—	—	—
Dinitrobenzene, 1,3- (dinitrobenzene, 2,4-)	99-65-0	6.8E+01	n	2.3E-02	n	2.3E+00	n	—	—	—	—	—	6.8E+01	n	1.1E-02	n	1.1E+00	n	—	—	—	—	—
Dinitrobenzene, 1,4-	100-25-4	6.8E+01	n	2.2E-02	n	2.2E+00	n	—	—	—	—	—	6.8E+01	n	1.1E-02	n	1.1E+00	n	—	—	—	—	—
Dinitrophenol, 2,4-	51-28-5	1.4E+03	n	2.8E-01	n	2.8E+01	n	—	—	—	—	—	1.4E+03	n	1.4E-01	n	1.4E+01	n	—	—	—	—	—
Dinitrophenol, 2,5-	329-71-5	1.4E+03	n	2.9E-01	n	2.9E+01	n	—	—	—	—	—	1.4E+03	n	1.4E-01	n	1.4E+01	n	—	—	—	—	—
Dinitrotoluene, 2,4-	121-14-2	2.8E+01	c	1.2E-02	c	1.2E+00	c	—	—	—	—	—	2.8E+01	c	6.0E-03	c	6.0E-01	c	—	—	—	—	—
Dinitrotoluene, 2,6-	606-20-2	2.8E+01	c	1.1E-02	c	1.1E+00	c	—	—	—	—	—	2.8E+01	c	5.4E-03	c	5.4E-01	c	—	—	—	—	—
Di-n-octyl phthalate	117-84-0	6.8E+03	n	1.0E+06	n >S	1.0E+06	n >S	—	—	—	—	—	6.8E+03	n	1.0E+06	n >S	1.0E+06	n >S	—	—	—	—	—
Dinoseb	88-85-7	6.8E+02	n	3.5E-01	m	3.5E+01	m	—	—	—	—	—	6.8E+02	n	1.8E-01	m	1.8E+01	m	—	—	—	—	—
Dioxane 1,4-	123-91-1	1.5E+02	c	4.0E-02	c	4.0E+00	c	3.0E+02	c	2.5E+04	c	—	1.0E+02	c	2.0E-02	c	2.0E+00	c	1.6E+02	c	1.6E+03	c	—
Dioxin (as 2,3,7,8-TCDD toxicity equivalent quotients (TEQs))	1746-01-6	5.0E-03	e	1.7E-02	m	1.7E+00	m	—	—	—	—	—	5.0E-03	e	8.5E-03	m	8.5E-01	m	—	—	—	—	—
Diphenyl ether	101-84-8	4.2E+03	n	2.7E+02	n	2.7E+04	n >S	—	—	—	—	—	4.2E+03	n	1.4E+02	n	1.4E+04	n >S	—	—	—	—	—
Diphenylamine	122-39-4	1.7E+04	n	2.9E+01	n	2.9E+03	n	—	—	—	—	—	1.7E+04	n	1.4E+01	n	1.4E+03	n	—	—	—	—	—
Diphenylhydrazine, 1,2-	122-66-7	2.2E+01	c	7.2E-02	c	7.2E+00	c	2.4E+02	c	1.8E+05	c >S	—	2.0E+01	c	3.6E-02	c	3.6E+00	c	1.2E+02	c	1.2E+04	c	—
Dipropylene glycol	110-98-5	8.2E+04	n	1.7E+01	n	1.7E+03	n	—	—	—	—	—	8.2E+04	n	8.5E+00	n	8.5E+02	n	—	—	—	—	—
Diquat	85-00-7	1.5E+03	n	2.0E-01	m	2.0E+01	m	—	—	—	—	—	1.5E+03	n	1.0E-01	m	1.0E+01	m	—	—	—	—	—
Disodium iminodiacetate (iminodiacetic acid, disodium salt)	142-73-4	6.8E+03	n	1.4E+00	n	1.4E+02	n	—	—	—	—	—	6.8E+03	n	7.0E-01	n	7.0E+01	n	—	—	—	—	—
Disulfoton	298-04-4	2.7E+01	n	1.0E+00	n	1.0E+02	n	—	—	—	—	—	2.7E+01	n	5.2E-01	n	5.2E+01	n	—	—	—	—	—
Diuron	330-54-1	1.4E+03	n	2.8E+00	n	2.8E+02	n	—	—	—	—	—	1.4E+03	n	1.4E+00	n	1.4E+02	n	—	—	—	—	—
Dodecylphenol, 4-	104-43-8	3.4E+04	n	1.0E+06	n >S	1.0E+06	n >S	—	—	—	—	—	3.4E+04	n	1.0E+06	n >S	1.0E+06	n >S	—	—	—	—	—
Endosulfan	115-29-7	4.1E+03	n	1.4E+01	n	1.4E+03	n >S	—	—	—	—	—	4.1E+03	n	6.9E+00	n	6.9E+02	n >S	—	—	—	—	—
Endosulfan I	959-98-8	1.4E+03	n	9.2E+01	n	9.2E+03	n >S	—	—	—	—	—	1.4E+03	n	4.6E+01	n	4.6E+03	n >S	—	—	—	—	—
Endosulfan II	33213-65-9	4.1E+03	n	2.8E+02	n	2.8E+04	n >S	—	—	—	—	—	4.1E+03	n	1.4E+02	n	1.4E+04	n >S	—	—	—	—	—
Endosulfan sulfate	1031-07-8	4.1E+03	n	1.4E+04	n >S	1.0E+06	n >S	—	—	—	—	—	4.1E+03	n	7.0E+03	n >S	7.0E+05	n >S	—	—	—	—	—
Endothall	145-73-3	1.4E+04	n	5.3E-01	m	5.3E+01	m	—	—	—	—	—	1.4E+04	n	2.7E-01	m	2.7E+01	m	—	—	—	—	—
Endrin	72-20-8	2.0E+02	n	7.5E-01	m	7.5E+01	m	—	—	—	—	—	2.0E+02	n	3.8E-01	m	3.8E+01	m	—	—	—	—	—
Endrin aldehyde	7421-93-4	2.0E+02	n	1.9E+03	n >S	1.9E+05	n >S	—	—	—	—	—	2.0E+02	n	9.4E+02	n >S	9.4E+04	n >S	—	—	—	—	—
Endrin ketone	53494-70-5	2.0E+02	n	1.5E+02	n	1.5E+04	n >S	—	—	—	—	—	2.0E+02	n	7.6E+01	n	7.6E+03	n >S	—	—	—	—	—

Table 2
Tier 1 Commercial/Industrial Soil PCLs¹

Last Revised: March 1, 2022

Chemical of Concern	CAS	0.5 acre source area										30 acre source area											
		TotSoil _{Comb} ² (mg/kg)	note ³	gWSoil _{mg} (mg/kg)	note ³	gWSoil _{class 3} (mg/kg)	note ³	AirSoil _{1stb-V} ⁴ (mg/kg)	note ³	AirGW-Soil _{1stb-V} (mg/kg)	note ³	gWSoil for Secondary MCL (mg/kg)	TotSoil _{Comb} ² (mg/kg)	note ³	gWSoil _{mg} (mg/kg)	note ³	gWSoil _{class 3} (mg/kg)	note ³	AirSoil _{1stb-V} ⁴ (mg/kg)	note ³	AirGW-Soil _{1stb-V} (mg/kg)	note ³	gWSoil for Secondary MCL (mg/kg)
Epichlorohydrin	106-89-8	3.7E+01	n	4.1E-01	c	4.1E+01	c	3.7E+01	n	2.0E+03	n	—	1.9E+01	n	2.1E-01	c	2.1E+01	c	1.9E+01	n	1.3E+02	n	—
EPN (o-ethyl o-(4-nitrophenyl)phenylphosphonothioate)	2104-64-5	6.8E+00	n	1.6E-01	n	1.6E+01	n	—	—	—	—	—	6.8E+00	n	8.2E-02	n	8.2E+00	n	—	—	—	—	—
Esfenvalerate	66230-04-4	1.4E+03	n	3.7E+02	n >S	3.7E+04	n >S	—	—	—	—	—	1.4E+03	n	1.9E+02	n >S	1.9E+04	n >S	—	—	—	—	—
Ethalfuralin (sonolan)	55283-68-6	2.1E+02	c	5.6E+01	c	5.6E+03	c	—	—	—	—	—	2.1E+02	c	2.8E+01	c	2.8E+03	c	—	—	—	—	—
Ethanol	64-17-5	1.0E+06	n	4.7E+03	n	4.7E+05	n	—	—	—	—	—	1.0E+06	n	2.4E+03	n	2.4E+05	n	—	—	—	—	—
Ethanol, 2-amino-	141-43-5	9.0E+02	n	2.4E-01	n	2.4E+01	n	4.1E+03	n	1.0E+06	n	—	7.5E+02	n	1.2E-01	n	1.2E+01	n	2.1E+03	n	7.4E+04	n	—
Ethanol, 2-(2-aminoethoxy)-	929-06-6	3.4E+02	n	7.0E-02	n	7.0E+00	n	—	—	—	—	—	3.4E+02	n	3.5E-02	n	3.5E+00	n	—	—	—	—	—
Ethanol, 2-(2-ethoxyethoxy)-	111-90-0	1.0E+06	n	4.9E+02	n	4.9E+04	n	—	—	—	—	—	1.0E+06	n	2.5E+02	n	2.5E+04	n	—	—	—	—	—
Ethanol, 2-(methylamino)-	109-83-1	4.9E+03	n	2.2E+00	n	2.2E+02	n	9.0E+03	n	1.0E+06	n >S	—	3.3E+03	n	1.1E+00	n	1.1E+02	n	4.6E+03	n	1.8E+05	n	—
Ethion	563-12-2	3.4E+02	n	2.3E+01	n	2.3E+03	n >S	—	—	—	—	—	3.4E+02	n	1.1E+01	n	1.1E+03	n >S	—	—	—	—	—
Ethoprop	13194-48-4	6.8E+01	n	3.7E-01	n	3.7E+01	n	—	—	—	—	—	6.8E+01	n	1.8E-01	n	1.8E+01	n	—	—	—	—	—
Ethoxy ethanol, 2-	110-80-5	2.5E+04	n	1.3E+01	n	1.3E+03	n >S	3.5E+04	n	1.0E+06	n >S	—	1.5E+04	n	6.4E+00	n	6.4E+02	n >S	1.8E+04	n	5.9E+05	n >S	—
Ethyl acetate	141-78-6	5.1E+03	n	1.4E+02	n	1.4E+04	n	5.1E+03	n	1.6E+05	n	—	2.6E+03	n	7.0E+01	n	7.0E+03	n	2.6E+03	n	1.0E+04	n	—
Ethyl acrylate	140-88-5	3.2E+02	n	2.7E-01	c	2.7E+01	c	3.4E+02	n	9.6E+03	n	—	1.7E+02	n	1.3E-01	c	1.3E+01	c	1.7E+02	n	6.2E+02	n	—
Ethyl benzene	100-41-4	2.9E+04	n	7.6E+00	m	7.6E+02	m	4.1E+04	n	4.5E+05	n >S	—	1.7E+04	n	3.8E+00	m	3.8E+02	m	2.1E+04	n	2.9E+04	n >S	—
Ethyl dipropylthiocarbamate, S-	759-94-4	1.7E+04	n	2.1E+01	n	2.1E+03	n	—	—	—	—	—	1.7E+04	n	1.1E+01	n	1.1E+03	n	—	—	—	—	—
Ethyl ether	60-29-7	2.0E+05	n	3.3E+01	n	3.3E+03	n	—	—	—	—	—	2.0E+05	n	1.7E+01	n	1.7E+03	n	—	—	—	—	—
Ethyl methacrylate	97-63-2	8.9E+03	n	2.2E+01	n	2.2E+03	n	9.9E+03	n	2.7E+05	n >S	—	4.8E+03	n	1.1E+01	n	1.1E+03	n	5.1E+03	n	1.8E+04	n	—
Ethyl methanesulfonate	62-50-0	9.8E+01	c	4.0E-02	c	4.0E+00	c	2.0E+02	c	6.0E+04	c	—	6.7E+01	c	2.0E-02	c	2.0E+00	c	1.0E+02	c	3.9E+03	c	—
Ethyl tert-butyl ether (2-ethyl-2-ethoxypropane)	637-92-3	8.8E+02	n	2.7E-01	n	2.7E+01	n	6.4E+03	n	5.6E+04	n >S	—	7.8E+02	n	1.3E-01	n	1.3E+01	n	3.3E+03	n	3.6E+03	n	—
Ethyl-1-hexanol, 2-	104-76-7	1.0E+05	n	2.3E+02	n	2.3E+04	n >S	—	—	—	—	—	1.0E+05	n	1.1E+02	n	1.1E+04	n >S	—	—	—	—	—
Ethyl-2-hexenal, 2-	645-62-5	1.5E+05	n	8.4E+01	n	8.4E+03	n >S	—	—	—	—	—	1.5E+05	n	4.2E+01	n	4.2E+03	n >S	—	—	—	—	—
Ethyl-2-methyl benzene, 1-	611-14-3	9.6E+03	n	1.7E+02	n	1.7E+04	n >S	1.2E+04	n	5.8E+05	n >S	—	5.4E+03	n	8.3E+01	n	8.3E+03	n >S	6.1E+03	n	3.8E+04	n >S	—
Ethyl-4-methyl benzene, 1-	622-96-8	8.4E+03	n	1.8E+02	n	1.8E+04	n >S	1.0E+04	n	4.8E+05	n >S	—	4.7E+03	n	9.0E+01	n	9.0E+03	n >S	5.2E+03	n	3.1E+04	n >S	—
Ethylene*	74-85-1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Ethylene dibromide (dibromoethane, 1,2-)	106-93-4	8.7E+00	c	2.1E-04	m	2.1E-02	m	2.2E+01	c	5.3E+02	c	—	6.3E+00	c	1.0E-04	m	1.0E-02	m	1.1E+01	c	3.4E+01	c	—
Ethylene glycol	107-21-1	1.0E+06	n	2.8E+02	n	2.8E+04	n	—	—	—	—	—	1.0E+06	n	1.4E+02	n	1.4E+04	n	—	—	—	—	—
Ethylene oxide	75-21-8	2.6E+01	c	4.0E-03	c	4.0E-01	c	4.3E+02	c	1.0E+04	c	—	2.5E+01	c	2.0E-03	c	2.0E-01	c	2.2E+02	c	6.5E+02	c	—
Ethylene thiourea	96-45-7	5.5E+01	n	1.1E-02	n	1.1E+00	n	—	—	—	—	—	5.5E+01	n	5.6E-03	n	5.6E-01	n	—	—	—	—	—
Ethylenediamine	107-15-3	9.2E+04	n	1.4E+01	n	1.4E+03	n	—	—	—	—	—	9.2E+04	n	6.9E+00	n	6.9E+02	n	—	—	—	—	—
Ethylenimine	151-56-4	1.5E-01	c	6.3E-05	c	6.3E-03	c	2.2E-01	c	4.7E+01	c	—	9.0E-02	c	3.1E-05	c	3.1E-03	c	1.1E-01	c	3.0E+00	c	—
Ethylhexyl acrylate, 2-	103-11-7	4.0E+02	c	1.7E+01	c	1.7E+03	c	—	—	—	—	—	4.0E+02	c	8.6E+00	c	8.6E+02	c	—	—	—	—	—
Famphur	52-85-7	2.0E+01	n	5.4E-03	n	5.4E-01	n	—	—	—	—	—	2.0E+01	n	2.7E-03	n	2.7E-01	n	—	—	—	—	—
Fensulfothion	115-90-2	6.8E+02	n	1.0E+00	n	1.0E+02	n	—	—	—	—	—	6.8E+02	n	5.2E-01	n	5.2E+01	n	—	—	—	—	—
Fenthion	55-38-9	4.8E+01	n	2.3E-01	n	2.3E+01	n	—	—	—	—	—	4.8E+01	n	1.2E-01	n	1.2E+01	n	—	—	—	—	—
Fenuron	101-42-8	4.8E+04	n	1.4E+01	n	1.4E+03	n	—	—	—	—	—	4.8E+04	n	6.9E+00	n	6.9E+02	n	—	—	—	—	—
Fluoranthene	206-44-0	2.5E+04	n	5.7E+03	n >S	5.7E+05	n >S	—	—	—	—	—	2.5E+04	n	2.9E+03	n >S	2.9E+05	n >S	—	—	—	—	—
Fluorene	86-73-7	2.5E+04	n	8.9E+02	n >S	8.9E+04	n >S	—	—	—	—	—	2.5E+04	n	4.5E+02	n >S	4.5E+04	n >S	—	—	—	—	—
Fluorine (soluble fluoride)	7782-41-4	5.8E+04	n	—	—	—	—	—	—	—	—	—	5.8E+04	n	—	—	—	—	—	—	—	—	—
Fluorochloridone	61213-25-0	5.1E+03	n	1.2E+01	n	1.2E+03	n	—	—	—	—	—	5.1E+03	n	5.9E+00	n	5.9E+02	n	—	—	—	—	—
Fonofos	944-22-9	1.4E+03	n	2.1E+01	n	2.1E+03	n >S	—	—	—	—	—	1.4E+03	n	1.1E+01	n	1.1E+03	n >S	—	—	—	—	—
Formaldehyde	50-00-0	1.4E+03	n	2.9E+01	n	2.9E+03	n	1.4E+03	n	2.4E+05	n	—	7.1E+02	n	1.5E+01	n	1.5E+03	n	7.1E+02	n	1.6E+04	n	—
Formic acid	64-18-6	3.0E+02	n	1.3E+02	n	1.3E+04	n	3.0E+02	n	4.7E+04	n	—	1.5E+02	n	6.3E+01	n	6.3E+03	n	1.5E+02	n	3.1E+03	n	—
Furan	110-00-9	1.0E+03	n	2.4E-01	n	2.4E+01	n	—	—	—	—	—	1.0E+03	n	1.2E-01	n	1.2E+01	n	—	—	—	—	—
Furfural	98-01-1	3.1E+03	n	4.4E-01	n	4.4E+01	n	—	—	—	—	—	3.1E+03	n	2.2E-01	n	2.2E+01	n	—	—	—	—	—
Glycidylaldehyde	765-34-4	1.4E+02	n	6.7E-02	n	6.7E+00	n	2.1E+02	n	4.6E+04	n	—	8.5E+01	n	3.3E-02	n	3.3E+00	n	1.1E+02	n	3.0E+03	n	—
Glyphosate	1071-83-6	6.8E+05	n	2.9E+01	m	2.9E+03	m	—	—	—	—	—	6.8E+05	n	1.5E+01	m	1.5E+03	m	—	—	—	—	—
Heptachlor	76-44-8	3.3E+00	c	1.9E-01	m	1.9E+01	m	1.5E+01	c	5.0E+03	c >S	—	2.8E+00	c	9.4E-02	m	9.4E+00	m	7.9E+00	c	3.2E+02	c >S	—
Heptachlor epoxide	1024-57-3	2.0E+00	c	5.8E-02	m	5.8E+00	m	4.0E+01	c	5.8E+04	c >S	—	1.9E+00	c	2.9E-02	m	2.9E+00	m	2.1E+01	c	3.8E+03	c >S	—
Heptane, n-	142-82-5	4.7E+04	n	2.1E+03	n >S	2.1E+05	n >S	1.9E+05	n	5.9E+05	n >S	—	3.8E+04	n	1.1E+03	n >S	1.1E+05	n >S	9.9E+04	n	3.8E+04	n >S	—

Table 2
Tier 1 Commercial/Industrial Soil PCLs¹

Last Revised: March 1, 2022

Chemical of Concern	CAS	0.5 acre source area										30 acre source area											
		TotSoil _{Comb} ² (mg/kg)	note ³	gWSoil _{mg} (mg/kg)	note ³	gWSoil _{class 3} (mg/kg)	note ³	AirSoil _{1st³h-V} ⁴ (mg/kg)	note ³	AirGW-Soil _{1st³h-V} (mg/kg)	note ³	gWSoil for Secondary MCL (mg/kg)	TotSoil _{Comb} ² (mg/kg)	note ³	gWSoil _{mg} (mg/kg)	note ³	gWSoil _{class 3} (mg/kg)	note ³	AirSoil _{1st³h-V} ⁴ (mg/kg)	note ³	AirGW-Soil _{1st³h-V} (mg/kg)	note ³	gWSoil for Secondary MCL (mg/kg)
Heptanoic acid, n-	111-14-8	1.7E+02	n	7.1E+01	n	7.1E+03	n >S	1.7E+02	n	4.5E+04	n >S	—	8.8E+01	n	3.5E+01	n	3.5E+03	n >S	8.8E+01	n	2.9E+03	n >S	—
Hexachlorobenzene	118-74-1	8.7E+00	c	1.1E+00	m	1.1E+02	m >S	3.2E+01	c	1.1E+04	c >S	—	6.9E+00	c	5.6E-01	m	5.6E+01	m >S	1.6E+01	c	7.0E+02	c >S	—
Hexachlorobutadiene	87-68-3	4.1E+01	c	7.4E+00	c	7.4E+02	c >S	4.9E+01	c	4.2E+03	c >S	—	2.3E+01	c	3.7E+00	c	3.7E+02	c >S	2.5E+01	c	2.7E+02	c	—
Hexachlorocyclohexane, alpha (alpha-BHC)	319-84-6	3.3E+00	c	1.8E-02	c	1.8E+00	c	2.3E+01	c	1.4E+04	c >S	—	2.9E+00	c	8.9E-03	c	8.9E-01	c	1.2E+01	c	9.1E+02	c >S	—
Hexachlorocyclohexane, beta (beta-BHC)	319-85-7	1.2E+01	c	6.5E-02	c	6.5E+00	c	1.2E+02	c	1.1E+05	c >S	—	1.1E+01	c	3.2E-02	c	3.2E+00	c	6.2E+01	c	7.1E+03	c >S	—
Hexachlorocyclohexane, delta (delta-BHC)	319-86-8	1.2E+01	c	3.9E-01	c	3.9E+01	c	1.7E+02	c	2.1E+05	c >S	—	1.2E+01	c	1.9E-01	c	1.9E+01	c	8.8E+01	c	1.3E+04	c >S	—
Hexachlorocyclohexane, gamma (lindane; gamma-BHC)	58-89-9	1.8E+01	c	9.2E-03	m	9.2E-01	m	—	—	—	—	—	1.8E+01	c	4.6E-03	m	4.6E-01	m	—	—	—	—	—
Hexachlorocyclohexane, techn (technical-BHC)	608-73-1	1.2E+01	c	1.1E-01	c	1.1E+01	c	1.5E+02	c	1.6E+05	c >S	—	1.1E+01	c	5.6E-02	c	5.6E+00	c	7.7E+01	c	1.1E+04	c >S	—
Hexachlorocyclopentadiene	77-47-4	2.0E+01	n	1.9E+01	m	1.9E+03	m >S	2.0E+01	n	2.9E+03	n >S	—	1.0E+01	n	9.6E+00	m	9.6E+02	m >S	1.0E+01	n	1.9E+02	n	—
Hexachloroethane	67-72-1	4.5E+02	n	3.8E+00	n	3.8E+02	n	6.9E+03	n	7.7E+05	n >S	—	4.2E+02	n	1.9E+00	n	1.9E+02	n	3.6E+03	n	5.0E+04	n >S	—
Hexachlorophene	70-30-4	2.0E+02	n	1.8E+04	n >S	1.0E+06	n >S	—	—	—	—	—	2.0E+02	n	8.8E+03	n >S	8.8E+05	n >S	—	—	—	—	—
Hexachloropropylene	1888-71-7	4.5E+02	n	2.2E+01	n	2.2E+03	n	7.1E+03	n	1.0E+06	n >S	—	4.2E+02	n	1.1E+01	n	1.1E+03	n	3.7E+03	n	8.3E+04	n >S	—
Hexanal, 2-ethyl-	123-05-7	1.0E+05	n	7.9E+01	n	7.9E+03	n >S	—	—	—	—	—	1.0E+05	n	3.9E+01	n	3.9E+03	n >S	—	—	—	—	—
Hexane, n-	110-54-3	1.2E+04	n	6.1E+02	n	6.1E+04	n >S	1.4E+04	n	7.4E+03	n >S	—	6.6E+03	n	3.0E+02	n	3.0E+04	n >S	7.4E+03	n	4.8E+02	n	—
Hexanediamine, 1,6-	124-09-4	3.4E+03	n	7.3E-01	n	7.3E+01	n	—	—	—	—	—	3.4E+03	n	3.7E-01	n	3.7E+01	n	—	—	—	—	—
Hexanedinitrile	111-69-3	5.6E+02	n	2.0E-01	n	2.0E+01	n	1.4E+03	n	4.5E+05	n	—	4.1E+02	n	1.0E-01	n	1.0E+01	n	7.1E+02	n	2.9E+04	n	—
Hexanediol, 1,6-	629-11-8	1.0E+06	n	7.8E+02	n	7.8E+04	n >S	1.0E+06	n	1.0E+06	n >S	—	1.0E+06	n	3.9E+02	n	3.9E+04	n >S	1.0E+06	n	1.0E+06	n >S	—
Hexanoic acid	142-62-1	1.9E+02	n	9.0E+00	n	9.0E+02	n	1.9E+02	n	5.7E+04	n >S	—	9.8E+01	n	4.5E+00	n	4.5E+02	n	9.8E+01	n	3.7E+03	n	—
Hexanone, 2-	591-78-6	1.1E+03	n	9.6E+00	n	9.6E+02	n	1.2E+03	n	4.3E+04	n	—	5.9E+02	n	4.8E+00	n	4.8E+02	n	5.9E+02	n	2.7E+03	n	—
Hexazinone	51235-04-2	2.2E+04	n	8.2E+00	n	8.2E+02	n	—	—	—	—	—	2.2E+04	n	4.1E+00	n	4.1E+02	n	—	—	—	—	—
Hexene, 1-	592-41-6	2.3E+03	n	2.2E+03	n	2.2E+05	n >S	2.4E+03	n	4.3E+03	n >S	—	1.2E+03	n	1.1E+03	n	1.1E+05	n >S	1.2E+03	n	2.8E+02	n	—
Hexene, cis-2-	7688-21-3	2.3E+03	n	1.8E+03	n	1.8E+05	n >S	2.4E+03	n	5.2E+03	n >S	—	1.2E+03	n	9.2E+02	n	9.2E+04	n >S	1.2E+03	n	3.3E+02	n	—
Hexylene glycol (2-methyl-2,4-pentanediol)	107-41-5	2.0E+05	n	4.4E+01	n	4.4E+03	n	—	—	—	—	—	2.0E+05	n	2.2E+01	n	2.2E+03	n	—	—	—	—	—
Hydrazine	302-01-2	7.2E-01	c	1.3E-03	c	1.3E-01	c	7.8E-01	c	1.6E+02	c	—	3.8E-01	c	6.5E-04	c	6.5E-02	c	4.0E-01	c	1.1E+01	c	—
Hydrocaproic acid, 6- (6-hydroxyhexanoic acid)	1191-25-9	2.2E+02	n	9.1E+00	n	9.1E+02	n	2.3E+02	n	7.8E+04	n >S	—	1.2E+02	n	4.5E+00	n	4.5E+02	n	1.2E+02	n	5.7E+03	n	—
Hydrogen chloride (hydrochloric acid)*	7647-01-0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hydroquinone	123-31-9	3.2E+02	c	7.0E-02	c	7.0E+00	c	—	—	—	—	—	3.2E+02	c	3.5E-02	c	3.5E+00	c	—	—	—	—	—
Indene	95-13-6	1.6E+02	n	2.1E+01	n	2.1E+03	n	1.6E+02	n	5.6E+03	n	—	8.0E+01	n	1.1E+01	n	1.1E+03	n	8.1E+01	n	3.6E+02	n	—
Indeno-1,2,3-cd-pyrene	193-39-5	1.7E+02	c	2.8E+03	c >S	2.8E+05	c >S	6.2E+04	c	1.0E+06	c >S	—	1.7E+02	c	1.4E+03	c >S	1.4E+05	c >S	3.2E+04	c	1.0E+06	c >S	—
Iron*	7439-89-6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Isoamyl alcohol	123-51-3	5.1E+03	n	9.6E-01	n	9.6E+01	n	—	—	—	—	—	5.1E+03	n	4.8E-01	n	4.8E+01	n	—	—	—	—	—
Isobutyl alcohol	78-83-1	3.1E+05	n	4.7E+01	n	4.7E+03	n	—	—	—	—	—	3.1E+05	n	2.3E+01	n	2.3E+03	n	—	—	—	—	—
Isobutylene (2-methyl-1-propene)	115-11-7	3.8E+03	n	8.2E+00	n	8.2E+02	n	1.0E+06	n	1.0E+06	n >S	—	3.8E+03	n	4.1E+00	n	4.1E+02	n	1.0E+06	n	1.7E+05	n >S	—
Isobutyric acid (2-methylpropanoic acid)	79-31-2	3.4E+05	n	7.0E+01	n	7.0E+03	n	—	—	—	—	—	3.4E+05	n	3.5E+01	n	3.5E+03	n	—	—	—	—	—
Isodecanol	25339-17-7	1.1E+03	n	8.8E+00	n	8.8E+02	n	—	—	—	—	—	1.1E+03	n	4.4E+00	n	4.4E+02	n	—	—	—	—	—
Isodrin	465-73-6	1.1E-01	c	3.3E+00	c	3.3E+02	c	2.9E+00	c	1.6E+04	c >S	—	1.0E-01	c	1.7E+00	c	1.7E+02	c	1.5E+00	c	1.0E+03	c	—
Isopentane	78-78-4	5.5E+04	n	8.0E+02	n	8.0E+04	n >S	5.2E+05	n	6.3E+05	n >S	—	5.0E+04	n	4.0E+02	n	4.0E+04	n >S	2.7E+05	n	4.0E+04	n >S	—
Isophorone	78-59-1	2.0E+04	c	6.7E+00	c	6.7E+02	c	—	—	—	—	—	2.0E+04	c	3.4E+00	c	3.4E+02	c	—	—	—	—	—
Isopropyl acetate	108-21-4	7.2E+04	n	1.2E+01	n	1.2E+03	n	—	—	—	—	—	7.2E+04	n	6.0E+00	n	6.0E+02	n	—	—	—	—	—
Isopropyl alcohol	67-63-0	1.3E+04	n	3.0E+02	n	3.0E+04	n	1.4E+04	n	1.0E+06	n >S	—	6.9E+03	n	1.5E+02	n	1.5E+04	n	7.0E+03	n	7.8E+04	n	—
Isosafrole	120-58-1	5.5E+01	c	2.9E-01	c	2.9E+01	c	1.5E+02	c	2.2E+04	c >S	—	4.1E+01	c	1.5E-01	c	1.5E+01	c	7.9E+01	c	1.5E+03	c	—
Kelthane (dicofol)	115-32-2	4.1E+03	n	2.2E+02	n	2.2E+04	n >S	—	—	—	—	—	4.1E+03	n	1.1E+02	n	1.1E+04	n >S	—	—	—	—	—
Kepone (chlordecone)	143-50-0	1.9E+00	c	2.2E-01	c	2.2E+01	c	8.2E+01	c	4.3E+05	c >S	—	1.8E+00	c	1.1E-01	c	1.1E+01	c	4.2E+01	c	2.8E+04	c >S	—
Lead (inorganic)	7439-92-1	1.6E+03	e	3.0E+00	e >S	3.0E+02	e >S	—	—	—	—	—	1.6E+03	e	1.5E+00	e >S	1.5E+02	e >S	—	—	—	—	—
Leptophos	21609-90-5	3.2E+00	n	1.9E+00	n	1.9E+02	n >S	4.7E+01	n	4.7E+05	n >S	—	3.0E+00	n	9.6E-01	n	9.6E+01	n >S	2.4E+01	n	3.0E+04	n >S	—
Limonene, d-*	5989-27-5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Lithium	7439-93-2	6.8E+03	n	—	—	—	—	—	—	—	—	—	6.8E+03	n	—	—	—	—	—	—	—	—	—
Magnesium*	7439-95-4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Malathion	121-75-5	2.8E+02	n	2.0E+01	n	2.0E+03	n >S	2.8E+02	n	1.7E+05	n >S	—	1.4E+02	n	9.8E+00	n	9.8E+02	n >S	1.4E+02	n	1.1E+04	n >S	—
Maleic anhydride	108-31-6	6.8E+04	n	2.1E+01	n	2.1E+03	n	—	—	—	—	—	6.8E+04	n	1.1E+01	n	1.1E+03	n	—	—	—	—	—

Table 2
Tier 1 Commercial/Industrial Soil PCLs¹

Last Revised: March 1, 2022

Chemical of Concern	CAS	0.5 acre source area										30 acre source area											
		TotSoil _{Comb} ² (mg/kg)	note ³	gWSoil _{mg} (mg/kg)	note ³	gWSoil _{class 3} (mg/kg)	note ³	AirSoil _{10th-V} ⁴ (mg/kg)	note ³	AirGW-Soil _{10th-V} (mg/kg)	note ³	gWSoil for Secondary MCL (mg/kg)	TotSoil _{Comb} ² (mg/kg)	note ³	gWSoil _{mg} (mg/kg)	note ³	gWSoil _{class 3} (mg/kg)	note ³	AirSoil _{10th-V} ⁴ (mg/kg)	note ³	AirGW-Soil _{10th-V} (mg/kg)	note ³	gWSoil for Secondary MCL (mg/kg)
Maleic hydrazide	123-33-1	3.4E+05	n	1.1E+02	n	1.1E+04	n	—	—	—	—	—	3.4E+05	n	5.3E+01	n	5.3E+03	n	—	—	—	—	—
Malononitrile	109-77-3	6.8E+01	n	1.5E-02	n	1.5E+00	n	—	—	—	—	—	6.8E+01	n	7.7E-03	n	7.7E-01	n	—	—	—	—	—
Mancozeb	8018-01-7	2.0E+04	n	5.4E+00	n	5.4E+02	n >S	—	—	—	—	—	2.0E+04	n	2.7E+00	n	2.7E+02	n >S	—	—	—	—	—
Manganese	7439-96-5	7.3E+04	n	1.0E+04	n >S	1.0E+06	n >S	—	—	—	50	—	6.9E+04	n	5.1E+03	n >S	5.1E+05	n >S	—	—	—	—	25
MCPA (4-(chloro-2-methylphenoxy) acetic acid)	94-74-6	3.4E+02	n	7.0E-02	n	7.0E+00	n	—	—	—	—	—	3.4E+02	n	3.5E-02	n	3.5E+00	n	—	—	—	—	—
MCPP (2-(4-chloro-2-methylphenoxy) propanoic acid)	93-65-2	6.8E+02	n	1.4E-01	n	1.4E+01	n	—	—	—	—	—	6.8E+02	n	7.0E-02	n	7.0E+00	n	—	—	—	—	—
Mercury (pH = 4.9) ⁵	7439-97-6	6.2E+00	n	7.8E-03	m	7.8E-01	m >S	6.4E+00	n	4.0E+01	n >S	—	3.3E+00	m	3.9E-03	m	3.9E-01	m >S	3.3E+00	n	2.6E+00	n >S	—
Mercury (pH=6.8) ⁵	7439-97-6	1.9E+01	n	2.1E+00	m	2.1E+02	m >S	2.2E+01	n	1.1E+04	n >S	—	1.1E+01	n	1.0E+00	m	1.0E+02	m >S	1.1E+01	n	6.9E+02	m >S	—
Merphos	150-50-5	2.0E+01	n	1.9E+01	n	1.9E+03	n >S	—	—	—	—	—	2.0E+01	n	9.7E+00	n	9.7E+02	n >S	—	—	—	—	—
Methacrylic acid (2-methyl-2-propenoic acid)	79-41-4	1.0E+04	n	1.4E+00	n	1.4E+02	n	—	—	—	—	—	1.0E+04	n	7.0E-01	n	7.0E+01	n	—	—	—	—	—
Methacrylonitrile	126-98-7	8.0E+02	n	7.5E+00	n	7.5E+02	n	8.2E+02	n	3.2E+04	n	—	4.2E+02	n	3.8E+00	n	3.8E+02	n	4.2E+02	n	2.1E+03	n	—
Methanol	67-56-1	3.7E+05	n	2.8E+02	n	2.8E+04	n	4.6E+05	n	1.0E+06	n >S	—	2.1E+05	n	1.4E+02	n	1.4E+04	n	2.4E+05	n	9.6E+05	n >S	—
Methapyrillene	91-80-5	4.1E+00	c	1.2E-03	c	1.2E-01	c	—	—	—	—	—	4.1E+00	c	5.9E-04	c	5.9E-02	c	—	—	—	—	—
Methomyl	16752-77-5	1.7E+04	n	1.5E+01	n	1.5E+03	n	—	—	—	—	—	1.7E+04	n	7.6E+00	n	7.6E+02	n	—	—	—	—	—
Methoxychlor	72-43-5	3.4E+03	n	1.2E+02	m	1.2E+04	m >S	—	—	—	—	—	3.4E+03	n	6.2E+01	m	6.2E+03	m >S	—	—	—	—	—
Methoxyethanol, 2-	109-86-4	4.2E+02	n	1.1E+01	n	1.1E+03	n >S	4.3E+02	n	6.2E+02	n >S	—	2.2E+02	n	5.4E+00	n	5.4E+02	n >S	2.2E+02	n	4.0E+01	n	—
Methyl acetate (acetic acid, methyl ester)	79-20-9	1.0E+06	n	1.5E+02	n	1.5E+04	n	—	—	—	—	—	1.0E+06	n	7.3E+01	n	7.3E+03	n	—	—	—	—	—
Methyl acrylate	96-33-3	3.6E+02	n	3.1E-01	n	3.1E+01	n	4.3E+02	n	7.9E+03	n	—	2.0E+02	n	1.5E-01	n	1.5E+01	n	2.2E+02	n	5.1E+02	n	—
Methyl amyl ketone (2-heptanone)	110-43-0	3.8E+04	n	1.4E+01	n	1.4E+03	n	1.6E+05	n	1.0E+06	n >S	—	3.1E+04	n	7.1E+00	n	7.1E+02	n	8.0E+04	n	3.9E+05	n >S	—
Methyl chrysene, 1-	3351-28-8	2.4E+03	c	5.0E+04	c >S	1.0E+06	c >S	1.0E+06	c	1.0E+06	c >S	—	2.4E+03	c	2.5E+04	c >S	1.0E+06	c >S	1.0E+06	c	1.0E+06	c >S	—
Methyl chrysene, 2-	3351-32-4	2.4E+03	c	5.0E+04	c >S	1.0E+06	c >S	1.0E+06	c	1.0E+06	c >S	—	2.4E+03	c	2.5E+04	c >S	1.0E+06	c >S	1.0E+06	c	1.0E+06	c >S	—
Methyl chrysene, 6-	1705-85-7	2.4E+02	c	4.0E+03	c >S	4.0E+05	c >S	3.9E+05	c	1.0E+06	c >S	—	2.4E+02	c	2.0E+03	c >S	2.0E+05	c >S	2.0E+05	c	1.0E+06	c >S	—
Methyl cyclohexane	108-87-2	6.4E+04	n	4.6E+04	n >S	1.0E+06	n >S	6.4E+04	n	2.5E+05	n >S	—	3.3E+04	n	2.3E+04	n >S	1.0E+06	n >S	3.3E+04	n	1.6E+04	n >S	—
Methyl ethyl ketone (2-butanone)	78-93-3	1.9E+05	n	8.7E+01	n	8.7E+03	n	2.8E+05	n	1.0E+06	n >S	—	1.2E+05	n	4.4E+01	n	4.4E+03	n	1.5E+05	n	8.7E+05	n >S	—
Methyl iodide (iodomethane)	74-88-4	1.4E+03	n	3.4E-01	n	3.4E+01	n	—	—	—	—	—	1.4E+03	n	1.7E-01	n	1.7E+01	n	—	—	—	—	—
Methyl isobutyl ketone (4-methyl-2-pentanone)	108-10-1	4.1E+04	n	1.5E+01	n	1.5E+03	n	8.1E+04	n	1.0E+06	n >S	—	2.8E+04	n	7.4E+00	n	7.4E+02	n	4.2E+04	n	1.5E+05	n >S	—
Methyl mercury	22967-92-6	9.7E+01	n	—	—	—	—	—	—	—	—	—	9.7E+01	n	—	—	—	—	—	—	—	—	—
Methyl methacrylate	80-62-6	1.5E+04	n	2.9E+02	n	2.9E+04	n	1.5E+04	n	3.2E+05	n >S	—	7.7E+03	n	1.5E+02	n	1.5E+04	n	7.7E+03	n	2.0E+04	n	—
Methyl methanesulfonate	66-27-3	9.5E+01	c	4.0E-02	c	4.0E+00	c	1.9E+02	c	5.4E+04	c	—	6.4E+01	c	2.0E-02	c	2.0E+00	c	9.7E+01	c	3.5E+03	c	—
Methyl parathion	298-00-0	1.7E+02	n	5.1E-01	n	5.1E+01	n	—	—	—	—	—	1.7E+02	n	2.5E-01	n	2.5E+01	n	—	—	—	—	—
Methyl-1-butene, 2-	563-46-2	5.3E+04	n	1.9E+02	n	1.9E+04	n >S	3.9E+05	n	4.8E+05	n >S	—	4.7E+04	n	9.7E+01	n	9.7E+03	n >S	2.0E+05	n	3.1E+04	n >S	—
Methyl-1-propanal, 2- (isobutyraldehyde)	78-84-2	4.1E+04	n	6.2E+00	n	6.2E+02	n	—	—	—	—	—	4.1E+04	n	3.1E+00	n	3.1E+02	n	—	—	—	—	—
Methyl-2-butene, 2-	513-35-9	5.3E+04	n	1.2E+02	n	1.2E+04	n >S	3.9E+05	n	5.5E+05	n >S	—	4.7E+04	n	5.8E+01	n	5.8E+03	n >S	2.0E+05	n	3.6E+04	n >S	—
Methyl-2-pentenal, 2-	623-36-9	1.5E+01	c	3.3E-03	c	3.3E-01	c	—	—	—	—	—	1.5E+01	c	1.6E-03	c	1.6E-01	c	—	—	—	—	—
Methylcholanthrene, 3-	56-49-5	7.9E-01	c	3.4E+01	c	3.4E+03	c >S	3.0E+03	c	1.0E+06	c >S	—	7.9E-01	c	1.7E+01	c	1.7E+03	c >S	1.5E+03	c	1.0E+06	c >S	—
Methylene bromide (dibromomethane)	74-95-3	1.1E+02	n	2.5E+00	c	2.5E+02	c	1.1E+02	n	3.1E+03	n	—	5.9E+01	n	1.3E+00	c	1.3E+02	c	5.9E+01	n	2.0E+02	n	—
Methylene chloride (dichloromethane)	75-09-2	1.2E+04	n	1.3E-02	m	1.3E+00	m	2.1E+04	c	9.4E+04	c >S	—	8.6E+03	n	6.5E-03	m	6.5E-01	m	1.1E+04	c	6.1E+03	c	—
Methylene-bis (2-chloroaniline) 4,4'-	101-14-4	1.8E+02	c	6.5E+00	c	6.5E+02	c	4.5E+03	c	1.0E+06	c >S	—	1.8E+02	c	3.2E+00	c	3.2E+02	c	2.3E+03	c	6.9E+05	c >S	—
Methylmercury hydroxide	1184-57-2	6.8E+01	n	1.4E-02	n	1.4E+00	n	—	—	—	—	—	6.8E+01	n	7.1E-03	n	7.1E-01	n	—	—	—	—	—
Methylnaphthalene, 1-	90-12-0	6.0E+02	c	6.6E+00	c	6.6E+02	c	—	—	—	—	—	6.0E+02	c	3.3E+00	c	3.3E+02	c	—	—	—	—	—
Methylnaphthalene, 2-	91-57-6	2.5E+03	n	5.1E+01	n	5.1E+03	n >S	—	—	—	—	—	2.5E+03	n	2.5E+01	n	2.5E+03	n >S	—	—	—	—	—
Methylpyrrolidone, N-	872-50-4	1.4E+04	n	2.9E+00	n	2.9E+02	n	—	—	—	—	—	1.4E+04	n	1.4E+00	n	1.4E+02	n	—	—	—	—	—
Methylstyrene, alpha-	98-83-9	6.3E+02	n	1.9E+01	n	1.9E+03	n	6.8E+02	n	3.0E+04	n >S	—	3.3E+02	n	9.7E+00	n	9.7E+02	n	3.5E+02	n	1.9E+03	n >S	—
Methyltetrahydrofuran, 2-	96-47-9	2.9E+02	c	6.2E-01	c	6.2E+01	c	3.2E+02	c	7.0E+03	c	—	1.6E+02	c	3.1E-01	c	3.1E+01	c	1.6E+02	c	4.5E+02	c	—
Methyltetrahydropyran, 2-	10141-72-7	3.3E+02	c	7.3E-01	c	7.3E+01	c	3.7E+02	c	9.6E+03	c	—	1.8E+02	c	3.6E-01	c	3.6E+01	c	1.9E+02	c	6.2E+02	c	—
Metolachlor	51218-45-2	1.0E+05	n	3.3E+02	n	3.3E+04	n >S	—	—	—	—	—	1.0E+05	n	1.6E+02	n	1.6E+04	n >S	—	—	—	—	—
Metribuzin	21087-64-9	1.7E+04	n	3.7E+00	n	3.7E+02	n	—	—	—	—	—	1.7E+04	n	1.8E+00	n	1.8E+02	n	—	—	—	—	—
Mirex	2385-85-5	1.4E+02	n	1.3E+04	n >S	1.0E+06	n >S	—	—	—	—	—	1.4E+02	n	6.7E+03	n >S	6.7E+05	n >S	—	—	—	—	—
Molinate	2212-67-1	1.4E+03	n	5.7E-01	n	5.7E+01	n	—	—	—	—	—	1.4E+03	n	2.9E-01	n	2.9E+01	n	—	—	—	—	—
Molybdenum	7439-98-7	4.5E+03	n	1.5E+02	n >S	1.5E+04	n >S	—	—	—	—	—	4.5E+03	n	7.3E+01	n >S	7.3E+03	n >S	—	—	—	—	—

Table 2
Tier 1 Commercial/Industrial Soil PCLs¹

Last Revised: March 1, 2022

Chemical of Concern	CAS	0.5 acre source area										30 acre source area												
		TotSoil _{Comb} ² (mg/kg)	note ³	gWSoil _{mg} (mg/kg)	note ³	gWSoil _{Class 3} (mg/kg)	note ³	Air _{Soil_{Inh-V}} ⁴ (mg/kg)	note ³	Air _{GW-Soil_{Inh-V}} (mg/kg)	note ³	gWSoil for Secondary MCL (mg/kg)	TotSoil _{Comb} ² (mg/kg)	note ³	gWSoil _{mg} (mg/kg)	note ³	gWSoil _{Class 3} (mg/kg)	note ³	Air _{Soil_{Inh-V}} ⁴ (mg/kg)	note ³	Air _{GW-Soil_{Inh-V}} (mg/kg)	note ³	gWSoil for Secondary MCL (mg/kg)	
Monocrotophos	2157-98-4	4.1E+02	n	8.8E-02	n	8.8E+00	n	—	—	—	—	—	4.1E+02	n	4.4E-02	n	4.4E+00	n	—	—	—	—	—	—
Morpholine	110-91-8	1.0E+06	n	7.1E+04	n	1.0E+06	n	—	—	—	—	—	1.0E+06	n	3.6E+04	n	9.8E+05	n	—	—	—	—	—	—
Morpholine, N-butyl-	1005-67-0	1.6E+03	n	6.9E-01	n	6.9E+01	n	—	—	—	—	—	1.6E+03	n	3.5E-01	n	3.5E+01	n	—	—	—	—	—	—
MTBE (methyl tert-butyl ether) ⁶	1634-04-4	2.0E+03	c	1.9E+00	n	1.9E+02	n	2.3E+03	c	1.7E+04	c	3.8E-02	1.1E+03	c	9.3E-01	n	9.3E+01	n	1.2E+03	c	1.1E+03	c	0.019	—
Naled	300-76-5	1.4E+03	n	1.1E+00	n	1.1E+02	n >S	—	—	—	—	—	1.4E+03	n	5.3E-01	n	5.3E+01	n >S	—	—	—	—	—	—
Naphthalene	91-20-3	3.6E+02	n	9.3E+01	n	9.3E+03	n >S	3.7E+02	n	2.8E+04	n >S	—	1.9E+02	n	4.7E+01	n	4.7E+03	n >S	1.9E+02	n	1.8E+03	n >S	—	—
Naphthoquinone, 1,4-	130-15-4	4.8E+03	n	1.4E+00	n	1.4E+02	n	—	—	—	—	—	4.8E+03	n	6.9E-01	n	6.9E+01	n	—	—	—	—	—	—
Naphthylamine, 1-	134-32-7	1.4E+04	n	2.8E+01	n	2.8E+03	n	—	—	—	—	—	1.4E+04	n	1.4E+01	n	1.4E+03	n	—	—	—	—	—	—
Naphthylamine, 2-	91-59-8	1.1E+01	c	2.9E-02	c	2.9E+00	c	—	—	—	—	—	1.1E+01	c	1.4E-02	c	1.4E+00	c	—	—	—	—	—	—
Napropamide	15299-99-7	6.8E+04	n	1.6E+03	n	1.6E+05	n >S	—	—	—	—	—	6.8E+04	n	8.2E+02	n	8.2E+04	n >S	—	—	—	—	—	—
Neopentyl glycol	126-30-7	2.0E+05	n	4.4E+01	n	4.4E+03	n	—	—	—	—	—	2.0E+05	n	2.2E+01	n	2.2E+03	n	—	—	—	—	—	—
Nickel and compounds	7440-02-0	8.8E+03	n	4.7E+02	n >S	4.7E+04	n >S	—	—	—	—	—	8.6E+03	n	2.3E+02	n >S	2.3E+04	n >S	—	—	—	—	—	—
Nitrate-N ^{7, 9}	14797-55-8	1.0E+06	n	—	—	—	—	—	—	—	—	—	1.0E+06	n	—	—	—	—	—	—	—	—	—	—
Nitrite-N ^{7, 9}	14797-65-0	9.7E+04	n	—	—	—	—	—	—	—	—	—	9.7E+04	n	—	—	—	—	—	—	—	—	—	—
Nitroaniline, 2-	88-74-4	5.0E+01	n	6.6E-02	n	6.6E+00	n	6.7E+01	n	1.7E+04	n >S	—	2.9E+01	n	3.3E-02	n	3.3E+00	n	3.4E+01	n	1.1E+03	n	—	—
Nitroaniline, 3-	99-09-2	5.9E+01	n	7.6E-02	n	7.6E+00	n	8.4E+01	n	2.3E+04	n >S	—	3.6E+01	n	3.8E-02	n	3.8E+00	n	4.3E+01	n	1.5E+03	n >S	—	—
Nitroaniline, 4-	100-01-6	9.5E+02	c	2.4E-01	c	2.4E+01	c	1.7E+03	n	4.7E+05	n >S	—	6.6E+02	n	1.2E-01	c	1.2E+01	c	8.7E+02	n	3.1E+04	n >S	—	—
Nitrobenzene	98-95-3	1.1E+02	c	1.0E+00	n	1.0E+02	n	1.1E+02	c	8.7E+03	c	—	5.7E+01	c	5.2E-01	n	5.2E+01	n	5.7E+01	c	5.6E+02	c	—	—
Nitroglycerin	55-63-0	6.8E+01	n	4.1E-02	n	4.1E+00	n	—	—	—	—	—	6.8E+01	n	2.1E-02	n	2.1E+00	n	—	—	—	—	—	—
Nitrophenol, 2-	88-75-5	1.4E+03	n	4.0E-01	n	4.0E+01	n	—	—	—	—	—	1.4E+03	n	2.0E-01	n	2.0E+01	n	—	—	—	—	—	—
Nitrophenol, 3-	554-84-7	1.4E+03	n	6.8E-01	n	6.8E+01	n	—	—	—	—	—	1.4E+03	n	3.4E-01	n	3.4E+01	n	—	—	—	—	—	—
Nitrophenol, 4-	100-02-7	1.4E+03	n	3.0E-01	n	3.0E+01	n	—	—	—	—	—	1.4E+03	n	1.5E-01	n	1.5E+01	n	—	—	—	—	—	—
Nitropropane, 2-	79-46-9	1.0E+00	c	2.1E-02	n	2.1E+00	n	1.0E+00	c	2.8E+01	c	—	5.3E-01	c	1.1E-02	n	1.1E+00	n	5.3E-01	c	1.8E+00	c	—	—
Nitroquinoline-N-oxide, 4-	56-57-5	1.2E+00	c	5.2E-04	c	5.2E-02	c	3.2E+00	c	4.5E+04	c	—	9.0E-01	c	2.6E-04	c	2.6E-02	c	1.6E+00	c	2.2E+04	c	—	—
Nitrosodiethanolamine	1116-54-7	6.8E+00	c	1.5E-03	c	1.5E-01	c	—	—	—	—	—	6.8E+00	c	7.4E-04	c	7.4E-02	c	—	—	—	—	—	—
Nitrosodiethylamine, n-	55-18-5	7.0E-02	c	2.8E-05	c	2.8E-03	c	1.1E-01	c	2.5E+01	c	—	4.4E-02	c	1.4E-05	c	1.4E-03	c	5.7E-02	c	1.6E+00	c	—	—
Nitrosodimethylamine, n-	62-75-9	2.1E-01	c	8.3E-05	c	8.3E-03	c	3.3E-01	c	7.0E+01	c	—	1.3E-01	c	4.1E-05	c	4.1E-03	c	1.7E-01	c	4.5E+00	c	—	—
Nitrosodi-n-butylamine, n-	924-16-3	1.2E+00	c	4.2E-03	c	4.2E-01	c	1.7E+00	c	8.8E+01	c	—	7.1E-01	c	2.1E-03	c	2.1E-01	c	9.0E-01	c	5.7E+00	c	—	—
Nitrosodi-n-propylamine, n-	621-64-7	1.4E+00	c	7.9E-04	c	7.9E-02	c	—	—	—	—	—	1.4E+00	c	3.9E-04	c	3.9E-02	c	—	—	—	—	—	—
Nitrosodiphenylamine	86-30-6	1.9E+03	c	6.3E+00	c	6.3E+02	c >S	—	—	—	—	—	1.9E+03	c	3.2E+00	c	3.2E+02	c >S	—	—	—	—	—	—
Nitroso-methyl-ethyl-amine, n-	10595-95-6	1.3E+00	c	2.6E-04	c	2.6E-02	c	—	—	—	—	—	1.3E+00	c	1.3E-04	c	1.3E-02	c	—	—	—	—	—	—
Nitrosomorpholine, N-	59-89-2	1.4E+00	c	5.9E-04	c	5.9E-02	c	2.9E+00	c	8.8E+02	c	—	9.7E-01	c	2.9E-04	c	2.9E-02	c	1.5E+00	c	5.7E+01	c	—	—
Nitroso-n-ethylurea, n-	759-73-9	1.4E-01	c	4.7E-05	c	4.7E-03	c	—	—	—	—	—	1.4E-01	c	2.3E-05	c	2.3E-03	c	—	—	—	—	—	—
Nitrosopiperidine, N-	100-75-4	1.1E+00	c	4.6E-04	c	4.6E-02	c	2.2E+00	c	5.9E+02	c	—	7.4E-01	c	2.3E-04	c	2.3E-02	c	1.2E+00	c	3.8E+01	c	—	—
Nitrosopyrrolidine, n-	930-55-2	4.7E+00	c	1.9E-03	c	1.9E-01	c	9.8E+00	c	3.1E+03	c	—	3.2E+00	c	9.5E-04	c	9.5E-02	c	5.0E+00	c	2.0E+02	c	—	—
Nitrotoluene, m-	99-08-1	6.8E+03	n	5.5E+00	n	5.5E+02	n	—	—	—	—	—	6.8E+03	n	2.8E+00	n	2.8E+02	n	—	—	—	—	—	—
Nitrotoluene, o-	88-72-2	8.7E+01	c	7.0E-02	c	7.0E+00	c	—	—	—	—	—	8.7E+01	c	3.5E-02	c	3.5E+00	c	—	—	—	—	—	—
Nitrotoluene, p-	99-99-0	1.2E+03	c	9.6E-01	c	9.6E+01	c	—	—	—	—	—	1.2E+03	c	4.8E-01	c	4.8E+01	c	—	—	—	—	—	—
Nonachlor, cis-	5103-73-1	5.3E+01	c	2.8E+01	c	2.8E+03	c >S	2.1E+03	c	1.0E+06	c >S	—	5.2E+01	c	1.4E+01	c	1.4E+03	c >S	1.1E+03	c	4.0E+05	c >S	—	—
Nonachlor, trans-	39765-80-5	5.3E+01	c	2.8E+01	c	2.8E+03	c >S	2.1E+03	c	1.0E+06	c >S	—	5.2E+01	c	1.4E+01	c	1.4E+03	c >S	1.1E+03	c	4.0E+05	c >S	—	—
Nonanal	124-19-6	1.4E+05	n	4.4E+02	n	4.4E+04	n >S	—	—	—	—	—	1.4E+05	n	2.2E+02	n	2.2E+04	n >S	—	—	—	—	—	—
Nonene, 1-n	124-11-8	1.0E+05	n	9.9E+03	n >S	9.9E+05	n >S	—	—	—	—	—	1.0E+05	n	4.9E+03	n >S	4.9E+05	n >S	—	—	—	—	—	—
Nonylphenol, 4-n-	104-40-5	6.8E+04	n	8.8E+05	n >S	1.0E+06	n >S	—	—	—	—	—	6.8E+04	n	4.4E+05	n >S	1.0E+06	n >S	—	—	—	—	—	—
Nonylphenol ethoxylate	9016-45-9	6.8E+04	n	1.0E+06	n >S	1.0E+06	n >S	—	—	—	—	—	6.8E+04	n	1.0E+06	n >S	1.0E+06	n >S	—	—	—	—	—	—
Octamethylpyrophosphoramide	152-16-9	1.4E+03	n	2.8E-01	n	2.8E+01	n	—	—	—	—	—	1.4E+03	n	1.4E-01	n	1.4E+01	n	—	—	—	—	—	—
Octanone	106-68-3	5.8E+04	n	3.3E+01	n	3.3E+03	n	1.0E+06	n	1.0E+06	n >S	—	5.6E+04	n	1.6E+01	n	1.6E+03	n	6.5E+05	n	1.0E+06	n >S	—	—
Oxamyl	23135-22-0	1.7E+04	n	4.2E-01	m	4.2E+01	m	—	—	—	—	—	1.7E+04	n	2.1E-01	m	2.1E+01	m	—	—	—	—	—	—
Oxychlordan	27304-13-8	5.3E+01	c	2.8E+01	c	2.8E+03	c >S	2.1E+03	c	1.0E+06	c >S	—	5.2E+01	c	1.4E+01	c	1.4E+03	c >S	1.1E+03	c	4.0E+05	c >S	—	—
Paraquat	1910-42-5	3.1E+03	n	6.3E-01	n	6.3E+01	n	—	—	—	—	—	3.1E+03	n	3.1E-01	n	3.1E+01	n	—	—	—	—	—	—
Parathion (ethyl parathion)	56-38-2	4.1E+03	n	9.9E+01	n	9.9E+03	n >S	—	—	—	—	—	4.1E+03	n	4.9E+01	n	4.9E+03	n >S	—	—	—	—	—	—

Table 2
Tier 1 Commercial/Industrial Soil PCLs¹

Last Revised: March 1, 2022

Chemical of Concern	CAS	0.5 acre source area										30 acre source area															
		TotSoil _{Comb} ² (mg/kg)		g ^W Soil _{mg} (mg/kg)		g ^W Soil _{Class 3} (mg/kg)		Air ^{Soil} _{1^{inh}-V} ⁴ (mg/kg)		Air ^{GW-Soil} _{1^{inh}-V} (mg/kg)		g ^W Soil for Secondary MCL (mg/kg)		TotSoil _{Comb} ² (mg/kg)		g ^W Soil _{mg} (mg/kg)		g ^W Soil _{Class 3} (mg/kg)		Air ^{Soil} _{1^{inh}-V} ⁴ (mg/kg)		Air ^{GW-Soil} _{1^{inh}-V} (mg/kg)		g ^W Soil for Secondary MCL (mg/kg)			
Pebulate	1114-71-2	3.4E+04	n	7.0E+01	n	7.0E+03	n >S	—	—	—	—	—	—	3.4E+04	n	3.5E+01	n	3.5E+03	n >S	—	—	—	—	—	—	—	—
Pendimethalin	40487-42-1	2.7E+04	n	2.2E+04	n >S	1.0E+06	n >S	—	—	—	—	—	—	2.7E+04	n	1.1E+04	n >S	1.0E+06	n >S	—	—	—	—	—	—	—	—
Pentachlorobenzene	608-93-5	5.5E+02	n	7.4E+01	n	7.4E+03	n >S	—	—	—	—	—	—	5.5E+02	n	3.7E+01	n	3.7E+03	n >S	—	—	—	—	—	—	—	—
Pentachloroethane	76-01-7	1.1E+02	c	2.2E-01	c	2.2E+01	c	1.6E+02	c	4.8E+03	c	—	—	6.5E+01	c	1.1E-01	c	1.1E+01	c	8.1E+01	c	3.1E+02	c	—	—	—	—
Pentachloronitrobenzene	82-68-8	7.3E+01	c	4.1E+00	c	4.1E+02	c >S	—	—	—	—	—	—	7.3E+01	c	2.1E+00	c	2.1E+02	c >S	—	—	—	—	—	—	—	—
Pentachlorophenol	87-86-5	3.2E+01	c	1.8E-02	m	1.8E+00	m	—	—	—	—	—	—	3.2E+01	c	9.2E-03	m	9.2E-01	m	—	—	—	—	—	—	—	—
Pentadiene, 1,3-cis-	1574-41-0	5.3E+04	n	5.6E+01	n	5.6E+03	n	3.9E+05	n	7.7E+05	n >S	—	—	4.7E+04	n	2.8E+01	n	2.8E+03	n	2.0E+05	n	5.0E+04	n >S	—	—	—	—
Pentadiene, 1,3-trans-	2004-70-8	5.3E+04	n	3.9E+01	n	3.9E+03	n	3.9E+05	n	9.3E+05	n >S	—	—	4.7E+04	n	1.9E+01	n	1.9E+03	n	2.0E+05	n	6.0E+04	n >S	—	—	—	—
Pentaerythritol tetranitrate (PETN)	78-11-5	1.4E+03	n	3.7E+01	n	3.7E+03	n	—	—	—	—	—	—	1.4E+03	n	1.8E+01	n	1.8E+03	n	—	—	—	—	—	—	—	—
Pentane	109-66-0	5.5E+04	n	1.0E+03	n	1.0E+05	n >S	5.2E+05	n	1.1E+05	n >S	—	—	5.0E+04	n	5.2E+02	n	5.2E+04	n >S	2.7E+05	n	7.3E+03	n >S	—	—	—	—
Pentane, 2-methyl-	107-83-5	5.3E+04	n	1.1E+03	n	1.1E+05	n >S	3.9E+05	n	6.4E+05	n >S	—	—	4.7E+04	n	5.7E+02	n	5.7E+04	n >S	2.0E+05	n	4.1E+04	n >S	—	—	—	—
Pentane, 3-methyl-	96-14-0	5.3E+04	n	9.3E+02	n	9.3E+04	n >S	3.9E+05	n	6.6E+05	n >S	—	—	4.7E+04	n	4.7E+02	n	4.7E+04	n >S	2.0E+05	n	4.3E+04	n >S	—	—	—	—
Pentenediol, 1,5-	111-29-5	1.0E+06	n	7.2E+02	n	7.2E+04	n	1.0E+06	n	1.0E+06	n >S	—	—	1.0E+06	n	3.6E+02	n	3.6E+04	n	1.0E+06	n	9.9E+05	n >S	—	—	—	—
Pentanol, 1-	71-41-0	3.4E+04	n	6.8E+00	n	6.8E+02	n	—	—	—	—	—	—	3.4E+04	n	3.4E+00	n	3.4E+02	n	—	—	—	—	—	—	—	—
Pentanol, 4-methyl-2-	108-11-2	2.7E+04	n	5.3E+00	n	5.3E+02	n	—	—	—	—	—	—	2.7E+04	n	2.6E+00	n	2.6E+02	n	—	—	—	—	—	—	—	—
Pentanone, 2-	107-87-9	4.1E+04	n	6.6E+00	n	6.6E+02	n	—	—	—	—	—	—	4.1E+04	n	3.3E+00	n	3.3E+02	n	—	—	—	—	—	—	—	—
Pentene, 2-	109-68-2	5.3E+04	n	1.4E+02	n	1.4E+04	n >S	3.9E+05	n	6.2E+05	n >S	—	—	4.7E+04	n	7.0E+01	n	7.0E+03	n >S	2.0E+05	n	4.0E+04	n >S	—	—	—	—
Pentyne, 1-	627-19-0	5.3E+04	n	3.8E+01	n	3.8E+03	n	3.9E+05	n	8.7E+05	n >S	—	—	4.7E+04	n	1.9E+01	n	1.9E+03	n	2.0E+05	n	5.6E+04	n >S	—	—	—	—
Perchlorate	14797-73-0	5.7E+02	n	4.2E-01	n	4.2E+01	n	—	—	—	—	—	—	5.7E+02	n	2.1E-01	n	2.1E+01	n	—	—	—	—	—	—	—	—
Perfluorooctane sulfonic acid (1-Octanesulfonic acid, heptadecafluoro-1-) [PFOS]	1763-23-1	1.5E+01	n	1.5E-01	n	1.5E+01	n	2.2E+02	n	2.3E+05	n >S	—	—	1.4E+01	n	7.5E-02	n	7.5E+00	n	1.1E+02	n	1.5E+04	n	—	—	—	—
Perfluoroundecanoic acid (Undecanoic acid, uncosafluoro-) [PFUnDA]	2058-94-8	8.2E+00	n	5.5E-02	n	5.5E+00	n	—	—	—	—	—	—	8.2E+00	n	2.7E-02	n	2.7E+00	n	—	—	—	—	—	—	—	—
Perfluoropentanoic acid (Pentanoic acid, nonafluoro-) [PFPeA]	2706-90-3	2.6E+00	n	9.5E-04	n	9.5E-02	n	—	—	—	—	—	—	2.6E+00	n	4.8E-04	n	4.8E-02	n	—	—	—	—	—	—	—	—
Perfluorohexanoic acid (Hexanoic acid, undecafluoro-) [PFHxA]	307-24-4	2.6E+00	n	1.4E-03	n	1.4E-01	n	—	—	—	—	—	—	2.6E+00	n	7.2E-04	n	7.2E-02	n	—	—	—	—	—	—	—	—
Perfluorododecanoic acid (Dodecanoic acid, tricosafuoro-) [PFDoA]	307-55-1	7.5E+00	n	1.0E-01	n	1.0E+01	n >S	9.7E+01	n	8.9E+04	n >S	—	—	7.0E+00	n	5.0E-02	n	5.0E+00	n >S	5.0E+01	n	5.8E+03	n >S	—	—	—	—
Perfluorooctanoic acid (Octanoic acid, pentadecafluoro-) [PFOA]	335-67-1	2.4E+00	n	8.8E-03	n	8.8E-01	n	3.4E+00	n	1.3E+03	n	—	—	1.4E+00	n	4.4E-03	n	4.4E-01	n	1.7E+00	n	8.3E+01	n	—	—	—	—
Perfluorodecanoic acid (Decanoic acid, nonadecafluoro-) [PFDA]	335-76-2	9.4E+00	n	6.7E-02	n	6.7E+00	n	1.2E+02	n	1.1E+05	n >S	—	—	8.8E+00	n	3.3E-02	n	3.3E+00	n	6.2E+01	n	7.1E+03	n >S	—	—	—	—
Perfluorodecane sulfonic acid (1-Decanesulfonic acid, heneicosafuoro-) [PFDS]	335-77-3	8.2E+00	n	1.2E-01	n	1.2E+01	n >S	—	—	—	—	—	—	8.2E+00	n	6.0E-02	n	6.0E+00	n >S	—	—	—	—	—	—	—	—
Perfluorohexane sulfonic acid (1-Hexanesulfonic acid, tridecafluoro-) [PFHxS]	355-46-4	2.2E+00	n	6.1E-03	n	6.1E-01	n	1.6E+01	n	8.8E+03	n >S	—	—	2.0E+00	n	3.0E-03	n	3.0E-01	n	8.2E+00	n	8.7E+02	n	—	—	—	—
Perfluorobutyric acid (Butanoic acid, heptafluoro-) [PFBA]	375-22-4	1.1E+03	n	5.8E-01	n	5.8E+01	n	2.7E+03	n	1.0E+06	n >S	—	—	8.2E+02	n	2.9E-01	n	2.9E+01	n	1.4E+03	n	1.0E+06	n >S	—	—	—	—
Perfluorobutane sulfonic acid (1-Butanesulfonic acid, nonafluoro-) [PFBS]	375-73-5	6.0E+02	n	3.2E-01	n	3.2E+01	n	1.6E+03	n	1.0E+06	n >S	—	—	4.4E+02	n	1.6E-01	n	1.6E+01	n	8.2E+02	n	1.0E+06	n >S	—	—	—	—
Perfluoroheptanoic acid (Heptanoic acid, tridecafluoro-) [PFHpA]	375-85-9	1.6E+01	n	1.4E-02	n	1.4E+00	n	—	—	—	—	—	—	1.6E+01	n	6.8E-03	n	6.8E-01	n	—	—	—	—	—	—	—	—
Perfluorononanoic acid (Nonanoic acid, heptadecafluoro-) [PFNA]	375-95-1	6.1E+00	n	9.2E-03	n	9.2E-01	n	2.4E+01	n	9.5E+03	n >S	—	—	4.9E+00	n	4.6E-03	n	4.6E-01	n	1.2E+01	n	6.2E+02	n >S	—	—	—	—
Perfluorotetradecanoic acid (Tetradecanoic acid, heptacosafuoro-) [PFTeDA]	376-06-7	8.2E+00	n	3.4E-01	n	3.4E+01	n >S	—	—	—	—	—	—	8.2E+00	n	1.7E-01	n	1.7E+01	n >S	—	—	—	—	—	—	—	—
Perfluorotridecanoic acid (Tridecanoic acid, pentacosafuoro-) [PFTriDA]	72629-94-8	8.2E+00	n	1.8E-01	n	1.8E+01	n >S	—	—	—	—	—	—	8.2E+00	n	9.1E-02	n	9.1E+00	n >S	—	—	—	—	—	—	—	—
Perfluorooctane sulfonamide (1-Octanesulfonamide, heptadecafluoro-) [PFOSA]	754-91-6	8.7E-02	n	2.8E+00	n	2.8E+02	n >S	8.8E-02	n	2.3E-01	n	—	—	4.5E-02	n	1.4E+00	n	1.4E+02	n >S	4.5E-02	n	1.5E-02	n	—	—	—	—
Perylene	198-55-0	1.4E+04	n	2.3E+05	n >S	1.0E+06	n >S	—	—	—	—	—	—	1.4E+04	n	1.1E+05	n >S	1.0E+06	n >S	—	—	—	—	—	—	—	—
Phenacetin	62-44-2	5.9E+03	c	2.8E+00	c	2.8E+02	c	1.8E+04	c	1.0E+06	c >S	—	—	4.5E+03	c	1.4E+00	c	1.4E+02	c	9.4E+03	c	3.8E+05	c >S	—	—	—	—
Phenanthrene	85-01-8	1.9E+04	n	1.2E+03	n >S	1.2E+05	n >S	—	—	—	—	—	—	1.9E+04	n	6.2E+02	n >S	6.2E+04	n >S	—	—	—	—	—	—	—	—
Phenanthridine	229-87-8	2.0E+03	n	1.6E+01	n	1.6E+03	n	—	—	—	—	—	—	2.0E+03	n	7.9E+00	n	7.9E+02	n	—	—	—	—	—	—	—	—
Phenol	108-95-2	2.7E+03	n	5.7E+01	n	5.7E+03	n	2.7E+03	n	5.8E+05	n >S	—	—	1.4E+03	n	2.9E+01	n	2.9E+03	n	1.4E+03	n	3.8E+04	n	—	—	—	—
Phenol, 4-tert-butyl-	98-54-4	8.2E+04	n	3.2E+02	n	3.2E+04	n >S	—	—	—	—	—	—	8.2E+04	n	1.6E+02	n	1.6E+04	n >S	—	—	—	—	—	—	—	—
Phenothiazine	92-84-2	7.5E+02	n	2.4E+01	n >S	2.4E+03	n >S	—	—	—	—	—	—	7.5E+02	n	1.2E+01	n >S	1.2E+03	n >S	—	—	—	—	—	—	—	—
Phenyl mercuric acetate	62-38-4	5.5E+01	n	4.9E-02	n	4.9E+00	n	—	—	—	—	—	—	5.5E+01	n	2.4E-02	n	2.4E+00	n	—	—	—	—	—	—	—	—
Phenylene diamine, m-	108-45-2	4.1E+03	n	8.6E-01	n	8.6E+01	n	—	—	—	—	—	—	4.1E+03	n	4.3E-01	n	4.3E+01	n	—	—	—	—	—	—	—	—
Phenylene diamine, p-	106-50-3	1.3E+05	n	2.7E+01	n	2.7E+03	n	—	—	—	—	—	—	1.3E+05	n	1.4E+01	n	1.4E+03	n	—	—	—	—	—	—	—	—

Table 2
Tier 1 Commercial/Industrial Soil PCLs¹

Last Revised: March 1, 2022

Chemical of Concern	CAS	0.5 acre source area										30 acre source area												
		TotSoil _{Comb} ² (mg/kg)	note ³	gWSoil _{mg} (mg/kg)	note ³	gWSoil _{Class 3} (mg/kg)	note ³	Air _{Soil_{10th-V}} ⁴ (mg/kg)	note ³	Air _{GW-Soil_{10th-V}} (mg/kg)	note ³	gWSoil for Secondary MCL (mg/kg)	TotSoil _{Comb} ² (mg/kg)	note ³	gWSoil _{mg} (mg/kg)	note ³	gWSoil _{Class 3} (mg/kg)	note ³	Air _{Soil_{10th-V}} ⁴ (mg/kg)	note ³	Air _{GW-Soil_{10th-V}} (mg/kg)	note ³	gWSoil for Secondary MCL (mg/kg)	
Phorate	298-02-2	1.4E+02	n	3.2E+00	n	3.2E+02	n	—	—	—	—	—	1.4E+02	n	1.6E+00	n	1.6E+02	n	—	—	—	—	—	—
Phosalone	2310-17-0	1.4E+03	n	7.0E+00	n	7.0E+02	n	—	—	—	—	—	1.4E+03	n	3.5E+00	n	3.5E+02	n	—	—	—	—	—	—
Phosdrin (mevinphos)	7786-34-7	1.7E+01	n	3.5E-03	n	3.5E-01	n	—	—	—	—	—	1.7E+01	n	1.8E-03	n	1.8E-01	n	—	—	—	—	—	—
Phosmet	732-11-6	1.4E+04	n	1.2E+01	n	1.2E+03	n	—	—	—	—	—	1.4E+04	n	6.1E+00	n	6.1E+02	n	—	—	—	—	—	—
Phosphine	7803-51-2	6.3E+00	n	—	—	—	—	6.4E+00	n	—	—	—	3.3E+00	n	—	—	—	—	3.3E+00	n	—	—	—	—
Phosphorotrithioic acid, S,S,S-tributyl ester	78-48-8	2.3E+02	c	9.7E+02	c >S	9.7E+04	c >S	—	—	—	—	—	2.3E+02	c	4.8E+02	c >S	4.8E+04	c >S	—	—	—	—	—	—
Phosphorus, total*	7723-14-0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Phosphorus, white	7723-14-0	1.6E+01	n	6.9E-02	n	6.9E+00	n	—	—	—	—	—	1.6E+01	n	3.4E-02	n	3.4E+00	n	—	—	—	—	—	—
Phthalic anhydride	85-44-9	6.6E+04	n	7.4E+02	n	7.4E+04	n >S	7.0E+04	n	1.0E+06	n >S	—	3.5E+04	n	3.7E+02	n	3.7E+04	n >S	3.6E+04	n	1.0E+06	n >S	—	—
Picloram	1918-02-1	4.8E+04	n	9.8E-01	m	9.8E+01	m	—	—	—	—	—	4.8E+04	n	4.9E-01	m	4.9E+01	m	—	—	—	—	—	—
Picoline, 2- (2-methylpyridine)	109-06-8	9.2E+03	n	1.7E+00	n	1.7E+02	n	—	—	—	—	—	9.2E+03	n	8.4E-01	n	8.4E+01	n	—	—	—	—	—	—
Polybrominated biphenyls (PBBs)	67774-32-7	2.1E+00	c	2.0E-02	c	2.0E+00	c >S	—	—	—	—	—	2.1E+00	c	1.0E-02	c	1.0E+00	c >S	—	—	—	—	—	—
Polychlorinated biphenyls (PCBs)	1336-36-3	7.7E+00	c	1.1E+01	m	1.1E+03	m	9.1E+01	c	1.0E+05	c >S	—	7.1E+00	c	5.3E+00	m	5.3E+02	m	4.7E+01	c	6.8E+03	c >S	—	—
Potassium*	7440-09-7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Primene	68955-53-3	4.1E+03	n	1.6E+02	n	1.6E+04	n	—	—	—	—	—	4.1E+03	n	8.1E+01	n	8.1E+03	n	—	—	—	—	—	—
Prometon (pramitol)	1610-18-0	1.0E+04	n	2.9E+01	n	2.9E+03	n >S	—	—	—	—	—	1.0E+04	n	1.4E+01	n	1.4E+03	n >S	—	—	—	—	—	—
Prometryn	7287-19-6	2.7E+04	n	2.9E+02	n	2.9E+04	n >S	—	—	—	—	—	2.7E+04	n	1.5E+02	n	1.5E+04	n >S	—	—	—	—	—	—
Pronamide	23950-58-5	5.1E+04	n	5.4E+01	n	5.4E+03	n >S	—	—	—	—	—	5.1E+04	n	2.7E+01	n	2.7E+03	n >S	—	—	—	—	—	—
Propanal (propionaldehyde)	123-38-6	1.7E+02	n	1.2E+00	n	1.2E+02	n	1.7E+02	n	4.6E+03	n	—	8.7E+01	n	5.9E-01	n	5.9E+01	n	8.8E+01	n	3.0E+02	n	—	—
Propane, 1-bromo-	106-94-5	3.7E+04	n	1.0E+01	n	1.0E+03	n	—	—	—	—	—	3.7E+04	n	5.1E+00	n	5.1E+02	n	—	—	—	—	—	—
Propanil	709-98-8	3.4E+03	n	1.4E+01	n	1.4E+03	n	—	—	—	—	—	3.4E+03	n	6.9E+00	n	6.9E+02	n	—	—	—	—	—	—
Propanoic acid (propionic acid)	79-09-4	5.1E+05	n	7.0E+01	n	7.0E+03	n	—	—	—	—	—	5.1E+05	n	3.5E+01	n	3.5E+03	n	—	—	—	—	—	—
Propanol, 1-	71-23-8	1.0E+06	n	3.0E+02	n	3.0E+04	n	—	—	—	—	—	1.0E+06	n	1.5E+02	n	1.5E+04	n	—	—	—	—	—	—
Propargite	2312-35-8	1.4E+04	n	3.3E+02	n >S	3.3E+04	n >S	—	—	—	—	—	1.4E+04	n	1.6E+02	n >S	1.6E+04	n >S	—	—	—	—	—	—
Propargyl alcohol	107-19-7	2.0E+03	n	3.1E-01	n	3.1E+01	n	—	—	—	—	—	2.0E+03	n	1.6E-01	n	1.6E+01	n	—	—	—	—	—	—
Propazine	139-40-2	4.3E+02	c	2.1E+00	c	2.1E+02	c	—	—	—	—	—	4.3E+02	c	1.1E+00	c	1.1E+02	c	—	—	—	—	—	—
Propham	122-42-9	1.4E+04	n	5.8E+00	n	5.8E+02	n	—	—	—	—	—	1.4E+04	n	2.9E+00	n	2.9E+02	n	—	—	—	—	—	—
Propionitrile (propane nitrile)	107-12-0	4.1E+02	n	5.8E-02	n	5.8E+00	n	—	—	—	—	—	4.1E+02	n	2.9E-02	n	2.9E+00	n	—	—	—	—	—	—
Propyl acetate, n-	109-60-4	9.2E+04	n	1.6E+01	n	1.6E+03	n	—	—	—	—	—	9.2E+04	n	7.9E+00	n	7.9E+02	n	—	—	—	—	—	—
Propylbenzene, n-	103-65-1	7.3E+03	n	1.3E+02	n	1.3E+04	n >S	8.9E+03	n	3.9E+05	n >S	—	4.1E+03	n	6.7E+01	n	6.7E+03	n >S	4.6E+03	n	2.5E+04	n >S	—	—
Propylene glycol	57-55-6	5.1E+02	n	2.8E+03	n	2.8E+05	n >S	5.1E+02	n	1.3E+05	n	—	2.6E+02	n	1.4E+03	n	1.4E+05	n >S	2.6E+02	n	8.7E+03	n	—	—
Propylene glycol monomethyl ether	107-98-2	2.2E+05	n	9.9E+01	n	9.9E+03	n	3.2E+05	n	1.0E+06	n >S	—	1.3E+05	n	5.0E+01	n	5.0E+03	n	1.7E+05	n	9.7E+05	n >S	—	—
Propylene oxide	75-56-9	6.9E+01	c	1.7E-02	c	1.7E+00	c	1.6E+02	c	5.3E+03	c	—	4.9E+01	c	8.4E-03	c	8.4E-01	c	8.4E+01	c	3.4E+02	c	—	—
Propylene tetramer	6842-15-5	1.6E+04	n	7.6E+04	n >S	1.0E+06	n >S	2.1E+04	n	6.4E+05	n >S	—	9.5E+03	n	3.8E+04	n >S	1.0E+06	n >S	1.1E+04	n	4.1E+04	n >S	—	—
Prothiofos (Tokuthion)	34643-46-4	6.8E+01	n	7.2E+03	n >S	7.2E+05	n >S	—	—	—	—	—	6.8E+01	n	3.6E+03	n >S	3.6E+05	n >S	—	—	—	—	—	—
Pyrene	129-00-0	1.9E+04	n	3.3E+03	n >S	3.3E+05	n >S	—	—	—	—	—	1.9E+04	n	1.7E+03	n >S	1.7E+05	n >S	—	—	—	—	—	—
Pyridine	110-86-1	1.0E+03	n	2.1E-01	n	2.1E+01	n	—	—	—	—	—	1.0E+03	n	1.0E-01	n	1.0E+01	n	—	—	—	—	—	—
Quinoline	91-22-5	6.4E+00	c	1.7E-02	c	1.7E+00	c	—	—	—	—	—	6.4E+00	c	8.4E-03	c	8.4E-01	c	—	—	—	—	—	—
Ronnel	299-84-3	3.4E+04	n	1.2E+03	n >S	1.2E+05	n >S	—	—	—	—	—	3.4E+04	n	6.2E+02	n >S	6.2E+04	n >S	—	—	—	—	—	—
Safrole	94-59-7	4.9E+01	c	3.7E-01	c	3.7E+01	c	1.1E+02	c	1.3E+04	c >S	—	3.5E+01	c	1.8E-01	c	1.8E+01	c	5.8E+01	c	8.1E+02	c	—	—
Selenium	7782-49-2	4.9E+03	n	2.3E+00	m >S	2.3E+02	m >S	—	—	—	—	—	4.9E+03	n	1.1E+00	m >S	1.1E+02	m >S	—	—	—	—	—	—
Selenourea	630-10-4	5.1E+03	n	—	—	—	—	—	—	—	—	—	5.1E+03	n	—	—	—	—	—	—	—	—	—	—
Silver	7440-22-4	2.3E+03	n	1.4E+00	n >S	1.4E+02	n >S	—	—	—	—	0.39	2.3E+03	n	7.1E-01	n >S	7.1E+01	n >S	—	—	—	—	—	0.2
Simazine	122-34-9	1.6E+02	c	5.5E-02	m	5.5E+00	m	—	—	—	—	—	1.6E+02	c	2.8E-02	m	2.8E+00	m	—	—	—	—	—	—
Sodium*	7440-23-5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sodium hypochlorite	7681-52-9	1.2E+05	n	—	—	—	—	—	—	—	—	—	9.6E+04	n	—	—	—	—	—	—	—	—	—	—
Sodium polyacrylate	9003-04-7	1.7E+02	n	7.2E+01	n	7.2E+03	n	1.7E+02	n	4.1E+04	n	—	8.7E+01	n	3.6E+01	n	3.6E+03	n	8.7E+01	n	2.7E+03	n	—	—
Strontium	7440-24-6	4.9E+05	n	1.8E+03	n	1.8E+05	n	—	—	—	—	—	4.9E+05	n	9.2E+02	n	9.2E+04	n	—	—	—	—	—	—
Strychnine	57-24-9	2.0E+02	n	1.1E-01	n	1.1E+01	n	—	—	—	—	—	2.0E+02	n	5.6E-02	n	5.6E+00	n	—	—	—	—	—	—
Styrene	100-42-5	1.5E+04	n	3.3E+00	m	3.3E+02	m	1.6E+04	n	6.9E+05	n >S	—	7.8E+03	n	1.6E+00	m	1.6E+02	m	8.1E+03	n	4.5E+04	n >S	—	—

Table 2
Tier 1 Commercial/Industrial Soil PCLs¹

Last Revised: March 1, 2022

Chemical of Concern	CAS	0.5 acre source area										30 acre source area											
		TotSoil _{Comb} ² (mg/kg)	note ³	gWSoil _{mg} (mg/kg)	note ³	gWSoil _{class 3} (mg/kg)	note ³	AirSoil _{1st-h-V} ⁴ (mg/kg)	note ³	AirGW-Soil _{1st-h-V} (mg/kg)	note ³	gWSoil for Secondary MCL (mg/kg)	TotSoil _{Comb} ² (mg/kg)	note ³	gWSoil _{mg} (mg/kg)	note ³	gWSoil _{class 3} (mg/kg)	note ³	AirSoil _{1st-h-V} ⁴ (mg/kg)	note ³	AirGW-Soil _{1st-h-V} (mg/kg)	note ³	gWSoil for Secondary MCL (mg/kg)
Sulfate*	14808-79-8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sulfide*	18496-25-8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sulfolane	126-33-0	1.1E+03	n	1.8E+00	n	1.8E+02	n	1.2E+03	n	3.5E+05	n >S	—	5.8E+02	n	9.1E-01	n	9.1E+01	n	6.2E+02	n	2.2E+04	n >S	—
Sulfur*	7704-34-9	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Sulprofos (Bolstar)	35400-43-2	2.0E+03	n	2.3E+04	n >S	1.0E+06	n >S	—	—	—	—	—	2.0E+03	n	1.1E+04	n >S	1.0E+06	n >S	—	—	—	—	—
Tebuconazole	107534-96-3	2.0E+04	n	9.4E+01	n	9.4E+03	n >S	—	—	—	—	—	2.0E+04	n	4.7E+01	n	4.7E+03	n >S	—	—	—	—	—
Tebuthiuron	34014-18-1	4.8E+04	n	1.6E+01	n	1.6E+03	n	—	—	—	—	—	4.8E+04	n	8.1E+00	n	8.1E+02	n	—	—	—	—	—
Terbufos	13071-79-9	1.7E+01	n	1.0E+00	n	1.0E+02	n	—	—	—	—	—	1.7E+01	n	5.0E-01	n	5.0E+01	n	—	—	—	—	—
Tert-amyl ethyl ether (TAE)	919-94-8	4.1E+04	n	2.8E+01	n	2.8E+03	n	—	—	—	—	—	4.1E+04	n	1.4E+01	n	1.4E+03	n	—	—	—	—	—
Tert-amyl-methyl ether (TAME)	994-05-8	4.1E+04	n	1.1E+01	n	1.1E+03	n	—	—	—	—	—	4.1E+04	n	5.7E+00	n	5.7E+02	n	—	—	—	—	—
Tert-butyl alcohol (2-methyl-2-propanol)	75-65-0	9.2E+04	n	1.4E+01	n	1.4E+03	n	—	—	—	—	—	9.2E+04	n	6.9E+00	n	6.9E+02	n	—	—	—	—	—
Tetrachlorobenzene, 1,2,3,4-	634-66-2	2.0E+02	n	3.6E+01	n	3.6E+03	n	—	—	—	—	—	2.0E+02	n	1.8E+01	n	1.8E+03	n	—	—	—	—	—
Tetrachlorobenzene, 1,2,3,5-	634-90-2	2.0E+02	n	5.6E+00	n	5.6E+02	n	—	—	—	—	—	2.0E+02	n	2.8E+00	n	2.8E+02	n	—	—	—	—	—
Tetrachlorobenzene, 1,2,4,5-	95-94-3	2.0E+02	n	1.4E+00	n	1.4E+02	n >S	—	—	—	—	—	2.0E+02	n	7.2E-01	n	7.2E+01	n >S	—	—	—	—	—
Tetrachloroethane, 1,1,1,2-	630-20-6	1.3E+02	c	3.2E+00	c	3.2E+02	c	1.5E+02	c	7.5E+03	c	—	7.3E+01	c	1.6E+00	c	1.6E+02	c	7.8E+01	c	4.9E+02	c	—
Tetrachloroethane, 1,1,2,2-	79-34-5	1.4E+02	c	5.2E-02	c	5.2E+00	c	—	—	—	—	—	1.4E+02	c	2.6E-02	c	2.6E+00	c	—	—	—	—	—
Tetrachloroethylene [PCE]	127-18-4	1.4E+03	c	5.0E-02	m	5.0E+00	m	1.6E+03	c	8.4E+03	c >S	—	7.7E+02	c	2.5E-02	m	2.5E+00	m	8.1E+02	c	5.4E+02	c	—
Tetrachlorophenol, 2,3,4,5-	4901-51-3	2.0E+04	n	4.4E+01	n	4.4E+03	n	—	—	—	—	—	2.0E+04	n	2.2E+01	n	2.2E+03	n	—	—	—	—	—
Tetrachlorophenol, 2,3,4,6-	58-90-2	2.0E+04	n	1.3E+01	n	1.3E+03	n >S	—	—	—	—	—	2.0E+04	n	6.7E+00	n	6.7E+02	n >S	—	—	—	—	—
Tetrachlorophenol, 2,3,5,6-	935-95-5	2.0E+04	n	6.5E+00	n >S	6.5E+02	n >S	—	—	—	—	—	2.0E+04	n	3.2E+00	n >S	3.2E+02	n >S	—	—	—	—	—
Tetrachlorvinphos (Stirophos)	22248-79-9	2.9E+04	n	7.1E+03	n	7.1E+05	n >S	—	—	—	—	—	2.9E+04	n	3.5E+03	n	3.5E+05	n >S	—	—	—	—	—
Tetradifon	116-29-0	1.4E+04	n	2.6E+02	n >S	2.6E+04	n >S	—	—	—	—	—	1.4E+04	n	1.3E+02	n >S	1.3E+04	n >S	—	—	—	—	—
Tetraethyl dithiopyrophosphate (sulfotep)	3689-24-5	3.4E+02	n	1.2E+00	n	1.2E+02	n	—	—	—	—	—	3.4E+02	n	5.8E-01	n	5.8E+01	n	—	—	—	—	—
Tetraethyl lead	78-00-2	6.8E-02	n	1.5E-03	n	1.5E-01	n	—	—	—	—	—	6.8E-02	n	7.5E-04	n	7.5E-02	n	—	—	—	—	—
Tetraethyl pyrophosphate (TEPP)	107-49-3	7.5E+00	n	2.8E-02	n	2.8E+00	n	—	—	—	—	—	7.5E+00	n	1.4E-02	n	1.4E+00	n	—	—	—	—	—
Tetraethylene glycol	112-60-7	2.2E+05	n	4.6E+01	n	4.6E+03	n	—	—	—	—	—	2.2E+05	n	2.3E+01	n	2.3E+03	n	—	—	—	—	—
Tetrahydrofuran	109-99-9	2.9E+02	c	5.6E-01	c	5.6E+01	c	3.2E+02	c	7.8E+03	c	—	1.6E+02	c	2.8E-01	c	2.8E+01	c	1.6E+02	c	5.0E+02	c	—
Tetrahydrofuran	142-68-7	3.1E+02	c	6.1E-01	c	6.1E+01	c	3.4E+02	c	1.0E+04	c	—	1.7E+02	c	3.0E-01	c	3.0E+01	c	1.7E+02	c	6.5E+02	c	—
Tetraoxadodecane, 2,5,8,11-	112-49-2	1.7E+04	n	5.1E+00	n	5.1E+02	n	—	—	—	—	—	1.7E+04	n	2.6E+00	n	2.6E+02	n	—	—	—	—	—
Thallium	7440-28-0	6.5E+01	n	1.7E+00	m	1.7E+02	m	—	—	—	—	—	6.5E+01	n	8.7E-01	m	8.7E+01	m	—	—	—	—	—
Thiofanox	39196-18-4	2.0E+02	n	9.4E-02	n	9.4E+00	n	—	—	—	—	—	2.0E+02	n	4.7E-02	n	4.7E+00	n	—	—	—	—	—
Thionazin	297-97-2	4.8E+01	n	3.3E-02	n	3.3E+00	n	—	—	—	—	—	4.8E+01	n	1.7E-02	n	1.7E+00	n	—	—	—	—	—
Thiophanate-methyl	23564-05-8	5.5E+04	n	1.3E+01	n >S	1.3E+03	n >S	—	—	—	—	—	5.5E+04	n	6.6E+00	n >S	6.6E+02	n >S	—	—	—	—	—
Thiram	137-26-8	3.4E+03	n	1.0E+01	n	1.0E+03	n >S	—	—	—	—	—	3.4E+03	n	5.2E+00	n	5.2E+02	n >S	—	—	—	—	—
Tin	7440-31-5	4.1E+05	n	1.1E+05	n >S	1.0E+06	n >S	—	—	—	—	—	4.1E+05	n	5.5E+04	n >S	1.0E+06	n >S	—	—	—	—	—
Titanium	7440-32-6	1.0E+06	n	—	—	—	—	—	—	—	—	—	1.0E+06	n	—	—	—	—	—	—	—	—	—
Toluene	108-88-3	4.2E+04	n	8.2E+00	m	8.2E+02	m	8.8E+04	n	7.3E+05	n >S	—	2.9E+04	n	4.1E+00	m	4.1E+02	m	4.5E+04	n	4.7E+04	n >S	—
Toluene diisocyanate, 2,4/2,6-	26471-62-5	2.0E+02	n	—	—	—	—	2.0E+02	n	2.4E+05	n	—	1.0E+02	n	—	—	—	—	1.0E+02	n	1.5E+04	n	—
Toluenediamine, 2,4-	95-80-7	6.0E+00	c	3.4E-02	c	3.4E+00	c	—	—	—	—	—	6.0E+00	c	1.7E-02	c	1.7E+00	c	—	—	—	—	—
Toluenediamine, 2,6-	823-40-5	2.0E+04	n	4.3E+00	n	4.3E+02	n	—	—	—	—	—	2.0E+04	n	2.2E+00	n	2.2E+02	n	—	—	—	—	—
Toluidine, o-	95-53-4	1.1E+02	c	1.3E+00	c	1.3E+02	c	2.3E+02	c	4.5E+04	c	—	7.6E+01	c	6.5E-01	c	6.5E+01	c	1.2E+02	c	2.9E+03	c	—
Toluidine, p-	106-49-0	2.3E+02	c	2.0E-01	c	2.0E+01	c	—	—	—	—	—	2.3E+02	c	9.9E-02	c	9.9E+00	c	—	—	—	—	—
Toxaphene	8001-35-2	1.7E+01	c	1.2E+01	m	1.2E+03	m	1.6E+03	c	1.0E+06	c >S	—	1.7E+01	c	5.8E+00	m	5.8E+02	m	8.3E+02	c	7.5E+05	c >S	—
TPH, TX1005, C6-C12	TPH-1005-1	3.9E+03	n	1.9E+02	n	1.9E+04	n >S	4.3E+03	n	1.6E+05	n >S	—	2.1E+03	n	9.7E+01	n	9.7E+03	n >S	2.2E+03	n	1.1E+04	n >S	—
TPH, TX1005, >C12-C28	TPH-1005-2	1.2E+04	n	5.9E+02	n	5.9E+04	n >S	2.1E+04	n	1.0E+06	n >S	—	7.8E+03	n	3.0E+02	n	3.0E+04	n >S	1.1E+04	n	1.4E+05	n >S	—
TPH, TX1005, >C12-C35	TPH-1005-3	1.2E+04	n	5.9E+02	n	5.9E+04	n >S	2.1E+04	n	1.0E+06	n >S	—	7.8E+03	n	3.0E+02	n	3.0E+04	n >S	1.1E+04	n	1.4E+05	n >S	—
TPH, TX1005, >C28-C35	TPH-1005-4	1.2E+04	n	5.9E+02	n	5.9E+04	n >S	2.1E+04	n	1.0E+06	n >S	—	7.8E+03	n	3.0E+02	n	3.0E+04	n >S	1.1E+04	n	1.4E+05	n >S	—
TP Silvex, 2,4,5-	93-72-1	5.5E+03	n	5.3E+00	m	5.3E+02	m	—	—	—	—	—	5.5E+03	n	2.6E+00	m	2.6E+02	m	—	—	—	—	—
Triademenol	55219-65-3	2.0E+04	n	2.5E+01	n	2.5E+03	n >S	—	—	—	—	—	2.0E+04	n	1.2E+01	n	1.2E+03	n >S	—	—	—	—	—
Triallate	2303-17-5	8.9E+03	n	5.6E+01	n	5.6E+03	n >S	—	—	—	—	—	8.9E+03	n	2.8E+01	n	2.8E+03	n >S	—	—	—	—	—

Table 2
Tier 1 Commercial/Industrial Soil PCLs¹

Last Revised: March 1, 2022

Chemical of Concern	CAS	0.5 acre source area										30 acre source area												
		TotSoil _{Comb} ² (mg/kg)	note ³	gWSoil _{mg} (mg/kg)	note ³	gWSoil _{Class 3} (mg/kg)	note ³	AirSoil _{1st²h-V} ⁴ (mg/kg)	note ³	AirGW-Soil _{1st²h-V} (mg/kg)	note ³	gWsoil for Secondary MCL (mg/kg)	TotSoil _{Comb} ² (mg/kg)	note ³	gWSoil _{mg} (mg/kg)	note ³	gWSoil _{Class 3} (mg/kg)	note ³	AirSoil _{1st²h-V} ⁴ (mg/kg)	note ³	AirGW-Soil _{1st²h-V} (mg/kg)	note ³	gWsoil for Secondary MCL (mg/kg)	
Triaminotrirobenzene (TATB)	3058-38-6	2.0E+03	n	4.6E-01	n	4.6E+01	n	—	—	—	—	—	2.0E+03	n	2.3E-01	n	2.3E+01	n	—	—	—	—	—	—
Tributyltin oxide	56-35-9	2.0E+02	n	—	—	—	—	—	—	—	—	—	2.0E+02	n	—	—	—	—	—	—	—	—	—	—
Trichloro-1,2,2-trifluoroethane, 1,1,2-	76-13-1	1.1E+05	n	2.4E+05	n >S	1.0E+06	n >S	1.1E+05	n	2.3E+05	n >S	—	5.5E+04	n	1.2E+05	n >S	1.0E+06	n >S	5.5E+04	n	1.5E+04	n >S	—	—
Trichlorobenzene, 1,2,3-	87-61-6	3.5E+02	n	7.9E+01	n	7.9E+03	n >S	4.2E+02	n	6.7E+04	n >S	—	2.0E+02	n	3.9E+01	n	3.9E+03	n >S	2.2E+02	n	4.3E+03	n >S	—	—
Trichlorobenzene, 1,2,4-	120-82-1	2.0E+02	n	4.8E+00	m	4.8E+02	m	2.1E+02	n	1.5E+04	n >S	—	1.1E+02	n	2.4E+00	m	2.4E+02	m	1.1E+02	n	9.7E+02	n	—	—
Trichlorobenzene, 1,3,5-	108-70-3	1.6E+02	n	2.2E+01	n	2.2E+03	n >S	1.8E+02	n	1.5E+04	n >S	—	8.7E+01	n	1.1E+01	n	1.1E+03	n >S	9.1E+01	n	9.4E+02	n >S	—	—
Trichloroethane, 1,1,1-	71-55-6	1.0E+05	n	1.6E+00	m	1.6E+02	m	1.1E+05	n	4.6E+05	n >S	—	5.5E+04	n	8.1E-01	m	8.1E+01	m	5.6E+04	n	3.0E+04	n >S	—	—
Trichloroethane, 1,1,2-	79-00-5	3.5E+01	c	2.0E-02	m	2.0E+00	m	3.8E+01	c	5.4E+02	c	—	1.9E+01	c	1.0E-02	m	1.0E+00	m	1.9E+01	c	3.5E+01	c	—	—
Trichloroethylene [TCE]	79-01-6	4.0E+01	n	3.4E-02	m	3.4E+00	m	4.3E+01	n	2.2E+02	n	—	2.1E+01	n	1.7E-02	m	1.7E+00	m	2.2E+01	n	1.4E+01	n	—	—
Trichlorofluoromethane	75-69-4	3.1E+05	n	3.8E+02	n	3.8E+04	n >S	—	—	—	—	—	3.1E+05	n	1.9E+02	n	1.9E+04	n >S	—	—	—	—	—	—
Trichloronate	327-98-0	2.0E+03	n	3.7E-02	n	3.7E+04	n >S	—	—	—	—	—	2.0E+03	n	1.8E+02	n	1.8E+04	n >S	—	—	—	—	—	—
Trichlorophenol, 2,3,4-	15950-66-0	6.8E+04	n	1.8E+02	n	1.8E+04	n	—	—	—	—	—	6.8E+04	n	8.9E+01	n	8.9E+03	n	—	—	—	—	—	—
Trichlorophenol, 2,3,5-	933-78-8	6.8E+04	n	8.3E+01	n	8.3E+03	n	—	—	—	—	—	6.8E+04	n	4.1E+01	n	4.1E+03	n	—	—	—	—	—	—
Trichlorophenol, 2,3,6-	933-75-5	6.8E+04	n	8.6E+01	n	8.6E+03	n >S	—	—	—	—	—	6.8E+04	n	4.3E+01	n	4.3E+03	n >S	—	—	—	—	—	—
Trichlorophenol, 2,4,5-	95-95-4	6.8E+04	n	1.0E+02	n	1.0E+04	n	—	—	—	—	—	6.8E+04	n	5.1E+01	n	5.1E+03	n	—	—	—	—	—	—
Trichlorophenol, 2,4,6-	88-06-2	6.8E+02	n	5.2E-01	n	5.2E+01	n	3.3E+03	c	5.9E+05	c >S	—	6.8E+02	n	2.6E-01	n	2.6E+01	n	1.7E+03	c	3.8E+04	c >S	—	—
Trichlorophenol, 3,4,5-	609-19-8	6.8E+04	n	9.8E+02	n	9.8E+04	n	—	—	—	—	—	6.8E+04	n	4.9E+02	n	4.9E+04	n	—	—	—	—	—	—
Trichlorophenoxyacetic acid, 2,4,5-	93-76-5	6.8E+03	n	2.9E+00	n	2.9E+02	n	—	—	—	—	—	6.8E+03	n	1.5E+00	n	1.5E+02	n	—	—	—	—	—	—
Trichloropropane, 1,1,2-	598-77-6	6.4E+00	n	4.3E+00	n	4.3E+02	n	6.4E+00	n	4.5E+01	n	—	3.3E+00	n	2.2E+00	n	2.2E+02	n	3.3E+00	n	2.9E+00	n	—	—
Trichloropropane, 1,2,3-	96-18-4	9.5E-01	c	1.2E-03	c	1.2E-01	c	2.0E+01	n	7.9E+02	n	—	9.5E-01	c	6.0E-04	c	6.0E-02	c	1.0E+01	n	5.1E+01	n	—	—
Triethanolamine	102-71-6	5.2E+03	n	2.8E+01	n	2.8E+03	n	5.4E+03	n	1.0E+06	n	—	2.7E+03	n	1.4E+01	n	1.4E+03	n	2.8E+03	n	9.6E+05	n	—	—
Triethylamine	121-44-8	1.5E+02	n	—	—	—	—	1.5E+02	n	2.2E+03	n	—	7.7E+01	n	—	—	—	—	7.7E+01	n	1.4E+02	n	—	—
Triethylene glycol	112-27-6	1.0E+06	n	2.8E+02	n	2.8E+04	n	—	—	—	—	—	1.0E+06	n	1.4E+02	n	1.4E+04	n	—	—	—	—	—	—
Triethylphosphorothioate, O, O, O-	126-68-1	5.7E+00	n	1.3E-02	n	1.3E+00	n	—	—	—	—	—	5.7E+00	n	6.5E-03	n	6.5E-01	n	—	—	—	—	—	—
Trifluralin	1582-09-8	2.5E+03	c	1.5E+02	c	1.5E+04	c >S	—	—	—	—	—	2.5E+03	c	7.3E+01	c	7.3E+03	c >S	—	—	—	—	—	—
Trimethylamine	75-50-3	2.1E+02	n	—	—	—	—	2.1E+02	n	6.1E+03	n	—	1.1E+02	n	—	—	—	—	1.1E+02	n	3.9E+02	n	—	—
Trimethylbenzene, 1,2,3-	526-73-8	4.4E+03	n	6.4E+01	n	6.4E+03	n >S	5.1E+03	n	2.0E+05	n >S	—	2.4E+03	n	3.2E+01	n	3.2E+03	n >S	2.6E+03	n	1.3E+04	n >S	—	—
Trimethylbenzene, 1,2,4-	95-63-6	4.9E+03	n	9.9E+01	n	9.9E+03	n >S	5.6E+03	n	2.7E+05	n >S	—	2.7E+03	n	4.9E+01	n	4.9E+03	n >S	2.9E+03	n	1.8E+04	n >S	—	—
Trimethylbenzene, 1,3,5-	108-67-8	4.3E+03	n	1.1E+02	n	1.1E+04	n >S	4.9E+03	n	2.3E+05	n >S	—	2.3E+03	n	5.4E+01	n	5.4E+03	n >S	2.5E+03	n	1.5E+04	n >S	—	—
Trinitrobenzene, 1,3,5-	99-35-4	2.0E+04	n	5.4E+00	n	5.4E+02	n	—	—	—	—	—	2.0E+04	n	2.7E+00	n	2.7E+02	n	—	—	—	—	—	—
Trinitrophenylmethylnitramine (tetryl; nitramine)	479-45-8	1.6E+03	n	1.6E+00	n	1.6E+02	n	—	—	—	—	—	1.6E+03	n	8.2E-01	n	8.2E+01	n	—	—	—	—	—	—
Trinitrotoluene, 2,4,6-	118-96-7	3.4E+02	n	5.1E-01	n	5.1E+01	n	—	—	—	—	—	3.4E+02	n	2.6E-01	n	2.6E+01	n	—	—	—	—	—	—
Tungsten (as sodium tungstate dihydride)	7440-33-7	8.2E+02	n	2.4E+02	n	2.4E+04	n	—	—	—	—	—	8.2E+02	n	1.2E+02	n	1.2E+04	n	—	—	—	—	—	—
Uranium (soluble salts)	7440-61-1	2.8E+03	n	1.8E+03	m >S	1.8E+05	m >S	—	—	—	—	—	2.6E+03	n	8.9E+02	m >S	8.9E+04	m >S	—	—	—	—	—	—
Valeric acid (pentanoic acid)	109-52-4	1.8E+02	n	7.0E+01	n >S	7.0E+03	n >S	1.8E+02	n	5.3E+04	n >S	—	9.5E+01	n	3.5E+01	n >S	3.5E+03	n >S	9.5E+01	n	3.4E+03	n >S	—	—
Vanadium	7440-62-2	6.2E+02	n	2.6E+03	n >S	2.6E+05	n >S	—	—	—	—	—	6.1E+02	n	1.3E+03	n >S	1.3E+05	n >S	—	—	—	—	—	—
Vernam	1929-77-7	6.8E+02	n	8.2E+00	n	8.2E+02	n	—	—	—	—	—	6.8E+02	n	4.1E+00	n	4.1E+02	n	—	—	—	—	—	—
Vinyl acetate	108-05-4	4.3E+03	n	1.6E+02	n	1.6E+04	n	4.3E+03	n	4.3E+04	n	—	2.2E+03	n	8.0E+01	n	8.0E+03	n	2.2E+03	n	2.8E+03	n	—	—
Vinyl chloride	75-01-4	1.5E+01	c	2.2E-02	m	2.2E+00	m	7.2E+01	c	7.1E+01	c	—	1.3E+01	c	1.1E-02	m	1.1E+00	m	3.7E+01	c	4.6E+00	c	—	—
Vinylcyclohexane	695-12-5	5.1E+05	n	4.2E+03	n >S	4.2E+05	n >S	—	—	—	—	—	5.1E+05	n	2.1E+03	n >S	2.1E+05	n >S	—	—	—	—	—	—
Warfarin	81-81-2	2.0E+02	n	8.4E-01	n	8.4E+01	n	—	—	—	—	—	2.0E+02	n	4.2E-01	n	4.2E+01	n	—	—	—	—	—	—
Xylene, m-	108-38-3	1.3E+04	n	1.1E+02	m	1.1E+04	m >S	1.3E+04	n	1.6E+05	n >S	—	6.7E+03	n	5.3E+01	m	5.3E+03	m >S	6.7E+03	n	1.0E+04	n >S	—	—
Xylene, o-	95-47-6	9.1E+04	n	7.1E+01	m	7.1E+03	m >S	9.5E+04	n	1.0E+06	n >S	—	4.8E+04	n	3.5E+01	m	3.5E+03	m >S	4.9E+04	n	4.9E+05	n >S	—	—
Xylene, p-	106-42-3	1.3E+04	n	1.5E+02	m	1.5E+04	m >S	1.3E+04	n	2.0E+05	n >S	—	6.7E+03	n	7.5E+01	m	7.5E+03	m >S	6.7E+03	n	1.3E+04	n >S	—	—
Xylenes	1330-20-7	1.2E+04	n	1.2E+02	m	1.2E+04	m >S	1.3E+04	n	1.8E+05	n >S	—	6.5E+03	n	6.1E+01	m	6.1E+03	m >S	6.7E+03	n	1.1E+04	n >S	—	—
Zinc	7440-66-6	2.5E+05	n	7.0E+03	n >S	7.0E+05	n >S	—	—	—	—	1600	2.5E+05	n	3.5E+03	n >S	3.5E+05	n >S	—	—	—	—	800	—
6 C aliphatics (TPH) (>53% n-hexane content)	NA	1.2E+04	n	5.1E+02	n	5.1E+04	n >S	1.4E+04	n	1.7E+04	n >S	—	6.6E+03	n	2.6E+02	n	2.6E+04	n >S	7.4E+03	n	1.1E+03	n	—	—
6 C aliphatics (TPH) (<53% n-hexane content)	NA	5.3E+04	n	5.1E+02	n	5.1E+04	n >S	4.0E+05	n	4.8E+05	n >S	—	4.7E+04	n										

Table 2
Tier 1 Commercial/Industrial Soil PCLs¹

Last Revised: March 1, 2022

Chemical of Concern	CAS	0.5 acre source area										30 acre source area											
		TotSoil _{Comb} ² (mg/kg)		GWSoil _{Ing} (mg/kg)		GWSoil _{Class 3} (mg/kg)		AirSoil _{Inh-V} ⁴ (mg/kg)		AirGW-Soil _{Inh-V} (mg/kg)		GWSoil for Secondary MCL (mg/kg)		TotSoil _{Comb} ² (mg/kg)		GWSoil _{Ing} (mg/kg)		GWSoil _{Class 3} (mg/kg)		AirSoil _{Inh-V} ⁴ (mg/kg)		AirGW-Soil _{Inh-V} (mg/kg)	
>8-10 C aliphatics (TPH)	NA	9.7E+03	n	1.1E+04	n >S	1.0E+06	n >S	1.1E+04	n	6.8E+04	n >S	—	5.2E+03	n	5.4E+03	n >S	5.4E+05	n >S	5.5E+03	n	4.4E+03	n >S	—
>10-12 C aliphatics (TPH)	NA	9.3E+03	n	7.6E+04	n >S	1.0E+06	n >S	1.1E+04	n	3.2E+05	n >S	—	5.1E+03	n	3.8E+04	n >S	1.0E+06	n >S	5.5E+03	n	2.1E+04	n >S	—
>12-16 C aliphatics (TPH)	NA	1.4E+04	n	1.0E+06	n >S	1.0E+06	n >S	1.7E+04	n	1.0E+06	n >S	—	7.7E+03	n	7.4E+05	n >S	1.0E+06	n >S	8.7E+03	n	9.3E+04	n >S	—
>16-21 C aliphatics (TPH)	NA	1.0E+06	n	1.0E+06	n >S	1.0E+06	n >S	—	—	—	—	—	1.0E+06	n	1.0E+06	n >S	1.0E+06	n >S	—	—	—	—	—
>16-21 C aliphatics (TPH) (for transformer mineral oil releases only)	NA	1.0E+06	n	1.0E+06	n >S	1.0E+06	n >S	—	—	—	—	—	1.0E+06	n	1.0E+06	n >S	1.0E+06	n >S	—	—	—	—	—
>21-35 C aliphatics (TPH)	NA	1.0E+06	n	1.0E+06	n >S	1.0E+06	n >S	—	—	—	—	—	1.0E+06	n	1.0E+06	n >S	1.0E+06	n >S	—	—	—	—	—
>21-35 C aliphatics (TPH) (for transformer mineral oil releases only)	NA	1.0E+06	n	1.0E+06	n >S	1.0E+06	n >S	—	—	—	—	—	1.0E+06	n	1.0E+06	n >S	1.0E+06	n >S	—	—	—	—	—
>7-8 C aromatics (TPH)	NA	2.9E+04	n	6.0E+01	n	6.0E+03	n >S	4.1E+04	n	3.4E+05	n >S	—	1.7E+04	n	3.0E+01	n	3.0E+03	n >S	2.1E+04	n	2.2E+04	n >S	—
>8-10 C aromatics (TPH)	NA	3.9E+03	n	1.9E+02	n	1.9E+04	n >S	4.3E+03	n	1.6E+05	n >S	—	2.1E+03	n	9.7E+01	n	9.7E+03	n >S	2.2E+03	n	1.1E+04	n >S	—
>10-12 C aromatics (TPH)	NA	6.9E+03	n	3.0E+02	n	3.0E+04	n >S	9.2E+03	n	6.1E+05	n >S	—	4.0E+03	n	1.5E+02	n	1.5E+04	n >S	4.8E+03	n	4.0E+04	n >S	—
>12-16 C aromatics (TPH)	NA	1.2E+04	n	5.9E+02	n	5.9E+04	n >S	2.1E+04	n	1.0E+06	n >S	—	7.8E+03	n	3.0E+02	n	3.0E+04	n >S	1.1E+04	n	1.4E+05	n >S	—
>16-21 C aromatics (TPH)	NA	2.0E+04	n	1.4E+03	n >S	1.4E+05	n >S	—	—	—	—	—	2.0E+04	n	7.0E+02	n >S	7.0E+04	n >S	—	—	—	—	—
>21-35 C aromatics (TPH)	NA	2.0E+04	n	1.1E+04	n >S	1.0E+06	n >S	—	—	—	—	—	2.0E+04	n	5.5E+03	n >S	5.5E+05	n >S	—	—	—	—	—
Transformer Mineral Oil	NA	8.0E+04	n	7.5E+05	n	1.0E+06	n	1.2E+05	n	1.0E+06	n	—	5.2E+04	n	3.7E+05	n	1.0E+06	n	6.1E+04	n	8.6E+05	n	—
Footnotes																							
1 In accordance with §350.72(b), when establishing Tier 1 PCLs for individual COCs for each of the individual and combined human health exposure pathways, the person must evaluate whether the PCLs need to be adjusted to lower concentrations to meet the cumulative carcinogenic risk level and hazard index criteria specified in §350.72(c). Chemicals which exhibit both carcinogenic and noncarcinogenic characteristics, they shall be evaluated as both a carcinogen and noncarcinogen when determining whether the PCL established for an individual COC for each of the individual and combined human health exposure pathways needs to be adjusted to a lower concentration to meet both cumulative risk and hazard criteria. The person shall then use the lower of the carcinogenic or noncarcinogenic PCL as the Tier 1 human health PCL. In other words, the Tier 1 PCLs provided in this table for an individual COC should not be used as the final Tier 1 human health PCL for any of the individual or combined exposure pathways in cases where there are more than 10 carcinogenic and/or more than 10 noncarcinogenic COCs within a source medium unless it can be demonstrated that further downward adjustment is not necessary to meet the cumulative risk and hazard criteria.																							
2 Combined includes inhalation; ingestion; dermal pathways																							
3 c = carcinogenic; n = noncarcinogenic; m = primary MCL-based; e = EPA Action Level-based; > S = solubility limit exceeded during calculation																							
4 For subsurface soils only																							
5 Site-specific PCLs for mercury may vary based on the pH-dependent Kd value (see Figure:30 TAC §350.73(f)(1)(C)).																							
6 Persons must use the value provided in the "GWSoil for Secondary MCL" column of this table as the "GWSoil PCL for MTBE if the conditions described in §350.74(f)(3) exist.																							
7 Please see the note on nitrate/nitrite in the "List of Updates" spreadsheet for March 31, 2017.																							
8 This chemical is one of four chemicals that make up total trihalomethanes (TTHMs). USEPA has established an MCL for TTHMs of 0.08 mg/L. Each individual chemical that contributes to TTHMs must meet the 0.08 mg/L based GWSoil _{Ing} PCL, and the person must ensure that the total soil concentrations for all four will not impact groundwater above the GWGW _{Ing} based MCL.																							
9 Nitrate, nitrite, and ammonia are inorganic anions that are mobile in most environmental situations, quickly partitioning from soil to groundwater. Due to these partitioning characteristics it is difficult to calculate a reliable soil-water partition coefficient (Kd) and Henry's law constant (H') for these compounds. The Kd and H' are parameters that are required to calculate the GWSoil _{Ing} PCL in accordance with 30 TAC 350.75(b)(1) using the Tier 1 GWSoil _{Ing} PCL equation.																							
* These compounds are not necessarily of concern from a human health standpoint, therefore calculation of human health-based values is not required. However, aesthetics and ecological criteria would still apply. See table entitled "Compounds for which Calculation of a Human Health PCL is Not Required" available on the TCEQ website at http://www.tceq.state.tx.us/remediation/trrp/trrp.html.																							
NA=Not applicable																							
All values capped at 1.0E+06																							

Footnotes

- 1** In accordance with §350.72(b), when establishing Tier 1 PCLs for individual COCs for each of the individual and combined human health exposure pathways, the person must evaluate whether the PCLs need to be adjusted to lower concentrations to meet the cumulative carcinogenic risk level and hazard index criteria specified in §350.72(c). For COCs which exhibit both carcinogenic and noncarcinogenic characteristics, they shall be evaluated as both a carcinogen and noncarcinogen when determining whether the PCL established for an individual COC for each of the individual and combined human health exposure pathways needs to be adjusted to a lower concentration to meet the cumulative risk and hazard criteria. The person shall then use the lower of the carcinogenic or noncarcinogenic PCL as the Tier 1 human health PCL. In other words, the Tier 1 PCLs provided in this table for an individual COC should not be used as the final Tier 1 human health PCL for any of the individual or combined exposure pathways in cases where there are more than 10 carcinogenic and/or more than 10 noncarcinogenic COCs within a source medium unless it can be demonstrated that further downward adjustment is not necessary to meet the cumulative risk and hazard criteria.
- 2** Combined includes inhalation; ingestion; dermal pathways
- 3** c = carcinogenic; n = noncarcinogenic; m = primary MCL-based; e = EPA Action Level-based; > S = solubility limit exceeded during calculation
- 4** For subsurface soils only
- 5** Site-specific PCLs for mercury may vary based on the pH-dependent Kd value (see Figure:30 TAC §350.73(f)(1)(C)).
- 6** Persons must use the value provided in the "GWSoil for Secondary MCL" column of this table as the GWSoil PCL for MTBE if the conditions described in §350.74(f)(3) exist.
- 7** Please see the note on nitrate/nitrite in the "List of Updates" spreadsheet for March 31, 2017.
- 8** This chemical is one of four chemicals that make up total trihalomethanes (TTHMs). USEPA has established an MCL for TTHMs of 0.08 mg/L. Each individual chemical that contributes to TTHMs must meet the 0.08 mg/L based GWSoil_{Ing} PCL, and the person must ensure that the total soil concentrations for all four will not impact groundwater above the GWSoil_{Ing} based MCL.
- 9** Nitrate, nitrite, and ammonia are inorganic anions that are mobile in most environmental situations, quickly partitioning from soil to groundwater. Due to these partitioning characteristics it is difficult to calculate a reliable soil-water partition coefficient (Kd) and Henry's law constant (H') for these compounds. The Kd and H' are parameters that are required to calculate the GWSoil_{Ing} PCL in accordance with 30 TAC 350.75(b)(1) using the Tier 1 GWSoil_{Ing} PCL equation.
- *** These compounds are not necessarily of concern from a human health standpoint, therefore calculation of human health-based values is not required. However, aesthetics and ecological criteria would still apply. See table entitled "Compounds for which Calculation of a Human Health PCL is Not Required" available on the TCEQ website at <http://www.tceq.state.tx.us/remediation/trrp/trrp.html>.
- NA=Not applicable

All values capped at 1.0E+06

This table shows the commercial/industrial protective concentration levels for 0.5 and 30 acre source areas

end of worksheet

Table 3
Tier 1 Groundwater PCLs - Residential and Commercial/Industrial¹

Last Revised: March 1, 2022

Chemical of Concern	CAS	Residential								Commercial/Industrial								Secondary MCL ⁹ (mg/L)
		GW _{Ing} ² (mg/L) note ⁴		GW _{Class3} ³ (mg/L) note ⁴		AirGW _{Inh-V} 0.5 acre source area (mg/L) note ⁴		AirGW _{Inh-V} 30 acre source area (mg/L) note ⁴		GW _{Ing} ² (mg/L) note ⁴		GW _{Class3} ³ (mg/L) note ⁴		AirGW _{Inh-V} 0.5 acre source area (mg/L) note ⁴		AirGW _{Inh-V} 30 acre source area (mg/L) note ⁴		
Acenaphthene	83-32-9	1.5E+00	n	1.5E+02	n >S	—	—	—	—	4.4E+00	n >S	4.4E+02	n >S	—	—	—	—	—
Acenaphthylene	208-96-8	1.5E+00	n	1.5E+02	n >S	—	—	—	—	4.4E+00	n >S	4.4E+02	n >S	—	—	—	—	—
Acetaldehyde	75-07-0	2.4E+00	n	2.4E+02	n	2.4E+03	n	3.1E+02	n	7.3E+00	n	7.3E+02	n	3.3E+03	n	4.3E+02	n	—
Acetate, 2-ethoxyethanol	111-15-9	2.4E+00	n	2.4E+02	n	4.5E+05	n >S	5.8E+04	n	7.3E+00	n	7.3E+02	n	6.3E+05	n >S	8.1E+04	n	—
Acetate, isoamyl	123-92-2	1.8E+00	n	1.8E+02	n	—	—	—	—	5.3E+00	n	5.3E+02	n	—	—	—	—	—
Acetate, isobutyl	110-19-0	1.2E+00	n	1.2E+02	n	—	—	—	—	3.5E+00	n	3.5E+02	n	—	—	—	—	—
Acetate, sec-butyl	105-46-4	1.2E+00	n	1.2E+02	n	—	—	—	—	3.5E+00	n	3.5E+02	n	—	—	—	—	—
Acetic acid*	64-19-7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Acetone (2-propanone)	67-64-1	2.2E+01	n	2.2E+03	n	1.0E+06	n >S	1.0E+06	n >S	6.6E+01	n	6.6E+03	n	1.0E+06	n >S	1.0E+06	n >S	—
Acetone cyanohydrin	75-86-5	7.3E-02	n	7.3E+00	n	3.4E+05	n	4.4E+04	n	2.2E-01	n	2.2E+01	n	4.8E+05	n	6.2E+04	n	—
Acetonitrile	75-05-8	7.8E-01	n	7.8E+01	n	3.2E+04	n	4.2E+03	n	2.3E+00	n	2.3E+02	n	4.5E+04	n	5.8E+03	n	—
Acetophenone	98-86-2	2.4E+00	n	2.4E+02	n	—	—	—	—	7.3E+00	n	7.3E+02	n	—	—	—	—	—
Acetylaminofluorene, 2-	53-96-3	2.4E+04	c	2.4E-02	c	6.3E+02	c >S	1.0E+02	c >S	5.4E-04	c	5.4E-02	c	1.1E+03	c >S	1.8E+02	c >S	—
Acifluorfen, sodium	62476-59-9	3.2E-01	n	3.2E+01	n	—	—	—	—	9.5E-01	n	9.5E+01	n	—	—	—	—	—
Acridine	260-94-6	7.3E-02	n	7.3E+00	n	—	—	—	—	2.2E-01	n	2.2E+01	n	—	—	—	—	—
Acrolein	107-02-8	1.2E-02	n	1.2E+00	n	9.5E+03	n	1.2E+03	n	3.7E-02	n	3.7E+00	n	1.3E+04	n	1.7E+03	n	—
Acrylamide	79-06-1	1.8E-03	c	1.8E-01	c	3.8E+03	c	5.0E+02	c	4.1E-03	c	4.1E-01	c	6.3E+03	c	8.4E+02	c	—
Acrylic acid	79-10-7	1.2E+01	n	1.2E+03	n	1.5E+04	n	2.0E+03	n	3.7E+01	n	3.7E+03	n	2.1E+04	n	2.7E+03	n	—
Acrylonitrile	107-13-1	1.7E-03	c	1.7E-01	c	5.8E+01	c	7.5E+00	c	3.8E-03	c	3.8E-01	c	9.7E+01	c	1.3E+01	c	—
Adipic acid (hexanedioic acid)	124-04-9	4.9E+01	n	4.9E+03	n	—	—	—	—	1.5E+02	n	1.5E+04	n	—	—	—	—	—
Alachlor	15972-60-8	2.0E-03	m	2.0E-01	m	—	—	—	—	2.0E-03	m	2.0E-01	m	—	—	—	—	—
Aldicarb	116-06-3	7.0E-03	m	7.0E-01	m	—	—	—	—	7.0E-03	m	7.0E-01	m	—	—	—	—	—
Aldicarb sulfone	1646-88-4	7.0E-03	m	7.0E-01	m	—	—	—	—	7.0E-03	m	7.0E-01	m	—	—	—	—	—
Aldrin	309-00-2	5.4E-05	c	5.4E-03	c	4.4E+00	c >S	5.7E-01	c >S	1.2E-04	c	1.2E-02	c	7.4E+00	c >S	9.6E-01	c >S	—
Allyl alcohol	107-18-6	1.2E-01	n	1.2E+01	n	3.0E+02	n	3.8E+01	n	3.7E-01	n	3.7E+01	n	4.1E+02	n	5.4E+01	n	—
Allyl chloride	107-05-1	2.4E-01	n	2.4E+01	n	9.1E+00	n	1.2E+00	n	7.3E-01	n	7.3E+01	n	1.3E+01	n	1.7E+00	n	—
Aluminum	7429-90-5	2.4E+01	n >S	2.4E+03	n >S	—	—	—	—	7.3E+01	n >S	7.3E+03	n >S	—	—	—	—	0.2
Ametryn	834-12-8	2.2E-01	n	2.2E+01	n	—	—	—	—	6.6E-01	n	6.6E+01	n	—	—	—	—	—
Amino-2,6-dinitrotoluene, 4-	19406-51-0	1.2E-02	n	1.2E+00	n	—	—	—	—	3.7E-02	n	3.7E+00	n	—	—	—	—	—
Amino-4,6-dinitrotoluene, 2-	35572-78-2	1.2E-02	n	1.2E+00	n	—	—	—	—	3.7E-02	n	3.7E+00	n	—	—	—	—	—
Aminobiphenyl, 4- (1,1-biphenyl-4-amine)	92-67-1	1.5E-04	c	1.5E-02	c	—	—	—	—	3.4E-04	c	3.4E-02	c	—	—	—	—	—
Aminopyridine, 4-	504-24-5	4.9E-04	n	4.9E-02	n	—	—	—	—	1.5E-03	n	1.5E-01	n	—	—	—	—	—
Ammonia ⁵	7664-41-7	—	—	—	—	8.7E+03	n	1.1E+03	n	—	—	—	—	1.2E+04	n	1.6E+03	n	1.5
Ammonium polyphosphate*	6833-79-9	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Ammonium salts*	AMMONIUM	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Aniline	62-53-3	1.6E-01	c	1.6E+01	c	1.1E+04	n	1.4E+03	n	3.6E-01	c	3.6E+01	c	1.6E+04	n	2.0E+03	n	—
Anthracene	120-12-7	7.3E+00	n >S	7.3E+02	n >S	—	—	—	—	2.2E+01	n >S	2.2E+03	n >S	—	—	—	—	—
Anthraquinone, 9,10-	84-65-1	2.3E-02	c	2.3E+00	c >S	—	—	—	—	5.2E-02	c	5.2E+00	c >S	—	—	—	—	—
Antimony	7440-36-0	6.0E-03	m >S	6.0E-01	m >S	—	—	—	—	6.0E-03	m >S	6.0E-01	m >S	—	—	—	—	—
Aramite	140-57-8	3.7E-02	c	3.7E+00	c	—	—	—	—	8.2E-02	c	8.2E+00	c	—	—	—	—	—
Arsenic	7440-38-2	1.0E-02	m >S	1.0E+00	m >S	—	—	—	—	1.0E-02	m >S	1.0E+00	m >S	—	—	—	—	—
Arsine	7784-42-1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Table 3
Tier 1 Groundwater PCLs - Residential and Commercial/Industrial¹

Last Revised: March 1, 2022

Chemical of Concern	CAS	Residential								Commercial/Industrial								Secondary MCL ⁵ (mg/L)
		GW _{Ing} ² (mg/L)	note ⁴	GW _{Class3} ³ (mg/L)	note ⁴	AirGW _{Inh-V} 0.5 acre source area (mg/L)	note ⁴	AirGW _{Inh-V} 30 acre source area (mg/L)	note ⁴	GW _{Ing} ² (mg/L)	note ⁴	GW _{Class3} ³ (mg/L)	note ⁴	AirGW _{Inh-V} 0.5 acre source area (mg/L)	note ⁴	AirGW _{Inh-V} 30 acre source area (mg/L)	note ⁴	
Atrazine	1912-24-9	3.0E-03	m	3.0E-01	m	—	—	—	—	3.0E-03	m	3.0E-01	m	—	—	—	—	—
Azinphos-methyl (guthion)	86-50-0	3.7E-02	n	3.7E+00	n >S	—	—	—	—	1.1E-01	n >S	1.1E+01	n >S	—	—	—	—	—
Azobenzene	103-33-3	8.3E-03	c	8.3E-01	c	6.8E+02	c >S	8.8E+01	c >S	1.9E-02	c	1.9E+00	c >S	1.1E+03	c >S	1.5E+02	c >S	—
Barium	7440-39-3	2.0E+00	m >S	2.0E+02	m >S	—	—	—	—	2.0E+00	m >S	2.0E+02	m >S	—	—	—	—	—
Bayleton	43121-43-3	7.3E-01	n	7.3E+01	n >S	—	—	—	—	2.2E+00	n	2.2E+02	n >S	—	—	—	—	—
Benefin (benfluralin)	1861-40-1	7.3E+00	n >S	7.3E+02	n >S	—	—	—	—	2.2E+01	n >S	2.2E+03	n >S	—	—	—	—	—
Benomyl	17804-35-2	1.2E+00	n	1.2E+02	n >S	—	—	—	—	3.7E+00	n >S	3.7E+02	n >S	—	—	—	—	—
Benzo-a-anthracene	56-55-3	9.1E-03	c	9.1E-01	c >S	3.0E+03	c >S	3.9E+02	c >S	2.0E-02	c >S	2.0E+00	c >S	5.0E+03	c >S	6.5E+02	c >S	—
Benzaldehyde	100-52-7	2.4E+00	n	2.4E+02	n	—	—	—	—	7.3E+00	n	7.3E+02	n	—	—	—	—	—
Benzene	71-43-2	5.0E-03	m	5.0E-01	m	1.8E+02	c	2.3E+01	c	5.0E-03	m	5.0E-01	m	3.0E+02	c	3.9E+01	c	—
Benzenediacetonitrile, 1,3-	626-17-5	1.5E-01	n	1.5E+01	n	—	—	—	—	4.4E-01	n	4.4E+01	n	—	—	—	—	—
Benzenedicarboxylic acid, 1,2-disodecyl ester	26761-40-0	9.8E-01	n >S	9.8E+01	n >S	1.5E+05	n >S	1.9E+04	n >S	2.9E+00	n >S	2.9E+02	n >S	2.0E+05	n >S	2.6E+04	n >S	—
Benzenethiol	108-98-5	2.4E-02	n	2.4E+00	n	—	—	—	—	7.3E-02	n	7.3E+00	n	—	—	—	—	—
Benzidine	92-87-5	4.0E-06	c	4.0E-04	c	5.0E+00	c	8.4E-01	c	8.9E-06	c	8.9E-04	c	8.4E+00	c	1.4E+00	c	—
Benzo-a-pyrene	50-32-8	2.0E-04	m	2.0E-02	m >S	2.9E+01	n >S	3.8E+00	n >S	2.0E-04	m	2.0E-02	m >S	4.1E+01	n >S	5.3E+00	n >S	—
Benzo-b-fluoranthene	205-99-2	9.1E-03	c >S	9.1E-01	c >S	2.4E+03	c >S	3.1E+02	c >S	2.0E-02	c >S	2.0E+00	c >S	4.0E+03	c >S	5.2E+02	c >S	—
Benzo-e-pyrene	192-97-2	7.3E-01	n >S	7.3E+01	n >S	—	—	—	—	2.2E+00	n >S	2.2E+02	n >S	—	—	—	—	—
Benzo-g,h,i-perylene	191-24-2	7.3E-01	n >S	7.3E+01	n >S	—	—	—	—	2.2E+00	n >S	2.2E+02	n >S	—	—	—	—	—
Benzoic acid	65-85-0	9.8E+01	n	9.8E+03	n >S	—	—	—	—	2.9E+02	n	2.9E+04	n >S	—	—	—	—	—
Benzo-j-fluoranthene	205-82-3	9.1E-03	c >S	9.1E-01	c >S	1.5E+03	c >S	2.0E+02	c >S	2.0E-02	c >S	2.0E+00	c >S	2.6E+03	c >S	3.3E+02	c >S	—
Benzo-k-fluoranthene	207-08-9	9.1E-02	c >S	9.1E+00	c >S	1.4E+05	c >S	1.8E+04	c >S	2.0E-01	c >S	2.0E+01	c >S	2.4E+05	c >S	3.1E+04	c >S	—
Benzophenone	119-61-9	1.6E-01	n	1.6E+01	n	—	—	—	—	4.9E-01	n	4.9E+01	n >S	—	—	—	—	—
Benzotrichloride	98-07-7	7.0E-05	c	7.0E-03	c	—	—	—	—	1.6E-04	c	1.6E-02	c	—	—	—	—	—
Benzoyl peroxide	94-36-0	1.2E+00	n	1.2E+02	n >S	—	—	—	—	3.7E+00	n	3.7E+02	n >S	—	—	—	—	—
Benzyl alcohol	100-51-6	2.4E+00	n	2.4E+02	n	—	—	—	—	7.3E+00	n	7.3E+02	n	—	—	—	—	—
Benzyl chloride	100-44-7	5.4E-03	c	5.4E-01	c	1.0E+02	n	1.3E+01	n	1.2E-02	c	1.2E+00	c	1.4E+02	n	1.8E+01	n	—
Benzyl dichloride	98-87-3	5.4E-03	c	5.4E-01	c	2.0E+02	n	2.6E+01	n	1.2E-02	c	1.2E+00	c	2.8E+02	n >S	3.6E+01	n	—
Beryllium	7440-41-7	4.0E-03	m >S	4.0E-01	m >S	—	—	—	—	4.0E-03	m >S	4.0E-01	m >S	—	—	—	—	—
Biphenyl, 1,1'-	92-52-4	1.2E+01	n >S	1.2E+03	n >S	—	—	—	—	3.7E+01	n >S	3.7E+03	n >S	—	—	—	—	—
Biphenyl, 1,1'-, 2-phenoxy-	6738-04-1	1.2E+00	n >S	1.2E+02	n >S	—	—	—	—	3.7E+00	n >S	3.7E+02	n >S	—	—	—	—	—
Biquinoline, 2,2'-	119-91-5	7.3E-02	n	7.3E+00	n >S	—	—	—	—	2.2E-01	n	2.2E+01	n >S	—	—	—	—	—
Bis (2-chloroethoxy) methane	111-91-1	8.3E-04	c	8.3E-02	c	8.0E+01	c	1.0E+01	c	1.9E-03	c	1.9E-01	c	1.3E+02	c	1.7E+01	c	—
Bis (2-chloroethyl) ether	111-44-4	8.3E-04	c	8.3E-02	c	9.3E+01	c	1.2E+01	c	1.9E-03	c	1.9E-01	c	1.6E+02	c	2.0E+01	c	—
Bis (2-chloro-1-methylethyl) ether	108-60-1	1.3E-02	c	1.3E+00	c	8.7E+02	c	1.1E+02	c	2.9E-02	c	2.9E+00	c	1.5E+03	c	1.9E+02	c	—
Bis (2-chloromethyl) ether	542-88-1	4.1E-06	c	4.1E-04	c	8.5E-02	c	1.1E-02	c	9.3E-06	c	9.3E-04	c	1.4E-01	c	1.9E-02	c	—
Bis (2-ethyl-hexyl) phthalate	117-81-7	6.0E-03	m	6.0E-01	m >S	—	—	—	—	6.0E-03	m	6.0E-01	m >S	—	—	—	—	—
Bismuth	7440-69-9	1.2E+01	n	1.2E+03	n	—	—	—	—	3.7E+01	n	3.7E+03	n	—	—	—	—	—
Bisphenol A	80-05-7	1.2E+00	n	1.2E+02	n	—	—	—	—	3.7E+00	n	3.7E+02	n	—	—	—	—	—
Boron	7440-42-8	4.9E+00	n	4.9E+02	n	—	—	—	—	1.5E+01	n	1.5E+03	n	—	—	—	—	—
Bromacil	314-40-9	2.4E+00	n	2.4E+02	n	—	—	—	—	7.3E+00	n	7.3E+02	n	—	—	—	—	—
Bromo-2-chloroethane, 1-	107-04-0	9.8E-01	n	9.8E+01	n	—	—	—	—	2.9E+00	n	2.9E+02	n	—	—	—	—	—
Bromobenzene	108-86-1	2.0E-01	n	2.0E+01	n	2.3E+03	n >S	2.9E+02	n	5.8E-01	n	5.8E+01	n	3.2E+03	n >S	4.1E+02	n >S	—

Table 3
Tier 1 Groundwater PCLs - Residential and Commercial/Industrial¹

Last Revised: March 1, 2022

Chemical of Concern	CAS	Residential								Commercial/Industrial								Secondary MCL ⁵ (mg/L)
		GW _{Ing} ² (mg/L)	note ⁴	GW _{Class3} ³ (mg/L)	note ⁴	AirGW _{Inh-V} 0.5 acre source area (mg/L)	note ⁴	AirGW _{Inh-V} 30 acre source area (mg/L)	note ⁴	GW _{Ing} ² (mg/L)	note ⁴	GW _{Class3} ³ (mg/L)	note ⁴	AirGW _{Inh-V} 0.5 acre source area (mg/L)	note ⁴	AirGW _{Inh-V} 30 acre source area (mg/L)	note ⁴	
Bromodichloromethane ⁶	75-27-4	8.0E-02	m	8.0E+00	m					8.0E-02	m	8.0E+00	m					—
Bromoform ⁶	75-25-2	8.0E-02	m	8.0E+00	m	5.1E+03	c >S	6.7E+02	c	8.0E-02	m	8.0E+00	m	8.6E+03	c >S	1.1E+03	c	—
Bromomethane	74-83-9	3.4E-02	n	3.4E+00	n	3.6E+01	n	4.6E+00	n	1.0E-01	n	1.0E+01	n	5.0E+01	n	6.5E+00	n	—
Bromophenyl phenylether, 4-	101-55-3	6.1E-05	c	6.1E-03	c	1.6E+00	c >S	2.0E-01	c	1.4E-04	c	1.4E-02	c	2.7E+00	c >S	3.4E-01	c	—
Butadiene, 1,3-	106-99-0	—	—	—	—	3.6E+01	n	4.7E+00	n	—	—	—	—	5.1E+01	n	6.6E+00	n	—
Butadiene, 2-methyl-1,3- (isoprene)	78-79-5	1.5E+00	n	1.5E+02	n	8.2E+04	n >S	1.1E+04	n >S	4.4E+00	n	4.4E+02	n	1.2E+05	n >S	1.5E+04	n >S	—
Butanal (butyraldehyde)	123-72-8	1.5E+00	n	1.5E+02	n	2.0E+04	n	2.6E+03	n	4.4E+00	n	4.4E+02	n	2.8E+04	n	3.6E+03	n	—
Butane, 2,3-dimethyl-	79-29-8	1.5E+00	n	1.5E+02	n >S	2.4E+03	n >S	3.0E+02	n >S	4.4E+00	n	4.4E+02	n >S	3.3E+03	n >S	4.3E+02	n >S	—
Butanoic acid (butyric acid)	107-92-6	1.2E+01	n	1.2E+03	n	1.9E+04	n	2.5E+03	n	3.7E+01	n	3.7E+03	n	2.7E+04	n	3.4E+03	n	—
Butanol, 2-	78-92-2	4.9E+01	n	4.9E+03	n	1.0E+06	n >S	1.0E+06	n >S	1.5E+02	n	1.5E+04	n	1.0E+06	n >S	1.0E+06	n >S	—
Butanol, 2-methyl-1-	137-32-6	2.4E-01	n	2.4E+01	n	—	—	—	—	7.3E-01	n	7.3E+01	n	—	—	—	—	—
Butanol, 2-methyl-2-	75-85-4	2.4E-01	n	2.4E+01	n	—	—	—	—	7.3E-01	n	7.3E+01	n	—	—	—	—	—
Butanol, n-	71-36-3	2.4E+00	n	2.4E+02	n	—	—	—	—	7.3E+00	n	7.3E+02	n	—	—	—	—	—
Butene, 1-	106-98-9	1.5E+00	n	1.5E+02	n	2.9E+03	n >S	3.8E+02	n >S	4.4E+00	n	4.4E+02	n >S	4.1E+03	n >S	5.3E+02	n >S	—
Butene, cis-2-	590-18-1	1.5E+00	n	1.5E+02	n	1.3E+03	n >S	1.7E+02	n	4.4E+00	n	4.4E+02	n >S	1.8E+03	n >S	2.3E+02	n	—
Butene, trans-2-	624-64-6	1.5E+00	n	1.5E+02	n	1.3E+03	n >S	1.7E+02	n	4.4E+00	n	4.4E+02	n >S	1.8E+03	n >S	2.3E+02	n	—
Butoxy ethanol, 2- (Ethylene glycol monobutyl ether; EGBE)	111-76-2	2.4E+00	n	2.4E+02	n	1.0E+06	n >S	1.0E+06	n >S	7.3E+00	n	7.3E+02	n	1.0E+06	n >S	1.0E+06	n >S	—
Butyl acetate	123-86-4	3.4E+00	n	3.4E+02	n	7.0E+05	n >S	9.1E+04	n >S	1.0E+01	n	1.0E+03	n	9.8E+05	n >S	1.3E+05	n >S	—
Butyl acrylate	141-32-2	2.2E-01	n	2.2E+01	n	—	—	—	—	6.6E-01	n	6.6E+01	n	—	—	—	—	—
Butyl benzyl phthalate	85-68-7	4.8E-01	c	4.8E+01	c >S	—	—	—	—	1.1E+00	c	1.1E+02	c >S	—	—	—	—	—
Butyl ether, n- (dibutyl ether)	142-96-1	2.4E+00	n	2.4E+02	n	—	—	—	—	7.3E+00	n	7.3E+02	n >S	—	—	—	—	—
Butyl methacrylate	97-88-1	2.2E+00	n	2.2E+02	n	—	—	—	—	6.6E+00	n	6.6E+02	n >S	—	—	—	—	—
Butylate	2008-41-5	1.2E+00	n	1.2E+02	n >S	—	—	—	—	3.7E+00	n	3.7E+02	n >S	—	—	—	—	—
Butylbenzene, n-	104-51-8	1.2E+00	n	1.2E+02	n >S	—	—	—	—	3.7E+00	n	3.7E+02	n >S	—	—	—	—	—
Butylbenzene, sec-	135-98-8	9.8E-01	n	9.8E+01	n >S	—	—	—	—	2.9E+00	n	2.9E+02	n >S	—	—	—	—	—
Butylbenzene, tert-	98-06-6	9.8E-01	n	9.8E+01	n >S	—	—	—	—	2.9E+00	n	2.9E+02	n >S	—	—	—	—	—
Cacodylic acid	75-60-5	7.3E-02	n	7.3E+00	n	—	—	—	—	2.2E-01	n	2.2E+01	n	—	—	—	—	—
Cadmium	7440-43-9	5.0E-03	m >S	5.0E-01	m >S	—	—	—	—	5.0E-03	m >S	5.0E-01	m >S	—	—	—	—	—
Calcium*	7440-70-2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Caprolactam	105-60-2	1.2E+01	n	1.2E+03	n	—	—	—	—	3.7E+01	n	3.7E+03	n	—	—	—	—	—
Captan	133-06-2	2.6E-01	c	2.6E+01	c >S	—	—	—	—	5.8E-01	c >S	5.8E+01	c >S	—	—	—	—	—
Carbaryl	63-25-2	2.4E+00	n	2.4E+02	n >S	—	—	—	—	7.3E+00	n	7.3E+02	n >S	—	—	—	—	—
Carbazole	86-74-8	4.6E-02	c	4.6E+00	c >S	—	—	—	—	1.0E-01	c	1.0E+01	c >S	—	—	—	—	—
Carbofuran	1563-66-2	4.0E-02	m	4.0E+00	m	—	—	—	—	4.0E-02	m	4.0E+00	m	—	—	—	—	—
Carbon disulfide	75-15-0	2.4E+00	n	2.4E+02	n	4.9E+03	n >S	6.3E+02	n	7.3E+00	n	7.3E+02	n	6.8E+03	n >S	8.8E+02	n	—
Carbon tetrachloride	56-23-5	5.0E-03	m	5.0E-01	m	2.0E+01	c	2.5E+00	c	5.0E-03	m	5.0E-01	m	3.3E+01	c	4.3E+00	c	—
Carbophenothion	786-19-6	3.2E-01	n	3.2E+01	n >S	—	—	—	—	9.5E-01	n	9.5E+01	n >S	—	—	—	—	—
Carbosulfan	55285-14-8	2.4E-01	n	2.4E+01	n >S	—	—	—	—	7.3E-01	n >S	7.3E+01	n >S	—	—	—	—	—
Carboxin	5234-68-4	2.4E+00	n	2.4E+02	n >S	—	—	—	—	7.3E+00	n	7.3E+02	n >S	—	—	—	—	—
Chloral	75-87-6	2.4E+00	n	2.4E+02	n	—	—	—	—	7.3E+00	n	7.3E+02	n	—	—	—	—	—
Chloral hydrate (1,1-ethanediol, 2,2,2-trichloro-)	302-17-0	2.4E+00	n	2.4E+02	n	—	—	—	—	7.3E+00	n	7.3E+02	n	—	—	—	—	—
Chloramben (amiben; 3-amino-2,5-dichlorobenzoic acid)	133-90-4	3.7E-01	n	3.7E+01	n	—	—	—	—	1.1E+00	n	1.1E+02	n	—	—	—	—	—

Table 3
Tier 1 Groundwater PCLs - Residential and Commercial/Industrial¹

Last Revised: March 1, 2022

Chemical of Concern	CAS	Residential								Commercial/Industrial								Secondary MCL ⁵ (mg/L)
		GW _{Ing} ² (mg/L)	note ⁴	GW _{Class3} ³ (mg/L)	note ⁴	AirGW _{Inh-V} 0.5 acre source area (mg/L)	note ⁴	AirGW _{Inh-V} 30 acre source area (mg/L)	note ⁴	GW _{Ing} ² (mg/L)	note ⁴	GW _{Class3} ³ (mg/L)	note ⁴	AirGW _{Inh-V} 0.5 acre source area (mg/L)	note ⁴	AirGW _{Inh-V} 30 acre source area (mg/L)	note ⁴	
Chlordane (technical)	12789-03-6	2.0E-03	m	2.0E-01	m >S	7.7E+02	c >S	9.9E+01	c >S	2.0E-03	m	2.0E-01	m >S	1.3E+03	c >S	1.7E+02	c >S	—
Chlordane, cis- (alpha chlordane)	5103-71-9	2.6E-03	c	2.6E-01	c >S	1.5E+02	c >S	2.0E+01	c >S	5.8E-03	c	5.8E-01	c >S	2.6E+02	c >S	3.3E+01	c >S	—
Chlordane, trans- (gamma chlordane)	5103-74-2	2.6E-03	c	2.6E-01	c >S	1.5E+02	c >S	2.0E+01	c >S	5.8E-03	c	5.8E-01	c >S	2.6E+02	c >S	3.3E+01	c >S	—
Chlorfenvinphos	470-90-6	1.7E-02	n	1.7E+00	n	—	—	—	—	5.1E-02	n	5.1E+00	n	—	—	—	—	—
Chloride*	16887-00-6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	250
Chlorine	7782-50-5	4.0E+00	m	4.0E+02	m	1.3E+01	n	1.6E+00	n	4.0E+00	m	4.0E+02	m	1.8E+01	n	2.3E+00	n	—
Chloro-1,3-butadiene, 2-	126-99-8	—	—	—	—	2.8E-01	c	3.7E-02	c	—	—	—	—	4.7E-01	c	6.1E-02	c	—
Chloro-2-propanol, 1-	127-00-4	4.9E-01	n	4.9E+01	n	—	—	—	—	1.5E+00	n	1.5E+02	n	—	—	—	—	—
Chloro-3-methylphenol, 4-	59-50-7	1.2E-01	n	1.2E+01	n	—	—	—	—	3.7E-01	n	3.7E+01	n	—	—	—	—	—
Chloroaniline, p-	106-47-8	4.6E-03	c	4.6E-01	c	—	—	—	—	1.0E-02	c	1.0E+00	c	—	—	—	—	—
Chlorobenzene	108-90-7	1.0E-01	m	1.0E+01	m	1.2E+03	n >S	1.5E+02	n	1.0E-01	m	1.0E+01	m	1.6E+03	n >S	2.1E+02	n	—
Chlorobenzilate	510-15-6	3.4E-03	c	3.4E-01	c	7.0E+03	c >S	9.0E+02	c >S	7.6E-03	c	7.6E-01	c	1.2E+04	c >S	1.5E+03	c >S	—
Chlorobromomethane (bromochloromethane)	74-97-5	9.8E-01	n	9.8E+01	n	—	—	—	—	2.9E+00	n	2.9E+02	n	—	—	—	—	—
Chlorodifluoromethane	75-45-6	—	—	—	—	1.7E+05	n >S	2.2E+04	n >S	—	—	—	—	2.4E+05	n >S	3.1E+04	n >S	—
Chloroethane (ethyl chloride)	75-00-3	9.8E+00	n	9.8E+02	n	1.2E+05	n >S	1.5E+04	n	2.9E+01	n	2.9E+03	n	1.6E+05	n >S	2.1E+04	n >S	—
Chloroethanol, 2-	107-07-3	4.9E-01	n	4.9E+01	n	—	—	—	—	1.5E+00	n	1.5E+02	n	—	—	—	—	—
Chloroethoxy ethene, 2- (2-chloroethylvinylether)	110-75-8	8.3E-04	c	8.3E-02	c	2.0E+01	n	2.5E+00	n	1.9E-03	c	1.9E-01	c	2.7E+01	n	3.5E+00	n	—
Chloroform ⁶	67-66-3	8.0E-02	m	8.0E+00	m	2.0E+01	c	2.6E+00	c	8.0E-02	m	8.0E+00	m	3.3E+01	c	4.3E+00	c	—
Chlorohexane, 1-	544-10-5	9.8E-01	n	9.8E+01	n >S	7.3E+03	n >S	9.4E+02	n >S	2.9E+00	n	2.9E+02	n >S	1.0E+04	n >S	1.3E+03	n >S	—
Chloromethane (methyl chloride)	74-87-3	7.0E-02	c	7.0E+00	c	3.6E+01	c	4.7E+00	c	1.6E-01	c	1.6E+01	c	6.1E+01	c	7.9E+00	c	—
Chloronaphthalene, 1- (Chloronaphthalene, alpha-)	90-13-1	2.0E+00	n	2.0E+02	n >S	—	—	—	—	5.8E+00	n	5.8E+02	n >S	—	—	—	—	—
Chloronaphthalene, 2- (chloronaphthalene, beta)	91-58-7	2.0E+00	n	2.0E+02	n >S	—	—	—	—	5.8E+00	n	5.8E+02	n >S	—	—	—	—	—
Chloronitrobenzene, p- (1-chloro-4-nitrobenzene)	100-00-5	2.4E-02	n	2.4E+00	n	7.6E+02	n >S	9.9E+01	n	7.3E-02	n	7.3E+00	n	1.1E+03	n >S	1.4E+02	n	—
Chlorophenol, 2-	95-57-8	1.2E-01	n	1.2E+01	n	—	—	—	—	3.7E-01	n	3.7E+01	n	—	—	—	—	—
Chlorophenol, 3-	108-43-0	1.2E-01	n	1.2E+01	n	—	—	—	—	3.7E-01	n	3.7E+01	n	—	—	—	—	—
Chlorophenol, 4-	106-48-9	1.2E-01	n	1.2E+01	n	—	—	—	—	3.7E-01	n	3.7E+01	n	—	—	—	—	—
Chlorophenyl phenylether, 4-	7005-72-3	6.1E-05	c	6.1E-03	c	1.2E+00	c	1.6E-01	c	1.4E-04	c	1.4E-02	c	2.1E+00	c >S	2.7E-01	c	—
Chloropropane, 2-	75-29-6	7.3E-01	n	7.3E+01	n	4.7E+02	n	6.0E+01	n	2.2E+00	n	2.2E+02	n	6.5E+02	n	8.5E+01	n	—
Chlorothalonil	1897-45-6	8.3E-02	c	8.3E+00	c	—	—	—	—	1.9E-01	c	1.9E+01	c	—	—	—	—	—
Chlorotoluene, o- (2-chlorotoluene)	95-49-8	4.9E-01	n	4.9E+01	n	2.4E+04	n >S	3.1E+03	n >S	1.5E+00	n	1.5E+02	n	3.3E+04	n >S	4.3E+03	n >S	—
Chlorotoluene, p- (4-chlorotoluene)	106-43-4	4.9E-01	n	4.9E+01	n	—	—	—	—	1.5E+00	n	1.5E+02	n >S	—	—	—	—	—
Chlorpyrifos	2921-88-2	7.3E-02	n	7.3E+00	n >S	—	—	—	—	2.2E-01	n	2.2E+01	n >S	—	—	—	—	—
Chromium (III)	16065-83-1	1.0E-01	m >S	1.0E+01	m >S	—	—	—	—	1.0E-01	m >S	1.0E+01	m >S	—	—	—	—	—
Chromium (total)	7440-47-3	1.0E-01	m >S	1.0E+01	m >S	—	—	—	—	1.0E-01	m >S	1.0E+01	m >S	—	—	—	—	—
Chromium (VI)	18540-29-9	1.0E-01	m >S	1.0E+01	m >S	—	—	—	—	1.0E-01	m >S	1.0E+01	m >S	—	—	—	—	—
Chrysene	218-01-9	9.1E-01	c >S	9.1E+01	c >S	8.6E+05	c >S	1.1E+05	c >S	2.0E+00	c >S	2.0E+02	c >S	1.0E+06	c >S	1.9E+05	c >S	—
Cobalt	7440-48-4	2.4E-01	n >S	2.4E+01	n >S	—	—	—	—	7.3E-01	n >S	7.3E+01	n >S	—	—	—	—	—
Copolymer acrylamide	69418-26-4	4.9E-03	n	4.9E-01	n	—	—	—	—	1.5E-02	n	1.5E+00	n	—	—	—	—	—
Copper	7440-50-8	1.3E+00	e >S	1.3E+02	e >S	—	—	—	—	1.3E+00	e >S	1.3E+02	e >S	—	—	—	—	1
Coronene	191-07-1	4.9E-02	n >S	4.9E+00	n >S	—	—	—	—	1.5E-01	n >S	1.5E+01	n >S	—	—	—	—	—
Coumaphos	56-72-4	1.7E-01	n	1.7E+01	n >S	—	—	—	—	5.1E-01	n >S	5.1E+01	n >S	—	—	—	—	—
Cresol	1319-77-3	1.2E+00	n	1.2E+02	n	—	—	—	—	3.7E+00	n	3.7E+02	n	—	—	—	—	—

Table 3
Tier 1 Groundwater PCLs - Residential and Commercial/Industrial¹

Last Revised: March 1, 2022

Chemical of Concern	CAS	Residential								Commercial/Industrial								Secondary MCL ⁵ (mg/L)
		GW _{Ing} ² (mg/L)	note ⁴	GW _{Class3} ³ (mg/L)	note ⁴	AirGW _{Inh-V} ^{0.5 acre source area} (mg/L)	note ⁴	AirGW _{Inh-V} ^{30 acre source area} (mg/L)	note ⁴	GW _{Ing} ² (mg/L)	note ⁴	GW _{Class3} ³ (mg/L)	note ⁴	AirGW _{Inh-V} ^{0.5 acre source area} (mg/L)	note ⁴	AirGW _{Inh-V} ^{30 acre source area} (mg/L)	note ⁴	
Cresol, m- (3-methylphenol)	108-39-4	1.2E+00	n	1.2E+02	n	—	—	—	—	3.7E+00	n	3.7E+02	n	—	—	—	—	—
Cresol, o- (2-methylphenol)	95-48-7	1.2E+00	n	1.2E+02	n	—	—	—	—	3.7E+00	n	3.7E+02	n	—	—	—	—	—
Cresol, p- (4-methylphenol)	106-44-5	1.2E-01	n	1.2E+01	n	—	—	—	—	3.7E-01	n	3.7E+01	n	—	—	—	—	—
Crotonaldehyde	123-73-9	4.8E-04	c	4.8E-02	c	—	—	—	—	1.1E-03	c	1.1E-01	c	—	—	—	—	—
Cumene (isopropylbenzene)	98-82-8	2.4E+00	n	2.4E+02	n >S	4.4E+03	n >S	5.7E+02	n >S	7.3E+00	n	7.3E+02	n >S	6.2E+03	n >S	8.0E+02	n >S	—
Cyanazine	21725-46-2	1.1E-03	c	1.1E-01	c	—	—	—	—	2.4E-03	c	2.4E-01	c	—	—	—	—	—
Cyanide	57-12-5	2.0E-01	m	2.0E+01	m	—	—	—	—	2.0E-01	m	2.0E+01	m	—	—	—	—	—
Cyanogen	460-19-5	2.4E-02	n	2.4E+00	n	7.3E+00	n	9.4E-01	n	7.3E-02	n	7.3E+00	n	1.0E+01	n	1.3E+00	n	—
Cycloate	1134-23-2	1.3E+00	n	1.3E+02	n >S	—	—	—	—	4.0E+00	n	4.0E+02	n >S	—	—	—	—	—
Cyclohexane	110-82-7	1.2E+02	n >S	1.2E+04	n >S	5.9E+03	n >S	7.7E+02	n >S	3.7E+02	n >S	3.7E+04	n >S	8.3E+03	n >S	1.1E+03	n >S	—
Cyclohexanol	108-93-0	1.2E+02	n >S	1.2E+04	n >S	—	—	—	—	3.7E+02	n >S	3.7E+04	n >S	—	—	—	—	—
Cyclohexanone	108-94-1	1.2E+02	n	1.2E+04	n	1.0E+06	n >S	1.8E+05	n >S	3.7E+02	n	3.7E+04	n >S	1.0E+06	n >S	2.5E+05	n >S	—
Cyclohexene, 1-methanol-3-	1679-51-2	4.9E-01	n	4.9E+01	n	—	—	—	—	1.5E+00	n	1.5E+02	n	—	—	—	—	—
Cyclohexene, 4-vinyl-1-	100-40-3	5.4E-01	n	5.4E+01	n >S	1.1E+03	n >S	1.4E+02	n >S	1.6E+00	n	1.6E+02	n >S	1.5E+03	n >S	2.0E+02	n >S	—
Cyclopentane	287-92-3	1.5E+00	n	1.5E+02	n	3.7E+04	n >S	4.8E+03	n >S	4.4E+00	n	4.4E+02	n >S	5.1E+04	n >S	6.7E+03	n >S	—
Cyclopentane, methyl-	96-37-7	2.4E+00	n	2.4E+02	n >S	6.8E+02	n >S	8.8E+01	n >S	7.3E+00	n	7.3E+02	n >S	9.5E+02	n >S	1.2E+02	n >S	—
Cyclopentene	142-29-0	1.2E+02	n	1.2E+04	n >S	—	—	—	—	3.7E+02	n	3.7E+04	n >S	—	—	—	—	—
Cyclotetramethylenetetranitramine (HMX)	2691-41-0	1.2E+00	n	1.2E+02	n	—	—	—	—	3.7E+00	n	3.7E+02	n	—	—	—	—	—
Cyclotrimethylenetrinitramine (RDX)	121-82-4	1.1E-02	c	1.1E+00	c	—	—	—	—	2.6E-02	c	2.6E+00	c	—	—	—	—	—
Cymene (isopropyltoluene)	99-87-6	2.4E+00	n	2.4E+02	n >S	—	—	—	—	7.3E+00	n	7.3E+02	n >S	—	—	—	—	—
Cymoxanil	57966-95-7	3.2E-01	n	3.2E+01	n	—	—	—	—	9.5E-01	n	9.5E+01	n	—	—	—	—	—
Dacthal (DCPA)	1861-32-1	2.4E-01	n >S	2.4E+01	n >S	—	—	—	—	7.3E-01	n >S	7.3E+01	n >S	—	—	—	—	—
Dalapon, sodium salt (2,2-dichloropropanoic acid)	75-99-0	2.0E-01	m	2.0E+01	m	—	—	—	—	2.0E-01	m	2.0E+01	m	—	—	—	—	—
DDD	72-54-8	3.8E-03	c	3.8E-01	c >S	—	—	—	—	8.5E-03	c	8.5E-01	c >S	—	—	—	—	—
DDE	72-55-9	2.7E-03	c	2.7E-01	c >S	—	—	—	—	6.0E-03	c	6.0E-01	c >S	—	—	—	—	—
DDT	50-29-3	2.7E-03	c	2.7E-01	c >S	6.2E+02	c >S	8.1E+01	c >S	6.0E-03	c >S	6.0E-01	c >S	1.0E+03	c >S	1.4E+02	c >S	—
Demeton	8065-48-3	9.8E-04	n	9.8E-02	n	—	—	—	—	2.9E-03	n	2.9E-01	n	—	—	—	—	—
Desethylatrazine	6190-65-4	8.6E-01	n	8.6E+01	n	—	—	—	—	2.6E+00	n	2.6E+02	n	—	—	—	—	—
Diacetone alcohol (4-hydroxy-4-methyl-2-pentanone)	123-42-2	9.8E-01	n	9.8E+01	n	—	—	—	—	2.9E+00	n	2.9E+02	n	—	—	—	—	—
Diallate	2303-16-4	1.5E-02	c	1.5E+00	c	—	—	—	—	3.4E-02	c	3.4E+00	c	—	—	—	—	—
Diazinon	333-41-5	2.2E-02	n	2.2E+00	n	4.0E+03	n >S	5.2E+02	n >S	6.6E-02	n	6.6E+00	n	5.6E+03	n >S	7.2E+02	n >S	—
Dibenz(a,h)acridine	226-36-8	7.6E-04	c >S	7.6E-02	c >S	8.1E+03	c >S	1.1E+03	c >S	1.7E-03	c >S	1.7E-01	c >S	1.4E+04	c >S	1.8E+03	c >S	—
Dibenz(a,j)acridine	224-42-0	1.3E-03	c >S	1.3E-01	c >S	1.0E+04	c >S	1.3E+03	c >S	2.8E-03	c >S	2.8E-01	c >S	1.7E+04	c >S	2.2E+03	c >S	—
Dibenz-a,h-anthracene ⁷	53-70-3	2.0E-04	m ⁷	2.0E-02	m >S	1.5E+03	c >S	2.0E+02	c >S	2.0E-03	c >S	2.0E-01	c >S	2.6E+03	c >S	3.3E+02	c >S	—
Dibenzo(a,e)pyrene	192-65-4	1.3E-04	c >S	1.3E-02	c >S	1.0E+03	c >S	1.3E+02	c >S	2.8E-04	c >S	2.8E-02	c >S	1.7E+03	c >S	2.2E+02	c >S	—
Dibenzo(a,h)pyrene	189-64-0	1.3E-05	c	1.3E-03	c >S	1.0E+02	c >S	1.3E+01	c >S	2.8E-05	c >S	2.8E-03	c >S	1.7E+02	c >S	2.2E+01	c >S	—
Dibenzo(a,i)pyrene	189-55-9	1.3E-05	c	1.3E-03	c >S	1.0E+02	c >S	1.3E+01	c >S	2.8E-05	c	2.8E-03	c >S	1.7E+02	c >S	2.2E+01	c >S	—
Dibenzofuran	132-64-9	9.8E-02	n	9.8E+00	n >S	—	—	—	—	2.9E-01	n	2.9E+01	n >S	—	—	—	—	—
Dibenzothiophene	132-65-0	2.4E-01	n >S	2.4E+01	n >S	—	—	—	—	7.3E-01	n >S	7.3E+01	n >S	—	—	—	—	—
Dibromo-3-chloropropane, 1,2-	96-12-8	2.0E-04	m	2.0E-02	m	6.2E-01	c	8.0E-02	c	2.0E-04	m	2.0E-02	m	1.0E+00	c	1.3E-01	c	—
Dibromochloromethane (chlorodibromomethane) ⁶	124-48-1	8.0E-02	m	8.0E+00	m	—	—	—	—	8.0E-02	m	8.0E+00	m	—	—	—	—	—
Dibromofluoromethane	1868-53-7	4.9E+00	n	4.9E+02	n	—	—	—	—	1.5E+01	n	1.5E+03	n	—	—	—	—	—

Table 3
Tier 1 Groundwater PCLs - Residential and Commercial/Industrial¹

Last Revised: March 1, 2022

Chemical of Concern	CAS	Residential								Commercial/Industrial								Secondary MCL ⁵ (mg/L)
		GW _{Ing} ² (mg/L)	note ⁴	GW _{Class3} ³ (mg/L)	note ⁴	AirGW _{Inh-V} 0.5 acre source area (mg/L)	note ⁴	AirGW _{Inh-V} 30 acre source area (mg/L)	note ⁴	GW _{Ing} ² (mg/L)	note ⁴	GW _{Class3} ³ (mg/L)	note ⁴	AirGW _{Inh-V} 0.5 acre source area (mg/L)	note ⁴	AirGW _{Inh-V} 30 acre source area (mg/L)	note ⁴	
Dicamba	1918-00-9	7.3E-01	n	7.3E+01	n	—	—	—	—	2.2E+00	n	2.2E+02	n	—	—	—	—	—
Dichlormid	37764-25-3	6.1E-01	n	6.1E+01	n	—	—	—	—	1.8E+00	n	1.8E+02	n	—	—	—	—	—
Dichloro-2-butene, 1,4-	764-41-0	—	—	—	—	6.7E-01	c	8.7E-02	c	—	—	—	—	1.1E+00	c	1.5E-01	c	—
Dichloro-2-butene, 1,4- trans	110-57-6	—	—	—	—	6.5E-01	c	8.5E-02	c	—	—	—	—	1.1E+00	c	1.4E-01	c	—
Dichlorobenzene, 1,2-	95-50-1	6.0E-01	m	6.0E+01	m	1.2E+03	n >S	1.5E+02	n	6.0E-01	m	6.0E+01	m	1.6E+03	n >S	2.1E+02	n >S	—
Dichlorobenzene, 1,3-	541-73-1	7.3E-01	n	7.3E+01	n	1.9E+02	n >S	2.5E+01	n	2.2E+00	n	2.2E+02	n >S	2.7E+02	n >S	3.4E+01	n	—
Dichlorobenzene, 1,4-	106-46-7	7.5E-02	m	7.5E+00	m	1.7E+04	n >S	2.2E+03	n >S	7.5E-02	m	7.5E+00	m	2.4E+04	n >S	3.1E+03	n >S	—
Dichlorobenzidine, 3,3-	91-94-1	2.0E-03	c	2.0E-01	c	—	—	—	—	4.5E-03	c	4.5E-01	c	—	—	—	—	—
Dichlorobutane, 2,3-	7581-97-7	2.4E-01	n	2.4E+01	n	1.4E+02	n	1.9E+01	n	7.3E-01	n	7.3E+01	n	2.0E+02	n	2.6E+01	n	—
Dichlorodifluoromethane	75-71-8	4.9E+00	n	4.9E+02	n >S	6.0E+01	n	7.8E+00	n	1.5E+01	n	1.5E+03	n >S	8.4E+01	n	1.1E+01	n	—
Dichloroethane, 1,1-	75-34-3	4.9E+00	n	4.9E+02	n	4.3E+04	n >S	5.6E+03	n >S	1.5E+01	n	1.5E+03	n	6.0E+04	n >S	7.8E+03	n >S	—
Dichloroethane, 1,2-	107-06-2	5.0E-03	m	5.0E-01	m	2.5E+02	c	3.3E+01	c	5.0E-03	m	5.0E-01	m	4.2E+02	c	5.5E+01	c	—
Dichloroethylene, 1,1-	75-35-4	7.0E-03	m	7.0E-01	m	1.7E+03	n	2.2E+02	n	7.0E-03	m	7.0E-01	m	2.3E+03	n	3.0E+02	n	—
Dichloroethylene, cis-1,2-	156-59-2	7.0E-02	m	7.0E+00	m	1.2E+03	n	1.6E+02	n	7.0E-02	m	7.0E+00	m	1.7E+03	n	2.2E+02	n	—
Dichloroethylene, trans-1,2	156-60-5	1.0E-01	m	1.0E+01	m	7.7E+02	n	9.9E+01	n	1.0E-01	m	1.0E+01	m	1.1E+03	n	1.4E+02	n	—
Dichlorofluoromethane	75-43-4	4.9E+00	n	4.9E+02	n	—	—	—	—	1.5E+01	n	1.5E+03	n	—	—	—	—	—
Dichlorophenol, 2,3-	576-24-9	7.3E-02	n	7.3E+00	n	—	—	—	—	2.2E-01	n	2.2E+01	n	—	—	—	—	—
Dichlorophenol, 2,4-	120-83-2	7.3E-02	n	7.3E+00	n	—	—	—	—	2.2E-01	n	2.2E+01	n	—	—	—	—	—
Dichlorophenol, 2,5-	583-78-8	7.3E-02	n	7.3E+00	n	—	—	—	—	2.2E-01	n	2.2E+01	n	—	—	—	—	—
Dichlorophenol, 2,6-	87-65-0	2.4E-02	n	2.4E+00	n	—	—	—	—	7.3E-02	n	7.3E+00	n	—	—	—	—	—
Dichlorophenol, 3,4-	95-77-2	7.3E-02	n	7.3E+00	n	—	—	—	—	2.2E-01	n	2.2E+01	n	—	—	—	—	—
Dichlorophenol, 3,5-	591-35-5	7.3E-02	n	7.3E+00	n	—	—	—	—	2.2E-01	n	2.2E+01	n	—	—	—	—	—
Dichlorophenoxy, 2,4- butyric acid, 4- (2,4-DB)	94-82-6	2.0E-01	n	2.0E+01	n	—	—	—	—	5.8E-01	n	5.8E+01	n	—	—	—	—	—
Dichlorophenoxyacetic acid, 2,4- (2,4-D)	94-75-7	7.0E-02	m	7.0E+00	m	—	—	—	—	7.0E-02	m	7.0E+00	m	—	—	—	—	—
Dichloroprop (2-(2,4-dichlorophenoxy) propanoic acid)	120-36-5	2.4E-01	n	2.4E+01	n	—	—	—	—	7.3E-01	n	7.3E+01	n	—	—	—	—	—
Dichloropropane, 1,2-	78-87-5	5.0E-03	m	5.0E-01	m	1.2E+02	n	1.5E+01	n	5.0E-03	m	5.0E-01	m	1.6E+02	n	2.1E+01	n	—
Dichloropropane, 1,3-	142-28-9	9.1E-03	c	9.1E-01	c	2.5E+02	c	3.3E+01	c	2.0E-02	c	2.0E+00	c	4.3E+02	c	5.5E+01	c	—
Dichloropropane, 2,2-	594-20-7	1.3E-02	c	1.3E+00	c	5.7E+01	n	7.3E+00	n	3.0E-02	c	3.0E+00	c	7.9E+01	n	1.0E+01	n	—
Dichloropropanol, 2,3-	616-23-9	7.3E-02	n	7.3E+00	n	—	—	—	—	2.2E-01	n	2.2E+01	n	—	—	—	—	—
Dichloropropene, 1,1-	563-58-6	9.1E-03	c	9.1E-01	c	1.9E+01	c	2.5E+00	c	2.0E-02	c	2.0E+00	c	3.2E+01	c	4.2E+00	c	—
Dichloropropene, 1,3- (mixed isomers)	542-75-6	9.1E-03	c	9.1E-01	c	1.8E+02	c	2.3E+01	c	2.0E-02	c	2.0E+00	c	3.0E+02	c	3.8E+01	c	—
Dichloropropene, cis 1,3-	10061-01-5	1.7E-03	c	1.7E-01	c	6.9E+02	n	8.9E+01	n	3.8E-03	c	3.8E-01	c	9.7E+02	n	1.2E+02	n	—
Dichloropropene, trans 1,3-	10061-02-6	9.1E-03	c	9.1E-01	c	1.9E+02	c	2.5E+01	c	2.0E-02	c	2.0E+00	c	3.2E+02	c	4.1E+01	c	—
Dichlorvos	62-73-7	3.1E-03	c	3.1E-01	c	1.0E+04	n	1.3E+03	n	7.0E-03	c	7.0E-01	c	1.4E+04	n	1.8E+03	n	—
Dicrotophos (bidrin)	141-66-2	2.4E-03	n	2.4E-01	n	—	—	—	—	7.3E-03	n	7.3E-01	n	—	—	—	—	—
Dicyclopentadiene	77-73-6	2.0E+00	n	2.0E+02	n	—	—	—	—	5.8E+00	n	5.8E+02	n	—	—	—	—	—
Dieldrin	60-57-1	5.7E-05	c	5.7E-03	c	1.3E+02	c >S	1.6E+01	c >S	1.3E-04	c	1.3E-02	c	2.1E+02	c >S	2.8E+01	c >S	—
Diethanolamine	111-42-2	1.2E-02	n	1.2E+00	n	1.0E+06	n	1.0E+06	n	3.7E-02	n	3.7E+00	n	1.0E+06	n	1.0E+06	n	—
Diethyldithiocarbamate, sodium salt	148-18-5	3.4E-03	c	3.4E-01	c	—	—	—	—	7.6E-03	c	7.6E-01	c	—	—	—	—	—
Diethyl phthalate	84-66-2	2.0E+01	n	2.0E+03	n >S	—	—	—	—	5.8E+01	n	5.8E+03	n >S	—	—	—	—	—
Diethylene glycol	111-46-6	4.9E+01	n	4.9E+03	n	—	—	—	—	1.5E+02	n	1.5E+04	n	—	—	—	—	—
Diethylene glycol monobutyl ether	112-34-5	7.3E-01	n	7.3E+01	n	3.2E+03	n	4.1E+02	n	2.2E+00	n	2.2E+02	n	4.5E+03	n	5.8E+02	n	—

Table 3
Tier 1 Groundwater PCLs - Residential and Commercial/Industrial¹

Last Revised: March 1, 2022

Chemical of Concern	CAS	Residential								Commercial/Industrial								Secondary MCL ⁵ (mg/L)
		GW _{Ing} ² (mg/L)	note ⁴	GW _{Class3} ³ (mg/L)	note ⁴	AirGW _{Inh-V} 0.5 acre source area (mg/L)	note ⁴	AirGW _{Inh-V} 30 acre source area (mg/L)	note ⁴	GW _{Ing} ² (mg/L)	note ⁴	GW _{Class3} ³ (mg/L)	note ⁴	AirGW _{Inh-V} 0.5 acre source area (mg/L)	note ⁴	AirGW _{Inh-V} 30 acre source area (mg/L)	note ⁴	
Diethylhexyl adipate	103-23-1	4.0E-01	m >S	4.0E+01	m >S	—	—	—	—	4.0E-01	m >S	4.0E+01	m >S	—	—	—	—	—
Diethylstilbestrol	56-53-1	1.9E-07	c	1.9E-05	c	—	—	—	—	4.3E-07	c	4.3E-05	c	—	—	—	—	—
Diisobutylene (trimethyl-1-pentene, 2,4,4-)	107-39-1	1.5E+00	n	1.5E+02	n >S	2.3E+01	n >S	3.0E+00	n	4.4E+00	n >S	4.4E+02	n >S	3.2E+01	n >S	4.2E+00	n >S	—
Diisopropylbenzene, p-	100-18-5	2.4E-01	n	2.4E+01	n >S	—	—	—	—	7.3E-01	n	7.3E+01	n >S	—	—	—	—	—
Diisopropyl ether (2,2'-oxybis-propane)	108-20-3	2.4E+00	n	2.4E+02	n	2.0E+04	n >S	2.5E+03	n	7.3E+00	n	7.3E+02	n	2.7E+04	n >S	3.5E+03	n >S	—
Dimethenamid	87674-68-8	3.7E-01	n	3.7E+01	n	—	—	—	—	1.1E+00	n	1.1E+02	n	—	—	—	—	—
Dimethoate	60-51-5	4.9E-03	n	4.9E-01	n	—	—	—	—	1.5E-02	n	1.5E+00	n	—	—	—	—	—
Dimethoxybenzidine, 3,3'-	119-90-4	6.5E-02	c	6.5E+00	c	—	—	—	—	1.5E-01	c	1.5E+01	c	—	—	—	—	—
Dimethyl-2-nitrobenzene, 1,3-	81-20-9	4.9E-02	n	4.9E+00	n	1.1E+04	n >S	1.4E+03	n >S	1.5E-01	n	1.5E+01	n	1.5E+04	n >S	2.0E+03	n >S	—
Dimethyl-3-nitrobenzene, 1,2-	83-41-0	4.9E-02	n	4.9E+00	n	1.3E+04	n >S	1.7E+03	n >S	1.5E-01	n	1.5E+01	n	1.9E+04	n >S	2.4E+03	n >S	—
Dimethyl-4-nitrobenzene, 1-2-	99-51-4	4.9E-02	n	4.9E+00	n	1.5E+04	n >S	1.9E+03	n >S	1.5E-01	n	1.5E+01	n	2.1E+04	n >S	2.7E+03	n >S	—
Dimethyl-5-nitrobenzene, 1,3-	99-12-7	4.9E-02	n	4.9E+00	n	9.5E+03	n >S	1.2E+03	n >S	1.5E-01	n	1.5E+01	n	1.3E+04	n >S	1.7E+03	n >S	—
Dimethylphenethylamine, alpha, alpha-	122-09-8	4.9E-02	n	4.9E+00	n	—	—	—	—	1.5E-01	n	1.5E+01	n	—	—	—	—	—
Dimethyl phenol, 2,4-	105-67-9	4.9E-01	n	4.9E+01	n	—	—	—	—	1.5E+00	n	1.5E+02	n	—	—	—	—	—
Dimethylaminoazobenzene, p-	60-11-7	2.4E-04	n	2.4E-02	n	—	—	—	—	7.3E-04	n	7.3E-02	n	—	—	—	—	—
Dimethylbenz-a-anthracene, 7,12-	57-97-6	3.7E-06	c	3.7E-04	c	3.3E+01	c >S	4.3E+00	c >S	8.2E-06	c	8.2E-04	c	5.5E+01	c >S	7.2E+00	c >S	—
Dimethylbenzidine, 3,3'-	119-93-7	8.3E-05	c	8.3E-03	c	—	—	—	—	1.9E-04	c	1.9E-02	c	—	—	—	—	—
Dimethylformamide, N,N-	68-12-2	2.4E+00	n	2.4E+02	n	3.7E+05	n	4.8E+04	n	7.3E+00	n	7.3E+02	n	5.2E+05	n	6.8E+04	n	—
Dimethylnaphthalene, 1,3-	575-41-7	9.8E-01	n	9.8E+01	n >S	—	—	—	—	2.9E+00	n	2.9E+02	n >S	—	—	—	—	—
Dimethylphthalate	131-11-3	2.0E+01	n	2.0E+03	n	—	—	—	—	5.8E+01	n	5.8E+03	n >S	—	—	—	—	—
Di-n-butyl phthalate	84-74-2	2.4E+00	n	2.4E+02	n >S	—	—	—	—	7.3E+00	n	7.3E+02	n >S	—	—	—	—	—
Dinitro-2-methylphenol, 4,6- (dinitro-o-cresol, 4, 6-)	534-52-1	2.4E-03	n	2.4E-01	n	—	—	—	—	7.3E-03	n	7.3E-01	n	—	—	—	—	—
Dinitrobenzene, 1,3- (dinitrobenzene, 2,4-)	99-65-0	2.4E-03	n	2.4E-01	n	—	—	—	—	7.3E-03	n	7.3E-01	n	—	—	—	—	—
Dinitrobenzene, 1,4-	100-25-4	2.4E-03	n	2.4E-01	n	—	—	—	—	7.3E-03	n	7.3E-01	n	—	—	—	—	—
Dinitrophenol, 2,4-	51-28-5	4.9E-02	n	4.9E+00	n	—	—	—	—	1.5E-01	n	1.5E+01	n	—	—	—	—	—
Dinitrophenol, 2,5-	329-71-5	4.9E-02	n	4.9E+00	n	—	—	—	—	1.5E-01	n	1.5E+01	n	—	—	—	—	—
Dinitrotoluene, 2,4-	121-14-2	1.3E-03	c	1.3E-01	c	—	—	—	—	3.0E-03	c	3.0E-01	c	—	—	—	—	—
Dinitrotoluene, 2,6-	606-20-2	1.3E-03	c	1.3E-01	c	—	—	—	—	3.0E-03	c	3.0E-01	c	—	—	—	—	—
Di-n-octyl phthalate	117-84-0	2.4E-01	n >S	2.4E+01	n >S	—	—	—	—	7.3E-01	n >S	7.3E+01	n >S	—	—	—	—	—
Dinoseb	88-85-7	7.0E-03	m	7.0E-01	m	—	—	—	—	7.0E-03	m	7.0E-01	m	—	—	—	—	—
Dioxane 1,4-	123-91-1	9.1E-03	c	9.1E-01	c	7.7E+03	c	1.0E+03	c	2.0E-02	c	2.0E+00	c	1.3E+04	c	1.7E+03	c	—
Dioxin (as 2,3,7,8-TCDD toxicity equivalent quotients (TEQs))	1746-01-6	3.0E-08	m	3.0E-06	m	—	—	—	—	3.0E-08	m	3.0E-06	m	—	—	—	—	—
Diphenyl ether	101-84-8	1.5E-01	n	1.5E+01	n >S	—	—	—	—	4.5E-01	n	4.5E+01	n >S	—	—	—	—	—
Diphenylamine	122-39-4	6.1E-01	n	6.1E+01	n	—	—	—	—	1.8E+00	n	1.8E+02	n	—	—	—	—	—
Diphenylhydrazine, 1,2-	122-66-7	1.1E-03	c	1.1E-01	c	3.8E+03	c >S	4.9E+02	c	2.6E-03	c	2.6E-01	c	6.4E+03	c >S	8.3E+02	c	—
Dipropylene glycol	110-98-5	2.9E+00	n	2.9E+02	n	—	—	—	—	8.8E+00	n	8.8E+02	n	—	—	—	—	—
Diquat	85-00-7	2.0E-02	m	2.0E+00	m	—	—	—	—	2.0E-02	m	2.0E+00	m	—	—	—	—	—
Disodium iminodiacetate (iminodiacetic acid, disodium salt)	142-73-4	2.4E-01	n	2.4E+01	n	—	—	—	—	7.3E-01	n	7.3E+01	n	—	—	—	—	—
Disulfoton	298-04-4	9.8E-04	n	9.8E-02	n	—	—	—	—	2.9E-03	n	2.9E-01	n	—	—	—	—	—
Diuron	330-54-1	4.9E-02	n	4.9E+00	n	—	—	—	—	1.5E-01	n	1.5E+01	n	—	—	—	—	—
Dodecylphenol, 4-	104-43-8	1.2E+00	n >S	1.2E+02	n >S	—	—	—	—	3.7E+00	n >S	3.7E+02	n >S	—	—	—	—	—
Endosulfan	115-29-7	1.5E-01	n	1.5E+01	n >S	—	—	—	—	4.4E-01	n	4.4E+01	n >S	—	—	—	—	—

Table 3
Tier 1 Groundwater PCLs - Residential and Commercial/Industrial¹

Last Revised: March 1, 2022

Chemical of Concern	CAS	Residential								Commercial/Industrial								Secondary MCL ⁵ (mg/L)
		GW _{Ing} ² (mg/L)	note ⁴	GW _{Class3} ³ (mg/L)	note ⁴	AirGW _{Inh-V} 0.5 acre source area (mg/L)	note ⁴	AirGW _{Inh-V} 30 acre source area (mg/L)	note ⁴	GW _{Ing} ² (mg/L)	note ⁴	GW _{Class3} ³ (mg/L)	note ⁴	AirGW _{Inh-V} 0.5 acre source area (mg/L)	note ⁴	AirGW _{Inh-V} 30 acre source area (mg/L)	note ⁴	
Endosulfan I	959-98-8	4.9E-02	n	4.9E+00	n >S	—	—	—	—	1.5E-01	n	1.5E+01	n >S	—	—	—	—	—
Endosulfan II	33213-65-9	1.5E-01	n	1.5E+01	n >S	—	—	—	—	4.4E-01	n	4.4E+01	n >S	—	—	—	—	—
Endosulfan sulfate	1031-07-8	1.5E-01	n >S	1.5E+01	n >S	—	—	—	—	4.4E-01	n >S	4.4E+01	n >S	—	—	—	—	—
Endothall	145-73-3	1.0E-01	m	1.0E+01	m	—	—	—	—	1.0E-01	m	1.0E+01	m	—	—	—	—	—
Endrin	72-20-8	2.0E-03	m	2.0E-01	m	—	—	—	—	2.0E-03	m	2.0E-01	m	—	—	—	—	—
Endrin aldehyde	7421-93-4	7.3E-03	n	7.3E-01	n >S	—	—	—	—	2.2E-02	n >S	2.2E+00	n >S	—	—	—	—	—
Endrin ketone	53494-70-5	7.3E-03	n	7.3E-01	n	—	—	—	—	2.2E-02	n	2.2E+00	n >S	—	—	—	—	—
Epichlorohydrin	106-89-8	9.2E-02	c	9.2E+00	c	7.1E+02	n	9.1E+01	n	2.1E-01	c	2.1E+01	c	9.9E+02	n	1.3E+02	n	—
EPN (o-ethyl o-(4-nitrophenyl)phenylphosphonothioate)	2104-64-5	2.4E-04	n	2.4E-02	n	—	—	—	—	7.3E-04	n	7.3E-02	n	—	—	—	—	—
Esfenvalerate	66230-04-4	4.9E-02	n >S	4.9E+00	n >S	—	—	—	—	1.5E-01	n >S	1.5E+01	n >S	—	—	—	—	—
Ethalfuralin (sonolan)	55283-68-6	1.0E-02	c	1.0E+00	c	—	—	—	—	2.3E-02	c	2.3E+00	c	—	—	—	—	—
Ethanol	64-17-5	8.1E+02	n	8.1E+04	n	—	—	—	—	2.4E+03	n	2.4E+05	n	—	—	—	—	—
Ethanol, 2-amino-	141-43-5	4.2E-02	n	4.2E+00	n	4.2E+05	n	5.5E+04	n	1.2E-01	n	1.2E+01	n	5.9E+05	n	7.7E+04	n	—
Ethanol, 2-(2-aminoethoxy)-	929-06-6	1.2E-02	n	1.2E+00	n	—	—	—	—	3.7E-02	n	3.7E+00	n	—	—	—	—	—
Ethanol, 2-(2-ethoxyethoxy)-	111-90-0	4.9E+01	n	4.9E+03	n	—	—	—	—	1.5E+02	n	1.5E+04	n	—	—	—	—	—
Ethanol, 2-(methylamino)-	109-83-1	3.9E-01	n	3.9E+01	n	1.0E+06	n	1.3E+05	n	1.2E+00	n	1.2E+02	n	1.0E+06	n >S	1.8E+05	n	—
Ethion	563-12-2	1.2E-02	n	1.2E+00	n >S	—	—	—	—	3.7E-02	n	3.7E+00	n >S	—	—	—	—	—
Ethoprop	13194-48-4	2.4E-03	n	2.4E-01	n	—	—	—	—	7.3E-03	n	7.3E-01	n	—	—	—	—	—
Ethoxy ethanol, 2-	110-80-5	2.2E+00	n	2.2E+02	n >S	1.0E+06	n >S	4.3E+05	n >S	6.6E+00	n	6.6E+02	n >S	1.0E+06	n >S	6.1E+05	n >S	—
Ethyl acetate	141-78-6	2.2E+01	n	2.2E+03	n	5.3E+04	n	6.9E+03	n	6.6E+01	n	6.6E+03	n	7.4E+04	n	9.6E+03	n	—
Ethyl acrylate	140-88-5	1.9E-02	c	1.9E+00	c	1.1E+03	n	1.4E+02	n	4.3E-02	c	4.3E+00	c	1.5E+03	n	2.0E+02	n	—
Ethyl benzene	100-41-4	7.0E-01	m	7.0E+01	m	3.0E+04	n >S	3.8E+03	n >S	7.0E-01	m	7.0E+01	m	4.2E+04	n >S	5.4E+03	n >S	—
Ethyl dipropylthiocarbamate, S-	759-94-4	6.1E-01	n	6.1E+01	n	—	—	—	—	1.8E+00	n	1.8E+02	n	—	—	—	—	—
Ethyl ether	60-29-7	4.9E+00	n	4.9E+02	n	—	—	—	—	1.5E+01	n	1.5E+03	n	—	—	—	—	—
Ethyl methacrylate	97-63-2	2.2E+00	n	2.2E+02	n	5.7E+04	n >S	7.4E+03	n	6.6E+00	n	6.6E+02	n	8.0E+04	n >S	1.0E+04	n	—
Ethyl methanesulfonate	62-50-0	9.2E-03	c	9.2E-01	c	1.9E+04	c	2.4E+03	c	2.1E-02	c	2.1E+00	c	3.1E+04	c	4.0E+03	c	—
Ethyl tert-butyl ether (2-ethyl-2-ethoxypropane)	637-92-3	2.4E-02	n	2.4E+00	n	1.1E+04	n >S	1.4E+03	n	7.3E-02	n	7.3E+00	n	1.5E+04	n >S	2.0E+03	n	—
Ethyl-1-hexanol, 2-	104-76-7	3.7E+00	n	3.7E+02	n	—	—	—	—	1.1E+01	n	1.1E+03	n >S	—	—	—	—	—
Ethyl-2-hexenal, 2-	645-62-5	3.7E+00	n	3.7E+02	n	—	—	—	—	1.1E+01	n	1.1E+03	n >S	—	—	—	—	—
Ethyl-2-methyl benzene, 1-	611-14-3	1.2E+00	n	1.2E+02	n >S	9.2E+03	n >S	1.2E+03	n >S	3.7E+00	n	3.7E+02	n >S	1.3E+04	n >S	1.7E+03	n >S	—
Ethyl-4-methyl benzene, 1-	622-96-8	1.2E+00	n	1.2E+02	n >S	7.0E+03	n >S	9.0E+02	n >S	3.7E+00	n	3.7E+02	n >S	9.7E+03	n >S	1.3E+03	n >S	—
Ethylene*	74-85-1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Ethylene dibromide (dibromoethane, 1,2-)	106-93-4	5.0E-05	m	5.0E-03	m	7.6E+01	c	9.8E+00	c	5.0E-05	m	5.0E-03	m	1.3E+02	c	1.7E+01	c	—
Ethylene glycol	107-21-1	4.9E+01	n	4.9E+03	n	—	—	—	—	1.5E+02	n	1.5E+04	n	—	—	—	—	—
Ethylene oxide	75-21-8	8.9E-04	c	8.9E-02	c	3.0E+03	c	3.9E+02	c	2.0E-03	c	2.0E-01	c	5.0E+03	c	6.5E+02	c	—
Ethylene thiourea	96-45-7	2.0E-03	n	2.0E-01	n	—	—	—	—	5.8E-03	n	5.8E-01	n	—	—	—	—	—
Ethylenediamine	107-15-3	2.2E+00	n	2.2E+02	n	—	—	—	—	6.6E+00	n	6.6E+02	n	—	—	—	—	—
Ethylenimine	151-56-4	1.4E-05	c	1.4E-03	c	1.4E+01	c	1.8E+00	c	3.1E-05	c	3.1E-03	c	2.3E+01	c	3.0E+00	c	—
Ethylhexyl acrylate, 2-	103-11-7	1.9E-02	c	1.9E+00	c	—	—	—	—	4.3E-02	c	4.3E+00	c	—	—	—	—	—
Famphur	52-85-7	7.3E-04	n	7.3E-02	n	—	—	—	—	2.2E-03	n	2.2E-01	n	—	—	—	—	—
Fensulfothion	115-90-2	2.4E-02	n	2.4E+00	n	—	—	—	—	7.3E-02	n	7.3E+00	n	—	—	—	—	—
Fenthion	55-38-9	1.7E-03	n	1.7E-01	n	—	—	—	—	5.1E-03	n	5.1E-01	n	—	—	—	—	—

Table 3
Tier 1 Groundwater PCLs - Residential and Commercial/Industrial¹

Last Revised: March 1, 2022

Chemical of Concern	CAS	Residential								Commercial/Industrial								Secondary MCL ⁵ (mg/L)
		GW _{Ing} ² (mg/L)	note ⁴	GW _{Class3} ³ (mg/L)	note ⁴	AirGW _{Inh-V} 0.5 acre source area (mg/L)	note ⁴	AirGW _{Inh-V} 30 acre source area (mg/L)	note ⁴	GW _{Ing} ² (mg/L)	note ⁴	GW _{Class3} ³ (mg/L)	note ⁴	AirGW _{Inh-V} 0.5 acre source area (mg/L)	note ⁴	AirGW _{Inh-V} 30 acre source area (mg/L)	note ⁴	
Fenuron	101-42-8	1.7E+00	n	1.7E+02	n	—	—	—	—	5.1E+00	n	5.1E+02	n	—	—	—	—	—
Fluoranthene	206-44-0	9.8E-01	n >S	9.8E+01	n >S	—	—	—	—	2.9E+00	n >S	2.9E+02	n >S	—	—	—	—	—
Fluorene	86-73-7	9.8E-01	n	9.8E+01	n >S	—	—	—	—	2.9E+00	n >S	2.9E+02	n >S	—	—	—	—	—
Fluorine (soluble fluoride)	7782-41-4	4.0E+00	m	4.0E+02	m	—	—	—	—	4.0E+00	m	4.0E+02	m	—	—	—	—	2
Fluorochloridone	61213-25-0	1.8E-01	n	1.8E+01	n	—	—	—	—	5.5E-01	n	5.5E+01	n	—	—	—	—	—
Fonofos	944-22-9	4.9E-02	n	4.9E+00	n	—	—	—	—	1.5E-01	n	1.5E+01	n >S	—	—	—	—	—
Formaldehyde	50-00-0	4.9E+00	n	4.9E+02	n	8.6E+04	n	1.1E+04	n	1.5E+01	n	1.5E+03	n	1.2E+05	n	1.6E+04	n	—
Formic acid	64-18-6	2.2E+01	n	2.2E+03	n	1.7E+04	n	2.3E+03	n	6.6E+01	n	6.6E+03	n	2.4E+04	n	3.2E+03	n	—
Furan	110-00-9	2.4E-02	n	2.4E+00	n	—	—	—	—	7.3E-02	n	7.3E+00	n	—	—	—	—	—
Furfural	98-01-1	7.3E-02	n	7.3E+00	n	—	—	—	—	2.2E-01	n	2.2E+01	n	—	—	—	—	—
Glycidylaldehyde	765-34-4	9.8E-03	n	9.8E-01	n	1.4E+04	n	1.9E+03	n	2.9E-02	n	2.9E+00	n	2.0E+04	n	2.6E+03	n	—
Glyphosate	1071-83-6	7.0E-01	m	7.0E+01	m	—	—	—	—	7.0E-01	m	7.0E+01	m	—	—	—	—	—
Heptachlor	76-44-8	4.0E-04	m	4.0E-02	m	6.3E+00	c >S	8.1E-01	c >S	4.0E-04	m	4.0E-02	m	1.1E+01	c >S	1.4E+00	c >S	—
Heptachlor epoxide	1024-57-3	2.0E-04	m	2.0E-02	m	1.2E+02	c >S	1.5E+01	c >S	2.0E-04	m	2.0E-02	m	2.0E+02	c >S	2.6E+01	c >S	—
Heptane, n-	142-82-5	1.5E+00	n	1.5E+02	n >S	8.7E+02	n >S	1.1E+02	n >S	4.4E+00	n >S	4.4E+02	n >S	1.2E+03	n >S	1.6E+02	n >S	—
Heptanoic acid, n-	111-14-8	1.2E+01	n	1.2E+03	n	1.7E+04	n >S	2.1E+03	n >S	3.7E+01	n	3.7E+03	n >S	2.3E+04	n >S	3.0E+03	n >S	—
Hexachlorobenzene	118-74-1	1.0E-03	m	1.0E-01	m >S	5.7E+00	c >S	7.4E-01	c >S	1.0E-03	m	1.0E-01	m >S	9.6E+00	c >S	1.2E+00	c >S	—
Hexachlorobutadiene	87-68-3	1.2E-02	c	1.2E+00	c	8.9E+00	c >S	1.1E+00	c	2.6E-02	c	2.6E+00	c >S	1.5E+01	c >S	1.9E+00	c	—
Hexachlorocyclohexane, alpha (alpha-BHC)	319-84-6	1.4E-04	c	1.4E-02	c	1.5E+02	c >S	2.0E+01	c >S	3.2E-04	c	3.2E-02	c	2.6E+02	c >S	3.3E+01	c >S	—
Hexachlorocyclohexane, beta (beta-BHC)	319-85-7	5.1E-04	c	5.1E-02	c	1.1E+03	c >S	1.5E+02	c >S	1.1E-03	c	1.1E-01	c	1.9E+03	c >S	2.5E+02	c >S	—
Hexachlorocyclohexane, delta (delta-BHC)	319-86-8	5.1E-04	c	5.1E-02	c	3.6E+02	c >S	4.7E+01	c >S	1.1E-03	c	1.1E-01	c	6.1E+02	c >S	7.9E+01	c >S	—
Hexachlorocyclohexane, gamma (lindane; gamma-BHC)	58-89-9	2.0E-04	m	2.0E-02	m	—	—	—	—	2.0E-04	m	2.0E-02	m	—	—	—	—	—
Hexachlorocyclohexane, techn (technical-BHC)	608-73-1	5.1E-04	c	5.1E-02	c	9.9E+02	c >S	1.3E+02	c >S	1.1E-03	c	1.1E-01	c	1.7E+03	c >S	2.2E+02	c >S	—
Hexachlorocyclopentadiene	77-47-4	5.0E-02	m	5.0E+00	m >S	5.4E+00	n >S	7.0E-01	n	5.0E-02	m	5.0E+00	m >S	7.6E+00	n >S	9.8E-01	n	—
Hexachloroethane	67-72-1	1.7E-02	n	1.7E+00	n	7.3E+03	n >S	9.5E+02	n >S	5.1E-02	n	5.1E+00	n	1.0E+04	n >S	1.3E+03	n >S	—
Hexachlorophene	70-30-4	7.3E-03	n >S	7.3E-01	n >S	—	—	—	—	2.2E-02	n >S	2.2E+00	n >S	—	—	—	—	—
Hexachloropropylene	1888-71-7	1.7E-02	n	1.7E+00	n	2.1E+03	n >S	2.8E+02	n >S	5.1E-02	n	5.1E+00	n	3.0E+03	n >S	3.9E+02	n >S	—
Hexanal, 2-ethyl-	123-05-7	3.7E+00	n	3.7E+02	n	—	—	—	—	1.1E+01	n	1.1E+03	n >S	—	—	—	—	—
Hexane, n-	110-54-3	1.5E+00	n	1.5E+02	n >S	3.8E+01	n >S	4.9E+00	n	4.4E+00	n	4.4E+02	n >S	5.3E+01	n >S	6.9E+00	n	—
Hexanediamine, 1,6-	124-09-4	1.2E-01	n	1.2E+01	n	—	—	—	—	3.7E-01	n	3.7E+01	n	—	—	—	—	—
Hexanedinitrile	111-69-3	3.4E-02	n	3.4E+00	n	1.6E+05	n	2.1E+04	n	1.0E-01	n	1.0E+01	n	2.2E+05	n	2.9E+04	n	—
Hexanediol, 1,6-	629-11-8	1.2E+02	n	1.2E+04	n	1.0E+06	n >S	1.0E+06	n >S	3.7E+02	n	3.7E+04	n >S	1.0E+06	n >S	1.0E+06	n >S	—
Hexanoic acid	142-62-1	1.6E+00	n	1.6E+02	n	2.1E+04	n >S	2.7E+03	n	4.7E+00	n	4.7E+02	n	3.0E+04	n >S	3.8E+03	n	—
Hexanone, 2-	591-78-6	1.2E+00	n	1.2E+02	n	1.2E+04	n	1.5E+03	n	3.7E+00	n	3.7E+02	n	1.6E+04	n	2.1E+03	n	—
Hexazinone	51235-04-2	8.1E-01	n	8.1E+01	n	—	—	—	—	2.4E+00	n	2.4E+02	n	—	—	—	—	—
Hexene, 1-	592-41-6	8.1E+00	n	8.1E+02	n >S	3.4E+01	n >S	4.3E+00	n	2.4E+01	n	2.4E+03	n >S	4.7E+01	n >S	6.1E+00	n	—
Hexene, cis-2-	7688-21-3	8.1E+00	n	8.1E+02	n >S	4.8E+01	n >S	6.2E+00	n	2.4E+01	n	2.4E+03	n >S	6.7E+01	n >S	8.7E+00	n	—
Hexylene glycol (2-methyl-2,4-pentanediol)	107-41-5	7.3E+00	n	7.3E+02	n	—	—	—	—	2.2E+01	n	2.2E+03	n	—	—	—	—	—
Hydrazine	302-01-2	3.0E-04	c	3.0E-02	c	5.1E+01	c	6.7E+00	c	6.8E-04	c	6.8E-02	c	8.6E+01	c	1.1E+01	c	—
Hydrocaproic acid, 6- (6-hydroxyhexanoic acid)	1191-25-9	1.6E+00	n	1.6E+02	n	2.9E+04	n >S	4.2E+03	n	4.7E+00	n	4.7E+02	n	4.0E+04	n >S	5.9E+03	n	—
Hydrogen chloride (hydrochloric acid)*	7647-01-0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hydroquinone	123-31-9	1.5E-02	c	1.5E+00	c	—	—	—	—	3.4E-02	c	3.4E+00	c	—	—	—	—	—

Table 3
Tier 1 Groundwater PCLs - Residential and Commercial/Industrial¹

Last Revised: March 1, 2022

Chemical of Concern	CAS	Residential								Commercial/Industrial								Secondary MCL ⁵ (mg/L)
		GW _{Ing} ² (mg/L)	note ⁴	GW _{Class3} ³ (mg/L)	note ⁴	AirGW _{Inh-V} ^{0.5 acre source area} (mg/L)	note ⁴	AirGW _{Inh-V} ^{30 acre source area} (mg/L)	note ⁴	GW _{Ing} ² (mg/L)	note ⁴	GW _{Class3} ³ (mg/L)	note ⁴	AirGW _{Inh-V} ^{0.5 acre source area} (mg/L)	note ⁴	AirGW _{Inh-V} ^{30 acre source area} (mg/L)	note ⁴	
Indene	95-13-6	4.9E-01	n	4.9E+01	n	2.7E+02	n	3.5E+01	n	1.5E+00	n	1.5E+02	n	3.8E+02	n	5.0E+01	n	—
Indeno-1,2,3-cd-pyrene	193-39-5	9.1E-03	c >S	9.1E-01	c >S	1.4E+04	c >S	1.8E+03	c >S	2.0E-02	c >S	2.0E+00	c >S	2.3E+04	c >S	3.0E+03	c >S	—
Iron*	7439-89-6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.3
Isoamyl alcohol	123-51-3	1.2E-01	n	1.2E+01	n	—	—	—	—	3.7E-01	n	3.7E+01	n	—	—	—	—	—
Isobutyl alcohol	78-83-1	7.3E+00	n	7.3E+02	n	—	—	—	—	2.2E+01	n	2.2E+03	n	—	—	—	—	—
Isobutylene (2-methyl-1-propene)	115-11-7	9.0E-02	n	9.0E+00	n	6.1E+04	n >S	7.9E+03	n >S	2.7E-01	n	2.7E+01	n	8.5E+04	n >S	1.1E+04	n >S	—
Isobutyric acid (2-methylpropanoic acid)	79-31-2	1.2E+01	n	1.2E+03	n	—	—	—	—	3.7E+01	n	3.7E+03	n	—	—	—	—	—
Isodecanol	25339-17-7	3.9E-02	n	3.9E+00	n	—	—	—	—	1.2E-01	n	1.2E+01	n	—	—	—	—	—
Isodrin	465-73-6	5.4E-06	c	5.4E-04	c	3.4E-02	c >S	4.4E-03	c	1.2E-05	c	1.2E-03	c	5.7E-02	c >S	7.4E-03	c	—
Isopentane	78-78-4	1.5E+00	n	1.5E+02	n >S	2.5E+03	n >S	3.2E+02	n >S	4.4E+00	n	4.4E+02	n >S	3.4E+03	n >S	4.4E+02	n >S	—
Isophorone	78-59-1	9.6E-01	c	9.6E+01	c	—	—	—	—	2.2E+00	c	2.2E+02	c	—	—	—	—	—
Isopropyl acetate	108-21-4	1.7E+00	n	1.7E+02	n	—	—	—	—	5.1E+00	n	5.1E+02	n	—	—	—	—	—
Isopropyl alcohol	67-63-0	4.9E+01	n	4.9E+03	n	4.2E+05	n >S	5.5E+04	n	1.5E+02	n	1.5E+04	n	5.9E+05	n >S	7.6E+04	n	—
Isosafrole	120-58-1	4.1E-03	c	4.1E-01	c	4.3E+02	c >S	5.5E+01	c	9.3E-03	c	9.3E-01	c	7.2E+02	c >S	9.3E+01	c	—
Kelthane (dicofol)	115-32-2	1.5E-01	n	1.5E+01	n >S	—	—	—	—	4.4E-01	n	4.4E+01	n >S	—	—	—	—	—
Kepone (chlordecone)	143-50-0	9.1E-05	c	9.1E-03	c	2.4E+02	c >S	3.0E+01	c >S	2.0E-04	c	2.0E-02	c	4.0E+02	c >S	5.1E+01	c >S	—
Lead (inorganic)	7439-92-1	1.5E-02	e >S	1.5E+00	e >S	—	—	—	—	1.5E-02	e >S	1.5E+00	e >S	—	—	—	—	—
Leptophos	21609-90-5	1.2E-04	n	1.2E-02	n >S	6.4E+01	n >S	8.2E+00	n >S	3.7E-04	n	3.7E-02	n >S	8.9E+01	n >S	1.2E+01	n >S	—
Limonene, d-*	5989-27-5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Lithium	7439-93-2	1.7E-01	n	1.7E+01	n	—	—	—	—	5.1E-01	n	5.1E+01	n	—	—	—	—	—
Magnesium*	7439-95-4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Malathion	121-75-5	4.9E-01	n	4.9E+01	n	9.2E+03	n >S	1.2E+03	n >S	1.5E+00	n	1.5E+02	n >S	1.3E+04	n >S	1.7E+03	n >S	—
Maleic anhydride	108-31-6	2.4E+00	n	2.4E+02	n	—	—	—	—	7.3E+00	n	7.3E+02	n	—	—	—	—	—
Maleic hydrazide	123-33-1	1.2E+01	n	1.2E+03	n	—	—	—	—	3.7E+01	n	3.7E+03	n	—	—	—	—	—
Malononitrile	109-77-3	2.4E-03	n	2.4E-01	n	—	—	—	—	7.3E-03	n	7.3E-01	n	—	—	—	—	—
Mancozeb	8018-01-7	7.3E-01	n	7.3E+01	n >S	—	—	—	—	2.2E+00	n	2.2E+02	n >S	—	—	—	—	—
Manganese	7439-96-5	1.1E+00	n >S	1.1E+02	n >S	—	—	—	—	1.0E+01	n >S	1.0E+03	n >S	—	—	—	—	0.05
MCPA (4-(chloro-2-methylphenoxy) acetic acid)	94-74-6	1.2E-02	n	1.2E+00	n	—	—	—	—	3.7E-02	n	3.7E+00	n	—	—	—	—	—
MCPP (2-(4-chloro-2-methylphenoxy) propanoic acid)	93-65-2	2.4E-02	n	2.4E+00	n	—	—	—	—	7.3E-02	n	7.3E+00	n	—	—	—	—	—
Mercury (pH = 4.9)	7439-97-6	2.0E-03	m	2.0E-01	m >S	7.3E+00	n >S	9.4E-01	n >S	2.0E-03	m	2.0E-01	m >S	1.0E+01	n >S	1.3E+00	n >S	—
Mercury (pH=6.8)	7439-97-6	2.0E-03	m	2.0E-01	m >S	7.3E+00	n >S	9.4E-01	n >S	2.0E-03	m	2.0E-01	m >S	1.0E+01	n >S	1.3E+00	n >S	—
Merphos	150-50-5	7.3E-04	n	7.3E-02	n >S	—	—	—	—	2.2E-03	n	2.2E-01	n >S	—	—	—	—	—
Methacrylic acid (2-methyl-2-propenoic acid)	79-41-4	2.4E-01	n	2.4E+01	n	—	—	—	—	7.3E-01	n	7.3E+01	n	—	—	—	—	—
Methacrylonitrile	126-98-7	1.2E+00	n	1.2E+02	n	1.1E+04	n	1.4E+03	n	3.7E+00	n	3.7E+02	n	1.6E+04	n	2.0E+03	n	—
Methanol	67-56-1	4.9E+01	n	4.9E+03	n	1.0E+06	n >S	1.0E+06	n >S	1.5E+02	n	1.5E+04	n	1.0E+06	n >S	1.0E+06	n >S	—
Methapyrilene	91-80-5	1.9E-04	c	1.9E-02	c	—	—	—	—	4.3E-04	c	4.3E-02	c	—	—	—	—	—
Methomyl	16752-77-5	6.1E-01	n	6.1E+01	n	—	—	—	—	1.8E+00	n	1.8E+02	n	—	—	—	—	—
Methoxychlor	72-43-5	4.0E-02	m	4.0E+00	m >S	—	—	—	—	4.0E-02	m	4.0E+00	m >S	—	—	—	—	—
Methoxyethanol, 2-	109-86-4	6.6E-01	n	6.6E+01	n >S	8.1E+01	n >S	1.1E+01	n	2.0E+00	n	2.0E+02	n >S	1.1E+02	n >S	1.5E+01	n	—
Methyl acetate (acetic acid, methyl ester)	79-20-9	2.4E+01	n	2.4E+03	n	—	—	—	—	7.3E+01	n	7.3E+03	n	—	—	—	—	—
Methyl acrylate	96-33-3	4.9E-02	n	4.9E+00	n	2.7E+03	n	3.4E+02	n	1.5E-01	n	1.5E+01	n	3.7E+03	n	4.8E+02	n	—
Methyl amyl ketone (2-heptanone)	110-43-0	1.2E+00	n	1.2E+02	n	1.0E+06	n >S	1.4E+05	n >S	3.7E+00	n	3.7E+02	n	1.0E+06	n >S	2.0E+05	n >S	—

Table 3
Tier 1 Groundwater PCLs - Residential and Commercial/Industrial¹

Last Revised: March 1, 2022

Chemical of Concern	CAS	Residential								Commercial/Industrial								Secondary MCL ⁵ (mg/L)
		GW _{Ing} ² (mg/L)	note ⁴	GW _{Class3} ³ (mg/L)	note ⁴	AirGW _{Inh-V} 0.5 acre source area (mg/L)	note ⁴	AirGW _{Inh-V} 30 acre source area (mg/L)	note ⁴	GW _{Ing} ² (mg/L)	note ⁴	GW _{Class3} ³ (mg/L)	note ⁴	AirGW _{Inh-V} 0.5 acre source area (mg/L)	note ⁴	AirGW _{Inh-V} 30 acre source area (mg/L)	note ⁴	
Methyl chrysene, 1-	3351-28-8	1.3E-01	c >S	1.3E+01	c >S	8.0E+05	c >S	1.0E+05	c >S	2.8E-01	c >S	2.8E+01	c >S	1.0E+06	c >S	1.7E+05	c >S	—
Methyl chrysene, 2-	3351-32-4	1.3E-01	c >S	1.3E+01	c >S	8.0E+05	c >S	1.0E+05	c >S	2.8E-01	c >S	2.8E+01	c >S	1.0E+06	c >S	1.7E+05	c >S	—
Methyl chrysene, 6-	1705-85-7	1.3E-02	c >S	1.3E+00	c >S	8.0E+04	c >S	1.0E+04	c >S	2.8E-02	c >S	2.8E+00	c >S	1.3E+05	c >S	1.7E+04	c >S	—
Methyl cyclohexane	108-87-2	1.2E+02	n >S	1.2E+04	n >S	1.4E+03	n >S	1.8E+02	n >S	3.7E+02	n >S	3.7E+04	n >S	2.0E+03	n >S	2.6E+02	n >S	—
Methyl ethyl ketone (2-butanone)	78-93-3	1.5E+01	n	1.5E+03	n	1.0E+06	n >S	6.2E+05	n >S	4.4E+01	n	4.4E+03	n	1.0E+06	n >S	8.7E+05	n >S	—
Methyl iodide (iodomethane)	74-88-4	3.4E-02	n	3.4E+00	n	—	—	—	—	1.0E-01	n	1.0E+01	n	—	—	—	—	—
Methyl isobutyl ketone (4-methyl-2-pentanone)	108-10-1	2.0E+00	n	2.0E+02	n	6.7E+05	n >S	8.7E+04	n >S	5.8E+00	n	5.8E+02	n	9.4E+05	n >S	1.2E+05	n >S	—
Methyl mercury	22967-92-6	2.4E-03	n	2.4E-01	n	—	—	—	—	7.3E-03	n	7.3E-01	n	—	—	—	—	—
Methyl methacrylate	80-62-6	3.4E+01	n	3.4E+03	n	7.9E+04	n >S	1.0E+04	n	1.0E+02	n	1.0E+04	n	1.1E+05	n >S	1.4E+04	n	—
Methyl methanesulfonate	66-27-3	9.2E-03	c	9.2E-01	c	1.7E+04	c	2.2E+03	c	2.1E-02	c	2.1E+00	c	2.8E+04	c	3.7E+03	c	—
Methyl parathion	298-00-0	6.1E-03	n	6.1E-01	n	—	—	—	—	1.8E-02	n	1.8E+00	n	—	—	—	—	—
Methyl-1-butene, 2-	563-46-2	1.5E+00	n	1.5E+02	n >S	7.8E+03	n >S	1.0E+03	n >S	4.4E+00	n	4.4E+02	n >S	1.1E+04	n >S	1.4E+03	n >S	—
Methyl-1-propanal, 2- (isobutyraldehyde)	78-84-2	9.8E-01	n	9.8E+01	n	—	—	—	—	2.9E+00	n	2.9E+02	n	—	—	—	—	—
Methyl-2-butene, 2-	513-35-9	1.5E+00	n	1.5E+02	n	1.5E+04	n >S	1.9E+03	n >S	4.4E+00	n	4.4E+02	n >S	2.1E+04	n >S	2.7E+03	n >S	—
Methyl-2-pentenal, 2-	623-36-9	4.8E-04	c	4.8E-02	c	—	—	—	—	1.1E-03	c	1.1E-01	c	—	—	—	—	—
Methylcholanthrene, 3-	56-49-5	4.1E-05	c	4.1E-03	c >S	4.1E+02	c >S	5.4E+01	c >S	9.3E-05	c	9.3E-03	c >S	7.0E+02	c >S	9.0E+01	c >S	—
Methylene bromide (dibromomethane)	74-95-3	1.2E-01	c	1.2E+01	c	2.4E+02	n	3.1E+01	n	2.7E-01	c	2.7E+01	c	3.3E+02	n	4.3E+01	n	—
Methylene chloride (dichloromethane)	75-09-2	5.0E-03	m	5.0E-01	m	2.1E+04	c >S	2.8E+03	c	5.0E-03	m	5.0E-01	m	3.6E+04	c >S	4.6E+03	c	—
Methylene-bis (2-chloroaniline) 4,4'-	101-14-4	9.1E-03	c	9.1E-01	c	2.0E+04	c >S	2.6E+03	c >S	2.0E-02	c	2.0E+00	c	3.3E+04	c >S	4.3E+03	c >S	—
Methylmercury hydroxide	1184-57-2	2.4E-03	n	2.4E-01	n	—	—	—	—	7.3E-03	n	7.3E-01	n	—	—	—	—	—
Methylnaphthalene, 1-	90-12-0	3.1E-02	c	3.1E+00	c	—	—	—	—	7.0E-02	c	7.0E+00	c	—	—	—	—	—
Methylnaphthalene, 2-	91-57-6	9.8E-02	n	9.8E+00	n	—	—	—	—	2.9E-01	n	2.9E+01	n >S	—	—	—	—	—
Methylpyrrolidone, N-	872-50-4	4.9E-01	n	4.9E+01	n	—	—	—	—	1.5E+00	n	1.5E+02	n	—	—	—	—	—
Methylstyrene, alpha-	98-83-9	2.0E-01	n	2.0E+01	n	6.6E+02	n >S	8.5E+01	n >S	6.1E-01	n	6.1E+01	n	9.2E+02	n >S	1.2E+02	n >S	—
Methyltetrahydrofuran, 2-	96-47-9	1.2E-01	c	1.2E+01	c	1.8E+03	c	2.3E+02	c	2.7E-01	c	2.7E+01	c	3.1E+03	c	3.9E+02	c	—
Methyltetrahydropyran, 2-	10141-72-7	1.2E-01	c	1.2E+01	c	2.1E+03	c	2.7E+02	c	2.7E-01	c	2.7E+01	c	3.6E+03	c	4.6E+02	c	—
Metolachlor	51218-45-2	3.7E+00	n	3.7E+02	n	—	—	—	—	1.1E+01	n	1.1E+03	n >S	—	—	—	—	—
Metribuzin	21087-64-9	6.1E-01	n	6.1E+01	n	—	—	—	—	1.8E+00	n	1.8E+02	n	—	—	—	—	—
Mirex	2385-85-5	4.9E-03	n >S	4.9E-01	n >S	—	—	—	—	1.5E-02	n >S	1.5E+00	n >S	—	—	—	—	—
Molinate	2212-67-1	4.9E-02	n	4.9E+00	n	—	—	—	—	1.5E-01	n	1.5E+01	n	—	—	—	—	—
Molybdenum	7439-98-7	1.2E-01	n >S	1.2E+01	n >S	—	—	—	—	3.7E-01	n >S	3.7E+01	n >S	—	—	—	—	—
Monocrotophos	2157-98-4	1.5E-02	n	1.5E+00	n	—	—	—	—	4.4E-02	n	4.4E+00	n	—	—	—	—	—
Morpholine	110-91-8	1.2E+04	n	1.0E+06	n	—	—	—	—	3.7E+04	n	1.0E+06	n	—	—	—	—	—
Morpholine, N-butyl-	1005-67-0	5.6E-02	n	5.6E+00	n	—	—	—	—	1.7E-01	n	1.7E+01	n	—	—	—	—	—
MTBE (methyl tert-butyl ether) ^{5, 8}	1634-04-4	2.4E-01	n	2.4E+01	n	4.0E+03	c	5.2E+02	c	7.3E-01	n	7.3E+01	n	6.8E+03	c	8.8E+02	c	0.015
Naled	300-76-5	4.9E-02	n	4.9E+00	n >S	—	—	—	—	1.5E-01	n	1.5E+01	n >S	—	—	—	—	—
Naphthalene	91-20-3	4.9E-01	n	4.9E+01	n >S	3.2E+02	n >S	4.1E+01	n >S	1.5E+00	n	1.5E+02	n >S	4.4E+02	n >S	5.7E+01	n >S	—
Naphthoquinone, 1,4-	130-15-4	1.7E-01	n	1.7E+01	n	—	—	—	—	5.1E-01	n	5.1E+01	n	—	—	—	—	—
Naphthylamine, 1-	134-32-7	4.9E-01	n	4.9E+01	n	—	—	—	—	1.5E+00	n	1.5E+02	n	—	—	—	—	—
Naphthylamine, 2-	91-59-8	5.1E-04	c	5.1E-02	c	—	—	—	—	1.1E-03	c	1.1E-01	c	—	—	—	—	—
Napropamide	15299-99-7	2.4E+00	n	2.4E+02	n >S	—	—	—	—	7.3E+00	n	7.3E+02	n >S	—	—	—	—	—
Neopentyl glycol	126-30-7	7.3E+00	n	7.3E+02	n	—	—	—	—	2.2E+01	n	2.2E+03	n	—	—	—	—	—

Table 3
Tier 1 Groundwater PCLs - Residential and Commercial/Industrial¹

Last Revised: March 1, 2022

Chemical of Concern	CAS	Residential								Commercial/Industrial								Secondary MCL ⁵ (mg/L)
		GW _{Ing} ² (mg/L)	note ⁴	GW _{Class3} ³ (mg/L)	note ⁴	AirGW _{Inh-V} 0.5 acre source area (mg/L)	note ⁴	AirGW _{Inh-V} 30 acre source area (mg/L)	note ⁴	GW _{Ing} ² (mg/L)	note ⁴	GW _{Class3} ³ (mg/L)	note ⁴	AirGW _{Inh-V} 0.5 acre source area (mg/L)	note ⁴	AirGW _{Inh-V} 30 acre source area (mg/L)	note ⁴	
Nickel and compounds	7440-02-0	4.9E-01	n >S	4.9E+01	n >S	—	—	—	—	1.5E+00	n >S	1.5E+02	n >S	—	—	—	—	—
Nitrate-N ⁹	14797-55-8	1.0E+01	m	1.0E+03	m	—	—	—	—	1.0E+01	m	1.0E+03	m	—	—	—	—	—
Nitrite-N ⁹	14797-65-0	1.0E+00	m	1.0E+02	m	—	—	—	—	1.0E+00	m	1.0E+02	m	—	—	—	—	—
Nitroaniline, 2-	88-74-4	7.3E-03	n	7.3E-01	n	4.0E+03	n >S	5.2E+02	n	2.2E-02	n	2.2E+00	n	5.6E+03	n >S	7.2E+02	n	—
Nitroaniline, 3-	99-09-2	7.3E-03	n	7.3E-01	n	4.7E+03	n >S	6.1E+02	n >S	2.2E-02	n	2.2E+00	n	6.6E+03	n >S	8.6E+02	n >S	—
Nitroaniline, 4-	100-01-6	4.6E-02	c	4.6E+00	c	1.4E+05	n >S	1.9E+04	n >S	1.0E-01	c	1.0E+01	c	2.0E+05	n >S	2.6E+04	n >S	—
Nitrobenzene	98-95-3	4.9E-02	n	4.9E+00	n	7.2E+02	c	9.3E+01	c	1.5E-01	n	1.5E+01	n	1.2E+03	c	1.6E+02	c	—
Nitroglycerin	55-63-0	2.4E-03	n	2.4E-01	n	—	—	—	—	7.3E-03	n	7.3E-01	n	—	—	—	—	—
Nitrophenol, 2-	88-75-5	4.9E-02	n	4.9E+00	n	—	—	—	—	1.5E-01	n	1.5E+01	n	—	—	—	—	—
Nitrophenol, 3-	554-84-7	4.9E-02	n	4.9E+00	n	—	—	—	—	1.5E-01	n	1.5E+01	n	—	—	—	—	—
Nitrophenol, 4-	100-02-7	4.9E-02	n	4.9E+00	n	—	—	—	—	1.5E-01	n	1.5E+01	n	—	—	—	—	—
Nitropropane, 2-	79-46-9	3.4E-03	n	3.4E-01	n	8.1E+00	c	1.0E+00	c	1.0E-02	n	1.0E+00	n	1.4E+01	c	1.8E+00	c	—
Nitroquinoline-N-oxide, 4-	56-57-5	9.7E-05	c	9.7E-03	c	1.1E+04	c	1.1E+04	c	2.2E-04	c	2.2E-02	c	1.9E+04	c	1.8E+04	c	—
Nitrosodiethanolamine	1116-54-7	3.3E-04	c	3.3E-02	c	—	—	—	—	7.3E-04	c	7.3E-02	c	—	—	—	—	—
Nitrosodiethylamine, n-	55-18-5	6.1E-06	c	6.1E-04	c	7.4E+00	c	9.5E-01	c	1.4E-05	c	1.4E-03	c	1.2E+01	c	1.6E+00	c	—
Nitrosodimethylamine, n-	62-75-9	1.8E-05	c	1.8E-03	c	2.0E+01	c	2.6E+00	c	4.0E-05	c	4.0E-03	c	3.4E+01	c	4.4E+00	c	—
Nitrosodi-n-butylamine, n-	924-16-3	1.7E-04	c	1.7E-02	c	4.7E+00	c	6.1E-01	c	3.8E-04	c	3.8E-02	c	7.9E+00	c	1.0E+00	c	—
Nitrosodi-n-propylamine, n-	621-64-7	1.3E-04	c	1.3E-02	c	—	—	—	—	2.9E-04	c	2.9E-02	c	—	—	—	—	—
Nitrosodiphenylamine	86-30-6	1.9E-01	c	1.9E+01	c	—	—	—	—	4.2E-01	c	4.2E+01	c >S	—	—	—	—	—
Nitroso-methyl-ethyl-amine, n-	10595-95-6	4.1E-05	c	4.1E-03	c	—	—	—	—	9.3E-05	c	9.3E-03	c	—	—	—	—	—
Nitrosomorpholine, N-	59-89-2	1.4E-04	c	1.4E-02	c	2.7E+02	c	3.6E+01	c	3.1E-04	c	3.1E-02	c	4.6E+02	c	6.0E+01	c	—
Nitroso-n-ethylurea, n-	759-73-9	6.5E-06	c	6.5E-04	c	—	—	—	—	1.5E-05	c	1.5E-03	c	—	—	—	—	—
Nitrosopiperidine, N-	100-75-4	9.7E-05	c	9.7E-03	c	1.6E+02	c	2.1E+01	c	2.2E-04	c	2.2E-02	c	2.8E+02	c	3.6E+01	c	—
Nitrosopyrrolidine, n-	930-55-2	4.3E-04	c	4.3E-02	c	9.6E+02	c	1.2E+02	c	9.7E-04	c	9.7E-02	c	1.6E+03	c	2.1E+02	c	—
Nitrotoluene, m-	99-08-1	2.4E-01	n	2.4E+01	n	—	—	—	—	7.3E-01	n	7.3E+01	n	—	—	—	—	—
Nitrotoluene, o-	88-72-2	4.1E-03	c	4.1E-01	c	—	—	—	—	9.3E-03	c	9.3E-01	c	—	—	—	—	—
Nitrotoluene, p-	99-99-0	5.7E-02	c	5.7E+00	c	—	—	—	—	1.3E-01	c	1.3E+01	c	—	—	—	—	—
Nonachlor, cis-	5103-73-1	2.6E-03	c	2.6E-01	c >S	7.7E+02	c >S	9.9E+01	c >S	5.8E-03	c	5.8E-01	c >S	1.3E+03	c >S	1.7E+02	c >S	—
Nonachlor, trans-	39765-80-5	2.6E-03	c	2.6E-01	c >S	7.7E+02	c >S	9.9E+01	c >S	5.8E-03	c	5.8E-01	c >S	1.3E+03	c >S	1.7E+02	c >S	—
Nonanal	124-19-6	4.9E+00	n	4.9E+02	n >S	—	—	—	—	1.5E+01	n	1.5E+03	n >S	—	—	—	—	—
Nonene, 1-n	124-11-8	2.4E+00	n >S	2.4E+02	n >S	—	—	—	—	7.3E+00	n >S	7.3E+02	n >S	—	—	—	—	—
Nonylphenol, 4-n-	104-40-5	2.4E+00	n >S	2.4E+02	n >S	—	—	—	—	7.3E+00	n >S	7.3E+02	n >S	—	—	—	—	—
Nonylphenol ethoxylate	9016-45-9	2.4E+00	n >S	2.4E+02	n >S	—	—	—	—	7.3E+00	n >S	7.3E+02	n >S	—	—	—	—	—
Octamethylpyrophosphoramidate	152-16-9	4.9E-02	n	4.9E+00	n	—	—	—	—	1.5E-01	n	1.5E+01	n	—	—	—	—	—
Octanone	106-68-3	1.5E+00	n	1.5E+02	n	1.0E+06	n >S	6.2E+05	n >S	4.4E+00	n	4.4E+02	n	1.0E+06	n >S	8.7E+05	n >S	—
Oxamyl	23135-22-0	2.0E-01	m	2.0E+01	m	—	—	—	—	2.0E-01	m	2.0E+01	m	—	—	—	—	—
Oxychlordane	27304-13-8	2.6E-03	c	2.6E-01	c >S	7.7E+02	c >S	9.9E+01	c >S	5.8E-03	c	5.8E-01	c >S	1.3E+03	c >S	1.7E+02	c >S	—
Paraquat	1910-42-5	1.1E-01	n	1.1E+01	n	—	—	—	—	3.3E-01	n	3.3E+01	n	—	—	—	—	—
Parathion (ethyl parathion)	56-38-2	1.5E-01	n	1.5E+01	n >S	—	—	—	—	4.4E-01	n	4.4E+01	n >S	—	—	—	—	—
Pebulate	1114-71-2	1.2E+00	n	1.2E+02	n >S	—	—	—	—	3.7E+00	n	3.7E+02	n >S	—	—	—	—	—
Pendimethalin	40487-42-1	9.8E-01	n >S	9.8E+01	n >S	—	—	—	—	2.9E+00	n >S	2.9E+02	n >S	—	—	—	—	—
Pentachlorobenzene	608-93-5	2.0E-02	n	2.0E+00	n >S	—	—	—	—	5.8E-02	n	5.8E+00	n >S	—	—	—	—	—

Table 3
Tier 1 Groundwater PCLs - Residential and Commercial/Industrial¹

Last Revised: March 1, 2022

Chemical of Concern	CAS	Residential								Commercial/Industrial								Secondary MCL ⁵ (mg/L)
		GW _{Ing} ² (mg/L)	note ⁴	GW _{Class3} ³ (mg/L)	note ⁴	AirGW _{Inh-V} ³ 0.5 acre source area (mg/L)	note ⁴	AirGW _{Inh-V} ³ 30 acre source area (mg/L)	note ⁴	GW _{Ing} ² (mg/L)	note ⁴	GW _{Class3} ³ (mg/L)	note ⁴	AirGW _{Inh-V} ³ 0.5 acre source area (mg/L)	note ⁴	AirGW _{Inh-V} ³ 30 acre source area (mg/L)	note ⁴	
Pentachloroethane	76-01-7	1.0E-02	c	1.0E+00	c	3.0E+02	c	3.8E+01	c	2.3E-02	c	2.3E+00	c	5.0E+02	c	6.4E+01	c	—
Pentachloronitrobenzene	82-68-8	3.5E-03	c	3.5E-01	c > S	—	—	—	—	7.9E-03	c	7.9E-01	c > S	—	—	—	—	—
Pentachlorophenol	87-86-5	1.0E-03	m	1.0E-01	m	—	—	—	—	1.0E-03	m	1.0E-01	m	—	—	—	—	—
Pentadiene, 1,3-cis-	1574-41-0	1.5E+00	n	1.5E+02	n	4.3E+04	n > S	5.6E+03	n > S	4.4E+00	n	4.4E+02	n	6.0E+04	n > S	7.8E+03	n > S	—
Pentadiene, 1,3-trans-	2004-70-8	1.5E+00	n	1.5E+02	n	7.6E+04	n > S	9.8E+03	n > S	4.4E+00	n	4.4E+02	n	1.1E+05	n > S	1.4E+04	n > S	—
Pentaerythritol tetranitrate (PETN)	78-11-5	4.9E-02	n	4.9E+00	n	—	—	—	—	1.5E-01	n	1.5E+01	n	—	—	—	—	—
Pentane	109-66-0	1.5E+00	n	1.5E+02	n > S	3.4E+02	n > S	4.4E+01	n > S	4.4E+00	n	4.4E+02	n > S	4.8E+02	n > S	6.2E+01	n > S	—
Pentane, 2-methyl-	107-83-5	1.5E+00	n	1.5E+02	n > S	1.7E+03	n > S	2.3E+02	n > S	4.4E+00	n	4.4E+02	n > S	2.4E+03	n > S	3.2E+02	n > S	—
Pentane, 3-methyl-	96-14-0	1.5E+00	n	1.5E+02	n > S	2.2E+03	n > S	2.9E+02	n > S	4.4E+00	n	4.4E+02	n > S	3.1E+03	n > S	4.0E+02	n > S	—
Pentenediol, 1,5-	111-29-5	1.2E+02	n	1.2E+04	n	1.0E+06	n > S	1.0E+06	n > S	3.7E+02	n	3.7E+04	n	1.0E+06	n > S	1.0E+06	n > S	—
Pentanol, 1-	71-41-0	8.1E-01	n	8.1E+01	n	—	—	—	—	2.4E+00	n	2.4E+02	n	—	—	—	—	—
Pentanol, 4-methyl-2-	108-11-2	6.4E-01	n	6.4E+01	n	—	—	—	—	1.9E+00	n	1.9E+02	n	—	—	—	—	—
Pentanone, 2-	107-87-9	9.8E-01	n	9.8E+01	n	—	—	—	—	2.9E+00	n	2.9E+02	n	—	—	—	—	—
Pentene, 2-	109-68-2	1.5E+00	n	1.5E+02	n	1.4E+04	n > S	1.8E+03	n > S	4.4E+00	n	4.4E+02	n > S	2.0E+04	n > S	2.5E+03	n > S	—
Pentyne, 1-	627-19-0	1.5E+00	n	1.5E+02	n	7.2E+04	n > S	9.3E+03	n > S	4.4E+00	n	4.4E+02	n	1.0E+05	n > S	1.3E+04	n > S	—
Perchlorate	14797-73-0	1.7E-02	n	1.7E+00	n	—	—	—	—	5.1E-02	n	5.1E+00	n	—	—	—	—	—
Perfluorooctane sulfonic acid (1-Octanesulfonic acid, heptafluoro-1-) [PFOS]	1763-23-1	5.6E-04	n	5.6E-02	n	1.8E+03	n > S	2.4E+02	n	1.7E-03	n	1.7E-01	n	2.6E+03	n > S	3.4E+02	n	—
Perfluoroundecanoic acid (Undecanoic acid, uncosafluoro-) [PFUnDa]	2058-94-8	2.9E-04	n	2.9E-02	n	—	—	—	—	8.8E-04	n	8.8E-02	n	—	—	—	—	—
Perfluoropentanoic acid (Pentanoic acid, nonafluoro-) [PFPeA]	2706-90-3	9.3E-05	n	9.3E-03	n	—	—	—	—	2.8E-04	n	2.8E-02	n	—	—	—	—	—
Perfluorohexanoic acid (Hexanoic acid, undecafluoro-) [PFHxA]	307-24-4	9.3E-05	n	9.3E-03	n	—	—	—	—	2.8E-04	n	2.8E-02	n	—	—	—	—	—
Perfluorododecanoic acid (Dodecanoic acid, tricosfluoro-) [PFDoA]	307-55-1	2.9E-04	n	2.9E-02	n	5.5E+02	n > S	7.2E+01	n > S	8.8E-04	n	8.8E-02	n > S	7.8E+02	n > S	1.0E+02	n > S	—
Perfluorooctanoic acid (Octanoic acid, pentadecafluoro-) [PFOA]	335-67-1	2.9E-04	n	2.9E-02	n	9.0E+01	n	1.2E+01	n	8.8E-04	n	8.8E-02	n	1.3E+02	n	1.6E+01	n	—
Perfluorodecanoic acid (Decanoic acid, nonadecafluoro-) [PFDA]	335-76-2	3.7E-04	n	3.7E-02	n	1.3E+03	n > S	1.6E+02	n > S	1.1E-03	n	1.1E-01	n	1.8E+03	n > S	2.3E+02	n > S	—
Perfluorodecane sulfonic acid (1-Decanesulfonic acid, heneicosafluoro-) [PFDS]	335-77-3	2.9E-04	n	2.9E-02	n	—	—	—	—	8.8E-04	n	8.8E-02	n > S	—	—	—	—	—
Perfluorohexane sulfonic acid (1-Hexanesulfonic acid, tridecafluoro-) [PFHxS]	355-46-4	9.3E-05	n	9.3E-03	n	2.9E+02	n	5.7E+01	n	2.8E-04	n	2.8E-02	n	4.0E+02	n > S	7.9E+01	n	—
Perfluorobutyric acid (Butanoic acid, heptafluoro-) [PFBA]	375-22-4	7.1E-02	n	7.1E+00	n	8.5E+05	n > S	7.1E+05	n	2.1E-01	n	2.1E+01	n	1.0E+06	n > S	1.0E+06	n > S	—
Perfluorobutane sulfonic acid (1-Butanesulfonic acid, nonafluoro-) [PFBS]	375-73-5	3.4E-02	n	3.4E+00	n	5.4E+05	n > S	4.7E+05	n > S	1.0E-01	n	1.0E+01	n	7.6E+05	n > S	6.5E+05	n > S	—
Perfluoroheptanoic acid (Heptanoic acid, tridecafluoro-) [PFHpA]	375-85-9	5.6E-04	n	5.6E-02	n	—	—	—	—	1.7E-03	n	1.7E-01	n	—	—	—	—	—
Perfluorononanoic acid (Nonanoic acid, heptafluoro-) [PFNA]	375-95-1	2.9E-04	n	2.9E-02	n	6.5E+02	n > S	8.4E+01	n > S	8.8E-04	n	8.8E-02	n	9.1E+02	n > S	1.2E+02	n > S	—
Perfluorotetradecanoic acid (Tetradecanoic acid, heptafluoro-) [PFTeDA]	376-06-7	2.9E-04	n	2.9E-02	n > S	—	—	—	—	8.8E-04	n	8.8E-02	n > S	—	—	—	—	—
Perfluorotridecanoic acid (Tridecanoic acid, pentacosfluoro-) [PFTriDA]	72629-94-8	2.9E-04	n	2.9E-02	n > S	—	—	—	—	8.8E-04	n	8.8E-02	n > S	—	—	—	—	—
Perfluorooctane sulfonamide (1-Octanesulfonamide, heptafluoro-) [PFOSA]	754-91-6	2.9E-04	n	2.9E-02	n	5.3E-05	n	6.8E-06	n	8.8E-04	n	8.8E-02	n > S	7.4E-05	n	9.6E-06	n	—
Perylene	198-55-0	4.9E-01	n > S	4.9E+01	n > S	—	—	—	—	1.5E+00	n > S	1.5E+02	n > S	—	—	—	—	—
Phenacetin	62-44-2	4.1E-01	c	4.1E+01	c	1.0E+06	c > S	1.5E+05	c > S	9.3E-01	c	9.3E+01	c	1.0E+06	c > S	2.5E+05	c > S	—
Phenanthrene	85-01-8	7.3E-01	n	7.3E+01	n > S	—	—	—	—	2.2E+00	n > S	2.2E+02	n > S	—	—	—	—	—
Phenanthridine	229-87-8	7.3E-02	n	7.3E+00	n	—	—	—	—	2.2E-01	n	2.2E+01	n	—	—	—	—	—
Phenol	108-95-2	7.3E+00	n	7.3E+02	n	1.6E+05	n > S	2.1E+04	n	2.2E+01	n	2.2E+03	n	2.2E+05	n > S	2.9E+04	n	—

Table 3
Tier 1 Groundwater PCLs - Residential and Commercial/Industrial¹

Last Revised: March 1, 2022

Chemical of Concern	CAS	Residential								Commercial/Industrial								Secondary MCL ⁵ (mg/L)
		GW _{Ing} ² (mg/L)	note ⁴	GW _{Class3} ³ (mg/L)	note ⁴	AirGW _{Inh-V} 0.5 acre source area (mg/L)	note ⁴	AirGW _{Inh-V} 30 acre source area (mg/L)	note ⁴	GW _{Ing} ² (mg/L)	note ⁴	GW _{Class3} ³ (mg/L)	note ⁴	AirGW _{Inh-V} 0.5 acre source area (mg/L)	note ⁴	AirGW _{Inh-V} 30 acre source area (mg/L)	note ⁴	
Phenol, 4-tert-butyl-	98-54-4	2.9E+00	n	2.9E+02	n >S	—	—	—	—	8.8E+00	n	8.8E+02	n >S	—	—	—	—	—
Phenothiazine	92-84-2	2.7E-02	n >S	2.7E+00	n >S	—	—	—	—	8.0E-02	n >S	8.0E+00	n >S	—	—	—	—	—
Phenyl mercuric acetate	62-38-4	2.0E-03	n	2.0E-01	n	—	—	—	—	5.8E-03	n	5.8E-01	n	—	—	—	—	—
Phenylene diamine, m-	108-45-2	1.5E-01	n	1.5E+01	n	—	—	—	—	4.4E-01	n	4.4E+01	n	—	—	—	—	—
Phenylene diamine, p-	106-50-3	4.6E+00	n	4.6E+02	n	—	—	—	—	1.4E+01	n	1.4E+03	n	—	—	—	—	—
Phorate	298-02-2	4.9E-03	n	4.9E-01	n	—	—	—	—	1.5E-02	n	1.5E+00	n	—	—	—	—	—
Phosalone	2310-17-0	4.9E-02	n	4.9E+00	n	—	—	—	—	1.5E-01	n	1.5E+01	n	—	—	—	—	—
Phosdrin (mevinphos)	7786-34-7	6.1E-04	n	6.1E-02	n	—	—	—	—	1.8E-03	n	1.8E-01	n	—	—	—	—	—
Phosmet	732-11-6	4.9E-01	n	4.9E+01	n	—	—	—	—	1.5E+00	n	1.5E+02	n	—	—	—	—	—
Phosphine	7803-51-2	7.3E-03	n	7.3E-01	n	2.9E-03	n	3.7E-04	n	2.2E-02	n	2.2E+00	n	4.0E-03	n	5.2E-04	n	—
Phosphorotrithioic acid, S,S,S-tributyl ester	78-48-8	1.1E-02	c >S	1.1E+00	c >S	—	—	—	—	2.4E-02	c >S	2.4E+00	c >S	—	—	—	—	—
Phosphorus, total*	7723-14-0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Phosphorus, white	7723-14-0	4.9E-04	n	4.9E-02	n	—	—	—	—	1.5E-03	n	1.5E-01	n	—	—	—	—	—
Phthalic anhydride	85-44-9	4.9E+01	n	4.9E+03	n	1.0E+06	n >S	4.0E+05	n >S	1.5E+02	n	1.5E+04	n >S	1.0E+06	n >S	5.6E+05	n >S	—
Picloram	1918-02-1	5.0E-01	m	5.0E+01	m	—	—	—	—	5.0E-01	m	5.0E+01	m	—	—	—	—	—
Picoline, 2- (2-methylpyridine)	109-06-8	2.2E-01	n	2.2E+01	n	—	—	—	—	6.6E-01	n	6.6E+01	n	—	—	—	—	—
Polybrominated biphenyls (PBBs)	67774-32-7	1.0E-04	c	1.0E-02	c	—	—	—	—	2.3E-04	c	2.3E-02	c >S	—	—	—	—	—
Polychlorinated biphenyls (PCBs)	1336-36-3	5.0E-04	m	5.0E-02	m	2.9E+00	c >S	3.8E-01	c >S	5.0E-04	m	5.0E-02	m	4.9E+00	c >S	6.4E-01	c >S	—
Potassium*	7440-09-7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Primene	68955-53-3	1.5E-01	n	1.5E+01	n	—	—	—	—	4.4E-01	n	4.4E+01	n	—	—	—	—	—
Prometon (pramitol)	1610-18-0	3.7E-01	n	3.7E+01	n	—	—	—	—	1.1E+00	n	1.1E+02	n >S	—	—	—	—	—
Prometryn	7287-19-6	9.8E-01	n	9.8E+01	n >S	—	—	—	—	2.9E+00	n	2.9E+02	n >S	—	—	—	—	—
Pronamide	23950-58-5	1.8E+00	n	1.8E+02	n >S	—	—	—	—	5.5E+00	n	5.5E+02	n >S	—	—	—	—	—
Propanal (propionaldehyde)	123-38-6	2.0E-01	n	2.0E+01	n	1.6E+03	n	2.1E+02	n	5.8E-01	n	5.8E+01	n	2.3E+03	n	3.0E+02	n	—
Propane, 1-bromo-	106-94-5	8.8E-01	n	8.8E+01	n	—	—	—	—	2.6E+00	n	2.6E+02	n	—	—	—	—	—
Propanil	709-98-8	1.2E-01	n	1.2E+01	n	—	—	—	—	3.7E-01	n	3.7E+01	n	—	—	—	—	—
Propanoic acid (propionic acid)	79-09-4	1.2E+01	n	1.2E+03	n	—	—	—	—	3.7E+01	n	3.7E+03	n	—	—	—	—	—
Propanol, 1-	71-23-8	4.9E+01	n	4.9E+03	n	—	—	—	—	1.5E+02	n	1.5E+04	n	—	—	—	—	—
Propargite	2312-35-8	4.9E-01	n	4.9E+01	n >S	—	—	—	—	1.5E+00	n >S	1.5E+02	n >S	—	—	—	—	—
Propargyl alcohol	107-19-7	4.9E-02	n	4.9E+00	n	—	—	—	—	1.5E-01	n	1.5E+01	n	—	—	—	—	—
Propazine	139-40-2	2.1E-02	c	2.1E+00	c	—	—	—	—	4.6E-02	c	4.6E+00	c	—	—	—	—	—
Propham	122-42-9	4.9E-01	n	4.9E+01	n	—	—	—	—	1.5E+00	n	1.5E+02	n	—	—	—	—	—
Propionitrile (propane nitrile)	107-12-0	9.8E-03	n	9.8E-01	n	—	—	—	—	2.9E-02	n	2.9E+00	n	—	—	—	—	—
Propyl acetate, n-	109-60-4	2.2E+00	n	2.2E+02	n	—	—	—	—	6.6E+00	n	6.6E+02	n	—	—	—	—	—
Propylbenzene, n-	103-65-1	9.8E-01	n	9.8E+01	n >S	6.0E+03	n >S	7.8E+02	n >S	2.9E+00	n	2.9E+02	n >S	8.5E+03	n >S	1.1E+03	n >S	—
Propylene glycol	57-55-6	4.9E+02	n	4.9E+04	n	5.0E+04	n	6.4E+03	n	1.5E+03	n	1.5E+05	n >S	7.0E+04	n	9.0E+03	n	—
Propylene glycol monomethyl ether	107-98-2	1.7E+01	n	1.7E+03	n	1.0E+06	n >S	1.0E+06	n >S	5.1E+01	n	5.1E+03	n	1.0E+06	n >S	1.0E+06	n >S	—
Propylene oxide	75-56-9	3.8E-03	c	3.8E-01	c	1.6E+03	c	2.0E+02	c	8.5E-03	c	8.5E-01	c	2.7E+03	c	3.4E+02	c	—
Propylene tetramer	6842-15-5	2.4E+00	n >S	2.4E+02	n >S	4.4E+01	n >S	5.7E+00	n >S	7.3E+00	n >S	7.3E+02	n >S	6.2E+01	n >S	8.0E+00	n >S	—
Prothiofos (Tokuthion)	34643-46-4	2.4E-03	n	2.4E-01	n >S	—	—	—	—	7.3E-03	n >S	7.3E-01	n >S	—	—	—	—	—
Pyrene	129-00-0	7.3E-01	n >S	7.3E+01	n >S	—	—	—	—	2.2E+00	n >S	2.2E+02	n >S	—	—	—	—	—
Pyridine	110-86-1	2.4E-02	n	2.4E+00	n	—	—	—	—	7.3E-02	n	7.3E+00	n	—	—	—	—	—

Table 3
Tier 1 Groundwater PCLs - Residential and Commercial/Industrial¹

Last Revised: March 1, 2022

Chemical of Concern	CAS	Residential								Commercial/Industrial								Secondary MCL ⁵ (mg/L)
		GW _{Ing} ² (mg/L)	note ⁴	GW _{Class3} ³ (mg/L)	note ⁴	AirGW _{Inh-V} 0.5 acre source area (mg/L)	note ⁴	AirGW _{Inh-V} 30 acre source area (mg/L)	note ⁴	GW _{Ing} ² (mg/L)	note ⁴	GW _{Class3} ³ (mg/L)	note ⁴	AirGW _{Inh-V} 0.5 acre source area (mg/L)	note ⁴	AirGW _{Inh-V} 30 acre source area (mg/L)	note ⁴	
Quinoline	91-22-5	3.0E-04	c	3.0E-02	c	—	—	—	—	6.8E-04	c	6.8E-02	c	—	—	—	—	—
Ronnel	299-84-3	1.2E+00	n	1.2E+02	n >S	—	—	—	—	3.7E+00	n >S	3.7E+02	n >S	—	—	—	—	—
Safrole	94-59-7	4.1E-03	c	4.1E-01	c	1.9E+02	c >S	2.4E+01	c	9.3E-03	c	9.3E-01	c	3.2E+02	c >S	4.1E+01	c	—
Selenium	7782-49-2	5.0E-02	m >S	5.0E+00	m >S	—	—	—	—	5.0E-02	m >S	5.0E+00	m >S	—	—	—	—	—
Selenourea	630-10-4	1.2E-01	n	1.2E+01	n	—	—	—	—	3.7E-01	n	3.7E+01	n	—	—	—	—	—
Silver	7440-22-4	1.2E-01	n >S	1.2E+01	n >S	—	—	—	—	3.7E-01	n >S	3.7E+01	n >S	—	—	—	—	0.1
Simazine	122-34-9	4.0E-03	m	4.0E-01	m	—	—	—	—	4.0E-03	m	4.0E-01	m	—	—	—	—	—
Sodium*	7440-23-5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sodium hypochlorite	7681-52-9	5.1E+00	n	5.1E+02	n	—	—	—	—	1.5E+01	n	1.5E+03	n	—	—	—	—	—
Sodium polyacrylate	9003-04-7	1.2E+01	n	1.2E+03	n	1.5E+04	n	2.0E+03	n	3.7E+01	n	3.7E+03	n	2.1E+04	n	2.7E+03	n	—
Strontium	7440-24-6	1.5E+01	n	1.5E+03	n	—	—	—	—	4.4E+01	n	4.4E+03	n	—	—	—	—	—
Strychnine	57-24-9	7.3E-03	n	7.3E-01	n	—	—	—	—	2.2E-02	n	2.2E+00	n	—	—	—	—	—
Styrene	100-42-5	1.0E-01	m	1.0E+01	m	1.5E+04	n >S	2.0E+03	n >S	1.0E-01	m	1.0E+01	m	2.1E+04	n >S	2.7E+03	n >S	—
Sulfate*	14808-79-8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	250
Sulfide*	18496-25-8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sulfolane	126-33-0	3.2E-01	n	3.2E+01	n	1.3E+05	n >S	1.7E+04	n >S	9.5E-01	n	9.5E+01	n	1.8E+05	n >S	2.3E+04	n >S	—
Sulfur*	7704-34-9	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sulprofos (Bolstar)	35400-43-2	7.3E-02	n >S	7.3E+00	n >S	—	—	—	—	2.2E-01	n >S	2.2E+01	n >S	—	—	—	—	—
Tebuconazole	107534-96-3	7.3E-01	n	7.3E+01	n >S	—	—	—	—	2.2E+00	n	2.2E+02	n >S	—	—	—	—	—
Tebuthiuron	34014-18-1	1.7E+00	n	1.7E+02	n	—	—	—	—	5.1E+00	n	5.1E+02	n	—	—	—	—	—
Terbufos	13071-79-9	6.1E-04	n	6.1E-02	n	—	—	—	—	1.8E-03	n	1.8E-01	n	—	—	—	—	—
Tert-amyl ethyl ether (TAEF)	919-94-8	9.8E-01	n	9.8E+01	n	—	—	—	—	2.9E+00	n	2.9E+02	n	—	—	—	—	—
Tert-amyl-methyl ether (TAME)	994-05-8	9.8E-01	n	9.8E+01	n	—	—	—	—	2.9E+00	n	2.9E+02	n	—	—	—	—	—
Tert-butyl alcohol (2-methyl-2-propanol)	75-65-0	2.2E+00	n	2.2E+02	n	—	—	—	—	6.6E+00	n	6.6E+02	n	—	—	—	—	—
Tetrachlorobenzene, 1,2,3,4-	634-66-2	7.3E-03	n	7.3E-01	n	—	—	—	—	2.2E-02	n	2.2E+00	n	—	—	—	—	—
Tetrachlorobenzene, 1,2,3,5-	634-90-2	7.3E-03	n	7.3E-01	n	—	—	—	—	2.2E-02	n	2.2E+00	n	—	—	—	—	—
Tetrachlorobenzene, 1,2,4,5-	95-94-3	7.3E-03	n	7.3E-01	n >S	—	—	—	—	2.2E-02	n	2.2E+00	n >S	—	—	—	—	—
Tetrachloroethane, 1,1,1,2-	630-20-6	3.5E-02	c	3.5E+00	c	1.1E+02	c	1.4E+01	c	7.9E-02	c	7.9E+00	c	1.9E+02	c	2.4E+01	c	—
Tetrachloroethane, 1,1,2,2-	79-34-5	4.6E-03	c	4.6E-01	c	—	—	—	—	1.0E-02	c	1.0E+00	c	—	—	—	—	—
Tetrachloroethylene [PCE]	127-18-4	5.0E-03	m	5.0E-01	m	5.0E+02	c >S	6.4E+01	c	5.0E-03	m	5.0E-01	m	8.4E+02	c >S	1.1E+02	c	—
Tetrachlorophenol, 2,3,4,5-	4901-51-3	7.3E-01	n	7.3E+01	n	—	—	—	—	2.2E+00	n	2.2E+02	n	—	—	—	—	—
Tetrachlorophenol, 2,3,4,6-	58-90-2	7.3E-01	n	7.3E+01	n	—	—	—	—	2.2E+00	n	2.2E+02	n >S	—	—	—	—	—
Tetrachlorophenol, 2,3,5,6-	935-95-5	7.3E-01	n	7.3E+01	n >S	—	—	—	—	2.2E+00	n >S	2.2E+02	n >S	—	—	—	—	—
Tetrachlorvinphos (Stirophos)	22248-79-9	1.0E+00	n	1.0E+02	n >S	—	—	—	—	3.1E+00	n	3.1E+02	n >S	—	—	—	—	—
Tetradifon	116-29-0	4.9E-01	n	4.9E+01	n >S	—	—	—	—	1.5E+00	n >S	1.5E+02	n >S	—	—	—	—	—
Tetraethyl dithiopyrophosphate (sulfotep)	3689-24-5	1.2E-02	n	1.2E+00	n	—	—	—	—	3.7E-02	n	3.7E+00	n	—	—	—	—	—
Tetraethyl lead	78-00-2	2.4E-06	n	2.4E-04	n	—	—	—	—	7.3E-06	n	7.3E-04	n	—	—	—	—	—
Tetraethyl pyrophosphate (TEPP)	107-49-3	2.7E-04	n	2.7E-02	n	—	—	—	—	8.0E-04	n	8.0E-02	n	—	—	—	—	—
Tetraethylene glycol	112-60-7	8.1E+00	n	8.1E+02	n	—	—	—	—	2.4E-01	n	2.4E+03	n	—	—	—	—	—
Tetrahydrofuran	109-99-9	1.2E-01	c	1.2E+01	c	2.2E+03	c	2.9E+02	c	2.7E-01	c	2.7E+01	c	3.7E+03	c	4.8E+02	c	—
Tetrahydropyran	142-68-7	1.2E-01	c	1.2E+01	c	2.6E+03	c	3.4E+02	c	2.7E-01	c	2.7E+01	c	4.4E+03	c	5.7E+02	c	—
Tetraoxadodecane, 2,5,8,11-	112-49-2	6.1E-01	n	6.1E+01	n	—	—	—	—	1.8E+00	n	1.8E+02	n	—	—	—	—	—

Table 3
Tier 1 Groundwater PCLs - Residential and Commercial/Industrial¹

Last Revised: March 1, 2022

Chemical of Concern	CAS	Residential								Commercial/Industrial								Secondary MCL ⁵ (mg/L)
		GW _{Ing} ² (mg/L)	note ⁴	GW _{Class3} ³ (mg/L)	note ⁴	AirGW _{Inh-V} ^{0.5 acre source area} (mg/L)	note ⁴	AirGW _{Inh-V} ^{30 acre source area} (mg/L)	note ⁴	GW _{Ing} ² (mg/L)	note ⁴	GW _{Class3} ³ (mg/L)	note ⁴	AirGW _{Inh-V} ^{0.5 acre source area} (mg/L)	note ⁴	AirGW _{Inh-V} ^{30 acre source area} (mg/L)	note ⁴	
Thallium	7440-28-0	2.0E-03	m	2.0E-01	m	—	—	—	—	2.0E-03	m	2.0E-01	m	—	—	—	—	—
Thiofanox	39196-18-4	7.3E-03	n	7.3E-01	n	—	—	—	—	2.2E-02	n	2.2E+00	n	—	—	—	—	—
Thionazin	297-97-2	1.7E-03	n	1.7E-01	n	—	—	—	—	5.1E-03	n	5.1E-01	n	—	—	—	—	—
Thiophanate-methyl	23564-05-8	2.0E+00	n	2.0E+02	n >S	—	—	—	—	5.8E+00	n >S	5.8E+02	n >S	—	—	—	—	—
Thiram	137-26-8	1.2E-01	n	1.2E+01	n	—	—	—	—	3.7E-01	n	3.7E+01	n >S	—	—	—	—	—
Tin	7440-31-5	1.5E+01	n >S	1.5E+03	n >S	—	—	—	—	4.4E+01	n >S	4.4E+03	n >S	—	—	—	—	—
Titanium	7440-32-6	1.2E+02	n >S	1.2E+04	n >S	—	—	—	—	3.7E+02	n >S	3.7E+04	n >S	—	—	—	—	—
Toluene	108-88-3	1.0E+00	m	1.0E+02	m	6.4E+04	n >S	8.2E+03	n >S	1.0E+00	m	1.0E+02	m	8.9E+04	n >S	1.2E+04	n >S	—
Toluene diisocyanate, 2,4/2,6-	26471-62-5	—	—	—	—	1.8E+03	n	2.4E+02	n	—	—	—	—	2.6E+03	n	3.3E+02	n	—
Toluenediamine, 2,4-	95-80-7	2.9E-04	c	2.9E-02	c	—	—	—	—	6.4E-04	c	6.4E-02	c	—	—	—	—	—
Toluenediamine, 2,6-	823-40-5	7.3E-01	n	7.3E+01	n	—	—	—	—	2.2E+00	n	2.2E+02	n	—	—	—	—	—
Toluidine, o-	95-53-4	5.7E-02	c	5.7E+00	c	2.6E+03	c	3.4E+02	c	1.3E-01	c	1.3E+01	c	4.4E+03	c	5.7E+02	c	—
Toluidine, p-	106-49-0	3.0E-02	c	3.0E+00	c	—	—	—	—	6.8E-02	c	6.8E+00	c	—	—	—	—	—
Toxaphene	8001-35-2	3.0E-03	m	3.0E-01	m	1.8E+03	c >S	2.3E+02	c >S	3.0E-03	m	3.0E-01	m	3.0E+03	c >S	3.9E+02	c >S	—
TPH, TX1005, C6-C12	TPH-1005-1	9.8E-01	n	9.8E+01	n >S	1.8E+03	n >S	2.3E+02	n >S	2.9E+00	n	2.9E+02	n >S	2.5E+03	n >S	3.2E+02	n >S	—
TPH, TX1005, >C12-C28	TPH-1005-2	9.8E-01	n	9.8E+01	n >S	7.5E+03	n >S	9.7E+02	n >S	2.9E+00	n	2.9E+02	n >S	1.0E+04	n >S	1.4E+03	n >S	—
TPH, TX1005, >C12-C35	TPH-1005-3	9.8E-01	n	9.8E+01	n >S	7.5E+03	n >S	9.7E+02	n >S	2.9E+00	n	2.9E+02	n >S	1.0E+04	n >S	1.4E+03	n >S	—
TPH, TX1005, >C28-C35	TPH-1005-4	9.8E-01	n	9.8E+01	n >S	7.5E+03	n >S	9.7E+02	n >S	2.9E+00	n	2.9E+02	n >S	1.0E+04	n >S	1.4E+03	n >S	—
TP Silvex, 2,4,5-	93-72-1	5.0E-02	m	5.0E+00	m	—	—	—	—	5.0E-02	m	5.0E+00	m	—	—	—	—	—
Triademenol	55219-65-3	7.3E-01	n	7.3E+01	n	—	—	—	—	2.2E+00	n	2.2E+02	n >S	—	—	—	—	—
Triallate	2303-17-5	3.2E-01	n	3.2E+01	n >S	—	—	—	—	9.5E-01	n	9.5E+01	n >S	—	—	—	—	—
Triaminotrinitrobenzene (TATB)	3058-38-6	7.3E-02	n	7.3E+00	n	—	—	—	—	2.2E-01	n	2.2E+01	n	—	—	—	—	—
Tributyltin oxide	56-35-9	7.3E-03	n	7.3E-01	n	—	—	—	—	2.2E-02	n	2.2E+00	n	—	—	—	—	—
Trichloro-1,2,2-trifluoroethane, 1,1,2-	76-13-1	7.3E+02	n >S	7.3E+04	n >S	1.5E+03	n >S	2.0E+02	n	2.2E+03	n >S	2.2E+05	n >S	2.1E+03	n >S	2.8E+02	n >S	—
Trichlorobenzene, 1,2,3-	87-61-6	7.3E-02	n	7.3E+00	n	1.3E+02	n >S	1.7E+01	n >S	2.2E-01	n	2.2E+01	n >S	1.9E+02	n >S	2.4E+01	n >S	—
Trichlorobenzene, 1,2,4-	120-82-1	7.0E-02	m	7.0E+00	m	1.6E+02	n >S	2.0E+01	n	7.0E-02	m	7.0E+00	m	2.2E+02	n >S	2.8E+01	n	—
Trichlorobenzene, 1,3,5-	108-70-3	7.3E-02	n	7.3E+00	n	1.0E+02	n >S	1.3E+01	n	2.2E-01	n	2.2E+01	n >S	1.4E+02	n >S	1.8E+01	n >S	—
Trichloroethane, 1,1,1-	71-55-6	2.0E-01	m	2.0E+01	m	4.1E+04	n >S	5.2E+03	n >S	2.0E-01	m	2.0E+01	m	5.7E+04	n >S	7.3E+03	n >S	—
Trichloroethane, 1,1,2-	79-00-5	5.0E-03	m	5.0E-01	m	8.0E+01	c	1.0E+01	c	5.0E-03	m	5.0E-01	m	1.3E+02	c	1.7E+01	c	—
Trichloroethylene [TCE]	79-01-6	5.0E-03	m	5.0E-01	m	2.4E+01	n	3.1E+00	n	5.0E-03	m	5.0E-01	m	3.3E+01	n	4.3E+00	n	—
Trichlorofluoromethane	75-69-4	7.3E+00	n	7.3E+02	n	—	—	—	—	2.2E+01	n	2.2E+03	n >S	—	—	—	—	—
Trichloronate	327-98-0	7.3E-02	n	7.3E+00	n >S	—	—	—	—	2.2E-01	n	2.2E+01	n >S	—	—	—	—	—
Trichlorophenol, 2,3,4-	15950-66-0	2.4E+00	n	2.4E+02	n	—	—	—	—	7.3E+00	n	7.3E+02	n	—	—	—	—	—
Trichlorophenol, 2,3,5-	933-78-8	2.4E+00	n	2.4E+02	n	—	—	—	—	7.3E+00	n	7.3E+02	n	—	—	—	—	—
Trichlorophenol, 2,3,6-	933-75-5	2.4E+00	n	2.4E+02	n >S	—	—	—	—	7.3E+00	n	7.3E+02	n >S	—	—	—	—	—
Trichlorophenol, 2,4,5-	95-95-4	2.4E+00	n	2.4E+02	n	—	—	—	—	7.3E+00	n	7.3E+02	n	—	—	—	—	—
Trichlorophenol, 2,4,6-	88-06-2	2.4E-02	n	2.4E+00	n	4.9E+04	c >S	6.4E+03	c >S	7.3E-02	n	7.3E+00	n	8.3E+04	c >S	1.1E+04	c >S	—
Trichlorophenol, 3,4,5-	609-19-8	2.4E+00	n	2.4E+02	n	—	—	—	—	7.3E+00	n	7.3E+02	n	—	—	—	—	—
Trichlorophenoxyacetic acid, 2,4,5-	93-76-5	2.4E-01	n	2.4E+01	n	—	—	—	—	7.3E-01	n	7.3E+01	n	—	—	—	—	—
Trichloropropane, 1,1,2-	598-77-6	1.2E-01	n	1.2E+01	n	2.7E+00	n	3.5E-01	n	3.7E-01	n	3.7E+01	n	3.8E+00	n	4.9E-01	n	—
Trichloropropane, 1,2,3-	96-18-4	3.0E-05	c	3.0E-03	c	3.2E+01	n	4.2E+00	n	6.8E-05	c	6.8E-03	c	4.5E+01	n	5.8E+00	n	—
Triethanolamine	102-71-6	4.9E+00	n	4.9E+02	n	1.0E+06	n	1.0E+06	n	1.5E+01	n	1.5E+03	n	1.0E+06	n	1.0E+06	n	—

Table 3
Tier 1 Groundwater PCLs - Residential and Commercial/Industrial¹

Last Revised: March 1, 2022

Chemical of Concern	CAS	Residential								Commercial/Industrial								Secondary MCL ⁵ (mg/L)
		GW _{Ing} ² (mg/L)	note ⁴	GW _{Class3} ³ (mg/L)	note ⁴	AirGW _{Inh-V} 0.5 acre source area (mg/L)	note ⁴	AirGW _{Inh-V} 30 acre source area (mg/L)	note ⁴	GW _{Ing} ² (mg/L)	note ⁴	GW _{Class3} ³ (mg/L)	note ⁴	AirGW _{Inh-V} 0.5 acre source area (mg/L)	note ⁴	AirGW _{Inh-V} 30 acre source area (mg/L)	note ⁴	
Triethylamine	121-44-8	—	—	—	—	6.3E+02	n	8.1E+01	n	—	—	—	—	8.8E+02	n	1.1E+02	n	—
Triethylene glycol	112-27-6	4.9E+01	n	4.9E+03	n	—	—	—	—	1.5E+02	n	1.5E+04	n	—	—	—	—	—
Triethylphosphorothioate, O, O, O-	126-68-1	2.0E-04	n	2.0E-02	n	—	—	—	—	6.1E-04	n	6.1E-02	n	—	—	—	—	—
Trifluralin	1582-09-8	1.2E-01	c	1.2E+01	c >S	—	—	—	—	2.7E-01	c	2.7E+01	c >S	—	—	—	—	—
Trimethylamine	75-50-3	—	—	—	—	1.7E+03	n	2.2E+02	n	—	—	—	—	2.3E+03	n	3.0E+02	n	—
Trimethylbenzene, 1,2,3-	526-73-8	8.3E-01	n	8.3E+01	n >S	5.6E+03	n >S	7.3E+02	n >S	2.5E+00	n	2.5E+02	n >S	7.9E+03	n >S	1.0E+03	n >S	—
Trimethylbenzene, 1,2,4-	95-63-6	8.3E-01	n	8.3E+01	n >S	4.9E+03	n >S	6.3E+02	n >S	2.5E+00	n	2.5E+02	n >S	6.8E+03	n >S	8.8E+02	n >S	—
Trimethylbenzene, 1,3,5-	108-67-8	8.3E-01	n	8.3E+01	n >S	3.8E+03	n >S	4.9E+02	n >S	2.5E+00	n	2.5E+02	n >S	5.3E+03	n >S	6.8E+02	n >S	—
Trinitrobenzene, 1,3,5-	99-35-4	7.3E-01	n	7.3E+01	n	—	—	—	—	2.2E+00	n	2.2E+02	n	—	—	—	—	—
Trinitrophenylmethylnitramine (tetryl; nitramine)	479-45-8	4.9E-02	n	4.9E+00	n	—	—	—	—	1.5E-01	n	1.5E+01	n	—	—	—	—	—
Trinitrotoluene, 2,4,6-	118-96-7	1.2E-02	n	1.2E+00	n	—	—	—	—	3.7E-02	n	3.7E+00	n	—	—	—	—	—
Tungsten (as sodium tungstate dihydride)	7440-33-7	2.4E-02	n	2.4E+00	n	—	—	—	—	7.3E-02	n	7.3E+00	n	—	—	—	—	—
Uranium (soluble salts)	7440-61-1	3.0E-02	m >S	3.0E+00	m >S	—	—	—	—	3.0E-02	m >S	3.0E+00	m >S	—	—	—	—	—
Valeric acid (pentanoic acid)	109-52-4	1.2E+01	n >S	1.2E+03	n >S	2.0E+04	n >S	2.6E+03	n >S	3.7E+01	n >S	3.7E+03	n >S	2.8E+04	n >S	3.6E+03	n >S	—
Vanadium	7440-62-2	4.4E-02	n >S	4.4E+00	n >S	—	—	—	—	1.3E-01	n >S	1.3E+01	n >S	—	—	—	—	—
Vernam	1929-77-7	2.4E-02	n	2.4E+00	n	—	—	—	—	7.3E-02	n	7.3E+00	n	—	—	—	—	—
Vinyl acetate	108-05-4	2.4E+01	n	2.4E+03	n	1.4E+04	n	1.8E+03	n	7.3E+01	n	7.3E+03	n	2.0E+04	n	2.6E+03	n	—
Vinyl chloride	75-01-4	2.0E-03	m	2.0E-01	m	3.8E+00	c	4.9E-01	c	2.0E-03	m	2.0E-01	m	6.4E+00	c	8.3E-01	c	—
Vinylcyclohexane	695-12-5	1.2E+01	n >S	1.2E+03	n >S	—	—	—	—	3.7E+01	n >S	3.7E+03	n >S	—	—	—	—	—
Warfarin	81-81-2	7.3E-03	n	7.3E-01	n	—	—	—	—	2.2E-02	n	2.2E+00	n	—	—	—	—	—
Xylene, m-	108-38-3	1.0E+01	m	1.0E+03	m >S	1.1E+04	n >S	1.4E+03	n >S	1.0E+01	m	1.0E+03	m >S	1.5E+04	n >S	1.9E+03	n >S	—
Xylene, o-	95-47-6	1.0E+01	m	1.0E+03	m >S	7.6E+05	n >S	9.8E+04	n >S	1.0E+01	m	1.0E+03	m >S	1.0E+06	n >S	1.4E+05	n >S	—
Xylene, p-	106-42-3	1.0E+01	m	1.0E+03	m >S	9.4E+03	n >S	1.2E+03	n >S	1.0E+01	m	1.0E+03	m >S	1.3E+04	n >S	1.7E+03	n >S	—
Xylenes	1330-20-7	1.0E+01	m	1.0E+03	m >S	1.0E+04	n >S	1.3E+03	n >S	1.0E+01	m	1.0E+03	m >S	1.4E+04	n >S	1.9E+03	n >S	—
Zinc	7440-66-6	7.3E+00	n >S	7.3E+02	n >S	—	—	—	—	2.2E+01	n >S	2.2E+03	n >S	—	—	—	—	5
6 C aliphatics (TPH) (>53% n-hexane content)	NA	1.5E+00	n	1.5E+02	n >S	1.1E+02	n >S	1.4E+01	n	4.4E+00	n	4.4E+02	n >S	1.5E+02	n >S	1.9E+01	n	—
6 C aliphatics (TPH) (<53% n-hexane content)	NA	1.5E+00	n	1.5E+02	n >S	2.9E+03	n >S	3.8E+02	n >S	4.4E+00	n	4.4E+02	n >S	4.1E+03	n >S	5.3E+02	n >S	—
>6-8 C aliphatics (TPH) (>53% n-hexane content)	NA	1.5E+00	n	1.5E+02	n >S	7.1E+01	n >S	9.1E+00	n >S	4.4E+00	n	4.4E+02	n >S	9.9E+01	n >S	1.3E+01	n >S	—
>6-8 C aliphatics (TPH) (<53% n-hexane content)	NA	1.5E+00	n	1.5E+02	n >S	1.9E+03	n >S	2.5E+02	n >S	4.4E+00	n	4.4E+02	n >S	2.7E+03	n >S	3.5E+02	n >S	—
>8-10 C aliphatics (TPH)	NA	2.4E+00	n >S	2.4E+02	n >S	3.3E+01	n >S	4.3E+00	n >S	7.3E+00	n >S	7.3E+02	n >S	4.6E+01	n >S	6.0E+00	n >S	—
>10-12 C aliphatics (TPH)	NA	2.4E+00	n >S	2.4E+02	n >S	2.2E+01	n >S	2.8E+00	n >S	7.3E+00	n >S	7.3E+02	n >S	3.1E+01	n >S	4.0E+00	n >S	—
>12-16 C aliphatics (TPH)	NA	2.4E+00	n >S	2.4E+02	n >S	5.1E+00	n >S	6.6E-01	n >S	7.3E+00	n >S	7.3E+02	n >S	7.1E+00	n >S	9.2E-01	n >S	—
>16-21 C aliphatics (TPH)	NA	4.9E+01	n >S	4.9E+03	n >S	—	—	—	—	1.5E+02	n >S	1.5E+04	n >S	—	—	—	—	—
>16-21 C aliphatics (TPH) (for transformer mineral oil releases only)	NA	3.9E+01	n >S	3.9E+03	n >S	—	—	—	—	1.2E+02	n >S	1.2E+04	n >S	—	—	—	—	—
>21-35 C aliphatics (TPH)	NA	4.9E+01	n >S	4.9E+03	n >S	—	—	—	—	1.5E+02	n >S	1.5E+04	n >S	—	—	—	—	—
>21-35 C aliphatics (TPH) (for transformer mineral oil releases only)	NA	3.9E+01	n >S	3.9E+03	n >S	—	—	—	—	1.2E+02	n >S	1.2E+04	n >S	—	—	—	—	—

Table 3
Tier 1 Groundwater PCLs - Residential and Commercial/Industrial¹

Last Revised: March 1, 2022

Chemical of Concern	CAS	Residential								Commercial/Industrial								Secondary MCL ⁵ (mg/L)
		GW _{GW_{Ing}} ² (mg/L)	note ⁴	GW _{GW_{Class3}} ³ (mg/L)	note ⁴	AirGW _{Inh-V} 0.5 acre source area (mg/L)	note ⁴	AirGW _{Inh-V} 30 acre source area (mg/L)	note ⁴	GW _{GW_{Ing}} ² (mg/L)	note ⁴	GW _{GW_{Class3}} ³ (mg/L)	note ⁴	AirGW _{Inh-V} 0.5 acre source area (mg/L)	note ⁴	AirGW _{Inh-V} 30 acre source area (mg/L)	note ⁴	
>7-8 C aromatics (TPH)	NA	2.4E+00	n	2.4E+02	n	2.9E+04	n >S	3.8E+03	n >S	7.3E+00	n	7.3E+02	n >S	4.1E+04	n >S	5.3E+03	n >S	—
>8-10 C aromatics (TPH)	NA	9.8E-01	n	9.8E+01	n >S	1.8E+03	n >S	2.3E+02	n >S	2.9E+00	n	2.9E+02	n >S	2.5E+03	n >S	3.2E+02	n >S	—
>10-12 C aromatics (TPH)	NA	9.8E-01	n	9.8E+01	n >S	4.3E+03	n >S	5.5E+02	n >S	2.9E+00	n	2.9E+02	n >S	6.0E+03	n >S	7.7E+02	n >S	—
>12-16 C aromatics (TPH)	NA	9.8E-01	n	9.8E+01	n >S	7.5E+03	n >S	9.7E+02	n >S	2.9E+00	n	2.9E+02	n >S	1.0E+04	n >S	1.4E+03	n >S	—
>16-21 C aromatics (TPH)	NA	7.3E-01	n >S	7.3E+01	n >S	—	—	—	—	2.2E+00	n >S	2.2E+02	n >S	—	—	—	—	—
>21-35 C aromatics (TPH)	NA	7.3E-01	n >S	7.3E+01	n >S	—	—	—	—	2.2E+00	n >S	2.2E+02	n >S	—	—	—	—	—
Transformer Mineral Oil	NA	1.3E+01	n >S	1.3E+03	n >S	5.6E+01	n	7.3E+00	n	4.0E+01	n >S	4.0E+03	n >S	7.9E+01	n	1.0E+01	n	—
Footnotes																		
1 In accordance with §350.72(b), when establishing Tier 1 PCLs for individual COCs for each of the individual and combined human health exposure pathways, the person must evaluate whether the PCLs need to be adjusted to lower concentrations to meet the cumulative carcinogenic risk level and hazard index criteria specified in §350.72(c). For COCs which exhibit both carcinogenic and noncarcinogenic characteristics, they shall be evaluated as both a carcinogen and noncarcinogen when determining whether the PCL established for an individual COC for each of the individual and combined human health exposure pathways needs to be adjusted to a lower concentration to meet the cumulative risk and hazard criteria. The person shall then use the lower of the carcinogenic or noncarcinogenic PCL as the Tier 1 human health PCL. In other words, the Tier 1 PCLs provided in this table for an individual COC should not be used as the final Tier 1 human health PCL for any of the individual or combined exposure pathways in cases where there are more than 10 carcinogenic and/or more than 10 noncarcinogenic COCs within a source medium unless it can be demonstrated that further downward adjustment is not necessary to meet the cumulative risk and hazard criteria.																		
2 based on primary MCLs when available																		
3 100 x ^{GW} GW _{Ing}																		
4 c = carcinogenic; n = noncarcinogenic; m = primary MCL-based; e = EPA Action Level-based; > S = solubility limit exceeded during calculation																		
5 The Secondary MCL values for ammonia and MTBE are based on taste and odor.																		
6 This chemical is one of four chemicals that make up total trihalomethanes (TTHMs). USEPA has established an MCL for TTHMs of 0.08 mg/L, so neither the individual concentration for any of these four chemicals can exceed the MCL, nor the total additive concentration of these four chemicals can exceed the MCL.																		
7 Dibenz-a,h-anthracene does not have an MCL. However, the relative potency factor for dibenz-a,h-anthracene is equal to the potency factor for benzo-a-pyrene and is treated like benzo-a-pyrene for groundwater pathways.																		
8 Persons must use the value provided in the "Secondary MCL" column of this table as the ^{GW} GW _{Ing} PCL for MTBE if the conditions described in §350.74(f)(3) exist.																		
9 Please see the note on nitrate/nitrite in the "List of Updates" spreadsheet for March 31, 2017.																		
* These compounds are not necessarily of concern from a human health standpoint, therefore calculation of human health-based values is not required. However, aesthetics and ecological criteria would still apply. See table entitled "Compounds for which Calculation of a Human Health PCL is Not Required" available on the TCEQ website at http://www.tceq.state.tx.us/remediation/trrp/trrp.html .																		
NA = not applicable																		
All values capped at 1E+06																		

This table shows the protective groundwater concentrations for residential and commercial/industrial land with 0.5 acre and 30 acre source areas

end of worksheet

Table 4
Tier 1 Residential Total Soil Combined PCLs

Last Revised: March 1, 2022

Chemical of Concern	CAS	Tot ^{Soil} Comb			
		(includes inhalation, ingestion, dermal, and vegetable consumption pathways)			
		0.5 acre source area Carcinogenic (mg/kg)	0.5 acre source area Noncarcinogenic (mg/kg)	30 acre source area Carcinogenic (mg/kg)	30 acre source area Noncarcinogenic (mg/kg)
Acenaphthene	83-32-9	—	3.0E+03	—	3.0E+03
Acenaphthylene	208-96-8	—	3.8E+03	—	3.8E+03
Acetaldehyde	75-07-0	1.7E+02	1.4E+02	8.7E+01	7.3E+01
Acetate, 2-ethoxyethanol	111-15-9	—	3.5E+03	—	2.3E+03
Acetate, isoamyl	123-92-2	—	5.9E+03	—	5.9E+03
Acetate, isobutyl	110-19-0	—	3.9E+03	—	3.9E+03
Acetate, sec-butyl	105-46-4	—	3.9E+03	—	3.9E+03
Acetic acid*	64-19-7	—	—	—	—
Acetone (2-propanone)	67-64-1	—	6.6E+04	—	5.9E+04
Acetone cyanohydrin	75-86-5	—	1.9E+02	—	1.8E+02
Acetonitrile	75-05-8	—	8.7E+02	—	5.3E+02
Acetophenone	98-86-2	—	6.7E+03	—	6.7E+03
Acetylaminofluorene, 2-	53-96-3	1.2E+00	—	1.1E+00	—
Acifluorfen, sodium	62476-59-9	—	8.7E+02	—	8.7E+02
Acridine	260-94-6	—	2.0E+02	—	2.0E+02
Acrolein	107-02-8	—	3.2E+01	—	2.7E+01
Acrylamide	79-06-1	7.0E+00	1.1E+02	5.7E+00	9.8E+01
Acrylic acid	79-10-7	—	1.2E+02	—	6.2E+01
Acrylonitrile	107-13-1	3.6E+00	2.2E+01	2.2E+00	1.3E+01
Adipic acid (hexanedioic acid)	124-04-9	—	1.3E+05	—	1.3E+05
Alachlor	15972-60-8	5.9E+01	6.7E+02	5.9E+01	6.7E+02
Aldicarb	116-06-3	—	6.7E+01	—	6.7E+01
Aldicarb sulfone	1646-88-4	—	6.7E+01	—	6.7E+01
Aldrin	309-00-2	5.0E-02	5.9E-01	5.0E-02	5.9E-01
Allyl alcohol	107-18-6	—	5.6E+00	—	2.9E+00
Allyl chloride	107-05-1	—	1.5E+01	—	7.8E+00
Aluminum	7429-90-5	—	6.5E+04	—	6.4E+04
Ametryn	834-12-8	—	6.0E+02	—	6.0E+02
Amino-2,6-dinitrotoluene, 4-	19406-51-0	1.6E+02	3.3E+01	1.6E+02	3.3E+01
Amino-4,6-dinitrotoluene, 2-	35572-78-2	1.6E+02	3.3E+01	1.6E+02	3.3E+01
Aminobiphenyl, 4- (1,1-biphenyl-4-amine)	92-67-1	7.7E-01	—	7.7E-01	—
Aminopyridine, 4-	504-24-5	—	1.3E+00	—	1.3E+00
Ammonia	7664-41-7	—	4.9E+03	—	2.5E+03
Ammonium polyphosphate*	6833-79-9	—	—	—	—
Ammonium salts*	AMMONIUM	—	—	—	—
Aniline	62-53-3	8.2E+02	1.0E+02	8.2E+02	5.9E+01
Anthracene	120-12-7	—	1.8E+04	—	1.8E+04
Anthraquinone, 9,10-	84-65-1	1.2E+02	1.3E+03	1.2E+02	1.3E+03
Antimony	7440-36-0	—	1.5E+01	—	1.5E+01
Aramite	140-57-8	1.1E+02	2.4E+03	1.1E+02	2.4E+03
Arsenic	7440-38-2	3.4E+01	2.4E+01	3.4E+01	2.4E+01

Table 4
Tier 1 Residential Total Soil Combined PCLs

Last Revised: March 1, 2022

Chemical of Concern	CAS	TotSoilComb			
		(includes inhalation, ingestion, dermal, and vegetable consumption pathways)			
		0.5 acre source area Carcinogenic (mg/kg)	0.5 acre source area Noncarcinogenic (mg/kg)	30 acre source area Carcinogenic (mg/kg)	30 acre source area Noncarcinogenic (mg/kg)
Arsine	7784-42-1	—	7.7E-01	—	3.9E-01
Atrazine	1912-24-9	2.1E+01	2.3E+03	2.1E+01	2.3E+03
Azinphos-methyl (guthion)	86-50-0	—	1.0E+02	—	1.0E+02
Azobenzene	103-33-3	3.7E+01	—	3.6E+01	—
Barium	7440-39-3	—	8.1E+03	—	8.1E+03
Bayleton	43121-43-3	—	2.0E+03	—	2.0E+03
Benefin (benfluralin)	1861-40-1	—	1.9E+04	—	1.9E+04
Benomyl	17804-35-2	—	3.3E+03	—	3.3E+03
Benz-a-anthracene	56-55-3	4.1E+01	—	4.1E+01	—
Benzaldehyde	100-52-7	—	8.2E+03	—	8.2E+03
Benzene	71-43-2	1.2E+02	3.0E+02	6.9E+01	2.9E+02
Benzenedicarbonitrile, 1,3-	626-17-5	—	4.0E+02	—	4.0E+02
Benzenedicarboxylic acid, 1,2-disodecyl ester	26761-40-0	—	2.7E+03	—	2.6E+03
Benzenethiol	108-98-5	—	8.2E+01	—	8.2E+01
Benzidine	92-87-5	1.5E-02	2.0E+02	1.3E-02	2.0E+02
Benzo-a-pyrene	50-32-8	4.1E+00	1.4E+01	4.1E+00	1.2E+01
Benzo-b-fluoranthene	205-99-2	4.2E+01	—	4.1E+01	—
Benzo-e-pyrene	192-97-2	—	1.8E+03	—	1.8E+03
Benzo-g,h,i-perylene	191-24-2	—	1.8E+03	—	1.8E+03
Benzoic acid	65-85-0	—	2.7E+05	—	2.7E+05
Benzo-j-fluoranthene	205-82-3	3.9E+01	—	3.9E+01	—
Benzo-k-fluoranthene	207-08-9	4.2E+02	—	4.2E+02	—
Benzophenone	119-61-9	—	4.5E+02	—	4.5E+02
Benzotrichloride	98-07-7	3.6E-01	—	3.6E-01	—
Benzoyl peroxide	94-36-0	—	3.3E+03	—	3.3E+03
Benzyl alcohol	100-51-6	—	6.7E+03	—	6.7E+03
Benzyl chloride	100-44-7	3.6E+01	2.6E+01	3.6E+01	1.4E+01
Benzyl dichloride	98-87-3	2.8E+01	3.9E+01	2.8E+01	2.3E+01
Beryllium	7440-41-7	9.4E+03	3.8E+01	4.8E+03	3.8E+01
Biphenyl, 1,1-	92-52-4	—	1.2E+04	—	1.2E+04
Biphenyl, 1,1'-, 2-phenoxy-	6738-04-1	—	3.2E+03	—	3.2E+03
Biquinoline, 2,2'-	119-91-5	—	1.8E+02	—	1.8E+02
Bis (2-chloroethoxy) methane	111-91-1	3.1E+00	2.0E+02	2.5E+00	2.0E+02
Bis (2-chloroethyl) ether	111-44-4	2.2E+00	—	1.4E+00	—
Bis (2-chloro-1-methylethyl) ether	108-60-1	5.1E+01	2.7E+03	4.1E+01	2.7E+03
Bis (2-chloromethyl) ether	542-88-1	4.8E-03	—	2.7E-03	—
Bis (2-ethyl-hexyl) phthalate	117-81-7	4.3E+01	2.7E+02	4.3E+01	2.7E+02
Bismuth	7440-69-9	—	3.7E+04	—	3.7E+04
Bisphenol A	80-05-7	—	3.3E+03	—	3.3E+03
Boron	7440-42-8	—	1.6E+04	—	1.6E+04
Bromacil	314-40-9	—	6.7E+03	—	6.7E+03

Table 4
Tier 1 Residential Total Soil Combined PCLs

Last Revised: March 1, 2022

Chemical of Concern	CAS	Tot ^{Soil} Comb			
		(includes inhalation, ingestion, dermal, and vegetable consumption pathways)			
		0.5 acre source area Carcinogenic (mg/kg)	0.5 acre source area Noncarcinogenic (mg/kg)	30 acre source area Carcinogenic (mg/kg)	30 acre source area Noncarcinogenic (mg/kg)
Bromo-2-chloroethane, 1-	107-04-0	—	3.3E+03	—	3.3E+03
Bromobenzene	108-86-1	—	3.9E+02	—	2.8E+02
Bromodichloromethane	75-27-4	9.8E+01	6.6E+02	9.8E+01	6.6E+02
Bromoform	75-25-2	4.0E+02	1.6E+03	2.8E+02	1.6E+03
Bromomethane	74-83-9		3.9E+01		2.4E+01
Bromophenyl phenylether, 4-	101-55-3	2.8E-01	—	2.7E-01	—
Butadiene, 1,3-	106-99-0	7.2E+02	5.1E+02	3.7E+02	2.6E+02
Butadiene, 2-methyl-1,3- (isoprene)	78-79-5	—	4.8E+03	—	4.7E+03
Butanal (butyraldehyde)	123-72-8	—	1.2E+03	—	6.8E+02
Butane, 2,3-dimethyl-	79-29-8	—	4.8E+03	—	4.7E+03
Butanoic acid (butyric acid)	107-92-6	—	1.3E+02	—	6.6E+01
Butanol, 2-	78-92-2	—	1.5E+05	—	1.3E+05
Butanol, 2-methyl-1-	137-32-6	—	8.2E+02	—	8.2E+02
Butanol, 2-methyl-2-	75-85-4	—	8.2E+02	—	8.2E+02
Butanol, n-	71-36-3	—	8.2E+03	—	8.2E+03
Butene, 1-	106-98-9	—	4.6E+03	—	4.4E+03
Butene, cis-2-	590-18-1	—	4.1E+03	—	3.5E+03
Butene, trans-2-	624-64-6	—	4.1E+03	—	3.5E+03
Butoxy ethanol, 2- (Ethylene glycol monobutyl ether; EGBE)	111-76-2	—	6.5E+03	—	6.4E+03
Butyl acetate	123-86-4	—	1.0E+04	—	9.1E+03
Butyl acrylate	141-32-2	—	7.4E+02	—	7.4E+02
Butyl benzyl phthalate	85-68-7	1.6E+03	1.0E+04	1.6E+03	1.0E+04
Butyl ether, n- (dibutyl ether)	142-96-1	—	8.2E+03	—	8.2E+03
Butyl methacrylate	97-88-1	—	3.4E+03	—	3.4E+03
Butylate	2008-41-5	—	3.3E+03	—	3.3E+03
Butylbenzene, n-	104-51-8	—	3.3E+03	—	3.3E+03
Butylbenzene, sec-	135-98-8	—	3.3E+03	—	3.3E+03
Butylbenzene, tert-	98-06-6	—	3.3E+03	—	3.3E+03
Cacodylic acid	75-60-5	—	2.0E+02	—	2.0E+02
Cadmium	7440-43-9	4.6E+04	5.2E+01	2.4E+04	5.1E+01
Calcium*	7440-70-2	—	—	—	—
Caprolactam	105-60-2	—	3.3E+04	—	3.3E+04
Captan	133-06-2	1.3E+03	8.7E+03	1.3E+03	8.7E+03
Carbaryl	63-25-2	—	6.7E+03	—	6.7E+03
Carbazole	86-74-8	2.3E+02	—	2.3E+02	—
Carbofuran	1563-66-2	—	3.3E+02	—	3.3E+02
Carbon disulfide	75-15-0	—	4.6E+03	—	3.3E+03
Carbon tetrachloride	56-23-5	3.5E+01	2.7E+02	2.3E+01	2.3E+02
Carbophenothion	786-19-6	—	8.2E+02	—	8.2E+02
Carbosulfan	55285-14-8	—	4.3E+02	—	4.3E+02
Carboxin	5234-68-4	—	6.7E+03	—	6.7E+03

Table 4
Tier 1 Residential Total Soil Combined PCLs

Last Revised: March 1, 2022

Chemical of Concern	CAS	TotSoilComb			
		(includes inhalation, ingestion, dermal, and vegetable consumption pathways)			
		0.5 acre source area Carcinogenic (mg/kg)	0.5 acre source area Noncarcinogenic (mg/kg)	30 acre source area Carcinogenic (mg/kg)	30 acre source area Noncarcinogenic (mg/kg)
Chloral	75-87-6	—	8.2E+03	—	8.2E+03
Chloral hydrate (1,1-ethanediol, 2,2,2-trichloro-)	302-17-0	—	6.7E+03	—	6.7E+03
Chloramben (amiben; 3-amino-2,5-dichlorobenzoic acid)	133-90-4	—	1.0E+03	—	1.0E+03
Chlordane (technical)	12789-03-6	6.0E+00	2.0E+01	5.9E+00	2.0E+01
Chlordane, cis- (alpha chlordane)	5103-71-9	1.3E+01	3.2E+01	1.3E+01	3.2E+01
Chlordane, trans- (gamma chordane)	5103-74-2	7.4E+00	2.3E+01	7.3E+00	2.3E+01
Chlorfenvinphos	470-90-6	—	1.4E+01	—	9.6E+00
Chloride*	16887-00-6	—	—	—	—
Chlorine	7782-50-5	—	1.3E+02	—	6.8E+01
Chloro-1,3-butadiene, 2-	126-99-8	1.2E+00	3.1E+02	6.1E-01	1.6E+02
Chloro-2-propanol, 1-	127-00-4	—	1.6E+03	—	1.6E+03
Chloro-3-methylphenol, 4-	59-50-7	—	3.3E+02	—	3.3E+02
Chloroaniline, p-	106-47-8	2.3E+01	2.7E+02	2.3E+01	2.7E+02
Chlorobenzene	108-90-7	—	5.2E+02	—	3.2E+02
Chlorobenzilate	510-15-6	1.7E+01	1.3E+03	1.6E+01	1.3E+03
Chlorobromomethane (bromochloromethane)	74-97-5	—	3.3E+03	—	3.3E+03
Chlorodifluoromethane	75-45-6	—	7.7E+05	—	3.9E+05
Chloroethane (ethyl chloride)	75-00-3	—	2.7E+04	—	2.3E+04
Chloroethanol, 2-	107-07-3	—	1.6E+03	—	1.6E+03
Chloroethoxy ethene, 2- (2-chloroethylvinylether)	110-75-8	5.5E+00	4.5E+00	5.5E+00	2.3E+00
Chloroform	67-66-3	1.6E+01	5.3E+02	8.0E+00	4.0E+02
Chlorohexane, 1-	544-10-5	—	2.7E+03	—	2.3E+03
Chloromethane (methyl chloride)	74-87-3	1.4E+02	2.4E+02	8.4E+01	2.1E+02
Chloronaphthalene, 1- (Chloronaphthalene, alpha-)	90-13-1	—	4.6E+03	—	4.6E+03
Chloronaphthalene, 2- (chloronaphthalene, beta)	91-58-7	—	5.0E+03	—	5.0E+03
Chloronitrobenzene, p- (1-chloro-4-nitrobenzene)	100-00-5	7.5E+02	3.2E+01	7.5E+02	2.2E+01
Chlorophenol, 2-	95-57-8	—	4.1E+02	—	4.1E+02
Chlorophenol, 3-	108-43-0	—	3.3E+02	—	3.3E+02
Chlorophenol, 4-	106-48-9	—	3.3E+02	—	3.3E+02
Chlorophenyl phenylether, 4-	7005-72-3	1.6E-01	—	1.5E-01	—
Chloropropane, 2-	75-29-6	—	9.4E+02	—	6.0E+02
Chlorothalonil	1897-45-6	4.3E+02	1.0E+03	4.3E+02	1.0E+03
Chlorotoluene, o- (2-chlorotoluene)	95-49-8	—	1.2E+03	—	1.1E+03
Chlorotoluene, p- (4-chlorotoluene)	106-43-4	—	1.6E+03	—	1.6E+03
Chlorpyrifos	2921-88-2	—	1.3E+02	—	1.3E+02
Chromium (III)	16065-83-1	—	3.3E+04	—	2.7E+04
Chromium (total)	7440-47-3	—	3.3E+04	—	2.7E+04
Chromium (VI)	18540-29-9	9.8E+03	1.2E+02	5.1E+03	1.2E+02
Chrysene	218-01-9	4.1E+03	—	4.1E+03	—
Cobalt	7440-48-4	3.8E+03	6.8E+02	1.9E+03	6.8E+02
Copolymer acrylamide	69418-26-4	—	1.3E+01	—	1.3E+01

Table 4
Tier 1 Residential Total Soil Combined PCLs

Last Revised: March 1, 2022

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		(includes inhalation, ingestion, dermal, and vegetable consumption pathways)			
		0.5 acre source area Carcinogenic (mg/kg)	0.5 acre source area Noncarcinogenic (mg/kg)	30 acre source area Carcinogenic (mg/kg)	30 acre source area Noncarcinogenic (mg/kg)
Copper	7440-50-8	—	1.3E+03	—	1.3E+03
Coronene	191-07-1	—	1.3E+02	—	1.3E+02
Coumaphos	56-72-4	—	4.3E+02	—	4.3E+02
Cresol	1319-77-3	—	3.3E+03	—	3.3E+03
Cresol, m- (3-methylphenol)	108-39-4	—	3.3E+03	—	3.3E+03
Cresol, o- (2-methylphenol)	95-48-7	—	3.3E+03	—	3.3E+03
Cresol, p- (4-methylphenol)	106-44-5	—	3.3E+02	—	3.3E+02
Crotonaldehyde	123-73-9	3.2E+00	8.2E+01	3.2E+00	8.2E+01
Cumene (isopropylbenzene)	98-82-8	—	4.3E+03	—	3.0E+03
Cyanazine	21725-46-2	5.6E+00	1.3E+02	5.6E+00	1.3E+02
Cyanide	57-12-5	—	4.5E+01	—	4.3E+01
Cyanogen	460-19-5	—	1.1E+01	—	5.9E+00
Cycloate	1134-23-2	—	3.7E+03	—	3.7E+03
Cyclohexane	110-82-7	—	7.5E+04	—	4.2E+04
Cyclohexanol	108-93-0	—	3.3E+05	—	3.3E+05
Cyclohexanone	108-94-1	—	3.2E+04	—	1.7E+04
Cyclohexene, 1-methanol-3-	1679-51-2	—	1.3E+03	—	1.3E+03
Cyclohexene, 4-vinyl-1-	100-40-3	—	1.3E+03	—	1.1E+03
Cyclopentane	287-92-3	—	4.8E+03	—	4.8E+03
Cyclopentane, methyl-	96-37-7	—	5.3E+03	—	4.0E+03
Cyclopentene	142-29-0	—	4.1E+05	—	4.1E+05
Cyclotetramethylenetetranitramine (HMX)	2691-41-0	—	1.6E+03	—	1.6E+03
Cyclotrimethylenetrinitramine (RDX)	121-82-4	5.9E+01	2.7E+02	5.9E+01	2.7E+02
Cymene (isopropyltoluene)	99-87-6	—	8.2E+03	—	8.2E+03
Cymoxanil	57966-95-7	—	8.7E+02	—	8.7E+02
Dacthal (DCPA)	1861-32-1	—	6.2E+02	—	6.2E+02
Dalapon, sodium salt (2,2-dichloropropanoic acid)	75-99-0	—	2.0E+03	—	2.0E+03
DDD	72-54-8	1.4E+01	—	1.4E+01	—
DDE	72-55-9	1.0E+01	—	1.0E+01	—
DDT	50-29-3	5.4E+00	1.9E+01	5.4E+00	1.9E+01
Demeton	8065-48-3	—	2.7E+00	—	2.7E+00
Desethylatrazine	6190-65-4	—	2.3E+03	—	2.3E+03
Diacetone alcohol (4-hydroxy-4-methyl-2-pentanone)	123-42-2	—	2.7E+03	—	2.7E+03
Diallate	2303-16-4	3.8E+01	—	3.8E+01	—
Diazinon	333-41-5	—	3.1E+01	—	2.1E+01
Dibenz(a,h)acridine	226-36-8	3.7E+00	—	3.7E+00	—
Dibenz(a,j)acridine	224-42-0	5.8E+00	—	5.8E+00	—
Dibenz-a,h-anthracene	53-70-3	4.0E+00	—	4.0E+00	—
Dibenzo(a,e)pyrene	192-65-4	6.1E-01	—	6.1E-01	—
Dibenzo(a,h)pyrene	189-64-0	6.1E-02	—	6.1E-02	—
Dibenzo(a,i)pyrene	189-55-9	6.1E-02	—	6.1E-02	—

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		0.5 acre source area Carcinogenic (mg/kg)	0.5 acre source area Noncarcinogenic (mg/kg)	30 acre source area Carcinogenic (mg/kg)	30 acre source area Noncarcinogenic (mg/kg)
Dibenzofuran	132-64-9	—	2.7E+02	—	2.7E+02
Dibenzothiophene	132-65-0	—	4.4E+02	—	4.4E+02
Dibromo-3-chloropropane, 1,2-	96-12-8	1.5E-01	5.0E+00	8.0E-02	3.2E+00
Dibromochloromethane (chlorodibromomethane)	124-48-1	7.2E+01	1.6E+03	7.2E+01	1.6E+03
Dibromofluoromethane	1868-53-7	—	1.6E+04	—	1.6E+04
Dicamba	1918-00-9	—	2.0E+03	—	2.0E+03
Dichlormid	37764-25-3	—	1.7E+03	—	1.7E+03
Dichloro-2-butene, 1,4-	764-41-0	2.0E-01	—	1.0E-01	—
Dichloro-2-butene, 1,4- trans	110-57-6	2.0E-01	—	1.1E-01	—
Dichlorobenzene, 1,2-	95-50-1	—	7.2E+02	—	3.9E+02
Dichlorobenzene, 1,3-	541-73-1	—	1.2E+02	—	6.2E+01
Dichlorobenzene, 1,4-	106-46-7	2.5E+02	1.2E+04	2.5E+02	6.1E+03
Dichlorobenzidine, 3,3-	91-94-1	1.0E+01	—	1.0E+01	—
Dichlorobutane, 2,3-	7581-97-7	—	9.5E+01	—	5.2E+01
Dichlorodifluoromethane	75-71-8	—	1.4E+03	—	7.5E+02
Dichloroethane, 1,1-	75-34-3	—	1.1E+04	—	8.8E+03
Dichloroethane, 1,2-	107-06-2	4.1E+01	6.1E+02	3.0E+01	3.3E+02
Dichloroethylene, 1,1-	75-35-4	—	2.3E+03	—	1.6E+03
Dichloroethylene, cis-1,2-	156-59-2	—	1.4E+02	—	1.2E+02
Dichloroethylene, trans-1,2	156-60-5	—	5.9E+02	—	3.7E+02
Dichlorofluoromethane	75-43-4	—	1.6E+04	—	1.6E+04
Dichlorophenol, 2,3-	576-24-9	—	2.0E+02	—	2.0E+02
Dichlorophenol, 2,4-	120-83-2	—	2.0E+02	—	2.0E+02
Dichlorophenol, 2,5-	583-78-8	—	2.0E+02	—	2.0E+02
Dichlorophenol, 2,6-	87-65-0	—	6.7E+01	—	6.7E+01
Dichlorophenol, 3,4-	95-77-2	—	2.0E+02	—	2.0E+02
Dichlorophenol, 3,5-	591-35-5	—	2.0E+02	—	2.0E+02
Dichlorophenoxy, 2,4- butyric acid, 4- (2,4-DB)	94-82-6	—	5.3E+02	—	5.3E+02
Dichlorophenoxyacetic acid, 2,4- (2,4-D)	94-75-7	—	1.5E+04	—	1.5E+04
Dichloroprop (2-(2,4-dichlorophenoxy) propanoic acid)	120-36-5	—	6.7E+02	—	6.7E+02
Dichloropropane, 1,2-	78-87-5	1.2E+02	6.1E+01	9.0E+01	3.1E+01
Dichloropropane, 1,3-	142-28-9	3.6E+01	2.6E+02	2.6E+01	1.4E+02
Dichloropropane, 2,2-	594-20-7	8.9E+01	6.1E+01	8.9E+01	3.1E+01
Dichloropropanol, 2,3-	616-23-9	—	2.0E+02	—	2.0E+02
Dichloropropene, 1,1-	563-58-6	3.6E+01	2.7E+02	2.6E+01	1.5E+02
Dichloropropene, 1,3- (mixed isomers)	542-75-6	3.6E+01	2.7E+02	2.6E+01	1.5E+02
Dichloropropene, cis 1,3-	10061-01-5	1.1E+01	8.0E+00	1.1E+01	7.8E+00
Dichloropropene, trans 1,3-	10061-02-6	3.6E+01	2.7E+02	2.6E+01	1.5E+02
Dichlorvos	62-73-7	1.6E+01	3.3E+01	1.6E+01	3.3E+01
Dicrotophos (bidrin)	141-66-2	—	6.7E+00	—	6.7E+00
Dicyclopentadiene	77-73-6	—	6.6E+03	—	6.6E+03

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		(includes inhalation, ingestion, dermal, and vegetable consumption pathways)			
		0.5 acre source area Carcinogenic (mg/kg)	0.5 acre source area Noncarcinogenic (mg/kg)	30 acre source area Carcinogenic (mg/kg)	30 acre source area Noncarcinogenic (mg/kg)
Dieldrin	60-57-1	1.5E-01	2.2E+00	1.5E-01	2.2E+00
Diethanolamine	111-42-2	—	3.3E+01	—	3.3E+01
Diethyldithiocarbamate, sodium salt	148-18-5	2.2E+01	2.5E+03	2.2E+01	2.5E+03
Diethyl phthalate	84-66-2	—	5.3E+04	—	5.3E+04
Diethylene glycol	111-46-6	—	1.3E+05	—	1.3E+05
Diethylene glycol monobutyl ether	112-34-5	—	2.0E+01	—	1.0E+01
Diethylhexyl adipate	103-23-1	3.9E+03	4.0E+04	3.9E+03	4.0E+04
Diethylstilbestrol	56-53-1	7.1E-04	—	7.1E-04	—
Diisobutylene (trimethyl-1-pentene, 2,4,4-)	107-39-1	—	1.9E+03	—	1.2E+03
Diisopropylbenzene, p-	100-18-5	—	6.7E+02	—	6.7E+02
Diisopropyl ether (2,2'-oxybis-propane)	108-20-3	—	4.6E+03	—	3.3E+03
Dimethenamid	87674-68-8	—	1.0E+03	—	1.0E+03
Dimethoate	60-51-5	—	1.3E+01	—	1.3E+01
Dimethoxybenzidine, 3,3'-	119-90-4	3.4E+02	—	3.4E+02	—
Dimethyl-2-nitrobenzene, 1,3-	81-20-9	—	1.3E+02	—	1.2E+02
Dimethyl-3-nitrobenzene, 1,2-	83-41-0	—	1.3E+02	—	1.2E+02
Dimethyl-4-nitrobenzene, 1-2-	99-51-4	—	1.3E+02	—	1.2E+02
Dimethyl-5-nitrobenzene, 1,3-	99-12-7	—	1.3E+02	—	1.2E+02
Dimethylphenethylamine, alpha, alpha-	122-09-8	—	1.3E+02	—	1.3E+02
Dimethyl phenol, 2,4-	105-67-9	—	1.3E+03	—	1.3E+03
Dimethylaminoazobenzene, p-	60-11-7	—	6.4E-01	—	6.4E-01
Dimethylbenz-a-anthracene, 7,12-	57-97-6	1.7E-02	—	1.7E-02	—
Dimethylbenzidine, 3,3'-	119-93-7	4.3E-01	—	4.3E-01	—
Dimethylformamide, N,N-	68-12-2	—	2.3E+03	—	1.4E+03
Dimethylnaphthalene, 1,3-	575-41-7	—	2.3E+03	—	2.3E+03
Dimethylphthalate	131-11-3	—	5.3E+04	—	5.3E+04
Di-n-butyl phthalate	84-74-2	—	6.2E+03	—	6.2E+03
Dinitro-2-methylphenol, 4,6- (dinitro-o-cresol, 4, 6-)	534-52-1	—	6.7E+00	—	6.7E+00
Dinitrobenzene, 1,3- (dinitrobenzene, 2,4-)	99-65-0	—	6.7E+00	—	6.7E+00
Dinitrobenzene, 1,4-	100-25-4	—	6.7E+00	—	6.7E+00
Dinitrophenol, 2,4-	51-28-5	—	1.3E+02	—	1.3E+02
Dinitrophenol, 2,5-	329-71-5	—	1.3E+02	—	1.3E+02
Dinitrotoluene, 2,4-	121-14-2	6.9E+00	1.3E+02	6.9E+00	1.3E+02
Dinitrotoluene, 2,6-	606-20-2	6.9E+00	6.7E+01	6.9E+00	6.7E+01
Di-n-octyl phthalate	117-84-0	—	6.4E+02	—	6.4E+02
Dinoseb	88-85-7	—	6.7E+01	—	6.7E+01
Dioxane 1,4-	123-91-1	4.5E+01	1.6E+03	3.7E+01	1.2E+03
Dioxin (as 2,3,7,8-TCDD toxicity equivalent quotients (TEQs))	1746-01-6	—	—	—	—
Diphenyl ether	101-84-8	—	3.8E+02	—	3.8E+02
Diphenylamine	122-39-4	—	1.7E+03	—	1.7E+03
Diphenylhydrazine, 1,2-	122-66-7	5.6E+00	—	5.4E+00	—

Table 4
Tier 1 Residential Total Soil Combined PCLs

Last Revised: March 1, 2022

Chemical of Concern	CAS	TotSoilComb			
		(includes inhalation, ingestion, dermal, and vegetable consumption pathways)			
		0.5 acre source area Carcinogenic (mg/kg)	0.5 acre source area Noncarcinogenic (mg/kg)	30 acre source area Carcinogenic (mg/kg)	30 acre source area Noncarcinogenic (mg/kg)
Dipropylene glycol	110-98-5	—	8.0E+03	—	8.0E+03
Diquat	85-00-7	—	1.5E+02	—	1.5E+02
Disodium iminodiacetate (iminodiacetic acid, disodium salt)	142-73-4	—	6.7E+02	—	6.7E+02
Disulfoton	298-04-4	—	2.7E+00	—	2.7E+00
Diuron	330-54-1	—	1.3E+02	—	1.3E+02
Dodecylphenol, 4-	104-43-8	—	3.3E+03	—	3.3E+03
Endosulfan	115-29-7	—	4.0E+02	—	4.0E+02
Endosulfan I	959-98-8	—	9.1E+01	—	9.1E+01
Endosulfan II	33213-65-9	—	2.7E+02	—	2.7E+02
Endosulfan sulfate	1031-07-8	—	3.8E+02	—	3.8E+02
Endothall	145-73-3	—	1.3E+03	—	1.3E+03
Endrin	72-20-8	—	9.0E+00	—	9.0E+00
Endrin aldehyde	7421-93-4	—	1.9E+01	—	1.9E+01
Endrin ketone	53494-70-5	—	1.9E+01	—	1.9E+01
Epichlorohydrin	106-89-8	2.8E+02	2.5E+01	1.8E+02	1.3E+01
EPN (o-ethyl o-(4-nitrophenyl)phenylphosphonothioate)	2104-64-5	—	6.7E-01	—	6.7E-01
Esfenvalerate	66230-04-4	—	7.4E+01	—	7.4E+01
Ethalfuralin (sonolan)	55283-68-6	4.7E+01	2.5E+03	4.7E+01	2.5E+03
Ethanol	64-17-5	—	1.0E+06	—	1.0E+06
Ethanol, 2-amino-	141-43-5	—	1.1E+02	—	1.1E+02
Ethanol, 2-(2-aminoethoxy)-	929-06-6	—	3.3E+01	—	3.3E+01
Ethanol, 2-(2-ethoxyethoxy)-	111-90-0	—	1.3E+05	—	1.3E+05
Ethanol, 2-(methylamino)-	109-83-1	—	9.1E+02	—	8.1E+02
Ethion	563-12-2	—	2.7E+01	—	2.7E+01
Ethoprop	13194-48-4	1.7E+02	6.7E+00	1.7E+02	6.7E+00
Ethoxy ethanol, 2-	110-80-5	—	5.7E+03	—	4.7E+03
Ethyl acetate	141-78-6	—	3.5E+03	—	1.8E+03
Ethyl acrylate	140-88-5	1.3E+02	1.5E+02	1.3E+02	9.6E+01
Ethyl benzene	100-41-4	—	6.4E+03	—	5.3E+03
Ethyl dipropylthiocarbamate, S-	759-94-4	—	1.7E+03	—	1.7E+03
Ethyl ether	60-29-7	—	1.6E+04	—	1.6E+04
Ethyl methacrylate	97-63-2	—	3.6E+03	—	2.4E+03
Ethyl methanesulfonate	62-50-0	3.4E+01	—	2.7E+01	—
Ethyl tert-butyl ether (2-ethyl-2-ethoxypropane)	637-92-3	—	8.0E+01	—	7.9E+01
Ethyl-1-hexanol, 2-	104-76-7	—	1.0E+04	—	1.0E+04
Ethyl-2-hexenal, 2-	645-62-5	—	1.2E+04	—	1.2E+04
Ethyl-2-methyl benzene, 1-	611-14-3	—	2.8E+03	—	2.1E+03
Ethyl-4-methyl benzene, 1-	622-96-8	—	2.6E+03	—	1.9E+03
Ethylene*	74-85-1	—	—	—	—
Ethylene dibromide (dibromoethane, 1,2-)	106-93-4	2.5E+00	5.1E+02	2.1E+00	4.0E+02
Ethylene glycol	107-21-1	—	1.3E+05	—	1.3E+05

Table 4
Tier 1 Residential Total Soil Combined PCLs

Last Revised: March 1, 2022

Chemical of Concern	CAS	Tot ^{Soil} Comb			
		(includes inhalation, ingestion, dermal, and vegetable consumption pathways)			
		0.5 acre source area Carcinogenic (mg/kg)	0.5 acre source area Noncarcinogenic (mg/kg)	30 acre source area Carcinogenic (mg/kg)	30 acre source area Noncarcinogenic (mg/kg)
Ethylene oxide	75-21-8	5.8E+00		5.7E+00	
Ethylene thiourea	96-45-7	4.3E+01	5.3E+00	4.3E+01	5.3E+00
Ethylenediamine	107-15-3	—	7.4E+03	—	7.4E+03
Ethylenimine	151-56-4	5.5E-02	—	3.9E-02	—
Ethylhexyl acrylate, 2-	103-11-7	9.8E+01	—	9.8E+01	—
Famphur	52-85-7	—	2.0E+00	—	2.0E+00
Fensulfothion	115-90-2	—	6.7E+01	—	6.7E+01
Fenthion	55-38-9	—	4.7E+00	—	4.7E+00
Fenuron	101-42-8	—	4.7E+03	—	4.7E+03
Fluoranthene	206-44-0	—	2.3E+03	—	2.3E+03
Fluorene	86-73-7	—	2.3E+03	—	2.3E+03
Fluorine (soluble fluoride)	7782-41-4	—	4.8E+03	—	4.8E+03
Fluorochloridone	61213-25-0	—	5.0E+02	—	5.0E+02
Fonofos	944-22-9	—	1.3E+02	—	1.3E+02
Formaldehyde	50-00-0	—	9.3E+02	—	4.9E+02
Formic acid	64-18-6	—	2.1E+02	—	1.1E+02
Furan	110-00-9	—	8.2E+01	—	8.2E+01
Furfural	98-01-1	—	2.5E+02	—	2.5E+02
Glycidylaldehyde	765-34-4	—	2.7E+01	—	2.3E+01
Glyphosate	1071-83-6	—	6.7E+04	—	6.7E+04
Heptachlor	76-44-8	1.3E-01	7.1E+00	1.3E-01	7.1E+00
Heptachlor epoxide	1024-57-3	2.4E-01	5.4E-01	2.4E-01	5.4E-01
Heptane, n-	142-82-5	—	4.7E+03	—	4.6E+03
Heptanoic acid, n-	111-14-8	—	1.2E+02	—	6.3E+01
Hexachlorobenzene	118-74-1	1.1E+00	2.9E+01	1.0E+00	2.9E+01
Hexachlorobutadiene	87-68-3	2.0E+01	6.7E+01	1.2E+01	6.7E+01
Hexachlorocyclohexane, alpha (alpha-BHC)	319-84-6	2.6E-01	2.7E+02	2.5E-01	2.7E+02
Hexachlorocyclohexane, beta (beta-BHC)	319-85-7	9.3E-01	—	9.2E-01	—
Hexachlorocyclohexane, delta (delta-BHC)	319-86-8	2.9E+00	2.2E+01	2.9E+00	2.2E+01
Hexachlorocyclohexane, gamma (lindane; gamma-BHC)	58-89-9	1.1E+00	9.2E+00	1.1E+00	9.2E+00
Hexachlorocyclohexane, techn (technical-BHC)	608-73-1	1.3E+00	—	1.3E+00	—
Hexachlorocyclopentadiene	77-47-4	—	1.4E+01	—	7.2E+00
Hexachloroethane	67-72-1	1.2E+02	4.6E+01	1.2E+02	4.6E+01
Hexachlorophene	70-30-4	—	2.0E+01	—	2.0E+01
Hexachloropropylene	1888-71-7	1.2E+02	4.6E+01	1.2E+02	4.6E+01
Hexanal, 2-ethyl-	123-05-7	—	1.0E+04	—	1.0E+04
Hexane, n-	110-54-3	—	3.3E+03	—	2.5E+03
Hexanediamine, 1,6-	124-09-4	—	3.3E+02	—	3.3E+02
Hexanedinitrile	111-69-3	—	8.5E+01	—	7.9E+01
Hexanediol, 1,6-	629-11-8	—	3.0E+05	—	2.8E+05
Hexanoic acid	142-62-1	—	1.3E+02	—	6.9E+01

Table 4
Tier 1 Residential Total Soil Combined PCLs

Last Revised: March 1, 2022

Chemical of Concern	CAS	TotSoilComb			
		(includes inhalation, ingestion, dermal, and vegetable consumption pathways)			
		0.5 acre source area Carcinogenic (mg/kg)	0.5 acre source area Noncarcinogenic (mg/kg)	30 acre source area Carcinogenic (mg/kg)	30 acre source area Noncarcinogenic (mg/kg)
Hexanone, 2-	591-78-6		6.9E+02		3.8E+02
Hexazinone	51235-04-2	—	2.2E+03	—	2.2E+03
Hexene, 1-	592-41-6	—	1.6E+03	—	8.4E+02
Hexene, cis-2-	7688-21-3	—	1.6E+03	—	8.4E+02
Hexylene glycol (2-methyl-2,4-pentanediol)	107-41-5	—	2.0E+04	—	2.0E+04
Hydrazine	302-01-2	3.8E-01	2.9E+00	2.1E-01	1.5E+00
Hydrocaproic acid, 6- (6-hydroxyhexanoic acid)	1191-25-9	—	1.6E+02	—	8.1E+01
Hydrogen chloride (hydrochloric acid)*	7647-01-0	—	—	—	—
Hydroquinone	123-31-9	7.8E+01	2.7E+03	7.8E+01	2.7E+03
Indene	95-13-6	—	1.0E+02	—	5.6E+01
Indeno-1,2,3-cd-pyrene	193-39-5	4.2E+01	—	4.2E+01	—
Iron*	7439-89-6	—	—	—	—
Isoamyl alcohol	123-51-3	—	4.1E+02	—	4.1E+02
Isobutyl alcohol	78-83-1	—	2.5E+04	—	2.5E+04
Isobutylene (2-methyl-1-propene)	115-11-7	—	3.0E+02	—	3.0E+02
Isobutyric acid (2-methylpropanoic acid)	79-31-2	—	3.3E+04	—	3.3E+04
Isodecanol	25339-17-7	—	7.1E+01	—	7.1E+01
Isodrin	465-73-6	2.7E-02	2.0E-01	2.7E-02	2.0E-01
Isopentane	78-78-4	—	4.8E+03	—	4.8E+03
Isophorone	78-59-1	4.9E+03	1.3E+04	4.9E+03	1.3E+04
Isopropyl acetate	108-21-4	—	5.7E+03	—	5.7E+03
Isopropyl alcohol	67-63-0	—	9.1E+03	—	4.8E+03
Isosafrole	120-58-1	1.7E+01	—	1.5E+01	—
Kelthane (dicofol)	115-32-2	—	2.7E+02	—	2.7E+02
Kepone (chlordecone)	143-50-0	3.6E-01	1.7E+01	3.5E-01	1.7E+01
Lead (inorganic)	7439-92-1	—	—	—	—
Leptophos	21609-90-5	—	1.6E-01	—	1.6E-01
Limonene, d-*	5989-27-5	—	—	—	—
Lithium	7439-93-2		4.4E+02		4.4E+02
Magnesium*	7439-95-4	—	—	—	—
Malathion	121-75-5	—	1.7E+02	—	9.6E+01
Maleic anhydride	108-31-6	—	6.7E+03	—	6.7E+03
Maleic hydrazide	123-33-1	—	3.3E+04	—	3.3E+04
Malononitrile	109-77-3	—	6.7E+00	—	6.7E+00
Mancozeb	8018-01-7	—	2.0E+03	—	2.0E+03
Manganese	7439-96-5	—	3.9E+03	—	3.9E+03
MCPA (4-(chloro-2-methylphenoxy) acetic acid)	94-74-6	—	3.3E+01	—	3.3E+01
MCPP (2-(4-chloro-2-methylphenoxy) propanoic acid)	93-65-2	—	6.7E+01	—	6.7E+01
Mercury (pH = 4.9) ¹	7439-97-6	—	3.6E+00	—	2.1E+00
Mercury (pH=6.8) ¹	7439-97-6	—	8.3E+00	—	5.5E+00
Merphos	150-50-5	—	2.0E+00	—	2.0E+00

Table 4
Tier 1 Residential Total Soil Combined PCLs

Last Revised: March 1, 2022

Chemical of Concern	CAS	TotSoilComb			
		(includes inhalation, ingestion, dermal, and vegetable consumption pathways)			
		0.5 acre source area Carcinogenic (mg/kg)	0.5 acre source area Noncarcinogenic (mg/kg)	30 acre source area Carcinogenic (mg/kg)	30 acre source area Noncarcinogenic (mg/kg)
Methacrylic acid (2-methyl-2-propenoic acid)	79-41-4	—	8.2E+02	—	8.2E+02
Methacrylonitrile	126-98-7	—	5.1E+02	—	2.8E+02
Methanol	67-56-1	—	1.1E+05	—	8.3E+04
Methapyriline	91-80-5	1.0E+00	—	1.0E+00	—
Methomyl	16752-77-5	—	1.7E+03	—	1.7E+03
Methoxychlor	72-43-5	—	2.7E+02	—	2.7E+02
Methoxyethanol, 2-	109-86-4	—	2.7E+02	—	1.5E+02
Methyl acetate (acetic acid, methyl ester)	79-20-9	—	8.2E+04	—	8.2E+04
Methyl acrylate	96-33-3	—	1.1E+02	—	8.0E+01
Methyl amyl ketone (2-heptanone)	110-43-0	—	3.9E+03	—	3.8E+03
Methyl chrysene, 1-	3351-28-8	5.8E+02	—	5.8E+02	—
Methyl chrysene, 2-	3351-32-4	5.8E+02	—	5.8E+02	—
Methyl chrysene, 6-	1705-85-7	5.7E+01	—	5.7E+01	—
Methyl cyclohexane	108-87-2	—	4.1E+04	—	2.2E+04
Methyl ethyl ketone (2-butanone)	78-93-3	—	4.0E+04	—	3.3E+04
Methyl iodide (iodomethane)	74-88-4	—	1.1E+02	—	1.1E+02
Methyl isobutyl ketone (4-methyl-2-pentanone)	108-10-1	—	5.9E+03	—	5.4E+03
Methyl mercury	22967-92-6	—	8.0E+00	—	8.0E+00
Methyl methacrylate	80-62-6	—	9.8E+03	—	5.3E+03
Methyl methanesulfonate	66-27-3	3.3E+01	—	2.6E+01	—
Methyl parathion	298-00-0	—	1.7E+01	—	1.7E+01
Methyl-1-butene, 2-	563-46-2	—	4.8E+03	—	4.7E+03
Methyl-1-propanal, 2- (isobutyraldehyde)	78-84-2	—	3.3E+03	—	3.3E+03
Methyl-2-butene, 2-	513-35-9	—	4.8E+03	—	4.7E+03
Methyl-2-pentenal, 2-	623-36-9	3.2E+00	—	3.2E+00	—
Methylcholanthrene, 3-	56-49-5	1.9E-01	—	1.9E-01	—
Methylene bromide (dibromomethane)	74-95-3	8.1E+02	8.1E+01	8.1E+02	4.2E+01
Methylene chloride (dichloromethane)	75-09-2	1.1E+04	1.6E+03	5.9E+03	1.5E+03
Methylene-bis (2-chloroaniline) 4,4'-	101-14-4	4.6E+01	1.3E+02	4.5E+01	1.3E+02
Methylmercury hydroxide	1184-57-2	—	6.7E+00	—	6.7E+00
Methylnaphthalene, 1-	90-12-0	1.5E+02	4.4E+03	1.5E+02	4.4E+03
Methylnaphthalene, 2-	91-57-6	—	2.5E+02	—	2.5E+02
Methylpyrrolidone, N-	872-50-4	—	1.3E+03	—	1.3E+03
Methylstyrene, alpha-	98-83-9	—	2.8E+02	—	1.8E+02
Methyltetrahydrofuran, 2-	96-47-9	1.5E+02	1.6E+04	8.6E+01	1.6E+04
Methyltetrahydropyran, 2-	10141-72-7	1.7E+02	1.6E+04	9.8E+01	1.6E+04
Metolachlor	51218-45-2	—	1.0E+04	—	1.0E+04
Metribuzin	21087-64-9	—	1.7E+03	—	1.7E+03
Mirex	2385-85-5	—	1.3E+01	—	1.3E+01
Molinate	2212-67-1	—	1.3E+02	—	1.3E+02
Molybdenum	7439-98-7	—	1.6E+02	—	1.6E+02

Table 4
Tier 1 Residential Total Soil Combined PCLs

Last Revised: March 1, 2022

Chemical of Concern	CAS	TotSoil _{Comb}			
		(includes inhalation, ingestion, dermal, and vegetable consumption pathways)			
		0.5 acre source area Carcinogenic (mg/kg)	0.5 acre source area Noncarcinogenic (mg/kg)	30 acre source area Carcinogenic (mg/kg)	30 acre source area Noncarcinogenic (mg/kg)
Monocrotophos	2157-98-4	—	4.0E+01	—	4.0E+01
Morpholine	110-91-8	—	1.0E+06	—	1.0E+06
Morpholine, N-butyl-	1005-67-0	—	1.5E+02	—	1.5E+02
MTBE (methyl tert-butyl ether)	1634-04-4	9.8E+02	8.0E+02	5.9E+02	7.9E+02
Naled	300-76-5	—	1.3E+02	—	1.3E+02
Naphthalene	91-20-3	—	2.2E+02	—	1.2E+02
Naphthoquinone, 1,4-	130-15-4	—	4.7E+02	—	4.7E+02
Naphthylamine, 1-	134-32-7	—	1.3E+03	—	1.3E+03
Naphthylamine, 2-	91-59-8	2.6E+00	—	2.6E+00	—
Napropamide	15299-99-7	—	6.7E+03	—	6.7E+03
Neopentyl glycol	126-30-7	—	2.0E+04	—	2.0E+04
Nickel and compounds	7440-02-0	1.3E+05	8.4E+02	6.8E+04	8.4E+02
Nitrate-N	14797-55-8	—	1.3E+05	—	1.3E+05
Nitrite-N	14797-65-0	—	8.0E+03	—	8.0E+03
Nitroaniline, 2-	88-74-4	—	1.4E+01	—	1.1E+01
Nitroaniline, 3-	99-09-2	1.2E+02	1.5E+01	1.2E+02	1.2E+01
Nitroaniline, 4-	100-01-6	2.3E+02	2.2E+02	2.3E+02	1.9E+02
Nitrobenzene	98-95-3	6.6E+01	1.2E+02	3.4E+01	1.1E+02
Nitroglycerin	55-63-0	2.8E+02	6.7E+00	2.8E+02	6.7E+00
Nitrophenol, 2-	88-75-5	—	1.3E+02	—	1.3E+02
Nitrophenol, 3-	554-84-7	—	1.3E+02	—	1.3E+02
Nitrophenol, 4-	100-02-7	—	1.3E+02	—	1.3E+02
Nitropropane, 2-	79-46-9	6.2E-01	1.1E+01	3.2E-01	1.1E+01
Nitroquinoline-N-oxide, 4-	56-57-5	4.0E-01	—	3.3E-01	—
Nitrosodiethanolamine	1116-54-7	1.7E+00	—	1.7E+00	—
Nitrosodiethylamine, n-	55-18-5	2.5E-02	—	1.8E-02	—
Nitrosodimethylamine, n-	62-75-9	7.4E-02	5.8E-01	5.5E-02	5.2E-01
Nitrosodi-n-butylamine, n-	924-16-3	4.7E-01	—	3.3E-01	—
Nitrosodi-n-propylamine, n-	621-64-7	4.0E-01	—	4.0E-01	—
Nitrosodiphenylamine	86-30-6	5.7E+02	—	5.7E+02	—
Nitroso-methyl-ethyl-amine, n-	10595-95-6	2.8E-01	—	2.8E-01	—
Nitrosomorpholine, N-	59-89-2	5.0E-01	—	3.9E-01	—
Nitroso-n-ethylurea, n-	759-73-9	3.4E-02	—	3.4E-02	—
Nitrosopiperidine, N-	100-75-4	3.6E-01	—	2.9E-01	—
Nitrosopyrrolidine, n-	930-55-2	1.6E+00	—	1.3E+00	—
Nitrotoluene, m-	99-08-1	—	6.7E+02	—	6.7E+02
Nitrotoluene, o-	88-72-2	2.1E+01	6.0E+01	2.1E+01	6.0E+01
Nitrotoluene, p-	99-99-0	2.9E+02	2.7E+02	2.9E+02	2.7E+02
Nonachlor, cis-	5103-73-1	5.6E+00	1.9E+01	5.6E+00	1.9E+01
Nonachlor, trans-	39765-80-5	5.6E+00	1.9E+01	5.6E+00	1.9E+01
Nonanal	124-19-6	—	1.3E+04	—	1.3E+04

Table 4
Tier 1 Residential Total Soil Combined PCLs

Last Revised: March 1, 2022

Chemical of Concern	CAS	TotSoil _{Comb}			
		(includes inhalation, ingestion, dermal, and vegetable consumption pathways)			
		0.5 acre source area Carcinogenic (mg/kg)	0.5 acre source area Noncarcinogenic (mg/kg)	30 acre source area Carcinogenic (mg/kg)	30 acre source area Noncarcinogenic (mg/kg)
Nonene, 1-n	124-11-8	—	8.2E+03	—	8.2E+03
Nonylphenol, 4-n-	104-40-5	—	6.5E+03	—	6.5E+03
Nonylphenol ethoxylate	9016-45-9	—	6.5E+03	—	6.5E+03
Octamethylpyrophosphoramidate	152-16-9	—	1.3E+02	—	1.3E+02
Octanone	106-68-3	—	4.9E+03	—	4.9E+03
Oxamyl	23135-22-0	—	1.7E+03	—	1.7E+03
Oxychlorthane	27304-13-8	5.6E+00	1.9E+01	5.6E+00	1.9E+01
Paraquat	1910-42-5	—	3.0E+02	—	3.0E+02
Parathion (ethyl parathion)	56-38-2	—	4.0E+02	—	4.0E+02
Pebulate	1114-71-2	—	3.3E+03	—	3.3E+03
Pendimethalin	40487-42-1	—	2.5E+03	—	2.5E+03
Pentachlorobenzene	608-93-5	—	5.3E+01	—	5.3E+01
Pentachloroethane	76-01-7	3.9E+01	2.5E+03	2.8E+01	2.5E+03
Pentachloronitrobenzene	82-68-8	1.0E+01	1.4E+02	1.0E+01	1.4E+02
Pentachlorophenol	87-86-5	7.3E-01	3.6E+01	7.3E-01	3.6E+01
Pentadiene, 1,3-cis-	1574-41-0	—	4.8E+03	—	4.7E+03
Pentadiene, 1,3-trans-	2004-70-8	—	4.8E+03	—	4.7E+03
Pentaerythritol tetranitrate (PETN)	78-11-5	—	1.3E+02	—	1.3E+02
Pentane	109-66-0	—	4.8E+03	—	4.8E+03
Pentane, 2-methyl-	107-83-5	—	4.8E+03	—	4.7E+03
Pentane, 3-methyl-	96-14-0	—	4.8E+03	—	4.7E+03
Pentanediol, 1,5-	111-29-5	—	3.0E+05	—	2.7E+05
Pentanol, 1-	71-41-0	—	2.7E+03	—	2.7E+03
Pentanol, 4-methyl-2-	108-11-2	—	2.1E+03	—	2.1E+03
Pentanone, 2-	107-87-9	—	3.3E+03	—	3.3E+03
Pentene, 2-	109-68-2	—	4.8E+03	—	4.7E+03
Pentyne, 1-	627-19-0	—	4.8E+03	—	4.7E+03
Perchlorate	14797-73-0	—	5.1E+01	—	5.1E+01
Perfluorooctane sulfonic acid (1-Octanesulfonic acid, heptafluoro-1-) [PFOS]	1763-23-1	—	1.5E+00	—	1.5E+00
Perfluoroundecanoic acid (Undecanoic acid, undecafluoro-) [PFUnDa]	2058-94-8	—	8.0E-01	—	8.0E-01
Perfluoropentanoic acid (Pentanoic acid, nonafluoro-) [PFPeA]	2706-90-3	—	2.5E-01	—	2.5E-01
Perfluorohexanoic acid (Hexanoic acid, undecafluoro-) [PFHxA]	307-24-4	—	2.5E-01	—	2.5E-01
Perfluorododecanoic acid (Dodecanoic acid, tricosfluoro-) [PFDoA]	307-55-1	—	7.9E-01	—	7.8E-01
Perfluorooctanoic acid (Octanoic acid, pentafluoro-) [PFOA]	335-67-1	—	6.0E-01	—	4.9E-01
Perfluorodecanoic acid (Decanoic acid, nonafluoro-) [PFDA]	335-76-2	—	9.9E-01	—	9.8E-01
Perfluorodecane sulfonic acid (1-Decanesulfonic acid, heneicosfluoro-) [PFDS]	335-77-3	—	8.0E-01	—	8.0E-01
Perfluorohexane sulfonic acid (1-Hexanesulfonic acid, tridecafluoro-) [PFHxS]	355-46-4	—	2.5E-01	—	2.4E-01

Table 4
Tier 1 Residential Total Soil Combined PCLs

Last Revised: March 1, 2022

Chemical of Concern	CAS	TotSoilComb			
		(includes inhalation, ingestion, dermal, and vegetable consumption pathways)			
		0.5 acre source area Carcinogenic (mg/kg)	0.5 acre source area Noncarcinogenic (mg/kg)	30 acre source area Carcinogenic (mg/kg)	30 acre source area Noncarcinogenic (mg/kg)
Perfluorobutyric acid (Butanoic acid, heptafluoro-) [PFBA]	375-22-4	—	1.8E+02	—	1.6E+02
Perfluorobutane sulfonic acid (1-Butanesulfonic acid, nonafluoro-) [PFBS]	375-73-5	—	8.6E+01	—	8.0E+01
Perfluoroheptanoic acid (Heptanoic acid, tridecafluoro-) [PFHpA]	375-85-9	—	1.5E+00	—	1.5E+00
Perfluorononanoic acid (Nonanoic acid, heptadecafluoro-) [PFNA]	375-95-1	—	7.6E-01	—	7.3E-01
Perfluorotetradecanoic acid (Tetradecanoic acid, heptacosafuoro-) [PFTeDA]	376-06-7	—	5.1E-01	—	5.1E-01
Perfluorotridecanoic acid (Tridecanoic acid, pentacosafuoro-) [PFTrDA]	72629-94-8	—	6.1E-01	—	6.1E-01
Perfluorooctane sulfonamide (1-Octanesulfonamide, heptadecafluoro-) [PFOSA]	754-91-6	—	5.8E-02	—	3.1E-02
Perylene	198-55-0	—	1.3E+03	—	1.3E+03
Phenacetin	62-44-2	1.8E+03	—	1.5E+03	—
Phenanthrene	85-01-8	—	1.7E+03	—	1.7E+03
Phenanthridine	229-87-8	—	2.0E+02	—	2.0E+02
Phenol	108-95-2	—	1.8E+03	—	9.5E+02
Phenol, 4-tert-butyl-	98-54-4	—	8.0E+03	—	8.0E+03
Phenothiazine	92-84-2	—	6.3E+01	—	6.3E+01
Phenyl mercuric acetate	62-38-4	—	5.3E+00	—	5.3E+00
Phenylene diamine, m-	108-45-2	—	4.0E+02	—	4.0E+02
Phenylene diamine, p-	106-50-3	—	1.3E+04	—	1.3E+04
Phorate	298-02-2	—	1.3E+01	—	1.3E+01
Phosalone	2310-17-0	—	1.3E+02	—	1.3E+02
Phosdrin (mevinphos)	7786-34-7	—	1.7E+00	—	1.7E+00
Phosmet	732-11-6	—	1.3E+03	—	1.3E+03
Phosphine	7803-51-2	—	3.8E+00	—	2.1E+00
Phosphorotrithioic acid, S,S,S-tributyl ester	78-48-8	5.2E+01	3.2E+01	5.2E+01	3.2E+01
Phosphorus, total*	7723-14-0	—	—	—	—
Phosphorus, white	7723-14-0	—	1.5E+00	—	1.5E+00
Phthalic anhydride	85-44-9	—	3.6E+04	—	2.1E+04
Picloram	1918-02-1	—	4.7E+03	—	4.7E+03
Picoline, 2- (2-methylpyridine)	109-06-8	—	7.4E+02	—	7.4E+02
Polybrominated biphenyls (PBBs)	67774-32-7	9.7E-03	1.6E-02	9.7E-03	1.6E-02
Polychlorinated biphenyls (PCBs)	1336-36-3	1.8E+00	1.1E+00	1.7E+00	1.1E+00
Potassium*	7440-09-7	—	—	—	—
Primene	68955-53-3	—	3.6E+02	—	3.6E+02
Prometon (pramitol)	1610-18-0	—	1.0E+03	—	1.0E+03
Prometryn	7287-19-6	—	2.7E+03	—	2.7E+03
Pronamide	23950-58-5	—	5.0E+03	—	5.0E+03
Propanal (propionaldehyde)	123-38-6	—	1.0E+02	—	5.8E+01
Propane, 1-bromo-	106-94-5	—	2.9E+03	—	2.9E+03
Propanil	709-98-8	—	3.3E+02	—	3.3E+02

Table 4
Tier 1 Residential Total Soil Combined PCLs

Last Revised: March 1, 2022

Chemical of Concern	CAS	TotSoil _{Comb}			
		(includes inhalation, ingestion, dermal, and vegetable consumption pathways)			
		0.5 acre source area Carcinogenic (mg/kg)	0.5 acre source area Noncarcinogenic (mg/kg)	30 acre source area Carcinogenic (mg/kg)	30 acre source area Noncarcinogenic (mg/kg)
Propanoic acid (propionic acid)	79-09-4	—	4.1E+04	—	4.1E+04
Propanol, 1-	71-23-8		1.6E+05		1.6E+05
Propargite	2312-35-8	—	1.3E+03	—	1.3E+03
Propargyl alcohol	107-19-7	—	1.6E+02	—	1.6E+02
Propazine	139-40-2	1.1E+02	1.3E+03	1.1E+02	1.3E+03
Propham	122-42-9	—	1.3E+03	—	1.3E+03
Propionitrile (propane nitrile)	107-12-0	—	3.3E+01	—	3.3E+01
Propyl acetate, n-	109-60-4	—	7.4E+03	—	7.4E+03
Propylbenzene, n-	103-65-1	—	2.2E+03	—	1.6E+03
Propylene glycol	57-55-6	—	3.7E+02	—	1.9E+02
Propylene glycol monomethyl ether	107-98-2	—	4.6E+04	—	3.9E+04
Propylene oxide	75-56-9	2.0E+01	4.6E+02	1.7E+01	2.4E+02
Propylene tetramer	6842-15-5	—	4.6E+03	—	3.6E+03
Prothiofos (Tokuthion)	34643-46-4	—	6.6E+00	—	6.6E+00
Pyrene	129-00-0	—	1.7E+03	—	1.7E+03
Pyridine	110-86-1	—	8.2E+01	—	8.2E+01
Quinoline	91-22-5	1.6E+00	—	1.6E+00	—
Ronnel	299-84-3	—	2.3E+03	—	2.3E+03
Safrole	94-59-7	1.6E+01	—	1.3E+01	—
Selenium	7782-49-2	—	3.1E+02	—	3.1E+02
Selenourea	630-10-4	—	4.1E+02	—	4.1E+02
Silver	7440-22-4	—	9.7E+01	—	9.7E+01
Simazine	122-34-9	3.9E+01	3.3E+02	3.9E+01	3.3E+02
Sodium*	7440-23-5	—	—	—	—
Sodium hypochlorite	7681-52-9	—	1.5E+04	—	1.4E+04
Sodium polyacrylate	9003-04-7	—	1.2E+02	—	6.2E+01
Strontium	7440-24-6	—	4.4E+04	—	4.4E+04
Strychnine	57-24-9	—	2.0E+01	—	2.0E+01
Styrene	100-42-5	—	6.7E+03	—	4.3E+03
Sulfate*	14808-79-8	—	—	—	—
Sulfide*	18496-25-8	—	—	—	—
Sulfolane	126-33-0	—	4.3E+02	—	2.9E+02
Sulfur*	7704-34-9	—	—	—	—
Sulprofos (Bolstar)	35400-43-2	—	2.0E+02	—	2.0E+02
Tebuconazole	107534-96-3	—	2.0E+03	—	2.0E+03
Tebuthiuron	34014-18-1	—	4.7E+03	—	4.7E+03
Terbufos	13071-79-9	—	1.7E+00	—	1.7E+00
Tert-amyl ethyl ether (TAEE)	919-94-8	—	3.3E+03	—	3.3E+03
Tert-amyl-methyl ether (TAME)	994-05-8	—	3.3E+03	—	3.3E+03
Tert-butyl alcohol (2-methyl-2-propanol)	75-65-0	—	7.4E+03	—	7.4E+03
Tetrachlorobenzene, 1,2,3,4-	634-66-2	—	2.0E+01	—	2.0E+01

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		0.5 acre source area Carcinogenic (mg/kg)	0.5 acre source area Noncarcinogenic (mg/kg)	30 acre source area Carcinogenic (mg/kg)	30 acre source area Noncarcinogenic (mg/kg)
Tetrachlorobenzene, 1,2,3,5-	634-90-2	—	1.3E+01	—	1.3E+01
Tetrachlorobenzene, 1,2,4,5-	95-94-3	—	2.0E+01	—	2.0E+01
Tetrachloroethane, 1,1,1,2-	630-20-6	6.5E+01	2.5E+03	3.9E+01	2.5E+03
Tetrachloroethane, 1,1,2,2-	79-34-5	3.0E+01	1.6E+03	3.0E+01	1.6E+03
Tetrachloroethylene [PCE]	127-18-4	7.1E+02	1.3E+03	4.2E+02	1.1E+03
Tetrachlorophenol, 2,3,4,5-	4901-51-3	—	4.0E+02	—	4.0E+02
Tetrachlorophenol, 2,3,4,6-	58-90-2	—	1.8E+02	—	1.8E+02
Tetrachlorophenol, 2,3,5,6-	935-95-5	—	2.3E+01	—	2.3E+01
Tetrachlorvinphos (Stirophos)	22248-79-9	—	2.6E+03	—	2.6E+03
Tetradifon	116-29-0	—	1.0E+03	—	1.0E+03
Tetraethyl dithiopyrophosphate (sulfotep)	3689-24-5	—	3.3E+01	—	3.3E+01
Tetraethyl lead	78-00-2	—	6.7E-03	—	6.7E-03
Tetraethyl pyrophosphate (TEPP)	107-49-3	—	7.3E-01	—	7.3E-01
Tetraethylene glycol	112-60-7	—	2.2E+04	—	2.2E+04
Tetrahydrofuran	109-99-9	1.5E+02	2.2E+04	8.6E+01	1.3E+04
Tetrahydropyran	142-68-7	1.6E+02	1.6E+04	9.2E+01	1.6E+04
Tetraoxadodecane, 2,5,8,11-	112-49-2	—	1.7E+03	—	1.7E+03
Thallium	7440-28-0	—	5.3E+00	—	5.3E+00
Thiofanox	39196-18-4	—	2.0E+01	—	2.0E+01
Thionazin	297-97-2	—	4.7E+00	—	4.7E+00
Thiophanate-methyl	23564-05-8	—	5.3E+03	—	5.3E+03
Thiram	137-26-8	—	3.3E+02	—	3.3E+02
Tin	7440-31-5	—	3.5E+04	—	3.5E+04
Titanium	7440-32-6	—	2.2E+05	—	2.2E+05
Toluene	108-88-3	—	5.9E+03	—	5.4E+03
Toluene diisocyanate, 2,4/2,6-	26471-62-5	—	1.5E+02	—	7.5E+01
Toluenediamine, 2,4-	95-80-7	1.5E+00	—	1.5E+00	—
Toluenediamine, 2,6-	823-40-5	—	2.0E+03	—	2.0E+03
Toluidine, o-	95-53-4	4.7E+01	—	3.5E+01	—
Toluidine, p-	106-49-0	7.1E+01	—	7.1E+01	—
Toxaphene	8001-35-2	1.2E+00	9.0E+00	1.2E+00	9.0E+00
TPH, TX1005, C6-C12	TPH-1005-1	—	1.6E+03	—	1.1E+03
TPH, TX1005, >C12-C28	TPH-1005-2	—	2.3E+03	—	2.0E+03
TPH, TX1005, >C12-C35	TPH-1005-3	—	2.3E+03	—	2.0E+03
TPH, TX1005, >C28-C35	TPH-1005-4	—	2.3E+03	—	2.0E+03
TP Silvex, 2,4,5-	93-72-1	—	5.3E+02	—	5.3E+02
Triademenol	55219-65-3	—	2.0E+03	—	2.0E+03
Triallate	2303-17-5	—	3.2E+02	—	3.2E+02
Triaminotrinrobenzene (TATB)	3058-38-6	—	2.0E+02	—	2.0E+02
Tributyltin oxide	56-35-9	—	2.0E+01	—	2.0E+01
Trichloro-1,2,2-trifluoroethane, 1,1,2-	76-13-1	—	7.4E+04	—	3.9E+04

Table 4
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		(includes inhalation, ingestion, dermal, and vegetable consumption pathways)			
		0.5 acre source area Carcinogenic (mg/kg)	0.5 acre source area Noncarcinogenic (mg/kg)	30 acre source area Carcinogenic (mg/kg)	30 acre source area Noncarcinogenic (mg/kg)
Trichlorobenzene, 1,2,3-	87-61-6	—	1.2E+02	—	8.7E+01
Trichlorobenzene, 1,2,4-	120-82-1	1.6E+02	1.2E+02	1.6E+02	7.0E+01
Trichlorobenzene, 1,3,5-	108-70-3	—	7.8E+01	—	4.9E+01
Trichloroethane, 1,1,1-	71-55-6	—	5.3E+04	—	3.2E+04
Trichloroethane, 1,1,2-	79-00-5	1.8E+01	3.3E+02	1.0E+01	3.3E+02
Trichloroethylene [TCE]	79-01-6	5.3E+01	1.8E+01	3.4E+01	1.1E+01
Trichlorofluoromethane	75-69-4	—	2.5E+04	—	2.5E+04
Trichloronate	327-98-0	—	1.4E+02	—	1.4E+02
Trichlorophenol, 2,3,4-	15950-66-0	—	6.7E+03	—	6.7E+03
Trichlorophenol, 2,3,5-	933-78-8	—	6.7E+03	—	6.7E+03
Trichlorophenol, 2,3,6-	933-75-5	—	5.3E+02	—	5.3E+02
Trichlorophenol, 2,4,5-	95-95-4	—	6.7E+03	—	6.7E+03
Trichlorophenol, 2,4,6-	88-06-2	3.5E+02	6.7E+01	3.0E+02	6.7E+01
Trichlorophenol, 3,4,5-	609-19-8	—	6.7E+03	—	6.7E+03
Trichlorophenoxyacetic acid, 2,4,5-	93-76-5	—	6.7E+02	—	6.7E+02
Trichloropropane, 1,1,2-	598-77-6	—	4.6E+00	—	2.4E+00
Trichloropropane, 1,2,3-	96-18-4	2.0E-01	1.3E+01	2.0E-01	7.0E+00
Triethanolamine	102-71-6	—	3.0E+03	—	1.7E+03
Triethylamine	121-44-8	—	1.1E+02	—	5.5E+01
Triethylene glycol	112-27-6	—	1.3E+05	—	1.3E+05
Triethylphosphorothioate, O, O, O-	126-68-1	—	5.5E-01	—	5.5E-01
Trifluralin	1582-09-8	2.7E+02	3.0E+02	2.7E+02	3.0E+02
Trimethylamine	75-50-3	—	1.5E+02	—	7.6E+01
Trimethylbenzene, 1,2,3-	526-73-8	—	1.6E+03	—	1.1E+03
Trimethylbenzene, 1,2,4-	95-63-6	—	1.6E+03	—	1.2E+03
Trimethylbenzene, 1,3,5-	108-67-8	—	1.5E+03	—	1.1E+03
Trinitrobenzene, 1,3,5-	99-35-4	—	2.0E+03	—	2.0E+03
Trinitrophenylmethylnitramine (tetryl; nitramine)	479-45-8	—	1.5E+02	—	1.5E+02
Trinitrotoluene, 2,4,6-	118-96-7	1.6E+02	3.3E+01	1.6E+02	3.3E+01
Tungsten (as sodium tungstate dihydride)	7440-33-7	—	7.3E+01	—	7.3E+01
Uranium (soluble salts)	7440-61-1	—	2.2E+02	—	2.2E+02
Valeric acid (pentanoic acid)	109-52-4	—	1.3E+02	—	6.8E+01
Vanadium	7440-62-2	—	7.6E+01	—	7.5E+01
Vernam	1929-77-7	—	6.7E+01	—	6.7E+01
Vinyl acetate	108-05-4	—	3.0E+03	—	1.5E+03
Vinyl chloride	75-01-4	3.7E+00	1.9E+02	3.4E+00	1.6E+02
Vinylcyclohexane	695-12-5	—	4.1E+04	—	4.1E+04
Warfarin	81-81-2	—	2.0E+01	—	2.0E+01
Xylene, m-	108-38-3	—	8.9E+03	—	4.7E+03
Xylene, o-	95-47-6	—	4.8E+04	—	2.9E+04
Xylene, p-	106-42-3	—	8.9E+03	—	4.7E+03

Table 4
Tier 1 Residential Total Soil Combined PCLs

Last Revised: March 1, 2022

Chemical of Concern	CAS	TotSoilComb (includes inhalation, ingestion, dermal, and vegetable consumption pathways)			
		0.5 acre source area Carcinogenic (mg/kg)	0.5 acre source area Noncarcinogenic (mg/kg)	30 acre source area Carcinogenic (mg/kg)	30 acre source area Noncarcinogenic (mg/kg)
Xylenes	1330-20-7	—	6.0E+03	—	3.7E+03
Zinc	7440-66-6	—	9.9E+03	—	9.9E+03
6 C aliphatics (TPH) (>53% n-hexane content)	NA	—	3.3E+03	—	2.5E+03
6 C aliphatics (TPH) (<53% n-hexane content)	NA	—	4.8E+03	—	4.8E+03
>6-8 C aliphatics (TPH) (>53% n-hexane content)	NA	—	3.3E+03	—	2.5E+03
>6-8 C aliphatics (TPH) (<53% n-hexane content)	NA	—	4.8E+03	—	4.8E+03
>8-10 C aliphatics (TPH)	NA	—	4.0E+03	—	2.7E+03
>10-12 C aliphatics (TPH)	NA	—	3.6E+03	—	2.5E+03
>12-16 C aliphatics (TPH)	NA	—	4.3E+03	—	3.2E+03
>16-21 C aliphatics (TPH)	NA	—	1.3E+05	—	1.3E+05
>16-21 C aliphatics (TPH) (for transformer mineral oil releases only)	NA	—	1.1E+05	—	1.1E+05
>21-35 C aliphatics (TPH)	NA	—	1.3E+05	—	1.3E+05
>21-35 C aliphatics (TPH) (for transformer mineral oil releases only)	NA	—	1.1E+05	—	1.1E+05
>7-8 C aromatics (TPH)	NA	—	6.4E+03	—	5.3E+03
>8-10 C aromatics (TPH)	NA	—	1.6E+03	—	1.1E+03
>10-12 C aromatics (TPH)	NA	—	1.9E+03	—	1.5E+03
>12-16 C aromatics (TPH)	NA	—	2.3E+03	—	2.0E+03
>16-21 C aromatics (TPH)	NA	—	2.0E+03	—	2.0E+03
>21-35 C aromatics (TPH)	NA	—	2.0E+03	—	2.0E+03
Footnotes					
1 Site-specific PCLs for mercury may vary based on the pH-dependent Kd value (see Figure:30 TAC §350.73(f)(1)(C)).					
* These compounds are not necessarily of concern from a human health standpoint, therefore calculation of human health-based values is not required. However, aesthetics and ecological criteria would still apply. See table entitled "Compounds for which Calculation of a Human Health PCL is Not Required" available on the TCEQ website at http://www.tceq.state.tx.us/remediation/trrp/trrp.html .					
NA = not applicable					
All values capped at 1E+06					

This table shows the total soil combined protective concentration levels for residential land with both carcinogenic and non-carcinogenic values depicted.

end of worksheet

Table 5
Tier 1 Commercial/Industrial Total Soil Combined PCLs
Last Revised: March 1, 2022

Chemical of Concern	CAS	TotSoil _{Comb}			
		(includes inhalation, ingestion, and dermal pathways)			
		0.5 acre source area Carcinogenic (mg/kg)	0.5 acre source area Noncarcinogenic (mg/kg)	30 acre source area Carcinogenic (mg/kg)	30 acre source area Noncarcinogenic (mg/kg)
Acenaphthene	83-32-9	—	3.7E+04	—	3.7E+04
Acenaphthylene	208-96-8	—	3.7E+04	—	3.7E+04
Acetaldehyde	75-07-0	2.9E+02	2.0E+02	1.5E+02	1.0E+02
Acetate, 2-ethoxyethanol	111-15-9	—	7.8E+03	—	4.2E+03
Acetate, isoamyl	123-92-2	—	7.4E+04	—	7.4E+04
Acetate, isobutyl	110-19-0	—	4.9E+04	—	4.9E+04
Acetate, sec-butyl	105-46-4	—	4.9E+04	—	4.9E+04
Acetic acid*	64-19-7	—	—	—	—
Acetone (2-propanone)	67-64-1	—	4.4E+05	—	2.9E+05
Acetone cyanohydrin	75-86-5	—	1.5E+03	—	1.2E+03
Acetonitrile	75-05-8	—	1.7E+03	—	9.1E+02
Acetophenone	98-86-2	—	6.8E+04	—	6.8E+04
Acetylaminofluorene, 2-	53-96-3	4.3E+00	—	3.8E+00	—
Acifluorfen, sodium	62476-59-9	—	8.9E+03	—	8.9E+03
Acridine	260-94-6	—	2.0E+03	—	2.0E+03
Acrolein	107-02-8	—	1.5E+02	—	9.0E+01
Acrylamide	79-06-1	2.1E+01	5.8E+02	1.5E+01	3.7E+02
Acrylic acid	79-10-7	—	1.7E+02	—	8.7E+01
Acrylonitrile	107-13-1	7.6E+00	4.1E+01	4.2E+00	2.2E+01
Adipic acid (hexanedioic acid)	124-04-9	—	1.0E+06	—	1.0E+06
Alachlor	15972-60-8	2.4E+02	6.8E+03	2.4E+02	6.8E+03
Aldicarb	116-06-3	—	6.8E+02	—	6.8E+02
Aldicarb sulfone	1646-88-4	—	6.8E+02	—	6.8E+02
Aldrin	309-00-2	1.0E+00	2.0E+01	9.7E-01	2.0E+01
Allyl alcohol	107-18-6	—	8.0E+00	—	4.1E+00
Allyl chloride	107-05-1	—	2.1E+01	—	1.1E+01
Aluminum	7429-90-5	—	6.2E+05	—	5.7E+05
Ametryn	834-12-8	—	6.1E+03	—	6.1E+03
Amino-2,6-dinitrotoluene, 4-	19406-51-0	6.4E+02	3.4E+02	6.4E+02	3.4E+02
Amino-4,6-dinitrotoluene, 2-	35572-78-2	6.4E+02	3.4E+02	6.4E+02	3.4E+02
Aminobiphenyl, 4- (1,1-biphenyl-4-amine)	92-67-1	3.1E+00	—	3.1E+00	—
Aminopyridine, 4-	504-24-5	—	1.4E+01	—	1.4E+01
Ammonia	7664-41-7	—	6.9E+03	—	3.5E+03
Ammonium polyphosphate*	6833-79-9	—	—	—	—
Ammonium salts*	AMMONIUM	—	—	—	—
Aniline	62-53-3	3.3E+03	1.8E+02	3.3E+03	9.3E+01
Anthracene	120-12-7	—	1.9E+05	—	1.9E+05
Anthraquinone, 9,10-	84-65-1	4.9E+02	1.4E+04	4.9E+02	1.4E+04
Antimony	7440-36-0	—	3.1E+02	—	3.1E+02
Aramite	140-57-8	7.6E+02	3.4E+04	7.6E+02	3.4E+04
Arsenic	7440-38-2	2.0E+02	3.3E+02	2.0E+02	3.3E+02

Table 5
Tier 1 Commercial/Industrial Total Soil Combined PCLs
Last Revised: March 1, 2022

Chemical of Concern	CAS	TotSoil _{Comb}			
		(includes inhalation, ingestion, and dermal pathways)			
		0.5 acre source area Carcinogenic (mg/kg)	0.5 acre source area Noncarcinogenic (mg/kg)	30 acre source area Carcinogenic (mg/kg)	30 acre source area Noncarcinogenic (mg/kg)
Arsine	7784-42-1	—	1.1E+00	—	5.5E-01
Atrazine	1912-24-9	8.6E+01	2.4E+04	8.6E+01	2.4E+04
Azinphos-methyl (guthion)	86-50-0	—	1.0E+03	—	1.0E+03
Azobenzene	103-33-3	1.6E+02	—	1.5E+02	—
Barium	7440-39-3	—	1.2E+05	—	1.2E+05
Bayleton	43121-43-3	—	2.0E+04	—	2.0E+04
Benefin (benfluralin)	1861-40-1	—	2.0E+05	—	2.0E+05
Benomyl	17804-35-2	—	3.4E+04	—	3.4E+04
Benz-a-anthracene	56-55-3	1.7E+02	—	1.7E+02	—
Benzaldehyde	100-52-7	—	1.0E+05	—	1.0E+05
Benzene	71-43-2	2.4E+02	2.4E+03	1.3E+02	1.8E+03
Benzenedicarbonitrile, 1,3-	626-17-5	—	4.1E+03	—	4.1E+03
Benzenedicarboxylic acid, 1,2-disodecyl ester	26761-40-0	—	2.7E+04	—	2.7E+04
Benzenethiol	108-98-5	—	1.0E+03	—	1.0E+03
Benzidine	92-87-5	4.7E-02	2.0E+03	3.3E-02	2.0E+03
Benzo-a-pyrene	50-32-8	1.7E+01	5.9E+01	1.7E+01	3.6E+01
Benzo-b-fluoranthene	205-99-2	1.7E+02	—	1.7E+02	—
Benzo-e-pyrene	192-97-2	—	1.9E+04	—	1.9E+04
Benzo-g,h,i-perylene	191-24-2	—	1.9E+04	—	1.9E+04
Benzoic acid	65-85-0	—	1.0E+06	—	1.0E+06
Benzo-j-fluoranthene	205-82-3	1.7E+02	—	1.7E+02	—
Benzo-k-fluoranthene	207-08-9	1.7E+03	—	1.7E+03	—
Benzophenone	119-61-9	—	4.6E+03	—	4.6E+03
Benzotrichloride	98-07-7	1.5E+00	—	1.5E+00	—
Benzoyl peroxide	94-36-0	—	3.4E+04	—	3.4E+04
Benzyl alcohol	100-51-6	—	6.8E+04	—	6.8E+04
Benzyl chloride	100-44-7	1.7E+02	4.2E+01	1.7E+02	2.2E+01
Benzyl dichloride	98-87-3	1.1E+02	7.3E+01	1.1E+02	3.9E+01
Beryllium	7440-41-7	1.6E+04	2.5E+02	8.1E+03	2.5E+02
Biphenyl, 1,1'-	92-52-4	—	8.5E+04	—	8.5E+04
Biphenyl, 1,1'-, 2-phenoxy-	6738-04-1	—	3.4E+04	—	3.4E+04
Biquinoline, 2,2'-	119-91-5	—	2.0E+03	—	2.0E+03
Bis (2-chloroethoxy) methane	111-91-1	9.1E+00	2.0E+03	6.2E+00	2.0E+03
Bis (2-chloroethyl) ether	111-44-4	4.9E+00	—	2.8E+00	—
Bis (2-chloro-1-methylethyl) ether	108-60-1	1.5E+02	2.7E+04	1.1E+02	2.7E+04
Bis (2-chloromethyl) ether	542-88-1	9.0E-03	—	4.8E-03	—
Bis (2-ethyl-hexyl) phthalate	117-81-7	5.6E+02	5.6E+03	5.6E+02	5.6E+03
Bismuth	7440-69-9	—	4.1E+05	—	4.1E+05
Bisphenol A	80-05-7	—	3.4E+04	—	3.4E+04
Boron	7440-42-8	—	1.9E+05	—	1.9E+05
Bromacil	314-40-9	—	6.8E+04	—	6.8E+04

Table 5
Tier 1 Commercial/Industrial Total Soil Combined PCLs
Last Revised: March 1, 2022

Chemical of Concern	CAS	TotSoilComb			
		(includes inhalation, ingestion, and dermal pathways)			
		0.5 acre source area Carcinogenic (mg/kg)	0.5 acre source area Noncarcinogenic (mg/kg)	30 acre source area Carcinogenic (mg/kg)	30 acre source area Noncarcinogenic (mg/kg)
Bromo-2-chloroethane, 1-	107-04-0	—	4.1E+04	—	4.1E+04
Bromobenzene	108-86-1	—	1.2E+03	—	6.4E+02
Bromodichloromethane	75-27-4	4.6E+02	8.2E+03	4.6E+02	8.2E+03
Bromoform	75-25-2	1.0E+03	2.0E+04	6.0E+02	2.0E+04
Bromomethane	74-83-9	—	7.9E+01	—	4.2E+01
Bromophenyl phenylether, 4-	101-55-3	1.2E+00	—	1.1E+00	—
Butadiene, 1,3-	106-99-0	1.2E+03	7.1E+02	6.2E+02	3.6E+02
Butadiene, 2-methyl-1,3- (isoprene)	78-79-5	—	5.3E+04	—	4.7E+04
Butanal (butyraldehyde)	123-72-8	—	2.1E+03	—	1.1E+03
Butane, 2,3-dimethyl-	79-29-8	—	5.3E+04	—	4.7E+04
Butanoic acid (butyric acid)	107-92-6	—	1.8E+02	—	9.3E+01
Butanol, 2-	78-92-2	—	1.0E+06	—	6.8E+05
Butanol, 2-methyl-1-	137-32-6	—	1.0E+04	—	1.0E+04
Butanol, 2-methyl-2-	75-85-4	—	1.0E+04	—	1.0E+04
Butanol, n-	71-36-3	—	1.0E+05	—	1.0E+05
Butene, 1-	106-98-9	—	4.0E+04	—	3.0E+04
Butene, cis-2-	590-18-1	—	2.2E+04	—	1.4E+04
Butene, trans-2-	624-64-6	—	2.2E+04	—	1.4E+04
Butoxy ethanol, 2- (Ethylene glycol monobutyl ether; EGBE)	111-76-2	—	5.8E+04	—	5.2E+04
Butyl acetate	123-86-4	—	6.4E+04	—	4.2E+04
Butyl acrylate	141-32-2	—	9.2E+03	—	9.2E+03
Butyl benzyl phthalate	85-68-7	1.0E+04	1.4E+05	1.0E+04	1.4E+05
Butyl ether, n- (dibutyl ether)	142-96-1	—	1.0E+05	—	1.0E+05
Butyl methacrylate	97-88-1	—	2.6E+04	—	2.6E+04
Butylate	2008-41-5	—	3.4E+04	—	3.4E+04
Butylbenzene, n-	104-51-8	—	3.4E+04	—	3.4E+04
Butylbenzene, sec-	135-98-8	—	4.1E+04	—	4.1E+04
Butylbenzene, tert-	98-06-6	—	4.1E+04	—	4.1E+04
Cacodylic acid	75-60-5	—	2.0E+03	—	2.0E+03
Cadmium	7440-43-9	7.7E+04	8.1E+02	4.0E+04	7.7E+02
Calcium*	7440-70-2	—	—	—	—
Caprolactam	105-60-2	—	3.4E+05	—	3.4E+05
Captan	133-06-2	5.5E+03	8.9E+04	5.5E+03	8.9E+04
Carbaryl	63-25-2	—	6.8E+04	—	6.8E+04
Carbazole	86-74-8	9.5E+02	—	9.5E+02	—
Carbofuran	1563-66-2	—	3.4E+03	—	3.4E+03
Carbon disulfide	75-15-0	—	1.3E+04	—	7.2E+03
Carbon tetrachloride	56-23-5	8.1E+01	1.4E+03	4.6E+01	8.7E+02
Carbophenothion	786-19-6	—	8.9E+03	—	8.9E+03
Carbosulfan	55285-14-8	—	6.8E+03	—	6.8E+03
Carboxin	5234-68-4	—	6.8E+04	—	6.8E+04

Table 5
Tier 1 Commercial/Industrial Total Soil Combined PCLs
Last Revised: March 1, 2022

Chemical of Concern	CAS	TotSoil _{Comb}			
		(includes inhalation, ingestion, and dermal pathways)			
		0.5 acre source area Carcinogenic (mg/kg)	0.5 acre source area Noncarcinogenic (mg/kg)	30 acre source area Carcinogenic (mg/kg)	30 acre source area Noncarcinogenic (mg/kg)
Chloral	75-87-6	—	1.0E+05	—	1.0E+05
Chloral hydrate (1,1-ethanediol, 2,2,2-trichloro-)	302-17-0	—	6.8E+04	—	6.8E+04
Chloramben (amiben; 3-amino-2,5-dichlorobenzoic acid)	133-90-4	—	1.0E+04	—	1.0E+04
Chlordane (technical)	12789-03-6	6.6E+01	3.9E+02	6.4E+01	3.7E+02
Chlordane, cis- (alpha chlordane)	5103-71-9	5.4E+01	3.3E+02	5.4E+01	3.3E+02
Chlordane, trans- (gamma chordane)	5103-74-2	5.3E+01	3.1E+02	5.1E+01	2.9E+02
Chlorfenvinphos	470-90-6	—	3.9E+01	—	2.1E+01
Chloride*	16887-00-6	—	—	—	—
Chlorine	7782-50-5	—	1.9E+02	—	9.6E+01
Chloro-1,3-butadiene, 2-	126-99-8	2.0E+00	4.3E+02	1.0E+00	2.2E+02
Chloro-2-propanol, 1-	127-00-4	—	2.0E+04	—	2.0E+04
Chloro-3-methylphenol, 4-	59-50-7	—	3.4E+03	—	3.4E+03
Chloroaniline, p-	106-47-8	9.5E+01	2.7E+03	9.5E+01	2.7E+03
Chlorobenzene	108-90-7	—	1.0E+03	—	5.4E+02
Chlorobenzilate	510-15-6	6.3E+01	1.4E+04	5.7E+01	1.4E+04
Chlorobromomethane (bromochloromethane)	74-97-5	—	4.1E+04	—	4.1E+04
Chlorodifluoromethane	75-45-6	—	1.0E+06	—	5.5E+05
Chloroethane (ethyl chloride)	75-00-3	—	1.4E+05	—	8.7E+04
Chloroethanol, 2-	107-07-3	—	2.0E+04	—	2.0E+04
Chloroethoxy ethene, 2- (2-chloroethylvinylether)	110-75-8	2.6E+01	6.4E+00	2.6E+01	3.3E+00
Chloroform	67-66-3	2.6E+01	1.7E+03	1.3E+01	9.7E+02
Chlorohexane, 1-	544-10-5	—	1.4E+04	—	8.7E+03
Chloromethane (methyl chloride)	74-87-3	2.9E+02	1.3E+03	1.6E+02	7.8E+02
Chloronaphthalene, 1- (Chloronaphthalene, alpha-)	90-13-1	—	5.0E+04	—	5.0E+04
Chloronaphthalene, 2- (chloronaphthalene, beta)	91-58-7	—	5.0E+04	—	5.0E+04
Chloronitrobenzene, p- (1-chloro-4-nitrobenzene)	100-00-5	3.0E+03	7.8E+01	3.0E+03	4.2E+01
Chlorophenol, 2-	95-57-8	—	5.1E+03	—	5.1E+03
Chlorophenol, 3-	108-43-0	—	3.4E+03	—	3.4E+03
Chlorophenol, 4-	106-48-9	—	3.4E+03	—	3.4E+03
Chlorophenyl phenylether, 4-	7005-72-3	9.8E-01	—	8.0E-01	—
Chloropropane, 2-	75-29-6	—	2.0E+03	—	1.1E+03
Chlorothalonil	1897-45-6	1.7E+03	1.0E+04	1.7E+03	1.0E+04
Chlorotoluene, o- (2-chlorotoluene)	95-49-8	—	7.8E+03	—	5.6E+03
Chlorotoluene, p- (4-chlorotoluene)	106-43-4	—	2.0E+04	—	2.0E+04
Chlorpyrifos	2921-88-2	—	2.0E+03	—	2.0E+03
Chromium (III)	16065-83-1	—	1.2E+05	—	7.5E+04
Chromium (total)	7440-47-3	—	1.2E+05	—	7.5E+04
Chromium (VI)	18540-29-9	1.6E+04	1.0E+03	8.5E+03	1.0E+03
Chrysene	218-01-9	1.7E+04	—	1.7E+04	—
Cobalt	7440-48-4	6.3E+03	8.7E+03	3.3E+03	8.0E+03
Copolymer acrylamide	69418-26-4	—	1.4E+02	—	1.4E+02

Table 5
Tier 1 Commercial/Industrial Total Soil Combined PCLs
Last Revised: March 1, 2022

Chemical of Concern	CAS	TotSoilComb (includes inhalation, ingestion, and dermal pathways)			
		0.5 acre source area Carcinogenic (mg/kg)	0.5 acre source area Noncarcinogenic (mg/kg)	30 acre source area Carcinogenic (mg/kg)	30 acre source area Noncarcinogenic (mg/kg)
Copper	7440-50-8	—	9.4E+04	—	9.4E+04
Coronene	191-07-1	—	1.4E+03	—	1.4E+03
Coumaphos	56-72-4	—	4.8E+03	—	4.8E+03
Cresol	1319-77-3	—	3.4E+04	—	3.4E+04
Cresol, m- (3-methylphenol)	108-39-4	—	3.4E+04	—	3.4E+04
Cresol, o- (2-methylphenol)	95-48-7	—	3.4E+04	—	3.4E+04
Cresol, p- (4-methylphenol)	106-44-5	—	3.4E+03	—	3.4E+03
Crotonaldehyde	123-73-9	1.5E+01	1.0E+03	1.5E+01	1.0E+03
Cumene (isopropylbenzene)	98-82-8	—	1.1E+04	—	6.3E+03
Cyanazine	21725-46-2	2.3E+01	1.4E+03	2.3E+01	1.4E+03
Cyanide	57-12-5	—	3.7E+02	—	2.8E+02
Cyanogen	460-19-5	—	1.7E+01	—	8.8E+00
Cycloate	1134-23-2	—	3.7E+04	—	3.7E+04
Cyclohexane	110-82-7	—	1.3E+05	—	6.5E+04
Cyclohexanol	108-93-0	—	1.0E+06	—	1.0E+06
Cyclohexanone	108-94-1	—	4.9E+04	—	2.5E+04
Cyclohexene, 1-methanol-3-	1679-51-2	—	1.4E+04	—	1.4E+04
Cyclohexene, 4-vinyl-1-	100-40-3	—	5.4E+03	—	3.1E+03
Cyclopentane	287-92-3	—	5.5E+04	—	5.0E+04
Cyclopentane, methyl-	96-37-7	—	1.8E+04	—	1.0E+04
Cyclopentene	142-29-0	—	1.0E+06	—	1.0E+06
Cyclotetramethylenetetranitramine (HMX)	2691-41-0	—	1.2E+04	—	1.2E+04
Cyclotrimethylenetrinitramine (RDX)	121-82-4	2.4E+02	2.7E+03	2.4E+02	2.7E+03
Cymene (isopropyltoluene)	99-87-6	—	1.0E+05	—	1.0E+05
Cymoxanil	57966-95-7	—	8.9E+03	—	8.9E+03
Dacthal (DCPA)	1861-32-1	—	6.8E+03	—	6.8E+03
Dalapon, sodium salt (2,2-dichloropropanoic acid)	75-99-0	—	2.0E+04	—	2.0E+04
DDD	72-54-8	1.0E+02	—	1.0E+02	—
DDE	72-55-9	7.3E+01	—	7.3E+01	—
DDT	50-29-3	7.1E+01	4.4E+02	6.8E+01	4.4E+02
Demeton	8065-48-3	—	2.7E+01	—	2.7E+01
Desethylatrazine	6190-65-4	—	2.4E+04	—	2.4E+04
Diacetone alcohol (4-hydroxy-4-methyl-2-pentanone)	123-42-2	—	2.7E+04	—	2.7E+04
Diallate	2303-16-4	3.1E+02	—	3.1E+02	—
Diazinon	333-41-5	—	7.9E+01	—	4.3E+01
Dibenz(a,h)acridine	226-36-8	1.6E+01	—	1.6E+01	—
Dibenz(a,j)acridine	224-42-0	2.4E+01	—	2.4E+01	—
Dibenz-a,h-anthracene	53-70-3	1.7E+01	—	1.7E+01	—
Dibenzo(a,e)pyrene	192-65-4	2.6E+00	—	2.6E+00	—
Dibenzo(a,h)pyrene	189-64-0	2.6E-01	—	2.6E-01	—
Dibenzo(a,i)pyrene	189-55-9	2.6E-01	—	2.6E-01	—

Table 5
Tier 1 Commercial/Industrial Total Soil Combined PCLs
Last Revised: March 1, 2022

Chemical of Concern	CAS	TotSoil _{Comb}			
		(includes inhalation, ingestion, and dermal pathways)			
		0.5 acre source area Carcinogenic (mg/kg)	0.5 acre source area Noncarcinogenic (mg/kg)	30 acre source area Carcinogenic (mg/kg)	30 acre source area Noncarcinogenic (mg/kg)
Dibenzofuran	132-64-9	—	2.7E+03	—	2.7E+03
Dibenzothiophene	132-65-0	—	3.8E+03	—	3.8E+03
Dibromo-3-chloropropane, 1,2-	96-12-8	2.6E-01	1.0E+01	1.4E-01	5.6E+00
Dibromochloromethane (chlorodibromomethane)	124-48-1	3.4E+02	2.0E+04	3.4E+02	2.0E+04
Dibromofluoromethane	1868-53-7	—	2.0E+05	—	2.0E+05
Dicamba	1918-00-9	—	2.0E+04	—	2.0E+04
Dichlormid	37764-25-3	—	1.7E+04	—	1.7E+04
Dichloro-2-butene, 1,4-	764-41-0	3.3E-01	—	1.7E-01	—
Dichloro-2-butene, 1,4- trans	110-57-6	3.4E-01	—	1.8E-01	—
Dichlorobenzene, 1,2-	95-50-1	—	1.1E+03	—	5.7E+02
Dichlorobenzene, 1,3-	541-73-1	—	1.7E+02	—	8.8E+01
Dichlorobenzene, 1,4-	106-46-7	1.2E+03	1.6E+04	1.2E+03	8.5E+03
Dichlorobenzidine, 3,3-	91-94-1	4.2E+01	—	4.2E+01	—
Dichlorobutane, 2,3-	7581-97-7	—	1.5E+02	—	7.7E+01
Dichlorodifluoromethane	75-71-8	—	2.1E+03	—	1.1E+03
Dichloroethane, 1,1-	75-34-3	—	4.1E+04	—	2.3E+04
Dichloroethane, 1,2-	107-06-2	1.1E+02	9.3E+02	7.1E+01	4.8E+02
Dichloroethylene, 1,1-	75-35-4	—	6.4E+03	—	3.5E+03
Dichloroethylene, cis-1,2-	156-59-2	—	7.9E+02	—	5.0E+02
Dichloroethylene, trans-1,2	156-60-5	—	1.2E+03	—	6.4E+02
Dichlorofluoromethane	75-43-4	—	2.0E+05	—	2.0E+05
Dichlorophenol, 2,3-	576-24-9	—	2.0E+03	—	2.0E+03
Dichlorophenol, 2,4-	120-83-2	—	2.0E+03	—	2.0E+03
Dichlorophenol, 2,5-	583-78-8	—	2.0E+03	—	2.0E+03
Dichlorophenol, 2,6-	87-65-0	—	6.8E+02	—	6.8E+02
Dichlorophenol, 3,4-	95-77-2	—	2.0E+03	—	2.0E+03
Dichlorophenol, 3,5-	591-35-5	—	2.0E+03	—	2.0E+03
Dichlorophenoxy, 2,4- butyric acid, 4- (2,4-DB)	94-82-6	—	5.5E+03	—	5.5E+03
Dichlorophenoxyacetic acid, 2,4- (2,4-D)	94-75-7	—	1.6E+05	—	1.6E+05
Dichloroprop (2-(2,4-dichlorophenoxy) propanoic acid)	120-36-5	—	6.8E+03	—	6.8E+03
Dichloropropane, 1,2-	78-87-5	3.5E+02	8.6E+01	2.3E+02	4.4E+01
Dichloropropane, 1,3-	142-28-9	9.9E+01	4.2E+02	6.1E+01	2.2E+02
Dichloropropane, 2,2-	594-20-7	4.2E+02	8.6E+01	4.2E+02	4.4E+01
Dichloropropanol, 2,3-	616-23-9	—	2.0E+03	—	2.0E+03
Dichloropropene, 1,1-	563-58-6	9.9E+01	4.2E+02	6.1E+01	2.2E+02
Dichloropropene, 1,3- (mixed isomers)	542-75-6	9.9E+01	4.2E+02	6.1E+01	2.2E+02
Dichloropropene, cis 1,3-	10061-01-5	5.3E+01	8.3E+01	5.3E+01	7.0E+01
Dichloropropene, trans 1,3-	10061-02-6	9.9E+01	4.2E+02	6.1E+01	2.2E+02
Dichlorvos	62-73-7	6.6E+01	3.4E+02	6.6E+01	3.4E+02
Dicrotophos (bidrin)	141-66-2	—	6.8E+01	—	6.8E+01
Dicyclopentadiene	77-73-6	—	8.2E+04	—	8.2E+04

Table 5
Tier 1 Commercial/Industrial Total Soil Combined PCLs
Last Revised: March 1, 2022

Chemical of Concern	CAS	TotSoilComb			
		(includes inhalation, ingestion, and dermal pathways)			
		0.5 acre source area Carcinogenic (mg/kg)	0.5 acre source area Noncarcinogenic (mg/kg)	30 acre source area Carcinogenic (mg/kg)	30 acre source area Noncarcinogenic (mg/kg)
Dieldrin	60-57-1	1.2E+00	3.4E+01	1.1E+00	3.4E+01
Diethanolamine	111-42-2	—	3.2E+02	—	3.0E+02
Diethyldithiocarbamate, sodium salt	148-18-5	1.1E+02	3.1E+04	1.1E+02	3.1E+04
Diethyl phthalate	84-66-2	—	5.5E+05	—	5.5E+05
Diethylene glycol	111-46-6	—	1.0E+06	—	1.0E+06
Diethylene glycol monobutyl ether	112-34-5	—	2.8E+01	—	1.5E+01
Diethylhexyl adipate	103-23-1	1.6E+04	4.1E+05	1.6E+04	4.1E+05
Diethylstilbestrol	56-53-1	4.1E-03	—	4.1E-03	—
Diisobutylene (trimethyl-1-pentene, 2,4,4-)	107-39-1	—	4.0E+03	—	2.1E+03
Diisopropylbenzene, p-	100-18-5	—	6.8E+03	—	6.8E+03
Diisopropyl ether (2,2'-oxybis-propane)	108-20-3	—	1.3E+04	—	7.2E+03
Dimethenamid	87674-68-8	—	1.0E+04	—	1.0E+04
Dimethoate	60-51-5	—	1.4E+02	—	1.4E+02
Dimethoxybenzidine, 3,3'-	119-90-4	1.4E+03	—	1.4E+03	—
Dimethyl-2-nitrobenzene, 1,3-	81-20-9	—	1.0E+03	—	8.1E+02
Dimethyl-3-nitrobenzene, 1,2-	83-41-0	—	9.7E+02	—	7.7E+02
Dimethyl-4-nitrobenzene, 1-2-	99-51-4	—	9.8E+02	—	7.8E+02
Dimethyl-5-nitrobenzene, 1,3-	99-12-7	—	9.4E+02	—	7.3E+02
Dimethylphenethylamine, alpha, alpha-	122-09-8	—	1.4E+03	—	1.4E+03
Dimethyl phenol, 2,4-	105-67-9	—	1.4E+04	—	1.4E+04
Dimethylaminoazobenzene, p-	60-11-7	—	6.8E+00	—	6.8E+00
Dimethylbenz-a-anthracene, 7,12-	57-97-6	6.9E-02	—	6.9E-02	—
Dimethylbenzidine, 3,3'-	119-93-7	1.7E+00	—	1.7E+00	—
Dimethylformamide, N,N-	68-12-2	—	4.3E+03	—	2.3E+03
Dimethylnaphthalene, 1,3-	575-41-7	—	2.5E+04	—	2.5E+04
Dimethylphthalate	131-11-3	—	5.5E+05	—	5.5E+05
Di-n-butyl phthalate	84-74-2	—	6.8E+04	—	6.8E+04
Dinitro-2-methylphenol, 4,6- (dinitro-o-cresol, 4, 6-)	534-52-1	—	6.8E+01	—	6.8E+01
Dinitrobenzene, 1,3- (dinitrobenzene, 2,4-)	99-65-0	—	6.8E+01	—	6.8E+01
Dinitrobenzene, 1,4-	100-25-4	—	6.8E+01	—	6.8E+01
Dinitrophenol, 2,4-	51-28-5	—	1.4E+03	—	1.4E+03
Dinitrophenol, 2,5-	329-71-5	—	1.4E+03	—	1.4E+03
Dinitrotoluene, 2,4-	121-14-2	2.8E+01	1.4E+03	2.8E+01	1.4E+03
Dinitrotoluene, 2,6-	606-20-2	2.8E+01	6.8E+02	2.8E+01	6.8E+02
Di-n-octyl phthalate	117-84-0	—	6.8E+03	—	6.8E+03
Dinoseb	88-85-7	—	6.8E+02	—	6.8E+02
Dioxane 1,4-	123-91-1	1.5E+02	5.0E+03	1.0E+02	2.8E+03
Dioxin (as 2,3,7,8-TCDD toxicity equivalent quotients (TEQs))	1746-01-6	—	—	—	—
Diphenyl ether	101-84-8	—	4.2E+03	—	4.2E+03
Diphenylamine	122-39-4	—	1.7E+04	—	1.7E+04
Diphenylhydrazine, 1,2-	122-66-7	2.2E+01	—	2.0E+01	—

Table 5
Tier 1 Commercial/Industrial Total Soil Combined PCLs
Last Revised: March 1, 2022

Chemical of Concern	CAS	TotSoil _{Comb}			
		(includes inhalation, ingestion, and dermal pathways)			
		0.5 acre source area Carcinogenic (mg/kg)	0.5 acre source area Noncarcinogenic (mg/kg)	30 acre source area Carcinogenic (mg/kg)	30 acre source area Noncarcinogenic (mg/kg)
Dipropylene glycol	110-98-5	—	8.2E+04	—	8.2E+04
Diquat	85-00-7	—	1.5E+03	—	1.5E+03
Disodium iminodiacetate (iminodiacetic acid, disodium salt)	142-73-4	—	6.8E+03	—	6.8E+03
Disulfoton	298-04-4	—	2.7E+01	—	2.7E+01
Diuron	330-54-1	—	1.4E+03	—	1.4E+03
Dodecylphenol, 4-	104-43-8	—	3.4E+04	—	3.4E+04
Endosulfan	115-29-7	—	4.1E+03	—	4.1E+03
Endosulfan I	959-98-8	—	1.4E+03	—	1.4E+03
Endosulfan II	33213-65-9	—	4.1E+03	—	4.1E+03
Endosulfan sulfate	1031-07-8	—	4.1E+03	—	4.1E+03
Endothall	145-73-3	—	1.4E+04	—	1.4E+04
Endrin	72-20-8	—	2.0E+02	—	2.0E+02
Endrin aldehyde	7421-93-4	—	2.0E+02	—	2.0E+02
Endrin ketone	53494-70-5	—	2.0E+02	—	2.0E+02
Epichlorohydrin	106-89-8	6.6E+02	3.7E+01	3.8E+02	1.9E+01
EPN (o-ethyl o-(4-nitrophenyl)phenylphosphonothioate)	2104-64-5	—	6.8E+00	—	6.8E+00
Esfenvalerate	66230-04-4	—	1.4E+03	—	1.4E+03
Ethalfuralin (sonolan)	55283-68-6	2.1E+02	2.7E+04	2.1E+02	2.7E+04
Ethanol	64-17-5	—	1.0E+06	—	1.0E+06
Ethanol, 2-amino-	141-43-5	—	9.0E+02	—	7.5E+02
Ethanol, 2-(2-aminoethoxy)-	929-06-6	—	3.4E+02	—	3.4E+02
Ethanol, 2-(2-ethoxyethoxy)-	111-90-0	—	1.0E+06	—	1.0E+06
Ethanol, 2-(methylamino)-	109-83-1	—	4.9E+03	—	3.3E+03
Ethion	563-12-2	—	3.4E+02	—	3.4E+02
Ethoprop	13194-48-4	6.8E+02	6.8E+01	6.8E+02	6.8E+01
Ethoxy ethanol, 2-	110-80-5	—	2.5E+04	—	1.5E+04
Ethyl acetate	141-78-6	—	5.1E+03	—	2.6E+03
Ethyl acrylate	140-88-5	6.0E+02	3.2E+02	6.0E+02	1.7E+02
Ethyl benzene	100-41-4	—	2.9E+04	—	1.7E+04
Ethyl dipropylthiocarbamate, S-	759-94-4	—	1.7E+04	—	1.7E+04
Ethyl ether	60-29-7	—	2.0E+05	—	2.0E+05
Ethyl methacrylate	97-63-2	—	8.9E+03	—	4.8E+03
Ethyl methanesulfonate	62-50-0	9.8E+01	—	6.7E+01	—
Ethyl tert-butyl ether (2-ethyl-2-ethoxypropane)	637-92-3	—	8.8E+02	—	7.8E+02
Ethyl-1-hexanol, 2-	104-76-7	—	1.0E+05	—	1.0E+05
Ethyl-2-hexenal, 2-	645-62-5	—	1.5E+05	—	1.5E+05
Ethyl-2-methyl benzene, 1-	611-14-3	—	9.6E+03	—	5.4E+03
Ethyl-4-methyl benzene, 1-	622-96-8	—	8.4E+03	—	4.7E+03
Ethylene*	74-85-1	—	—	—	—
Ethylene dibromide (dibromoethane, 1,2-)	106-93-4	8.7E+00	1.9E+03	6.3E+00	1.1E+03
Ethylene glycol	107-21-1	—	1.0E+06	—	1.0E+06

Table 5
Tier 1 Commercial/Industrial Total Soil Combined PCLs

Last Revised: March 1, 2022

Chemical of Concern	CAS	TotSoil _{Comb}			
		(includes inhalation, ingestion, and dermal pathways)			
		0.5 acre source area Carcinogenic (mg/kg)	0.5 acre source area Noncarcinogenic (mg/kg)	30 acre source area Carcinogenic (mg/kg)	30 acre source area Noncarcinogenic (mg/kg)
Ethylene oxide	75-21-8	2.6E+01		2.5E+01	
Ethylene thiourea	96-45-7	1.7E+02	5.5E+01	1.7E+02	5.5E+01
Ethylenediamine	107-15-3	—	9.2E+04	—	9.2E+04
Ethylenimine	151-56-4	1.5E-01	—	9.0E-02	—
Ethylhexyl acrylate, 2-	103-11-7	4.0E+02	—	4.0E+02	—
Famphur	52-85-7	—	2.0E+01	—	2.0E+01
Fensulfothion	115-90-2	—	6.8E+02	—	6.8E+02
Fenthion	55-38-9	—	4.8E+01	—	4.8E+01
Fenuron	101-42-8	—	4.8E+04	—	4.8E+04
Fluoranthene	206-44-0	—	2.5E+04	—	2.5E+04
Fluorene	86-73-7	—	2.5E+04	—	2.5E+04
Fluorine (soluble fluoride)	7782-41-4	—	5.8E+04	—	5.8E+04
Fluorochloridone	61213-25-0	—	5.1E+03	—	5.1E+03
Fonofos	944-22-9	—	1.4E+03	—	1.4E+03
Formaldehyde	50-00-0	—	1.4E+03	—	7.1E+02
Formic acid	64-18-6	—	3.0E+02	—	1.5E+02
Furan	110-00-9	—	1.0E+03	—	1.0E+03
Furfural	98-01-1	—	3.1E+03	—	3.1E+03
Glycidylaldehyde	765-34-4	—	1.4E+02	—	8.5E+01
Glyphosate	1071-83-6	—	6.8E+05	—	6.8E+05
Heptachlor	76-44-8	3.3E+00	3.4E+02	2.8E+00	3.4E+02
Heptachlor epoxide	1024-57-3	2.0E+00	8.9E+00	1.9E+00	8.9E+00
Heptane, n-	142-82-5	—	4.7E+04	—	3.8E+04
Heptanoic acid, n-	111-14-8	—	1.7E+02	—	8.8E+01
Hexachlorobenzene	118-74-1	8.7E+00	5.5E+02	6.9E+00	5.5E+02
Hexachlorobutadiene	87-68-3	4.1E+01	6.8E+02	2.3E+01	6.8E+02
Hexachlorocyclohexane, alpha (alpha-BHC)	319-84-6	3.3E+00	6.8E+03	2.9E+00	6.8E+03
Hexachlorocyclohexane, beta (beta-BHC)	319-85-7	1.2E+01	—	1.1E+01	—
Hexachlorocyclohexane, delta (delta-BHC)	319-86-8	1.2E+01	2.6E+02	1.2E+01	2.6E+02
Hexachlorocyclohexane, gamma (lindane; gamma-BHC)	58-89-9	1.8E+01	2.6E+02	1.8E+01	2.6E+02
Hexachlorocyclohexane, techn (technical-BHC)	608-73-1	1.2E+01	—	1.1E+01	—
Hexachlorocyclopentadiene	77-47-4	—	2.0E+01	—	1.0E+01
Hexachloroethane	67-72-1	4.8E+02	4.5E+02	4.8E+02	4.2E+02
Hexachlorophene	70-30-4	—	2.0E+02	—	2.0E+02
Hexachloropropylene	1888-71-7	4.8E+02	4.5E+02	4.8E+02	4.2E+02
Hexanal, 2-ethyl-	123-05-7	—	1.0E+05	—	1.0E+05
Hexane, n-	110-54-3	—	1.2E+04	—	6.6E+03
Hexanediamine, 1,6-	124-09-4	—	3.4E+03	—	3.4E+03
Hexanedinitrile	111-69-3	—	5.6E+02	—	4.1E+02
Hexanediol, 1,6-	629-11-8	—	1.0E+06	—	1.0E+06
Hexanoic acid	142-62-1	—	1.9E+02	—	9.8E+01

Table 5
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Chemical of Concern	CAS	TotSoil _{Comb}			
		(includes inhalation, ingestion, and dermal pathways)			
		0.5 acre source area Carcinogenic (mg/kg)	0.5 acre source area Noncarcinogenic (mg/kg)	30 acre source area Carcinogenic (mg/kg)	30 acre source area Noncarcinogenic (mg/kg)
Hexanone, 2-	591-78-6		1.1E+03		5.9E+02
Hexazinone	51235-04-2	—	2.2E+04	—	2.2E+04
Hexene, 1-	592-41-6	—	2.3E+03	—	1.2E+03
Hexene, cis-2-	7688-21-3	—	2.3E+03	—	1.2E+03
Hexylene glycol (2-methyl-2,4-pentanediol)	107-41-5	—	2.0E+05	—	2.0E+05
Hydrazine	302-01-2	7.2E-01	4.1E+00	3.8E-01	2.1E+00
Hydrocaproic acid, 6- (6-hydroxyhexanoic acid)	1191-25-9	—	2.2E+02	—	1.2E+02
Hydrogen chloride (hydrochloric acid)*	7647-01-0	—	—	—	—
Hydroquinone	123-31-9	3.2E+02	2.7E+04	3.2E+02	2.7E+04
Indene	95-13-6	—	1.6E+02	—	8.0E+01
Indeno-1,2,3-cd-pyrene	193-39-5	1.7E+02	—	1.7E+02	—
Iron*	7439-89-6	—	—	—	—
Isoamyl alcohol	123-51-3	—	5.1E+03	—	5.1E+03
Isobutyl alcohol	78-83-1	—	3.1E+05	—	3.1E+05
Isobutylene (2-methyl-1-propene)	115-11-7	—	3.8E+03	—	3.8E+03
Isobutyric acid (2-methylpropanoic acid)	79-31-2	—	3.4E+05	—	3.4E+05
Isodecanol	25339-17-7	—	1.1E+03	—	1.1E+03
Isodrin	465-73-6	1.1E-01	2.0E+00	1.0E-01	2.0E+00
Isopentane	78-78-4	—	5.5E+04	—	5.0E+04
Isophorone	78-59-1	2.0E+04	1.4E+05	2.0E+04	1.4E+05
Isopropyl acetate	108-21-4	—	7.2E+04	—	7.2E+04
Isopropyl alcohol	67-63-0	—	1.3E+04	—	6.9E+03
Isosafrole	120-58-1	5.5E+01	—	4.1E+01	—
Kelthane (dicofol)	115-32-2	—	4.1E+03	—	4.1E+03
Kepone (chlordecone)	143-50-0	1.9E+00	2.0E+02	1.8E+00	2.0E+02
Lead (inorganic)	7439-92-1	—	—	—	—
Leptophos	21609-90-5	—	3.2E+00	—	3.0E+00
Limonene, d-*	5989-27-5	—	—	—	—
Lithium	7439-93-2		6.8E+03		6.8E+03
Magnesium*	7439-95-4	—	—	—	—
Malathion	121-75-5	—	2.8E+02	—	1.4E+02
Maleic anhydride	108-31-6	—	6.8E+04	—	6.8E+04
Maleic hydrazide	123-33-1	—	3.4E+05	—	3.4E+05
Malononitrile	109-77-3	—	6.8E+01	—	6.8E+01
Mancozeb	8018-01-7	—	2.0E+04	—	2.0E+04
Manganese	7439-96-5	—	7.3E+04	—	6.9E+04
MCPA (4-(chloro-2-methylphenoxy) acetic acid)	94-74-6	—	3.4E+02	—	3.4E+02
MCPP (2-(4-chloro-2-methylphenoxy) propanoic acid)	93-65-2	—	6.8E+02	—	6.8E+02
Mercury (pH = 4.9) ¹	7439-97-6	—	6.2E+00	—	3.3E+00
Mercury (pH=6.8) ¹	7439-97-6	—	1.9E+01	—	1.1E+01
Merphos	150-50-5	—	2.0E+01	—	2.0E+01

Table 5
Tier 1 Commercial/Industrial Total Soil Combined PCLs
Last Revised: March 1, 2022

Chemical of Concern	CAS	TotSoil _{Comb}			
		(includes inhalation, ingestion, and dermal pathways)			
		0.5 acre source area Carcinogenic (mg/kg)	0.5 acre source area Noncarcinogenic (mg/kg)	30 acre source area Carcinogenic (mg/kg)	30 acre source area Noncarcinogenic (mg/kg)
Methacrylic acid (2-methyl-2-propenoic acid)	79-41-4	—	1.0E+04	—	1.0E+04
Methacrylonitrile	126-98-7	—	8.0E+02	—	4.2E+02
Methanol	67-56-1	—	3.7E+05	—	2.1E+05
Methapyrilene	91-80-5	4.1E+00	—	4.1E+00	—
Methomyl	16752-77-5	—	1.7E+04	—	1.7E+04
Methoxychlor	72-43-5	—	3.4E+03	—	3.4E+03
Methoxyethanol, 2-	109-86-4	—	4.2E+02	—	2.2E+02
Methyl acetate (acetic acid, methyl ester)	79-20-9	—	1.0E+06	—	1.0E+06
Methyl acrylate	96-33-3	—	3.6E+02	—	2.0E+02
Methyl amyl ketone (2-heptanone)	110-43-0	—	3.8E+04	—	3.1E+04
Methyl chrysene, 1-	3351-28-8	2.4E+03	—	2.4E+03	—
Methyl chrysene, 2-	3351-32-4	2.4E+03	—	2.4E+03	—
Methyl chrysene, 6-	1705-85-7	2.4E+02	—	2.4E+02	—
Methyl cyclohexane	108-87-2	—	6.4E+04	—	3.3E+04
Methyl ethyl ketone (2-butanone)	78-93-3	—	1.9E+05	—	1.2E+05
Methyl iodide (iodomethane)	74-88-4	—	1.4E+03	—	1.4E+03
Methyl isobutyl ketone (4-methyl-2-pentanone)	108-10-1	—	4.1E+04	—	2.8E+04
Methyl mercury	22967-92-6	—	9.7E+01	—	9.7E+01
Methyl methacrylate	80-62-6	—	1.5E+04	—	7.7E+03
Methyl methanesulfonate	66-27-3	9.5E+01	—	6.4E+01	—
Methyl parathion	298-00-0	—	1.7E+02	—	1.7E+02
Methyl-1-butene, 2-	563-46-2	—	5.3E+04	—	4.7E+04
Methyl-1-propanal, 2- (isobutyraldehyde)	78-84-2	—	4.1E+04	—	4.1E+04
Methyl-2-butene, 2-	513-35-9	—	5.3E+04	—	4.7E+04
Methyl-2-pentenal, 2-	623-36-9	1.5E+01	—	1.5E+01	—
Methylcholanthrene, 3-	56-49-5	7.9E-01	—	7.9E-01	—
Methylene bromide (dibromomethane)	74-95-3	3.8E+03	1.1E+02	3.8E+03	5.9E+01
Methylene chloride (dichloromethane)	75-09-2	2.0E+04	1.2E+04	1.1E+04	8.6E+03
Methylene-bis (2-chloroaniline) 4,4'-	101-14-4	1.8E+02	1.4E+03	1.8E+02	1.4E+03
Methylmercury hydroxide	1184-57-2	—	6.8E+01	—	6.8E+01
Methylnaphthalene, 1-	90-12-0	6.0E+02	4.3E+04	6.0E+02	4.3E+04
Methylnaphthalene, 2-	91-57-6	—	2.5E+03	—	2.5E+03
Methylpyrrolidone, N-	872-50-4	—	1.4E+04	—	1.4E+04
Methylstyrene, alpha-	98-83-9	—	6.3E+02	—	3.3E+02
Methyltetrahydrofuran, 2-	96-47-9	2.9E+02	2.0E+05	1.6E+02	2.0E+05
Methyltetrahydropyran, 2-	10141-72-7	3.3E+02	2.0E+05	1.8E+02	2.0E+05
Metolachlor	51218-45-2	—	1.0E+05	—	1.0E+05
Metribuzin	21087-64-9	—	1.7E+04	—	1.7E+04
Mirex	2385-85-5	—	1.4E+02	—	1.4E+02
Molinate	2212-67-1	—	1.4E+03	—	1.4E+03
Molybdenum	7439-98-7	—	4.5E+03	—	4.5E+03

Table 5
Tier 1 Commercial/Industrial Total Soil Combined PCLs
Last Revised: March 1, 2022

Chemical of Concern	CAS	TotSoil _{Comb}			
		(includes inhalation, ingestion, and dermal pathways)			
		0.5 acre source area Carcinogenic (mg/kg)	0.5 acre source area Noncarcinogenic (mg/kg)	30 acre source area Carcinogenic (mg/kg)	30 acre source area Noncarcinogenic (mg/kg)
Monocrotophos	2157-98-4	—	4.1E+02	—	4.1E+02
Morpholine	110-91-8	—	1.0E+06	—	1.0E+06
Morpholine, N-butyl-	1005-67-0	—	1.6E+03	—	1.6E+03
MTBE (methyl tert-butyl ether)	1634-04-4	2.0E+03	8.8E+03	1.1E+03	7.8E+03
Naled	300-76-5	—	1.4E+03	—	1.4E+03
Naphthalene	91-20-3	—	3.6E+02	—	1.9E+02
Naphthoquinone, 1,4-	130-15-4	—	4.8E+03	—	4.8E+03
Naphthylamine, 1-	134-32-7	—	1.4E+04	—	1.4E+04
Naphthylamine, 2-	91-59-8	1.1E+01	—	1.1E+01	—
Napropamide	15299-99-7	—	6.8E+04	—	6.8E+04
Neopentyl glycol	126-30-7	—	2.0E+05	—	2.0E+05
Nickel and compounds	7440-02-0	2.2E+05	8.8E+03	1.1E+05	8.6E+03
Nitrate-N	14797-55-8	—	1.0E+06	—	1.0E+06
Nitrite-N	14797-65-0	—	9.7E+04	—	9.7E+04
Nitroaniline, 2-	88-74-4	—	5.0E+01	—	2.9E+01
Nitroaniline, 3-	99-09-2	5.0E+02	5.9E+01	5.0E+02	3.6E+01
Nitroaniline, 4-	100-01-6	9.5E+02	1.0E+03	9.5E+02	6.6E+02
Nitrobenzene	98-95-3	1.1E+02	7.0E+02	5.7E+01	4.8E+02
Nitroglycerin	55-63-0	1.1E+03	6.8E+01	1.1E+03	6.8E+01
Nitrophenol, 2-	88-75-5	—	1.4E+03	—	1.4E+03
Nitrophenol, 3-	554-84-7	—	1.4E+03	—	1.4E+03
Nitrophenol, 4-	100-02-7	—	1.4E+03	—	1.4E+03
Nitropropane, 2-	79-46-9	1.0E+00	1.1E+02	5.3E-01	8.7E+01
Nitroquinoline-N-oxide, 4-	56-57-5	1.2E+00	—	9.0E-01	—
Nitrosodiethanolamine	1116-54-7	6.8E+00	—	6.8E+00	—
Nitrosodiethylamine, n-	55-18-5	7.0E-02	—	4.4E-02	—
Nitrosodimethylamine, n-	62-75-9	2.1E-01	3.6E+00	1.3E-01	2.4E+00
Nitrosodi-n-butylamine, n-	924-16-3	1.2E+00	—	7.1E-01	—
Nitrosodi-n-propylamine, n-	621-64-7	1.4E+00	—	1.4E+00	—
Nitrosodiphenylamine	86-30-6	1.9E+03	—	1.9E+03	—
Nitroso-methyl-ethyl-amine, n-	10595-95-6	1.3E+00	—	1.3E+00	—
Nitrosomorpholine, N-	59-89-2	1.4E+00	—	9.7E-01	—
Nitroso-n-ethylurea, n-	759-73-9	1.4E-01	—	1.4E-01	—
Nitrosopiperidine, N-	100-75-4	1.1E+00	—	7.4E-01	—
Nitrosopyrrolidine, n-	930-55-2	4.7E+00	—	3.2E+00	—
Nitrotoluene, m-	99-08-1	—	6.8E+03	—	6.8E+03
Nitrotoluene, o-	88-72-2	8.7E+01	6.1E+02	8.7E+01	6.1E+02
Nitrotoluene, p-	99-99-0	1.2E+03	2.7E+03	1.2E+03	2.7E+03
Nonachlor, cis-	5103-73-1	5.3E+01	3.2E+02	5.2E+01	3.0E+02
Nonachlor, trans-	39765-80-5	5.3E+01	3.2E+02	5.2E+01	3.0E+02
Nonanal	124-19-6	—	1.4E+05	—	1.4E+05

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		(includes inhalation, ingestion, and dermal pathways)			
		0.5 acre source area Carcinogenic (mg/kg)	0.5 acre source area Noncarcinogenic (mg/kg)	30 acre source area Carcinogenic (mg/kg)	30 acre source area Noncarcinogenic (mg/kg)
Nonene, 1-n	124-11-8	—	1.0E+05	—	1.0E+05
Nonylphenol, 4-n-	104-40-5	—	6.8E+04	—	6.8E+04
Nonylphenol ethoxylate	9016-45-9	—	6.8E+04	—	6.8E+04
Octamethylpyrophosphoramidate	152-16-9	—	1.4E+03	—	1.4E+03
Octanone	106-68-3	—	5.8E+04	—	5.6E+04
Oxamyl	23135-22-0	—	1.7E+04	—	1.7E+04
Oxychlorthane	27304-13-8	5.3E+01	3.2E+02	5.2E+01	3.0E+02
Paraquat	1910-42-5	—	3.1E+03	—	3.1E+03
Parathion (ethyl parathion)	56-38-2	—	4.1E+03	—	4.1E+03
Pebulate	1114-71-2	—	3.4E+04	—	3.4E+04
Pendimethalin	40487-42-1	—	2.7E+04	—	2.7E+04
Pentachlorobenzene	608-93-5	—	5.5E+02	—	5.5E+02
Pentachloroethane	76-01-7	1.1E+02	3.1E+04	6.5E+01	3.1E+04
Pentachloronitrobenzene	82-68-8	7.3E+01	2.0E+03	7.3E+01	2.0E+03
Pentachlorophenol	87-86-5	3.2E+01	2.3E+03	3.2E+01	2.3E+03
Pentadiene, 1,3-cis-	1574-41-0	—	5.3E+04	—	4.7E+04
Pentadiene, 1,3-trans-	2004-70-8	—	5.3E+04	—	4.7E+04
Pentaerythritol tetranitrate (PETN)	78-11-5	—	1.4E+03	—	1.4E+03
Pentane	109-66-0	—	5.5E+04	—	5.0E+04
Pentane, 2-methyl-	107-83-5	—	5.3E+04	—	4.7E+04
Pentane, 3-methyl-	96-14-0	—	5.3E+04	—	4.7E+04
Pentanediol, 1,5-	111-29-5	—	1.0E+06	—	1.0E+06
Pentanol, 1-	71-41-0	—	3.4E+04	—	3.4E+04
Pentanol, 4-methyl-2-	108-11-2	—	2.7E+04	—	2.7E+04
Pentanone, 2-	107-87-9	—	4.1E+04	—	4.1E+04
Pentene, 2-	109-68-2	—	5.3E+04	—	4.7E+04
Pentyne, 1-	627-19-0	—	5.3E+04	—	4.7E+04
Perchlorate	14797-73-0	—	5.7E+02	—	5.7E+02
Perfluorooctane sulfonic acid (1-Octanesulfonic acid, heptadecafluoro-1-) [PFOS]	1763-23-1	—	1.5E+01	—	1.4E+01
Perfluoroundecanoic acid (Undecanoic acid, uncosafluoro-) [PFUnDa]	2058-94-8	—	8.2E+00	—	8.2E+00
Perfluoropentanoic acid (Pentanoic acid, nonafluoro-) [PFPeA]	2706-90-3	—	2.6E+00	—	2.6E+00
Perfluorohexanoic acid (Hexanoic acid, undecafluoro-) [PFHxA]	307-24-4	—	2.6E+00	—	2.6E+00
Perfluorododecanoic acid (Dodecanoic acid, tricosfluoro-) [PFDoA]	307-55-1	—	7.5E+00	—	7.0E+00
Perfluorooctanoic acid (Octanoic acid, pentadecafluoro-) [PFOA]	335-67-1	—	2.4E+00	—	1.4E+00
Perfluorodecanoic acid (Decanoic acid, nonadecafluoro-) [PFDA]	335-76-2	—	9.4E+00	—	8.8E+00
Perfluorodecane sulfonic acid (1-Decanesulfonic acid, heneicosafluoro-) [PFDS]	335-77-3	—	8.2E+00	—	8.2E+00
Perfluorohexane sulfonic acid (1-Hexanesulfonic acid, tridecafluoro-) [PFHxS]	355-46-4	—	2.2E+00	—	2.0E+00

Table 5
Tier 1 Commercial/Industrial Total Soil Combined PCLs

Last Revised: March 1, 2022

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		(includes inhalation, ingestion, and dermal pathways)			
		0.5 acre source area Carcinogenic (mg/kg)	0.5 acre source area Noncarcinogenic (mg/kg)	30 acre source area Carcinogenic (mg/kg)	30 acre source area Noncarcinogenic (mg/kg)
Perfluorobutyric acid (Butanoic acid, heptafluoro-) [PFBA]	375-22-4	—	1.1E+03	—	8.2E+02
Perfluorobutane sulfonic acid (1-Butanesulfonic acid, nonafluoro-) [PFBS]	375-73-5	—	6.0E+02	—	4.4E+02
Perfluoroheptanoic acid (Heptanoic acid, tridecafluoro-) [PFHpA]	375-85-9	—	1.6E+01	—	1.6E+01
Perfluorononanoic acid (Nonanoic acid, heptadecafluoro-) [PFNA]	375-95-1	—	6.1E+00	—	4.9E+00
Perfluorotetradecanoic acid (Tetradecanoic acid, heptacosafuoro-) [PFTeDA]	376-06-7	—	8.2E+00	—	8.2E+00
Perfluorotridecanoic acid (Tridecanoic acid, pentacosafuoro-) [PFTrDA]	72629-94-8	—	8.2E+00	—	8.2E+00
Perfluorooctane sulfonamide (1-Octanesulfonamide, heptadecafluoro-) [PFOSA]	754-91-6	—	8.7E-02	—	4.5E-02
Perylene	198-55-0	—	1.4E+04	—	1.4E+04
Phenacetin	62-44-2	5.9E+03	—	4.5E+03	—
Phenanthrene	85-01-8	—	1.9E+04	—	1.9E+04
Phenanthridine	229-87-8	—	2.0E+03	—	2.0E+03
Phenol	108-95-2	—	2.7E+03	—	1.4E+03
Phenol, 4-tert-butyl-	98-54-4	—	8.2E+04	—	8.2E+04
Phenothiazine	92-84-2	—	7.5E+02	—	7.5E+02
Phenyl mercuric acetate	62-38-4	—	5.5E+01	—	5.5E+01
Phenylene diamine, m-	108-45-2	—	4.1E+03	—	4.1E+03
Phenylene diamine, p-	106-50-3	—	1.3E+05	—	1.3E+05
Phorate	298-02-2	—	1.4E+02	—	1.4E+02
Phosalone	2310-17-0	—	1.4E+03	—	1.4E+03
Phosdrin (mevinphos)	7786-34-7	—	1.7E+01	—	1.7E+01
Phosmet	732-11-6	—	1.4E+04	—	1.4E+04
Phosphine	7803-51-2	—	6.3E+00	—	3.3E+00
Phosphorotrithioic acid, S,S,S-tributyl ester	78-48-8	2.3E+02	3.4E+02	2.3E+02	3.4E+02
Phosphorus, total*	7723-14-0	—	—	—	—
Phosphorus, white	7723-14-0	—	1.6E+01	—	1.6E+01
Phthalic anhydride	85-44-9	—	6.6E+04	—	3.5E+04
Picloram	1918-02-1	—	4.8E+04	—	4.8E+04
Picoline, 2- (2-methylpyridine)	109-06-8	—	9.2E+03	—	9.2E+03
Polybrominated biphenyls (PBBs)	67774-32-7	2.1E+00	4.8E+00	2.1E+00	4.8E+00
Polychlorinated biphenyls (PCBs)	1336-36-3	7.7E+00	1.2E+01	7.1E+00	1.2E+01
Potassium*	7440-09-7	—	—	—	—
Primene	68955-53-3	—	4.1E+03	—	4.1E+03
Prometon (pramitol)	1610-18-0	—	1.0E+04	—	1.0E+04
Prometryn	7287-19-6	—	2.7E+04	—	2.7E+04
Pronamide	23950-58-5	—	5.1E+04	—	5.1E+04
Propanal (propionaldehyde)	123-38-6	—	1.7E+02	—	8.7E+01
Propane, 1-bromo-	106-94-5	—	3.7E+04	—	3.7E+04
Propanil	709-98-8	—	3.4E+03	—	3.4E+03

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		(includes inhalation, ingestion, and dermal pathways)			
		0.5 acre source area Carcinogenic (mg/kg)	0.5 acre source area Noncarcinogenic (mg/kg)	30 acre source area Carcinogenic (mg/kg)	30 acre source area Noncarcinogenic (mg/kg)
Propanoic acid (propionic acid)	79-09-4	—	5.1E+05	—	5.1E+05
Propanol, 1-	71-23-8		1.0E+06		1.0E+06
Propargite	2312-35-8	—	1.4E+04	—	1.4E+04
Propargyl alcohol	107-19-7	—	2.0E+03	—	2.0E+03
Propazine	139-40-2	4.3E+02	1.4E+04	4.3E+02	1.4E+04
Propham	122-42-9	—	1.4E+04	—	1.4E+04
Propionitrile (propane nitrile)	107-12-0	—	4.1E+02	—	4.1E+02
Propyl acetate, n-	109-60-4	—	9.2E+04	—	9.2E+04
Propylbenzene, n-	103-65-1	—	7.3E+03	—	4.1E+03
Propylene glycol	57-55-6	—	5.1E+02	—	2.6E+02
Propylene glycol monomethyl ether	107-98-2	—	2.2E+05	—	1.3E+05
Propylene oxide	75-56-9	6.9E+01	6.4E+02	4.9E+01	3.3E+02
Propylene tetramer	6842-15-5	—	1.6E+04	—	9.5E+03
Prothiofos (Tokuthion)	34643-46-4	—	6.8E+01	—	6.8E+01
Pyrene	129-00-0	—	1.9E+04	—	1.9E+04
Pyridine	110-86-1	—	1.0E+03	—	1.0E+03
Quinoline	91-22-5	6.4E+00	—	6.4E+00	—
Ronnel	299-84-3	—	3.4E+04	—	3.4E+04
Safrole	94-59-7	4.9E+01	—	3.5E+01	—
Selenium	7782-49-2	—	4.9E+03	—	4.9E+03
Selenourea	630-10-4	—	5.1E+03	—	5.1E+03
Silver	7440-22-4	—	2.3E+03	—	2.3E+03
Simazine	122-34-9	1.6E+02	3.4E+03	1.6E+02	3.4E+03
Sodium*	7440-23-5	—	—	—	—
Sodium hypochlorite	7681-52-9	—	1.2E+05	—	9.6E+04
Sodium polyacrylate	9003-04-7	—	1.7E+02	—	8.7E+01
Strontium	7440-24-6	—	4.9E+05	—	4.9E+05
Strychnine	57-24-9	—	2.0E+02	—	2.0E+02
Styrene	100-42-5	—	1.5E+04	—	7.8E+03
Sulfate*	14808-79-8	—	—	—	—
Sulfide*	18496-25-8	—	—	—	—
Sulfolane	126-33-0	—	1.1E+03	—	5.8E+02
Sulfur*	7704-34-9	—	—	—	—
Sulprofos (Bolstar)	35400-43-2	—	2.0E+03	—	2.0E+03
Tebuconazole	107534-96-3	—	2.0E+04	—	2.0E+04
Tebuthiuron	34014-18-1	—	4.8E+04	—	4.8E+04
Terbufos	13071-79-9	—	1.7E+01	—	1.7E+01
Tert-amyl ethyl ether (TAEE)	919-94-8	—	4.1E+04	—	4.1E+04
Tert-amyl-methyl ether (TAME)	994-05-8	—	4.1E+04	—	4.1E+04
Tert-butyl alcohol (2-methyl-2-propanol)	75-65-0	—	9.2E+04	—	9.2E+04
Tetrachlorobenzene, 1,2,3,4-	634-66-2	—	2.0E+02	—	2.0E+02

Table 5
Tier 1 Commercial/Industrial Total Soil Combined PCLs
Last Revised: March 1, 2022

Chemical of Concern	CAS	TotSoil _{Comb}			
		(includes inhalation, ingestion, and dermal pathways)			
		0.5 acre source area Carcinogenic (mg/kg)	0.5 acre source area Noncarcinogenic (mg/kg)	30 acre source area Carcinogenic (mg/kg)	30 acre source area Noncarcinogenic (mg/kg)
Tetrachlorobenzene, 1,2,3,5-	634-90-2	—	2.0E+02	—	2.0E+02
Tetrachlorobenzene, 1,2,4,5-	95-94-3	—	2.0E+02	—	2.0E+02
Tetrachloroethane, 1,1,1,2-	630-20-6	1.3E+02	3.1E+04	7.3E+01	3.1E+04
Tetrachloroethane, 1,1,2,2-	79-34-5	1.4E+02	2.0E+04	1.4E+02	2.0E+04
Tetrachloroethylene [PCE]	127-18-4	1.4E+03	5.8E+03	7.7E+02	3.4E+03
Tetrachlorophenol, 2,3,4,5-	4901-51-3	—	2.0E+04	—	2.0E+04
Tetrachlorophenol, 2,3,4,6-	58-90-2	—	2.0E+04	—	2.0E+04
Tetrachlorophenol, 2,3,5,6-	935-95-5	—	2.0E+04	—	2.0E+04
Tetrachlorvinphos (Stirophos)	22248-79-9	—	2.9E+04	—	2.9E+04
Tetradifon	116-29-0	—	1.4E+04	—	1.4E+04
Tetraethyl dithiopyrophosphate (sulfotep)	3689-24-5	—	3.4E+02	—	3.4E+02
Tetraethyl lead	78-00-2	—	6.8E-02	—	6.8E-02
Tetraethyl pyrophosphate (TEPP)	107-49-3	—	7.5E+00	—	7.5E+00
Tetraethylene glycol	112-60-7	—	2.2E+05	—	2.2E+05
Tetrahydrofuran	109-99-9	2.9E+02	4.1E+04	1.6E+02	2.2E+04
Tetrahydropyran	142-68-7	3.1E+02	2.0E+05	1.7E+02	2.0E+05
Tetraoxadodecane, 2,5,8,11-	112-49-2	—	1.7E+04	—	1.7E+04
Thallium	7440-28-0	—	6.5E+01	—	6.5E+01
Thiofanox	39196-18-4	—	2.0E+02	—	2.0E+02
Thionazin	297-97-2	—	4.8E+01	—	4.8E+01
Thiophanate-methyl	23564-05-8	—	5.5E+04	—	5.5E+04
Thiram	137-26-8	—	3.4E+03	—	3.4E+03
Tin	7440-31-5	—	4.1E+05	—	4.1E+05
Titanium	7440-32-6	—	1.0E+06	—	1.0E+06
Toluene	108-88-3	—	4.2E+04	—	2.9E+04
Toluene diisocyanate, 2,4/2,6-	26471-62-5	—	2.0E+02	—	1.0E+02
Toluenediamine, 2,4-	95-80-7	6.0E+00	—	6.0E+00	—
Toluenediamine, 2,6-	823-40-5	—	2.0E+04	—	2.0E+04
Toluidine, o-	95-53-4	1.1E+02	—	7.6E+01	—
Toluidine, p-	106-49-0	2.3E+02	—	2.3E+02	—
Toxaphene	8001-35-2	1.7E+01	2.1E+02	1.7E+01	2.1E+02
TPH, TX1005, C6-C12	TPH-1005-1	—	3.9E+03	—	2.1E+03
TPH, TX1005, >C12-C28	TPH-1005-2	—	1.2E+04	—	7.8E+03
TPH, TX1005, >C12-C35	TPH-1005-3	—	1.2E+04	—	7.8E+03
TPH, TX1005, >C28-C35	TPH-1005-4	—	1.2E+04	—	7.8E+03
TP Silvex, 2,4,5-	93-72-1	—	5.5E+03	—	5.5E+03
Triademenol	55219-65-3	—	2.0E+04	—	2.0E+04
Triallate	2303-17-5	—	8.9E+03	—	8.9E+03
Triaminotrinitrobenzene (TATB)	3058-38-6	—	2.0E+03	—	2.0E+03
Tributyltin oxide	56-35-9	—	2.0E+02	—	2.0E+02
Trichloro-1,2,2-trifluoroethane, 1,1,2-	76-13-1	—	1.1E+05	—	5.5E+04

Table 5
Tier 1 Commercial/Industrial Total Soil Combined PCLs

Last Revised: March 1, 2022

Chemical of Concern	CAS	TotSoil _{Comb}			
		(includes inhalation, ingestion, and dermal pathways)			
		0.5 acre source area Carcinogenic (mg/kg)	0.5 acre source area Noncarcinogenic (mg/kg)	30 acre source area Carcinogenic (mg/kg)	30 acre source area Noncarcinogenic (mg/kg)
Trichlorobenzene, 1,2,3-	87-61-6	—	3.5E+02	—	2.0E+02
Trichlorobenzene, 1,2,4-	120-82-1	6.6E+02	2.0E+02	6.6E+02	1.1E+02
Trichlorobenzene, 1,3,5-	108-70-3	—	1.6E+02	—	8.7E+01
Trichloroethane, 1,1,1-	71-55-6	—	1.0E+05	—	5.5E+04
Trichloroethane, 1,1,2-	79-00-5	3.5E+01	4.1E+03	1.9E+01	4.1E+03
Trichloroethylene [TCE]	79-01-6	1.2E+02	4.0E+01	6.7E+01	2.1E+01
Trichlorofluoromethane	75-69-4	—	3.1E+05	—	3.1E+05
Trichloronate	327-98-0	—	2.0E+03	—	2.0E+03
Trichlorophenol, 2,3,4-	15950-66-0	—	6.8E+04	—	6.8E+04
Trichlorophenol, 2,3,5-	933-78-8	—	6.8E+04	—	6.8E+04
Trichlorophenol, 2,3,6-	933-75-5	—	6.8E+04	—	6.8E+04
Trichlorophenol, 2,4,5-	95-95-4	—	6.8E+04	—	6.8E+04
Trichlorophenol, 2,4,6-	88-06-2	1.1E+03	6.8E+02	8.6E+02	6.8E+02
Trichlorophenol, 3,4,5-	609-19-8	—	6.8E+04	—	6.8E+04
Trichlorophenoxyacetic acid, 2,4,5-	93-76-5	—	6.8E+03	—	6.8E+03
Trichloropropane, 1,1,2-	598-77-6	—	6.4E+00	—	3.3E+00
Trichloropropane, 1,2,3-	96-18-4	9.5E-01	1.9E+01	9.5E-01	1.0E+01
Triethanolamine	102-71-6	—	5.2E+03	—	2.7E+03
Triethylamine	121-44-8	—	1.5E+02	—	7.7E+01
Triethylene glycol	112-27-6	—	1.0E+06	—	1.0E+06
Triethylphosphorothioate, O, O, O-	126-68-1	—	5.7E+00	—	5.7E+00
Trifluralin	1582-09-8	2.5E+03	5.1E+03	2.5E+03	5.1E+03
Trimethylamine	75-50-3	—	2.1E+02	—	1.1E+02
Trimethylbenzene, 1,2,3-	526-73-8	—	4.4E+03	—	2.4E+03
Trimethylbenzene, 1,2,4-	95-63-6	—	4.9E+03	—	2.7E+03
Trimethylbenzene, 1,3,5-	108-67-8	—	4.3E+03	—	2.3E+03
Trinitrobenzene, 1,3,5-	99-35-4	—	2.0E+04	—	2.0E+04
Trinitrophenylmethylnitramine (tetryl; nitramine)	479-45-8	—	1.6E+03	—	1.6E+03
Trinitrotoluene, 2,4,6-	118-96-7	6.4E+02	3.4E+02	6.4E+02	3.4E+02
Tungsten (as sodium tungstate dihydride)	7440-33-7	—	8.2E+02	—	8.2E+02
Uranium (soluble salts)	7440-61-1	—	2.8E+03	—	2.6E+03
Valeric acid (pentanoic acid)	109-52-4	—	1.8E+02	—	9.5E+01
Vanadium	7440-62-2	—	6.2E+02	—	6.1E+02
Vernam	1929-77-7	—	6.8E+02	—	6.8E+02
Vinyl acetate	108-05-4	—	4.3E+03	—	2.2E+03
Vinyl chloride	75-01-4	1.5E+01	9.1E+02	1.3E+01	5.5E+02
Vinylcyclohexane	695-12-5	—	5.1E+05	—	5.1E+05
Warfarin	81-81-2	—	2.0E+02	—	2.0E+02
Xylene, m-	108-38-3	—	1.3E+04	—	6.7E+03
Xylene, o-	95-47-6	—	9.1E+04	—	4.8E+04
Xylene, p-	106-42-3	—	1.3E+04	—	6.7E+03

Table 5
Tier 1 Commercial/Industrial Total Soil Combined PCLs
Last Revised: March 1, 2022

Chemical of Concern	CAS	TotSoil _{Comb}			
		(includes inhalation, ingestion, and dermal pathways)			
		0.5 acre source area Carcinogenic (mg/kg)	0.5 acre source area Noncarcinogenic (mg/kg)	30 acre source area Carcinogenic (mg/kg)	30 acre source area Noncarcinogenic (mg/kg)
Xylenes	1330-20-7	—	1.2E+04	—	6.5E+03
Zinc	7440-66-6	—	2.5E+05	—	2.5E+05
6 C aliphatics (TPH) (>53% n-hexane content)	NA	—	1.2E+04	—	6.6E+03
6 C aliphatics (TPH) (<53% n-hexane content)	NA	—	5.3E+04	—	4.7E+04
>6-8 C aliphatics (TPH) (>53% n-hexane content)	NA	—	1.2E+04	—	6.6E+03
>6-8 C aliphatics (TPH) (<53% n-hexane content)	NA	—	5.3E+04	—	4.7E+04
>8-10 C aliphatics (TPH)	NA	—	9.7E+03	—	5.2E+03
>10-12 C aliphatics (TPH)	NA	—	9.3E+03	—	5.1E+03
>12-16 C aliphatics (TPH)	NA	—	1.4E+04	—	7.7E+03
>16-21 C aliphatics (TPH)	NA	—	1.0E+06	—	1.0E+06
>16-21 C aliphatics (TPH) (for transformer mineral oil releases only)	NA	—	1.0E+06	—	1.0E+06
>21-35 C aliphatics (TPH)	NA	—	1.0E+06	—	1.0E+06
>21-35 C aliphatics (TPH) (for transformer mineral oil releases only)	NA	—	1.0E+06	—	1.0E+06
>7-8 C aromatics (TPH)	NA	—	2.9E+04	—	1.7E+04
>8-10 C aromatics (TPH)	NA	—	3.9E+03	—	2.1E+03
>10-12 C aromatics (TPH)	NA	—	6.9E+03	—	4.0E+03
>12-16 C aromatics (TPH)	NA	—	1.2E+04	—	7.8E+03
>16-21 C aromatics (TPH)	NA	—	2.0E+04	—	2.0E+04
>21-35 C aromatics (TPH)	NA	—	2.0E+04	—	2.0E+04
Footnotes					
1 Site-specific PCLs for mercury may vary based on the pH-dependent Kd value (see Figure:30 TAC §350.73(f)(1)(C)).					
* These compounds are not necessarily of concern from a human health standpoint, therefore calculation of human health-based values is not required. However, aesthetics and ecological criteria would still apply. See table entitled "Compounds for which Calculation of a Human Health PCL is Not Required" available on the TCEQ website at http://www.tceq.state.tx.us/remediation/trrp/trrp.html .					
NA = not applicable					
All values capped at 1E+06					

This table shows the total soil combined protective concentration levels for commercial/industrial land with both carcinogenic and non-carcinogenic values depicted.

end of worksheet

Table 6
Tier 1 Individual Residential Soil PCLs

Last Revised: March 1, 2022

Chemical of Concern	CAS	Carcinogenic							Noncarcinogenic						
		Air ¹ Soil _{Inh} -vp 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh} -vp 30 acre source area (mg/kg)	Soil _{Inh} (mg/kg)	Soil _{Derm} (mg/kg)	Veg _{Inh} (mg/kg)	Air ¹ Soil _{Inh} -v ¹ 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh} -v ¹ 30 acre source area (mg/kg)	Air ¹ Soil _{Inh} -vp 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh} -vp 30 acre source area (mg/kg)	Soil _{Inh} (mg/kg)	Soil _{Derm} (mg/kg)	Veg _{Inh} (mg/kg)	Air ¹ Soil _{Inh} -v ¹ 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh} -v ¹ 30 acre source area (mg/kg)
Acenaphthene	83-32-9	—	—	—	—	—	—	—	—	—	4.9E+03	1.6E+04	1.4E+04	—	—
Acenaphthylene	208-96-8	—	—	—	—	—	—	—	—	—	4.9E+03	1.6E+04	—	—	—
Acetaldehyde	75-07-0	1.7E+02	8.7E+01	—	—	—	1.7E+02	8.7E+01	1.4E+02	7.4E+01	8.2E+03	—	—	1.4E+02	7.4E+01
Acetate, 2-ethoxyethanol	111-15-9	—	—	—	—	—	—	—	6.0E+03	3.1E+03	8.2E+03	—	—	6.0E+03	3.1E+03
Acetate, isoamyl	123-92-2	—	—	—	—	—	—	—	—	—	5.9E+03	—	—	—	—
Acetate, isobutyl	110-19-0	—	—	—	—	—	—	—	—	—	3.9E+03	—	—	—	—
Acetate, sec-butyl	105-46-4	—	—	—	—	—	—	—	—	—	3.9E+03	—	—	—	—
Acetic acid*	64-19-7	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Acetone (2-propanone)	67-64-1	—	—	—	—	—	—	—	6.0E+05	3.1E+05	7.4E+04	—	—	6.0E+05	3.1E+05
Acetone cyanohydrin	75-86-5	—	—	—	—	—	—	—	4.3E+03	2.2E+03	2.5E+02	1.1E+03	—	4.3E+03	2.2E+03
Acetonitrile	75-05-8	—	—	—	—	—	—	—	1.3E+03	6.7E+02	2.6E+03	—	—	1.3E+03	6.7E+02
Acetophenone	98-86-2	—	—	—	—	—	—	—	—	—	8.2E+03	3.6E+04	—	—	—
Acetylaminofluorene, 2-	53-96-3	1.9E+01	9.5E+00	1.6E+00	5.5E+00	—	1.9E+01	9.5E+00	—	—	—	—	—	—	—
Acifluorfen, sodium	62476-59-9	—	—	—	—	—	—	—	—	—	1.1E+03	4.6E+03	—	—	—
Acridine	260-94-6	—	—	—	—	—	—	—	—	—	2.5E+02	1.1E+03	—	—	—
Acrolein	107-02-8	—	—	—	—	—	—	—	1.5E+02	7.8E+01	4.1E+01	—	—	1.5E+02	7.8E+01
Acrylamide	79-06-1	2.8E+01	1.4E+01	1.2E+01	4.2E+01	—	2.8E+01	1.4E+01	7.2E+02	3.7E+02	1.6E+02	7.1E+02	—	7.2E+02	3.7E+02
Acrylic acid	79-10-7	—	—	—	—	—	—	—	1.2E+02	6.2E+01	4.1E+04	—	—	1.2E+02	6.2E+01
Acrylonitrile	107-13-1	5.3E+00	2.7E+00	1.1E+01	—	—	5.3E+00	2.7E+00	3.1E+01	1.6E+01	8.2E+01	—	—	3.1E+01	1.6E+01
Adipic acid (hexanedioic acid)	124-04-9	—	—	—	—	—	—	—	—	—	1.6E+05	7.1E+05	—	—	—
Alachlor	15972-60-8	—	—	7.6E+01	2.6E+02	—	—	—	—	—	8.2E+02	3.6E+03	—	—	—
Aldicarb	116-06-3	—	—	—	—	—	—	—	—	—	8.2E+01	3.6E+02	—	—	—
Aldicarb sulfone	1646-88-4	—	—	—	—	—	—	—	—	—	8.2E+01	3.6E+02	—	—	—
Aldrin	309-00-2	8.3E+00	4.3E+00	3.6E-01	1.2E+00	6.2E-02	8.3E+00	4.3E+00	—	—	2.5E+00	1.1E+01	8.4E-01	—	—
Allyl alcohol	107-18-6	—	—	—	—	—	—	—	5.7E+00	2.9E+00	4.1E+02	—	—	5.7E+00	2.9E+00
Allyl chloride	107-05-1	—	—	—	—	—	—	—	1.5E+01	7.9E+00	8.2E+02	—	—	1.5E+01	7.9E+00
Aluminum	7429-90-5	—	—	—	—	—	—	—	1.0E+06	1.0E+06	8.2E+04	3.6E+05	1.0E+06	—	—
Ametryn	834-12-8	—	—	—	—	—	—	—	—	—	7.4E+02	3.2E+03	—	—	—
Amino-2,6-dinitrotoluene, 4-	19406-51-0	—	—	2.0E+02	6.9E+02	—	—	—	—	—	4.1E+01	1.8E+02	—	—	—
Amino-4,6-dinitrotoluene, 2-	35572-78-2	—	—	2.0E+02	6.9E+02	—	—	—	—	—	4.1E+01	1.8E+02	—	—	—
Aminobiphenyl, 4- (1,1-biphenyl-4-amine)	92-67-1	—	—	1.0E+00	3.4E+00	—	—	—	—	—	—	—	—	—	—
Aminopyridine, 4-	504-24-5	—	—	—	—	—	—	—	—	—	1.6E+00	7.1E+00	—	—	—
Ammonia	7664-41-7	—	—	—	—	—	—	—	4.9E+03	2.5E+03	—	—	—	4.9E+03	2.5E+03
Ammonium polyphosphate*	6833-79-9	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Ammonium salts*	AMMONIUM	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Aniline	62-53-3	—	—	1.1E+03	3.6E+03	—	—	—	1.3E+02	6.7E+01	5.7E+02	2.5E+03	—	1.3E+02	6.7E+01
Anthracene	120-12-7	—	—	—	—	—	—	—	—	—	2.5E+04	8.2E+04	2.9E+05	—	—
Anthraquinone, 9,10-	84-65-1	—	—	1.6E+02	5.3E+02	—	—	—	—	—	1.6E+03	7.1E+03	—	—	—
Antimony	7440-36-0	—	—	—	—	—	—	—	—	—	3.3E+01	2.1E+02	3.2E+01	—	—
Aramite	140-57-8	1.0E+06	1.0E+06	2.4E+02	8.3E+02	2.7E+02	—	—	—	—	4.1E+03	1.8E+04	8.9E+03	—	—
Arsenic	7440-38-2	1.5E+05	7.7E+04	5.2E+01	4.6E+02	1.3E+02	—	—	—	—	3.1E+01	3.6E+02	1.5E+02	—	—
Arsine	7784-42-1	—	—	—	—	—	—	—	7.7E-01	3.9E-01	—	—	—	7.7E-01	3.9E-01
Atrazine	1912-24-9	—	—	2.7E+01	9.4E+01	—	—	—	—	—	2.9E+03	1.2E+04	—	—	—
Azinphos-methyl (guthion)	86-50-0	—	—	—	—	—	—	—	—	—	1.2E+02	5.3E+02	—	—	—
Azobenzene	103-33-3	1.4E+03	7.1E+02	5.5E+01	1.9E+02	3.5E+02	1.4E+03	7.1E+02	—	—	—	—	—	—	—

Table 6
Tier 1 Individual Residential Soil PCLs

Last Revised: March 1, 2022

Chemical of Concern	CAS	Carcinogenic							Noncarcinogenic						
		Air ¹ Soil _{Inh-vp} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-vp} 30 acre source area (mg/kg)	Soil _{Inh} (mg/kg)	Soil _{Derm} (mg/kg)	Veg _{Inh} (mg/kg)	Air ¹ Soil _{Inh-v} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-v} 30 acre source area (mg/kg)	Air ¹ Soil _{Inh-vp} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-vp} 30 acre source area (mg/kg)	Soil _{Inh} (mg/kg)	Soil _{Derm} (mg/kg)	Veg _{Inh} (mg/kg)	Air ¹ Soil _{Inh-v} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-v} 30 acre source area (mg/kg)
Barium	7440-39-3	—	—	—	—	—	—	—	—	—	1.6E+04	5.0E+04	2.4E+04	—	—
Bayleton	43121-43-3	—	—	—	—	—	—	—	—	—	2.5E+03	1.1E+04	—	—	—
Benefin (benfluralin)	1861-40-1	—	—	—	—	—	—	—	—	—	2.5E+04	1.1E+05	4.2E+05	—	—
Benomyl	17804-35-2	—	—	—	—	—	—	—	—	—	4.1E+03	1.8E+04	—	—	—
Benz-a-anthracene	56-55-3	5.4E+03	2.8E+03	6.1E+01	1.6E+02	6.8E+02	5.5E+03	2.8E+03	—	—	—	—	—	—	—
Benzaldehyde	100-52-7	—	—	—	—	—	—	—	—	—	8.2E+03	—	—	—	—
Benzene	71-43-2	1.6E+02	8.4E+01	4.0E+02	—	—	1.6E+02	8.4E+01	4.3E+03	2.2E+03	3.3E+02	—	—	4.3E+03	2.2E+03
Benzenediacarbonitrile, 1,3-	626-17-5	—	—	—	—	—	—	—	—	—	4.9E+02	2.1E+03	—	—	—
Benzenedicarboxylic acid, 1,2-disodecyl ester	26761-40-0	—	—	—	—	—	—	—	1.0E+06	1.0E+06	3.3E+03	1.4E+04	6.6E+05	1.0E+06	1.0E+06
Benzenethiol	108-98-5	—	—	—	—	—	—	—	—	—	8.2E+01	—	—	—	—
Benzydine	92-87-5	6.3E-02	3.2E-02	2.6E-02	9.0E-02	—	6.3E-02	3.2E-02	—	—	2.5E+02	1.1E+03	—	—	—
Benzo-a-pyrene	50-32-8	1.2E+03	6.2E+02	6.1E+00	1.6E+01	6.5E+01	1.2E+03	6.4E+02	6.2E+01	3.2E+01	2.5E+01	8.2E+01	5.2E+02	6.4E+01	3.3E+01
Benzo-b-fluoranthene	205-99-2	8.8E+03	4.5E+03	6.1E+01	1.6E+02	8.2E+02	9.0E+03	4.6E+03	—	—	—	—	—	—	—
Benzo-e-pyrene	192-97-2	—	—	—	—	—	—	—	—	—	2.5E+03	8.2E+03	7.4E+04	—	—
Benzo-g,h,i-perylene	191-24-2	—	—	—	—	—	—	—	—	—	2.5E+03	8.2E+03	3.0E+04	—	—
Benzoic acid	65-85-0	—	—	—	—	—	—	—	—	—	3.3E+05	1.0E+06	—	—	—
Benzo-j-fluoranthene	205-82-3	4.7E+03	2.4E+03	6.1E+01	1.6E+02	3.6E+02	4.7E+03	2.4E+03	—	—	—	—	—	—	—
Benzo-k-fluoranthene	207-08-9	2.1E+05	1.1E+05	6.1E+02	1.6E+03	8.4E+03	2.2E+05	1.1E+05	—	—	—	—	—	—	—
Benzophenone	119-61-9	—	—	—	—	—	—	—	—	—	5.5E+02	2.4E+03	—	—	—
Benzotrithloride	98-07-7	—	—	4.7E-01	1.6E+00	—	—	—	—	—	—	—	—	—	—
Benzoyl peroxide	94-36-0	—	—	—	—	—	—	—	—	—	4.1E+03	1.8E+04	—	—	—
Benzyl alcohol	100-51-6	—	—	—	—	—	—	—	—	—	8.2E+03	3.6E+04	—	—	—
Benzyl chloride	100-44-7	—	—	3.6E+01	—	—	—	—	3.1E+01	1.6E+01	1.6E+02	—	—	3.1E+01	1.6E+01
Benzyl dichloride	98-87-3	—	—	3.6E+01	1.2E+02	—	—	—	5.5E+01	2.8E+01	1.6E+02	7.1E+02	—	5.5E+01	2.8E+01
Beryllium	7440-41-7	9.4E+03	4.8E+03	—	—	—	—	—	1.9E+04	1.0E+04	1.6E+02	5.0E+01	3.1E+03	—	—
Biphenyl, 1,1'-	92-52-4	—	—	—	—	—	—	—	—	—	4.1E+04	1.8E+04	—	—	—
Biphenyl, 1,1'-, 2-phenoxy-	6738-04-1	—	—	—	—	—	—	—	—	—	4.1E+03	1.8E+04	1.0E+05	—	—
Biquinoline, 2,2'-	119-91-5	—	—	—	—	—	—	—	—	—	2.5E+02	1.1E+03	1.9E+03	—	—
Bis (2-chloroethoxy) methane	111-91-1	1.1E+01	5.8E+00	5.5E+00	1.9E+01	—	1.1E+01	5.8E+00	—	—	2.5E+02	1.1E+03	—	—	—
Bis (2-chloroethyl) ether	111-44-4	3.6E+00	1.8E+00	5.5E+00	—	—	3.6E+00	1.8E+00	—	—	—	—	—	—	—
Bis (2-chloro-1-methylethyl) ether	108-60-1	2.1E+02	1.1E+02	8.7E+01	3.0E+02	—	2.1E+02	1.1E+02	—	—	3.3E+03	1.4E+04	—	—	—
Bis (2-chloromethyl) ether	542-88-1	5.8E-03	3.0E-03	2.8E-02	—	—	5.8E-03	3.0E-03	—	—	—	—	—	—	—
Bis (2-ethyl-hexyl) phthalate	117-81-7	—	—	4.3E+02	2.8E+02	5.8E+01	—	—	—	—	1.6E+03	1.4E+03	4.3E+02	—	—
Bismuth	7440-69-9	—	—	—	—	—	—	—	—	—	4.1E+04	3.6E+05	—	—	—
Bisphenol A	80-05-7	—	—	—	—	—	—	—	—	—	4.1E+03	1.8E+04	—	—	—
Boron	7440-42-8	—	—	—	—	—	—	—	1.0E+06	1.0E+06	1.6E+04	7.1E+05	—	—	—
Bromacil	314-40-9	—	—	—	—	—	—	—	—	—	8.2E+03	3.6E+04	—	—	—
Bromo-2-chloroethane, 1-	107-04-0	—	—	—	—	—	—	—	—	—	3.3E+03	—	—	—	—
Bromobenzene	108-86-1	—	—	—	—	—	—	—	9.7E+02	5.0E+02	6.6E+02	—	—	9.7E+02	5.0E+02
Bromodichloromethane	75-27-4	—	—	9.8E+01	—	—	—	—	—	—	6.6E+02	—	—	—	—
Bromoform	75-25-2	8.4E+02	4.3E+02	7.7E+02	—	—	8.4E+02	4.3E+02	—	—	1.6E+03	—	—	—	—
Bromomethane	74-83-9	—	—	—	—	—	—	—	6.0E+01	3.1E+01	1.1E+02	—	—	6.0E+01	3.1E+01
Bromophenyl phenylether, 4-	101-55-3	9.7E+00	5.0E+00	4.0E-01	1.4E+00	3.0E+00	9.8E+00	5.0E+00	—	—	—	—	—	—	—
Butadiene, 1,3-	106-99-0	7.2E+02	3.7E+02	—	—	—	7.2E+02	3.7E+02	5.1E+02	2.6E+02	—	—	—	5.1E+02	2.6E+02
Butadiene, 2-methyl-1,3- (isoprene)	78-79-5	—	—	—	—	—	—	—	2.8E+05	1.4E+05	4.9E+03	—	—	2.8E+05	1.4E+05

Table 6
Tier 1 Individual Residential Soil PCLs

Last Revised: March 1, 2022

Chemical of Concern	CAS	Carcinogenic							Noncarcinogenic						
		Air ¹ Soil _{Inh-vp} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-vp} 30 acre source area (mg/kg)	Soil _{Inh} (mg/kg)	Soil _{Derm} (mg/kg)	Veg _{Inh} (mg/kg)	Air ¹ Soil _{Inh-v} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-v} 30 acre source area (mg/kg)	Air ¹ Soil _{Inh-vp} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-vp} 30 acre source area (mg/kg)	Soil _{Inh} (mg/kg)	Soil _{Derm} (mg/kg)	Veg _{Inh} (mg/kg)	Air ¹ Soil _{Inh-v} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-v} 30 acre source area (mg/kg)
Butanal (butyraldehyde)	123-72-8	—	—	—	—	—	—	—	1.5E+03	7.9E+02	4.9E+03	—	—	1.5E+03	7.9E+02
Butane, 2,3-dimethyl-	79-29-8	—	—	—	—	—	—	—	2.8E+05	1.4E+05	4.9E+03	—	—	2.8E+05	1.4E+05
Butanoic acid (butyric acid)	107-92-6	—	—	—	—	—	—	—	1.3E+02	6.6E+01	4.1E+04	1.8E+05	—	1.3E+02	6.6E+01
Butanol, 2-	78-92-2	—	—	—	—	—	—	—	1.0E+06	7.2E+05	1.6E+05	—	—	1.0E+06	7.2E+05
Butanol, 2-methyl-1-	137-32-6	—	—	—	—	—	—	—	—	—	8.2E+02	—	—	—	—
Butanol, 2-methyl-2-	75-85-4	—	—	—	—	—	—	—	—	—	8.2E+02	—	—	—	—
Butanol, n-	71-36-3	—	—	—	—	—	—	—	—	—	8.2E+03	—	—	—	—
Butene, 1-	106-98-9	—	—	—	—	—	—	—	8.1E+04	4.2E+04	4.9E+03	—	—	8.1E+04	4.2E+04
Butene, cis-2-	590-18-1	—	—	—	—	—	—	—	2.5E+04	1.3E+04	4.9E+03	—	—	2.5E+04	1.3E+04
Butene, trans-2-	624-64-6	—	—	—	—	—	—	—	2.5E+04	1.3E+04	4.9E+03	—	—	2.5E+04	1.3E+04
Butoxy ethanol, 2- (Ethylene glycol monobutyl ether; EGBE)	111-76-2	—	—	—	—	—	—	—	2.9E+05	1.5E+05	8.2E+03	3.6E+04	—	2.9E+05	1.5E+05
Butyl acetate	123-86-4	—	—	—	—	—	—	—	8.4E+04	4.3E+04	1.1E+04	—	—	8.4E+04	4.3E+04
Butyl acrylate	141-32-2	—	—	—	—	—	—	—	—	—	7.4E+02	—	—	—	—
Butyl benzyl phthalate	85-68-7	—	—	3.2E+03	1.1E+04	4.6E+03	—	—	—	—	1.6E+04	7.1E+04	4.7E+04	—	—
Butyl ether, n- (dibutyl ether)	142-96-1	—	—	—	—	—	—	—	—	—	8.2E+03	—	—	—	—
Butyl methacrylate	97-88-1	—	—	—	—	—	—	—	—	—	7.4E+03	6.4E+03	—	—	—
Butylate	2008-41-5	—	—	—	—	—	—	—	—	—	4.1E+03	1.8E+04	—	—	—
Butylbenzene, n-	104-51-8	—	—	—	—	—	—	—	—	—	4.1E+03	1.8E+04	—	—	—
Butylbenzene, sec-	135-98-8	—	—	—	—	—	—	—	—	—	3.3E+03	—	—	—	—
Butylbenzene, tert-	98-06-6	—	—	—	—	—	—	—	—	—	3.3E+03	—	—	—	—
Cacodylic acid	75-60-5	—	—	—	—	—	—	—	—	—	2.5E+02	1.1E+03	—	—	—
Cadmium	7440-43-9	4.6E+04	2.4E+04	—	—	—	—	—	1.1E+04	5.5E+03	2.6E+02	2.3E+03	6.7E+01	—	—
Calcium*	7440-70-2	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Caprolactam	105-60-2	—	—	—	—	—	—	—	—	—	4.1E+04	1.8E+05	—	—	—
Captan	133-06-2	—	—	1.7E+03	5.9E+03	—	—	—	—	—	1.1E+04	4.6E+04	—	—	—
Carbaryl	63-25-2	—	—	—	—	—	—	—	—	—	8.2E+03	3.6E+04	—	—	—
Carbazole	86-74-8	—	—	3.0E+02	1.0E+03	—	—	—	—	—	—	—	—	—	—
Carbofuran	1563-66-2	—	—	—	—	—	—	—	—	—	4.1E+02	1.8E+03	—	—	—
Carbon disulfide	75-15-0	—	—	—	—	—	—	—	1.1E+04	5.5E+03	8.2E+03	—	—	1.1E+04	5.5E+03
Carbon tetrachloride	56-23-5	6.0E+01	3.1E+01	8.7E+01	—	—	6.0E+01	3.1E+01	1.5E+03	7.9E+02	3.3E+02	—	—	1.5E+03	7.9E+02
Carbophenothion	786-19-6	—	—	—	—	—	—	—	—	—	1.1E+03	4.6E+03	1.6E+04	—	—
Carbosulfan	55285-14-8	—	—	—	—	—	—	—	—	—	8.2E+02	3.6E+03	1.2E+03	—	—
Carboxin	5234-68-4	—	—	—	—	—	—	—	—	—	8.2E+03	3.6E+04	—	—	—
Chloral	75-87-6	—	—	—	—	—	—	—	—	—	8.2E+03	—	—	—	—
Chloral hydrate (1,1-ethanediol, 2,2,2-trichloro-)	302-17-0	—	—	—	—	—	—	—	—	—	8.2E+03	3.6E+04	—	—	—
Chloramben (amiben; 3-amino-2,5-dichlorobenzoic acid)	133-90-4	—	—	—	—	—	—	—	—	—	1.2E+03	5.3E+03	—	—	—
Chlordane (technical)	12789-03-6	1.2E+03	6.4E+02	1.7E+01	1.5E+02	9.7E+00	1.2E+03	6.4E+02	3.7E+03	1.9E+03	4.1E+01	4.4E+02	4.6E+01	3.7E+03	1.9E+03
Chlordane, cis- (alpha chlordane)	5103-71-9	4.0E+03	2.1E+03	1.7E+01	5.9E+01	3.0E+02	4.1E+03	2.1E+03	1.2E+04	6.2E+03	4.1E+01	1.8E+02	1.4E+03	1.2E+04	6.3E+03
Chlordane, trans- (gamma chlordane)	5103-74-2	9.6E+02	5.0E+02	1.7E+01	5.9E+01	1.7E+01	9.7E+02	5.0E+02	2.9E+03	1.5E+03	4.1E+01	1.8E+02	7.8E+01	2.9E+03	1.5E+03
Chlorfenvinphos	470-90-6	—	—	—	—	—	—	—	3.1E+01	1.6E+01	5.7E+01	2.5E+02	5.2E+01	3.1E+01	1.6E+01
Chloride*	16887-00-6	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Chlorine	7782-50-5	—	—	—	—	—	—	—	1.3E+02	6.9E+01	8.2E+03	7.1E+04	—	1.3E+02	6.9E+01
Chloro-1,3-butadiene, 2-	126-99-8	1.2E+00	6.1E-01	—	—	—	1.2E+00	6.1E-01	3.1E+02	1.6E+02	—	—	—	3.1E+02	1.6E+02
Chloro-2-propanol, 1-	127-00-4	—	—	—	—	—	—	—	—	—	1.6E+03	—	—	—	—
Chloro-3-methylphenol, 4-	59-50-7	—	—	—	—	—	—	—	—	—	4.1E+02	1.8E+03	—	—	—

Table 6
Tier 1 Individual Residential Soil PCLs

Last Revised: March 1, 2022

Chemical of Concern	CAS	Carcinogenic							Noncarcinogenic						
		Air ¹ Soil _{Inh-Vp} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-Vp} 30 acre source area (mg/kg)	Soil _{Inh} (mg/kg)	Soil _{Derm} (mg/kg)	Veg _{Inh} (mg/kg)	Air ¹ Soil _{Inh-V} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-V} 30 acre source area (mg/kg)	Air ¹ Soil _{Inh-Vp} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-Vp} 30 acre source area (mg/kg)	Soil _{Inh} (mg/kg)	Soil _{Derm} (mg/kg)	Veg _{Inh} (mg/kg)	Air ¹ Soil _{Inh-V} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-V} 30 acre source area (mg/kg)
Chloroaniline, p-	106-47-8	—	—	3.0E+01	1.0E+02	—	—	—	—	—	3.3E+02	1.4E+03	—	—	—
Chlorobenzene	108-90-7	—	—	—	—	—	—	—	7.7E+02	3.9E+02	1.6E+03	—	—	7.7E+02	3.9E+02
Chlorobenzilate	510-15-6	3.5E+02	1.8E+02	2.2E+01	7.7E+01	—	3.5E+02	1.8E+02	—	—	1.6E+03	7.1E+03	—	—	—
Chlorobromomethane (bromochloromethane)	74-97-5	—	—	—	—	—	—	—	—	—	3.3E+03	—	—	—	—
Chlorodifluoromethane	75-45-6	—	—	—	—	—	—	—	7.7E+05	3.9E+05	—	—	—	7.7E+05	3.9E+05
Chloroethane (ethyl chloride)	75-00-3	—	—	—	—	—	—	—	1.5E+05	7.9E+04	3.3E+04	—	—	1.5E+05	7.9E+04
Chloroethanol, 2-	107-07-3	—	—	—	—	—	—	—	—	—	1.6E+03	—	—	—	—
Chloroethoxy ethene, 2- (2-chloroethylvinylether)	110-75-8	—	—	5.5E+00	—	—	—	—	4.6E+00	2.4E+00	1.6E+02	—	—	4.6E+00	2.4E+00
Chloroform	67-66-3	1.6E+01	8.0E+00	—	—	—	1.6E+01	8.0E+00	1.5E+03	7.7E+02	8.2E+02	—	—	1.5E+03	7.7E+02
Chlorohexane, 1-	544-10-5	—	—	—	—	—	—	—	1.5E+04	7.9E+03	3.3E+03	—	—	1.5E+04	7.9E+03
Chloromethane (methyl chloride)	74-87-3	2.0E+02	1.0E+02	4.7E+02	—	—	2.0E+02	1.0E+02	1.4E+03	7.1E+02	2.9E+02	—	—	1.4E+03	7.1E+02
Chloronaphthalene, 1- (Chloronaphthalene, alpha-)	90-13-1	—	—	—	—	—	—	—	—	—	6.6E+03	2.2E+04	5.2E+04	—	—
Chloronaphthalene, 2- (chloronaphthalene, beta)	91-58-7	—	—	—	—	—	—	—	—	—	6.6E+03	2.2E+04	—	—	—
Chloronitrobenzene, p- (1-chloro-4-nitrobenzene)	100-00-5	—	—	9.6E+02	3.3E+03	—	—	—	6.3E+01	3.2E+01	8.2E+01	3.6E+02	—	6.3E+01	3.2E+01
Chlorophenol, 2-	95-57-8	—	—	—	—	—	—	—	—	—	4.1E+02	—	—	—	—
Chlorophenol, 3-	108-43-0	—	—	—	—	—	—	—	—	—	4.1E+02	1.8E+03	—	—	—
Chlorophenol, 4-	106-48-9	—	—	—	—	—	—	—	—	—	4.1E+02	1.8E+03	—	—	—
Chlorophenyl phenylether, 4-	7005-72-3	2.5E+00	1.3E+00	4.0E-01	1.4E+00	3.9E-01	2.5E+00	1.3E+00	—	—	—	—	—	—	—
Chloropropane, 2-	75-29-6	—	—	—	—	—	—	—	1.5E+03	7.9E+02	2.5E+03	—	—	1.5E+03	7.9E+02
Chlorothalonil	1897-45-6	—	—	5.5E+02	1.9E+03	—	—	—	—	—	1.2E+03	5.3E+03	—	—	—
Chlorotoluene, o- (2-chlorotoluene)	95-49-8	—	—	—	—	—	—	—	1.3E+04	6.8E+03	1.6E+03	7.1E+03	—	1.3E+04	6.8E+03
Chlorotoluene, p- (4-chlorotoluene)	106-43-4	—	—	—	—	—	—	—	—	—	1.6E+03	—	—	—	—
Chlorpyrifos	2921-88-2	—	—	—	—	—	—	—	—	—	2.5E+02	1.1E+03	3.6E+02	—	—
Chromium (III)	16065-83-1	—	—	—	—	—	—	—	1.4E+05	7.0E+04	1.2E+05	6.9E+04	1.0E+06	—	—
Chromium (total)	7440-47-3	—	—	—	—	—	—	—	1.4E+05	7.0E+04	1.2E+05	6.9E+04	1.0E+06	—	—
Chromium (VI)	18540-29-9	9.8E+03	5.1E+03	—	—	—	—	—	2.1E+05	1.1E+05	2.5E+02	2.7E+02	2.9E+03	—	—
Chrysene	218-01-9	8.5E+05	4.4E+05	6.1E+03	1.6E+04	5.9E+04	8.7E+05	4.5E+05	—	—	—	—	—	—	—
Cobalt	7440-48-4	3.8E+03	1.9E+03	—	—	—	—	—	6.1E+04	3.1E+04	8.2E+02	3.6E+04	5.0E+03	—	—
Copolymer acrylamide	69418-26-4	—	—	—	—	—	—	—	—	—	1.6E+01	7.1E+01	—	—	—
Copper	7440-50-8	—	—	—	—	—	—	—	—	—	7.9E+03	3.4E+05	1.6E+03	—	—
Coronene	191-07-1	—	—	—	—	—	—	—	—	—	1.6E+02	7.1E+02	7.6E+03	—	—
Coumaphos	56-72-4	—	—	—	—	—	—	—	—	—	5.7E+02	2.5E+03	5.3E+03	—	—
Cresol	1319-77-3	—	—	—	—	—	—	—	—	—	4.1E+03	1.8E+04	—	—	—
Cresol, m- (3-methylphenol)	108-39-4	—	—	—	—	—	—	—	—	—	4.1E+03	1.8E+04	—	—	—
Cresol, o- (2-methylphenol)	95-48-7	—	—	—	—	—	—	—	—	—	4.1E+03	1.8E+04	—	—	—
Cresol, p- (4-methylphenol)	106-44-5	—	—	—	—	—	—	—	—	—	4.1E+02	1.8E+03	—	—	—
Crotonaldehyde	123-73-9	—	—	3.2E+00	—	—	—	—	—	—	8.2E+01	—	—	—	—
Cumene (isopropylbenzene)	98-82-8	—	—	—	—	—	—	—	9.2E+03	4.8E+03	8.2E+03	—	—	9.2E+03	4.8E+03
Cyanazine	21725-46-2	—	—	7.2E+00	2.5E+01	—	—	—	—	—	1.6E+02	7.1E+02	—	—	—
Cyanide	57-12-5	—	—	—	—	—	—	—	7.2E+02	3.7E+02	4.9E+01	2.1E+03	—	7.2E+02	3.7E+02
Cyanogen	460-19-5	—	—	—	—	—	—	—	1.2E+01	6.3E+00	8.2E+01	—	—	1.2E+01	6.3E+00
Cycloate	1134-23-2	—	—	—	—	—	—	—	—	—	4.5E+03	2.0E+04	—	—	—
Cyclohexane	110-82-7	—	—	—	—	—	—	—	9.2E+04	4.7E+04	4.1E+05	—	—	9.2E+04	4.7E+04
Cyclohexanol	108-93-0	—	—	—	—	—	—	—	—	—	4.1E+05	1.0E+06	—	—	—
Cyclohexanone	108-94-1	—	—	—	—	—	—	—	3.5E+04	1.8E+04	4.1E+05	—	—	3.5E+04	1.8E+04

Table 6
Tier 1 Individual Residential Soil PCLs

Last Revised: March 1, 2022

Chemical of Concern	CAS	Carcinogenic							Noncarcinogenic						
		Air ¹ Soil _{Inh-vp} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-vp} 30 acre source area (mg/kg)	Soil _{Soil_{Ing}} (mg/kg)	Soil _{Soil_{Derm}} (mg/kg)	Veg _{Soil_{Ing}} (mg/kg)	Air ¹ Soil _{Inh-v} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-v} 30 acre source area (mg/kg)	Air ¹ Soil _{Inh-vp} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-vp} 30 acre source area (mg/kg)	Soil _{Soil_{Ing}} (mg/kg)	Soil _{Soil_{Derm}} (mg/kg)	Veg _{Soil_{Ing}} (mg/kg)	Air ¹ Soil _{Inh-v} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-v} 30 acre source area (mg/kg)
Cyclohexene, 1-methanol-3-	1679-51-2	—	—	—	—	—	—	—	—	—	1.6E+03	7.1E+03	—	—	—
Cyclohexene, 4-vinyl-1-	100-40-3	—	—	—	—	—	—	—	5.1E+03	2.6E+03	1.8E+03	—	—	5.1E+03	2.6E+03
Cyclopentane	287-92-3	—	—	—	—	—	—	—	3.7E+05	1.9E+05	4.9E+03	—	—	3.7E+05	1.9E+05
Cyclopentane, methyl-	96-37-7	—	—	—	—	—	—	—	1.5E+04	7.9E+03	8.2E+03	—	—	1.5E+04	7.9E+03
Cyclopentene	142-29-0	—	—	—	—	—	—	—	—	—	4.1E+05	—	—	—	—
Cyclotetramethylenetetranitramine (HMX)	2691-41-0	—	—	—	—	—	—	—	—	—	4.1E+03	2.7E+03	—	—	—
Cyclotrimethylenetrinitramine (RDX)	121-82-4	—	—	7.6E+01	2.6E+02	—	—	—	—	—	3.3E+02	1.4E+03	—	—	—
Cymene (isopropyltoluene)	99-87-6	—	—	—	—	—	—	—	—	—	8.2E+03	—	—	—	—
Cymoxanil	57966-95-7	—	—	—	—	—	—	—	—	—	1.1E+03	4.6E+03	—	—	—
Dacthal (DCPA)	1861-32-1	—	—	—	—	—	—	—	—	—	8.2E+02	3.6E+03	1.0E+04	—	—
Dalapon, sodium salt (2,2-dichloropropanoic acid)	75-99-0	—	—	—	—	—	—	—	—	—	2.5E+03	1.1E+04	—	—	—
DDD	72-54-8	—	—	2.5E+01	2.9E+02	3.7E+01	—	—	—	—	—	—	—	—	—
DDE	72-55-9	—	—	1.8E+01	2.0E+02	2.7E+01	—	—	—	—	—	—	—	—	—
DDT	50-29-3	1.2E+03	6.2E+02	1.8E+01	2.0E+02	8.1E+00	1.2E+03	6.2E+02	—	—	4.1E+01	5.9E+02	3.7E+01	—	—
Demeton	8065-48-3	—	—	—	—	—	—	—	—	—	3.3E+00	1.4E+01	—	—	—
Desethylatrazine	6190-65-4	—	—	—	—	—	—	—	—	—	2.9E+03	1.2E+04	—	—	—
Diacetone alcohol (4-hydroxy-4-methyl-2-pentanone)	123-42-2	—	—	—	—	—	—	—	—	—	3.3E+03	1.4E+04	—	—	—
Diallate	2303-16-4	—	—	1.0E+02	3.4E+02	7.6E+01	—	—	—	—	—	—	—	—	—
Diazinon	333-41-5	—	—	—	—	—	—	—	6.5E+01	3.3E+01	7.4E+01	3.2E+02	—	6.5E+01	3.3E+01
Dibenz(a,h)acridine	226-36-8	1.4E+04	7.4E+03	5.1E+00	1.7E+01	6.6E+01	1.5E+04	7.9E+03	—	—	—	—	—	—	—
Dibenz(a,j)acridine	224-42-0	1.9E+04	1.0E+04	8.3E+00	2.2E+01	1.4E+02	2.1E+04	1.1E+04	—	—	—	—	—	—	—
Dibenz-a,h-anthracene	53-70-3	2.7E+03	1.4E+03	6.1E+00	1.6E+01	4.6E+01	2.9E+03	1.5E+03	—	—	—	—	—	—	—
Dibenzo(a,e)pyrene	192-65-4	5.6E+03	2.9E+03	8.3E-01	2.8E+00	1.1E+01	7.2E+03	3.7E+03	—	—	—	—	—	—	—
Dibenzo(a,h)pyrene	189-64-0	5.5E+02	2.8E+02	8.3E-02	2.8E-01	1.1E+00	7.0E+02	3.6E+02	—	—	—	—	—	—	—
Dibenzo(a,i)pyrene	189-55-9	5.5E+02	2.8E+02	8.3E-02	2.8E-01	1.1E+00	7.0E+02	3.6E+02	—	—	—	—	—	—	—
Dibenzofuran	132-64-9	—	—	—	—	—	—	—	—	—	3.3E+02	1.4E+03	—	—	—
Dibenzothiophene	132-65-0	—	—	—	—	—	—	—	—	—	8.2E+02	1.1E+03	8.8E+03	—	—
Dibromo-3-chloropropane, 1,2-	96-12-8	1.6E-01	8.1E-02	7.6E+00	2.6E+01	—	1.6E-01	8.1E-02	8.1E+00	4.2E+00	1.6E+01	7.1E+01	—	8.1E+00	4.2E+00
Dibromochloromethane (chlorodibromomethane)	124-48-1	—	—	7.2E+01	—	—	—	—	—	—	1.6E+03	—	—	—	—
Dibromofluoromethane	1868-53-7	—	—	—	—	—	—	—	—	—	1.6E+04	—	—	—	—
Dicamba	1918-00-9	—	—	—	—	—	—	—	—	—	2.5E+03	1.1E+04	—	—	—
Dichlormid	37764-25-3	—	—	—	—	—	—	—	—	—	2.0E+03	8.9E+03	—	—	—
Dichloro-2-butene, 1,4-	764-41-0	2.0E-01	1.0E-01	—	—	—	2.0E-01	1.0E-01	—	—	—	—	—	—	—
Dichloro-2-butene, 1,4- trans	110-57-6	2.0E-01	1.1E-01	—	—	—	2.0E-01	1.1E-01	—	—	—	—	—	—	—
Dichlorobenzene, 1,2-	95-50-1	—	—	—	—	—	—	—	8.0E+02	4.1E+02	7.4E+03	—	—	8.0E+02	4.1E+02
Dichlorobenzene, 1,3-	541-73-1	—	—	—	—	—	—	—	1.2E+02	6.3E+01	2.5E+03	—	—	1.2E+02	6.3E+01
Dichlorobenzene, 1,4-	106-46-7	—	—	2.5E+02	—	—	—	—	1.2E+04	6.1E+03	—	—	—	1.2E+04	6.1E+03
Dichlorobenzidine, 3,3'-	91-94-1	—	—	1.3E+01	4.6E+01	—	—	—	—	—	—	—	—	—	—
Dichlorobutane, 2,3-	7581-97-7	—	—	—	—	—	—	—	1.1E+02	5.5E+01	8.2E+02	—	—	1.1E+02	5.5E+01
Dichlorodifluoromethane	75-71-8	—	—	—	—	—	—	—	1.5E+03	7.9E+02	1.6E+04	—	—	1.5E+03	7.9E+02
Dichloroethane, 1,1-	75-34-3	—	—	—	—	—	—	—	3.7E+04	1.9E+04	1.6E+04	—	—	3.7E+04	1.9E+04
Dichloroethane, 1,2-	107-06-2	1.1E+02	5.4E+01	6.7E+01	—	—	1.1E+02	5.4E+01	6.8E+02	3.5E+02	6.4E+03	—	—	6.8E+02	3.5E+02
Dichloroethylene, 1,1-	75-35-4	—	—	—	—	—	—	—	5.2E+03	2.7E+03	4.1E+03	—	—	5.2E+03	2.7E+03
Dichloroethylene, cis-1,2-	156-59-2	—	—	—	—	—	—	—	9.2E+02	4.7E+02	1.6E+02	—	—	9.2E+02	4.7E+02
Dichloroethylene, trans-1,2	156-60-5	—	—	—	—	—	—	—	9.2E+02	4.7E+02	1.6E+03	—	—	9.2E+02	4.7E+02

Table 6
Tier 1 Individual Residential Soil PCLs

Last Revised: March 1, 2022

Chemical of Concern	CAS	Carcinogenic							Noncarcinogenic						
		Air ¹ Soil _{Inh} -vp 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh} -vp 30 acre source area (mg/kg)	Soil _{Inh} (mg/kg)	Soil _{Derm} (mg/kg)	Veg _{Inh} (mg/kg)	Air ¹ Soil _{Inh} -V ¹ 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh} -V ¹ 30 acre source area (mg/kg)	Air ¹ Soil _{Inh} -vp 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh} -vp 30 acre source area (mg/kg)	Soil _{Inh} (mg/kg)	Soil _{Derm} (mg/kg)	Veg _{Inh} (mg/kg)	Air ¹ Soil _{Inh} -V ¹ 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh} -V ¹ 30 acre source area (mg/kg)
Dichlorofluoromethane	75-43-4	—	—	—	—	—	—	—	—	—	1.6E+04	—	—	—	—
Dichlorophenol, 2,3-	576-24-9	—	—	—	—	—	—	—	—	—	2.5E+02	1.1E+03	—	—	—
Dichlorophenol, 2,4-	120-83-2	—	—	—	—	—	—	—	—	—	2.5E+02	1.1E+03	—	—	—
Dichlorophenol, 2,5-	583-78-8	—	—	—	—	—	—	—	—	—	2.5E+02	1.1E+03	—	—	—
Dichlorophenol, 2,6-	87-65-0	—	—	—	—	—	—	—	—	—	8.2E+01	3.6E+02	—	—	—
Dichlorophenol, 3,4-	95-77-2	—	—	—	—	—	—	—	—	—	2.5E+02	1.1E+03	—	—	—
Dichlorophenol, 3,5-	591-35-5	—	—	—	—	—	—	—	—	—	2.5E+02	1.1E+03	—	—	—
Dichlorophenoxy, 2,4- butyric acid, 4- (2,4-DB)	94-82-6	—	—	—	—	—	—	—	—	—	6.6E+02	2.8E+03	—	—	—
Dichlorophenoxyacetic acid, 2,4- (2,4-D)	94-75-7	—	—	—	—	—	—	—	—	—	1.6E+04	1.4E+05	—	—	—
Dichloroprop (2-(2,4-dichlorophenoxy) propanoic acid)	120-36-5	—	—	—	—	—	—	—	—	—	8.2E+02	3.6E+03	—	—	—
Dichloropropane, 1,2-	78-87-5	3.9E+02	2.0E+02	1.6E+02	—	—	3.9E+02	2.0E+02	6.1E+01	3.2E+01	1.1E+04	—	—	6.1E+01	3.2E+01
Dichloropropane, 1,3-	142-28-9	9.0E+01	4.6E+01	6.1E+01	—	—	9.0E+01	4.6E+01	3.1E+02	1.6E+02	1.6E+03	—	—	3.1E+02	1.6E+02
Dichloropropane, 2,2-	594-20-7	—	—	8.9E+01	—	—	—	—	6.1E+01	3.2E+01	7.4E+03	—	—	6.1E+01	3.2E+01
Dichloropropanol, 2,3-	616-23-9	—	—	—	—	—	—	—	—	—	2.5E+02	1.1E+03	—	—	—
Dichloropropene, 1,1-	563-58-6	9.0E+01	4.6E+01	6.1E+01	—	—	9.0E+01	4.6E+01	3.1E+02	1.6E+02	2.5E+03	—	—	3.1E+02	1.6E+02
Dichloropropene, 1,3- (mixed isomers)	542-75-6	9.0E+01	4.6E+01	6.1E+01	—	—	9.0E+01	4.6E+01	3.1E+02	1.6E+02	2.5E+03	—	—	3.1E+02	1.6E+02
Dichloropropene, cis 1,3-	10061-01-5	—	—	1.1E+01	—	—	—	—	3.1E+02	1.6E+02	8.2E+00	—	—	3.1E+02	1.6E+02
Dichloropropene, trans 1,3-	10061-02-6	9.0E+01	4.6E+01	6.1E+01	—	—	9.0E+01	4.6E+01	3.1E+02	1.6E+02	2.5E+03	—	—	3.1E+02	1.6E+02
Dichlorvos	62-73-7	—	—	2.1E+01	7.2E+01	—	—	—	3.4E+05	1.8E+05	4.1E+01	1.8E+02	—	1.0E+06	6.2E+05
Dicrotophos (bidrin)	141-66-2	—	—	—	—	—	—	—	—	—	8.2E+00	3.6E+01	—	—	—
Dicyclopentadiene	77-73-6	—	—	—	—	—	—	—	—	—	6.6E+03	—	—	—	—
Dieldrin	60-57-1	3.2E+01	1.6E+01	3.8E-01	1.3E+00	2.9E-01	3.2E+01	1.6E+01	—	—	4.1E+00	1.8E+01	6.3E+00	—	—
Diethanolamine	111-42-2	—	—	—	—	—	—	—	3.5E+03	1.8E+03	4.1E+01	1.8E+02	—	3.5E+03	1.8E+03
Diethyldithiocarbamate, sodium salt	148-18-5	—	—	2.2E+01	—	—	—	—	—	—	2.5E+03	—	—	—	—
Diethyl phthalate	84-66-2	—	—	—	—	—	—	—	—	—	6.6E+04	2.8E+05	—	—	—
Diethylene glycol	111-46-6	—	—	—	—	—	—	—	—	—	1.6E+05	7.1E+05	—	—	—
Diethylene glycol monobutyl ether	112-34-5	—	—	—	—	—	—	—	2.0E+01	1.0E+01	2.5E+03	1.1E+04	—	2.0E+01	1.0E+01
Diethylhexyl adipate	103-23-1	—	—	5.1E+03	1.7E+04	—	—	—	—	—	4.9E+04	2.1E+05	—	—	—
Diethylstilbestrol	56-53-1	—	—	1.3E-03	4.4E-03	2.5E-03	—	—	—	—	—	—	—	—	—
Diisobutylene (trimethyl-1-pentene, 2,4,4-)	107-39-1	—	—	—	—	—	—	—	3.1E+03	1.6E+03	4.9E+03	—	—	3.1E+03	1.6E+03
Diisopropylbenzene, p-	100-18-5	—	—	—	—	—	—	—	—	—	8.2E+02	3.6E+03	—	—	—
Diisopropyl ether (2,2'-oxybis-propane)	108-20-3	—	—	—	—	—	—	—	1.1E+04	5.5E+03	8.2E+03	—	—	1.1E+04	5.5E+03
Dimethenamid	87674-68-8	—	—	—	—	—	—	—	—	—	1.2E+03	5.3E+03	—	—	—
Dimethoate	60-51-5	—	—	—	—	—	—	—	—	—	1.6E+01	7.1E+01	—	—	—
Dimethoxybenzidine, 3,3'-	119-90-4	—	—	4.3E+02	1.5E+03	—	—	—	—	—	—	—	—	—	—
Dimethyl-2-nitrobenzene, 1,3-	81-20-9	—	—	—	—	—	—	—	2.7E+03	1.4E+03	1.6E+02	7.1E+02	—	2.8E+03	1.4E+03
Dimethyl-3-nitrobenzene, 1,2-	83-41-0	—	—	—	—	—	—	—	2.4E+03	1.2E+03	1.6E+02	7.1E+02	—	2.4E+03	1.2E+03
Dimethyl-4-nitrobenzene, 1-2-	99-51-4	—	—	—	—	—	—	—	2.5E+03	1.3E+03	1.6E+02	7.1E+02	—	2.5E+03	1.3E+03
Dimethyl-5-nitrobenzene, 1,3-	99-12-7	—	—	—	—	—	—	—	2.2E+03	1.1E+03	1.6E+02	7.1E+02	—	2.2E+03	1.1E+03
Dimethylphenethylamine, alpha, alpha-	122-09-8	—	—	—	—	—	—	—	—	—	1.6E+02	7.1E+02	—	—	—
Dimethyl phenol, 2,4-	105-67-9	—	—	—	—	—	—	—	—	—	1.6E+03	7.1E+03	—	—	—
Dimethylaminoazobenzene, p-	60-11-7	—	—	—	—	—	—	—	—	—	8.2E-01	3.6E+00	1.5E+01	—	—
Dimethylbenz-a-anthracene, 7,12-	57-97-6	1.2E+02	6.3E+01	2.4E-02	6.4E-02	3.7E-01	1.4E+02	7.3E+01	—	—	—	—	—	—	—
Dimethylbenzidine, 3,3'-	119-93-7	—	—	5.5E-01	1.9E+00	—	—	—	—	—	—	—	—	—	—
Dimethylformamide, N,N-	68-12-2	—	—	—	—	—	—	—	3.2E+03	1.6E+03	8.2E+03	—	—	3.2E+03	1.6E+03

Table 6
Tier 1 Individual Residential Soil PCLs

Last Revised: March 1, 2022

Chemical of Concern	CAS	Carcinogenic							Noncarcinogenic						
		Air ¹ Soil _{Inh} -vp 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh} -vp 30 acre source area (mg/kg)	Soil _{Inh} (mg/kg)	Soil _{Derm} (mg/kg)	Veg _{Inh} (mg/kg)	Air ¹ Soil _{Inh} -v ¹ 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh} -v ¹ 30 acre source area (mg/kg)	Air ¹ Soil _{Inh} -vp 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh} -vp 30 acre source area (mg/kg)	Soil _{Inh} (mg/kg)	Soil _{Derm} (mg/kg)	Veg _{Inh} (mg/kg)	Air ¹ Soil _{Inh} -v ¹ 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh} -v ¹ 30 acre source area (mg/kg)
Dimethylnaphthalene, 1,3-	575-41-7	—	—	—	—	—	—	—	—	—	3.3E+03	1.1E+04	3.1E+04	—	—
Dimethylphthalate	131-11-3	—	—	—	—	—	—	—	—	—	6.6E+04	2.8E+05	—	—	—
Di-n-butyl phthalate	84-74-2	—	—	—	—	—	—	—	—	—	8.2E+03	3.6E+04	8.7E+04	—	—
Dinitro-2-methylphenol, 4,6- (dinitro-o-cresol, 4, 6-)	534-52-1	—	—	—	—	—	—	—	—	—	8.2E+00	3.6E+01	—	—	—
Dinitrobenzene, 1,3- (dinitrobenzene, 2,4-)	99-65-0	—	—	—	—	—	—	—	—	—	8.2E+00	3.6E+01	—	—	—
Dinitrobenzene, 1,4-	100-25-4	—	—	—	—	—	—	—	—	—	8.2E+00	3.6E+01	—	—	—
Dinitrophenol, 2,4-	51-28-5	—	—	—	—	—	—	—	—	—	1.6E+02	7.1E+02	—	—	—
Dinitrophenol, 2,5-	329-71-5	—	—	—	—	—	—	—	—	—	1.6E+02	7.1E+02	—	—	—
Dinitrotoluene, 2,4-	121-14-2	—	—	8.9E+00	3.1E+01	—	—	—	—	—	1.6E+02	7.1E+02	—	—	—
Dinitrotoluene, 2,6-	606-20-2	—	—	8.9E+00	3.1E+01	—	—	—	—	—	8.2E+01	3.6E+02	—	—	—
Di-n-octyl phthalate	117-84-0	—	—	—	—	—	—	—	—	—	8.2E+02	3.6E+03	2.0E+04	—	—
Dinoseb	88-85-7	—	—	—	—	—	—	—	—	—	8.2E+01	3.6E+02	—	—	—
Dioxane 1,4-	123-91-1	1.8E+02	9.3E+01	6.1E+01	—	—	1.8E+02	9.3E+01	4.2E+03	2.2E+03	2.5E+03	—	—	4.2E+03	2.2E+03
Dioxin (as 2,3,7,8-TCDD toxicity equivalent quotients (TEQs))	1746-01-6	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Diphenyl ether	101-84-8	—	—	—	—	—	—	—	—	—	5.1E+02	2.2E+03	4.5E+03	—	—
Diphenylamine	122-39-4	—	—	—	—	—	—	—	—	—	2.0E+03	8.9E+03	—	—	—
Diphenylhydrazine, 1,2-	122-66-7	1.4E+02	7.2E+01	7.6E+00	2.6E+01	—	1.4E+02	7.2E+01	—	—	—	—	—	—	—
Dipropylene glycol	110-98-5	—	—	—	—	—	—	—	—	—	9.8E+03	4.3E+04	—	—	—
Diquat	85-00-7	—	—	—	—	—	—	—	—	—	1.8E+02	7.8E+02	—	—	—
Disodium iminodiacetate (iminodiacetic acid, disodium salt)	142-73-4	—	—	—	—	—	—	—	—	—	8.2E+02	3.6E+03	—	—	—
Disulfoton	298-04-4	—	—	—	—	—	—	—	—	—	3.3E+00	1.4E+01	—	—	—
Diuron	330-54-1	—	—	—	—	—	—	—	—	—	1.6E+02	7.1E+02	—	—	—
Dodecylphenol, 4-	104-43-8	—	—	—	—	—	—	—	—	—	4.1E+03	1.8E+04	3.9E+05	—	—
Endosulfan	115-29-7	—	—	—	—	—	—	—	—	—	4.9E+02	2.1E+03	—	—	—
Endosulfan I	959-98-8	—	—	—	—	—	—	—	—	—	1.6E+02	7.1E+02	2.9E+02	—	—
Endosulfan II	33213-65-9	—	—	—	—	—	—	—	—	—	4.9E+02	2.1E+03	8.6E+02	—	—
Endosulfan sulfate	1031-07-8	—	—	—	—	—	—	—	—	—	4.9E+02	2.1E+03	1.0E+04	—	—
Endothall	145-73-3	—	—	—	—	—	—	—	—	—	1.6E+03	7.1E+03	—	—	—
Endrin	72-20-8	—	—	—	—	—	—	—	—	—	2.5E+01	1.1E+02	1.6E+01	—	—
Endrin aldehyde	7421-93-4	—	—	—	—	—	—	—	—	—	2.5E+01	1.1E+02	6.5E+02	—	—
Endrin ketone	53494-70-5	—	—	—	—	—	—	—	—	—	2.5E+01	1.1E+02	3.8E+02	—	—
Epichlorohydrin	106-89-8	5.1E+02	2.6E+02	6.1E+02	—	—	5.1E+02	2.6E+02	2.6E+01	1.4E+01	4.9E+02	—	—	2.6E+01	1.4E+01
EPN (o-ethyl o-(4-nitrophenyl)phenylphosphonothioate)	2104-64-5	—	—	—	—	—	—	—	—	—	8.2E-01	3.6E+00	—	—	—
Esfenvalerate	66230-04-4	—	—	—	—	—	—	—	—	—	1.6E+02	7.1E+02	1.7E+02	—	—
Ethalfuralin (sonolan)	55283-68-6	—	—	6.8E+01	2.3E+02	4.5E+02	—	—	—	—	3.3E+03	1.4E+04	4.3E+04	—	—
Ethanol	64-17-5	—	—	—	—	—	—	—	—	—	1.0E+06	—	—	—	—
Ethanol, 2-amino-	141-43-5	—	—	—	—	—	—	—	2.9E+03	1.5E+03	1.4E+02	6.0E+02	—	2.9E+03	1.5E+03
Ethanol, 2-(2-aminoethoxy)-	929-06-6	—	—	—	—	—	—	—	—	—	4.1E+01	1.8E+02	—	—	—
Ethanol, 2-(2-ethoxyethoxy)-	111-90-0	—	—	—	—	—	—	—	—	—	1.6E+05	7.1E+05	—	—	—
Ethanol, 2-(methylamino)-	109-83-1	—	—	—	—	—	—	—	6.4E+03	3.3E+03	1.3E+03	5.7E+03	—	6.4E+03	3.3E+03
Ethion	563-12-2	—	—	—	—	—	—	—	—	—	4.1E+01	1.8E+02	1.6E+02	—	—
Ethoprop	13194-48-4	—	—	2.2E+02	7.4E+02	—	—	—	—	—	8.2E+00	3.6E+01	—	—	—
Ethoxy ethanol, 2-	110-80-5	—	—	—	—	—	—	—	2.5E+04	1.3E+04	7.4E+03	—	—	2.5E+04	1.3E+04
Ethyl acetate	141-78-6	—	—	—	—	—	—	—	3.7E+03	1.9E+03	7.4E+04	—	—	3.7E+03	1.9E+03
Ethyl acrylate	140-88-5	—	—	1.3E+02	—	—	—	—	2.4E+02	1.2E+02	4.1E+02	—	—	2.4E+02	1.2E+02

Table 6
Tier 1 Individual Residential Soil PCLs

Last Revised: March 1, 2022

Chemical of Concern	CAS	Carcinogenic							Noncarcinogenic						
		Air ¹ Soil _{Inh-Vp} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-Vp} 30 acre source area (mg/kg)	Soil _{Inh} (mg/kg)	Soil _{Derm} (mg/kg)	Veg _{Inh} (mg/kg)	Air ¹ Soil _{Inh-V} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-V} 30 acre source area (mg/kg)	Air ¹ Soil _{Inh-Vp} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-Vp} 30 acre source area (mg/kg)	Soil _{Inh} (mg/kg)	Soil _{Derm} (mg/kg)	Veg _{Inh} (mg/kg)	Air ¹ Soil _{Inh-V} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-V} 30 acre source area (mg/kg)
Ethyl benzene	100-41-4	—	—	—	—	—	—	—	2.9E+04	1.5E+04	8.2E+03	—	—	2.9E+04	1.5E+04
Ethyl dipropylthiocarbamate, S-	759-94-4	—	—	—	—	—	—	—	—	—	2.0E+03	8.9E+03	—	—	—
Ethyl ether	60-29-7	—	—	—	—	—	—	—	—	—	1.6E+04	—	—	—	—
Ethyl methacrylate	97-63-2	—	—	—	—	—	—	—	7.1E+03	3.6E+03	7.4E+03	—	—	7.1E+03	3.6E+03
Ethyl methanesulfonate	62-50-0	1.2E+02	6.1E+01	6.1E+01	2.1E+02	—	1.2E+02	6.1E+01	—	—	—	—	—	—	—
Ethyl tert-butyl ether (2-ethyl-2-ethoxypropane)	637-92-3	—	—	—	—	—	—	—	4.6E+03	2.4E+03	8.2E+01	—	—	4.6E+03	2.4E+03
Ethyl-1-hexanol, 2-	104-76-7	—	—	—	—	—	—	—	—	—	1.2E+04	5.3E+04	—	—	—
Ethyl-2-hexenal, 2-	645-62-5	—	—	—	—	—	—	—	—	—	1.2E+04	—	—	—	—
Ethyl-2-methyl benzene, 1-	611-14-3	—	—	—	—	—	—	—	8.4E+03	4.3E+03	4.1E+03	—	—	8.4E+03	4.3E+03
Ethyl-4-methyl benzene, 1-	622-96-8	—	—	—	—	—	—	—	7.2E+03	3.7E+03	4.1E+03	—	—	7.2E+03	3.7E+03
Ethylene*	74-85-1	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Ethylene dibromide (dibromoethane, 1,2-)	106-93-4	1.3E+01	6.8E+00	3.0E+00	—	—	1.3E+01	6.8E+00	1.7E+03	8.6E+02	7.4E+02	—	—	1.7E+03	8.6E+02
Ethylene glycol	107-21-1	—	—	—	—	—	—	—	—	—	1.6E+05	7.1E+05	—	—	—
Ethylene oxide	75-21-8	2.6E+02	1.3E+02	6.0E+00	—	—	2.6E+02	1.3E+02	—	—	—	—	—	—	—
Ethylene thiourea	96-45-7	—	—	5.5E+01	1.9E+02	—	—	—	—	—	6.6E+00	2.8E+01	—	—	—
Ethylenediamine	107-15-3	—	—	—	—	—	—	—	—	—	7.4E+03	—	—	—	—
Ethylenimine	151-56-4	1.3E-01	6.8E-02	9.3E-02	—	—	1.3E-01	6.8E-02	—	—	—	—	—	—	—
Ethylhexyl acrylate, 2-	103-11-7	—	—	1.3E+02	4.3E+02	—	—	—	—	—	—	—	—	—	—
Famphur	52-85-7	—	—	—	—	—	—	—	—	—	2.5E+00	1.1E+01	—	—	—
Fensulfothion	115-90-2	—	—	—	—	—	—	—	—	—	8.2E+01	3.6E+02	—	—	—
Fenthion	55-38-9	—	—	—	—	—	—	—	—	—	5.7E+00	2.5E+01	—	—	—
Fenuron	101-42-8	—	—	—	—	—	—	—	—	—	5.7E+03	2.5E+04	—	—	—
Fluoranthene	206-44-0	—	—	—	—	—	—	—	—	—	3.3E+03	1.1E+04	2.9E+04	—	—
Fluorene	86-73-7	—	—	—	—	—	—	—	—	—	3.3E+03	1.1E+04	2.2E+04	—	—
Fluorine (soluble fluoride)	7782-41-4	—	—	—	—	—	—	—	1.0E+06	1.0E+06	4.9E+03	2.1E+05	—	—	—
Fluorochloridone	61213-25-0	—	—	—	—	—	—	—	—	—	6.1E+02	2.7E+03	—	—	—
Fonofos	944-22-9	—	—	—	—	—	—	—	—	—	1.6E+02	7.1E+02	—	—	—
Formaldehyde	50-00-0	—	—	—	—	—	—	—	9.9E+02	5.1E+02	1.6E+04	—	—	9.9E+02	5.1E+02
Formic acid	64-18-6	—	—	—	—	—	—	—	2.1E+02	1.1E+02	7.4E+04	—	—	2.1E+02	1.1E+02
Furan	110-00-9	—	—	—	—	—	—	—	—	—	8.2E+01	—	—	—	—
Furfural	98-01-1	—	—	—	—	—	—	—	—	—	2.5E+02	—	—	—	—
Glycidylaldehyde	765-34-4	—	—	—	—	—	—	—	1.5E+02	7.7E+01	3.3E+01	—	—	1.5E+02	7.7E+01
Glyphosate	1071-83-6	—	—	—	—	—	—	—	—	—	8.2E+04	3.6E+05	—	—	—
Heptachlor	76-44-8	9.1E+00	4.7E+00	1.3E+00	4.6E+00	1.5E-01	9.1E+00	4.7E+00	—	—	4.1E+01	1.8E+02	9.0E+00	—	—
Heptachlor epoxide	1024-57-3	2.4E+01	1.2E+01	6.7E-01	2.3E+00	4.5E-01	2.4E+01	1.2E+01	—	—	1.1E+00	4.6E+00	1.4E+00	—	—
Heptane, n-	142-82-5	—	—	—	—	—	—	—	1.4E+05	7.1E+04	4.9E+03	—	—	1.4E+05	7.1E+04
Heptanoic acid, n-	111-14-8	—	—	—	—	—	—	—	1.2E+02	6.3E+01	4.1E+04	1.8E+05	—	1.2E+02	6.3E+01
Hexachlorobenzene	118-74-1	1.9E+01	9.8E+00	3.8E+00	1.3E+01	1.9E+00	1.9E+01	9.8E+00	—	—	6.6E+01	2.8E+02	6.4E+01	—	—
Hexachlorobutadiene	87-68-3	2.9E+01	1.5E+01	7.8E+01	2.7E+02	—	2.9E+01	1.5E+01	—	—	8.2E+01	3.6E+02	—	—	—
Hexachlorocyclohexane, alpha (alpha-BHC)	319-84-6	1.4E+01	7.2E+00	9.6E-01	8.2E+00	3.7E-01	1.4E+01	7.2E+00	—	—	6.6E+02	7.1E+03	5.0E+02	—	—
Hexachlorocyclohexane, beta (beta-BHC)	319-85-7	7.2E+01	3.7E+01	3.4E+00	2.9E+01	1.4E+00	7.2E+01	3.7E+01	—	—	—	—	—	—	—
Hexachlorocyclohexane, delta (delta-BHC)	319-86-8	1.0E+02	5.2E+01	3.4E+00	2.9E+01	—	1.0E+02	5.2E+01	—	—	2.5E+01	2.7E+02	—	—	—
Hexachlorocyclohexane, gamma (lindane; gamma-BHC)	58-89-9	—	—	4.7E+00	4.0E+01	1.5E+00	—	—	—	—	2.5E+01	2.7E+02	1.6E+01	—	—
Hexachlorocyclohexane, techn (technical-BHC)	608-73-1	8.9E+01	4.6E+01	3.4E+00	2.9E+01	2.4E+00	8.9E+01	4.6E+01	—	—	—	—	—	—	—
Hexachlorocyclopentadiene	77-47-4	—	—	—	—	—	—	—	1.4E+01	7.3E+00	4.9E+02	2.1E+03	—	1.4E+01	7.3E+00

Table 6
Tier 1 Individual Residential Soil PCLs

Last Revised: March 1, 2022

Chemical of Concern	CAS	Carcinogenic							Noncarcinogenic						
		Air ¹ Soil _{Inh} -vp 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh} -vp 30 acre source area (mg/kg)	Soil _{Inh} (mg/kg)	Soil _{Derm} (mg/kg)	Veg _{Inh} (mg/kg)	Air ¹ Soil _{Inh} -V ¹ 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh} -V ¹ 30 acre source area (mg/kg)	Air ¹ Soil _{Inh} -vp 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh} -vp 30 acre source area (mg/kg)	Soil _{Inh} (mg/kg)	Soil _{Derm} (mg/kg)	Veg _{Inh} (mg/kg)	Air ¹ Soil _{Inh} -V ¹ 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh} -V ¹ 30 acre source area (mg/kg)
Hexachloroethane	67-72-1	—	—	1.5E+02	5.2E+02	—	—	—	4.9E+03	2.5E+03	5.7E+01	2.5E+02	—	5.0E+03	2.5E+03
Hexachlorophene	70-30-4	—	—	—	—	—	—	—	—	—	2.5E+01	1.1E+02	2.6E+03	—	—
Hexachloropropylene	1888-71-7	—	—	1.5E+02	5.2E+02	—	—	—	5.1E+03	2.6E+03	5.7E+01	2.5E+02	—	5.1E+03	2.6E+03
Hexanal, 2-ethyl-	123-05-7	—	—	—	—	—	—	—	—	—	1.2E+04	5.3E+04	—	—	—
Hexane, n-	110-54-3	—	—	—	—	—	—	—	1.0E+04	5.3E+03	4.9E+03	—	—	1.0E+04	5.3E+03
Hexanediamine, 1,6-	124-09-4	—	—	—	—	—	—	—	—	—	4.1E+02	1.8E+03	—	—	—
Hexanedinitrile	111-69-3	—	—	—	—	—	—	—	9.8E+02	5.1E+02	1.1E+02	5.0E+02	—	9.8E+02	5.1E+02
Hexanediol, 1,6-	629-11-8	—	—	—	—	—	—	—	1.0E+06	1.0E+06	4.1E+05	1.0E+06	—	1.0E+06	1.0E+06
Hexanoic acid	142-62-1	—	—	—	—	—	—	—	1.4E+02	7.0E+01	5.2E+03	2.3E+04	—	1.4E+02	7.0E+01
Hexanone, 2-	591-78-6	—	—	—	—	—	—	—	8.3E+02	4.2E+02	4.1E+03	—	—	8.3E+02	4.2E+02
Hexazinone	51235-04-2	—	—	—	—	—	—	—	—	—	2.7E+03	1.2E+04	—	—	—
Hexene, 1-	592-41-6	—	—	—	—	—	—	—	1.7E+03	8.7E+02	2.7E+04	—	—	1.7E+03	8.7E+02
Hexene, cis-2-	7688-21-3	—	—	—	—	—	—	—	1.7E+03	8.7E+02	2.7E+04	—	—	1.7E+03	8.7E+02
Hexylene glycol (2-methyl-2,4-pentanediol)	107-41-5	—	—	—	—	—	—	—	—	—	2.5E+04	1.1E+05	—	—	—
Hydrazine	302-01-2	4.6E-01	2.4E-01	2.0E+00	—	—	4.6E-01	2.4E-01	2.9E+00	1.5E+00	—	—	—	2.9E+00	1.5E+00
Hydrocaproic acid, 6- (6-hydroxyhexanoic acid)	1191-25-9	—	—	—	—	—	—	—	1.6E+02	8.3E+01	5.2E+03	2.3E+04	—	1.6E+02	8.3E+01
Hydrogen chloride (hydrochloric acid)*	7647-01-0	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hydroquinone	123-31-9	—	—	1.0E+02	3.5E+02	—	—	—	—	—	3.3E+03	1.4E+04	—	—	—
Indene	95-13-6	—	—	—	—	—	—	—	1.1E+02	5.8E+01	1.6E+03	—	—	1.1E+02	5.8E+01
Indeno-1,2,3-cd-pyrene	193-39-5	3.4E+04	1.7E+04	6.1E+01	1.6E+02	8.3E+02	3.7E+04	1.9E+04	—	—	—	—	—	—	—
Iron*	7439-89-6	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Isoamyl alcohol	123-51-3	—	—	—	—	—	—	—	—	—	4.1E+02	—	—	—	—
Isobutyl alcohol	78-83-1	—	—	—	—	—	—	—	—	—	2.5E+04	—	—	—	—
Isobutylene (2-methyl-1-propene)	115-11-7	—	—	—	—	—	—	—	1.0E+06	8.7E+05	3.0E+02	—	—	1.0E+06	8.7E+05
Isobutyric acid (2-methylpropanoic acid)	79-31-2	—	—	—	—	—	—	—	—	—	4.1E+04	1.8E+05	—	—	—
Isodecanol	25339-17-7	—	—	—	—	—	—	—	—	—	1.3E+02	5.7E+02	2.1E+02	—	—
Isodrin	465-73-6	1.7E+00	8.9E-01	3.6E-02	1.2E-01	—	1.7E+00	9.0E-01	—	—	2.5E-01	1.1E+00	—	—	—
Isopentane	78-78-4	—	—	—	—	—	—	—	3.7E+05	1.9E+05	4.9E+03	—	—	3.7E+05	1.9E+05
Isophorone	78-59-1	—	—	6.4E+03	2.2E+04	—	—	—	—	—	1.6E+04	7.1E+04	—	—	—
Isopropyl acetate	108-21-4	—	—	—	—	—	—	—	—	—	5.7E+03	—	—	—	—
Isopropyl alcohol	67-63-0	—	—	—	—	—	—	—	9.7E+03	5.0E+03	1.6E+05	—	—	9.7E+03	5.0E+03
Isosafrole	120-58-1	9.1E+01	4.7E+01	2.8E+01	9.4E+01	—	9.1E+01	4.7E+01	—	—	—	—	—	—	—
Kelthane (dicofol)	115-32-2	—	—	—	—	—	—	—	—	—	4.9E+02	2.1E+03	8.2E+02	—	—
Kepone (chlordecone)	143-50-0	4.8E+01	2.5E+01	6.1E-01	2.1E+00	1.5E+00	4.9E+01	2.5E+01	—	—	2.5E+01	1.1E+02	1.2E+02	—	—
Lead (inorganic)	7439-92-1	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Leptophos	21609-90-5	—	—	—	—	—	—	—	3.3E+01	1.7E+01	4.1E-01	1.8E+00	3.1E-01	3.3E+01	1.7E+01
Limonene, d-*	5989-27-5	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Lithium	7439-93-2	—	—	—	—	—	—	—	—	—	5.7E+02	2.5E+04	2.1E+03	—	—
Magnesium*	7439-95-4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Malathion	121-75-5	—	—	—	—	—	—	—	2.0E+02	1.0E+02	1.6E+03	7.1E+03	—	2.0E+02	1.0E+02
Maleic anhydride	108-31-6	—	—	—	—	—	—	—	—	—	8.2E+03	3.6E+04	—	—	—
Maleic hydrazide	123-33-1	—	—	—	—	—	—	—	—	—	4.1E+04	1.8E+05	—	—	—
Malononitrile	109-77-3	—	—	—	—	—	—	—	—	—	8.2E+00	3.6E+01	—	—	—
Mancozeb	8018-01-7	—	—	—	—	—	—	—	—	—	2.5E+03	1.1E+04	—	—	—
Manganese	7439-96-5	—	—	—	—	—	—	—	8.1E+05	4.2E+05	1.1E+04	3.0E+04	7.6E+03	—	—

Table 6
Tier 1 Individual Residential Soil PCLs

Last Revised: March 1, 2022

Chemical of Concern	CAS	Carcinogenic							Noncarcinogenic						
		Air ¹ Soil _{Inh} -vp 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh} -vp 30 acre source area (mg/kg)	Soil _{Inh} (mg/kg)	Soil _{Derm} (mg/kg)	Veg _{Inh} (mg/kg)	Air ¹ Soil _{Inh} -V ¹ 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh} -V ¹ 30 acre source area (mg/kg)	Air ¹ Soil _{Inh} -vp 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh} -vp 30 acre source area (mg/kg)	Soil _{Inh} (mg/kg)	Soil _{Derm} (mg/kg)	Veg _{Inh} (mg/kg)	Air ¹ Soil _{Inh} -V ¹ 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh} -V ¹ 30 acre source area (mg/kg)
MCPA (4-(chloro-2-methylphenoxy) acetic acid)	94-74-6	—	—	—	—	—	—	—	—	—	4.1E+01	1.8E+02	—	—	—
MCPP (2-(4-chloro-2-methylphenoxy) propanoic acid)	93-65-2	—	—	—	—	—	—	—	—	—	8.2E+01	3.6E+02	—	—	—
Mercury (pH = 4.9) ²	7439-97-6	—	—	—	—	—	—	—	4.6E+00	2.4E+00	2.5E+01	7.5E+01	3.6E+02	4.6E+00	2.4E+00
Mercury (pH=6.8) ²	7439-97-6	—	—	—	—	—	—	—	1.6E+01	8.0E+00	2.5E+01	7.5E+01	3.6E+02	1.6E+01	8.0E+00
Merphos	150-50-5	—	—	—	—	—	—	—	—	—	2.5E+00	1.1E+01	—	—	—
Methacrylic acid (2-methyl-2-propenoic acid)	79-41-4	—	—	—	—	—	—	—	—	—	8.2E+02	—	—	—	—
Methacrylonitrile	126-98-7	—	—	—	—	—	—	—	5.8E+02	3.0E+02	4.1E+03	—	—	5.8E+02	3.0E+02
Methanol	67-56-1	—	—	—	—	—	—	—	3.3E+05	1.7E+05	1.6E+05	—	—	3.3E+05	1.7E+05
Methapyrilene	91-80-5	—	—	1.3E+00	4.4E+00	—	—	—	—	—	—	—	—	—	—
Methomyl	16752-77-5	—	—	—	—	—	—	—	—	—	2.0E+03	8.9E+03	—	—	—
Methoxychlor	72-43-5	—	—	—	—	—	—	—	—	—	4.1E+02	1.8E+03	1.5E+03	—	—
Methoxyethanol, 2-	109-86-4	—	—	—	—	—	—	—	3.1E+02	1.6E+02	2.2E+03	—	—	3.1E+02	1.6E+02
Methyl acetate (acetic acid, methyl ester)	79-20-9	—	—	—	—	—	—	—	—	—	8.2E+04	—	—	—	—
Methyl acrylate	96-33-3	—	—	—	—	—	—	—	3.1E+02	1.6E+02	1.6E+02	—	—	3.1E+02	1.6E+02
Methyl amyl ketone (2-heptanone)	110-43-0	—	—	—	—	—	—	—	1.1E+05	5.7E+04	4.1E+03	—	—	1.1E+05	5.7E+04
Methyl chrysene, 1-	3351-28-8	1.0E+06	1.0E+06	8.3E+02	2.2E+03	1.3E+04	1.0E+06	1.0E+06	—	—	—	—	—	—	—
Methyl chrysene, 2-	3351-32-4	1.0E+06	1.0E+06	8.3E+02	2.2E+03	1.3E+04	1.0E+06	1.0E+06	—	—	—	—	—	—	—
Methyl chrysene, 6-	1705-85-7	2.1E+05	1.1E+05	8.3E+01	2.2E+02	1.0E+03	2.3E+05	1.2E+05	—	—	—	—	—	—	—
Methyl cyclohexane	108-87-2	—	—	—	—	—	—	—	4.6E+04	2.4E+04	4.1E+05	—	—	4.6E+04	2.4E+04
Methyl ethyl ketone (2-butanone)	78-93-3	—	—	—	—	—	—	—	2.0E+05	1.0E+05	4.9E+04	—	—	2.0E+05	1.0E+05
Methyl iodide (iodomethane)	74-88-4	—	—	—	—	—	—	—	—	—	1.1E+02	—	—	—	—
Methyl isobutyl ketone (4-methyl-2-pentanone)	108-10-1	—	—	—	—	—	—	—	5.8E+04	3.0E+04	6.6E+03	—	—	5.8E+04	3.0E+04
Methyl mercury	22967-92-6	—	—	—	—	—	—	—	—	—	8.2E+00	3.6E+02	—	—	—
Methyl methacrylate	80-62-6	—	—	—	—	—	—	—	1.1E+04	5.5E+03	1.1E+05	—	—	1.1E+04	5.5E+03
Methyl methanesulfonate	66-27-3	1.1E+02	5.7E+01	6.1E+01	2.1E+02	—	1.1E+02	5.7E+01	—	—	—	—	—	—	—
Methyl parathion	298-00-0	—	—	—	—	—	—	—	—	—	2.0E+01	8.9E+01	—	—	—
Methyl-1-butene, 2-	563-46-2	—	—	—	—	—	—	—	2.8E+05	1.4E+05	4.9E+03	—	—	2.8E+05	1.4E+05
Methyl-1-propanal, 2- (isobutyraldehyde)	78-84-2	—	—	—	—	—	—	—	—	—	3.3E+03	—	—	—	—
Methyl-2-butene, 2-	513-35-9	—	—	—	—	—	—	—	2.8E+05	1.4E+05	4.9E+03	—	—	2.8E+05	1.4E+05
Methyl-2-pentenal, 2-	623-36-9	—	—	3.2E+00	—	—	—	—	—	—	—	—	—	—	—
Methylcholanthrene, 3-	56-49-5	1.5E+03	7.8E+02	2.8E-01	7.3E-01	5.0E+00	1.8E+03	9.0E+02	—	—	—	—	—	—	—
Methylene bromide (dibromomethane)	74-95-3	—	—	8.1E+02	—	—	—	—	8.2E+01	4.2E+01	4.9E+03	—	—	8.2E+01	4.2E+01
Methylene chloride (dichloromethane)	75-09-2	1.3E+04	6.6E+03	6.2E+04	—	—	1.3E+04	6.6E+03	2.0E+04	1.0E+04	1.7E+03	—	—	2.0E+04	1.0E+04
Methylene-bis (2-chloroaniline) 4,4'-	101-14-4	2.7E+03	1.4E+03	6.1E+01	2.1E+02	—	2.7E+03	1.4E+03	—	—	1.6E+02	7.1E+02	—	—	—
Methylmercury hydroxide	1184-57-2	—	—	—	—	—	—	—	—	—	8.2E+00	3.6E+01	—	—	—
Methylnaphthalene, 1-	90-12-0	—	—	2.1E+02	5.5E+02	—	—	—	—	—	5.7E+03	1.9E+04	—	—	—
Methylnaphthalene, 2-	91-57-6	—	—	—	—	—	—	—	—	—	3.3E+02	1.1E+03	—	—	—
Methylpyrrolidone, N-	872-50-4	—	—	—	—	—	—	—	—	—	1.6E+03	7.1E+03	—	—	—
Methylstyrene, alpha-	98-83-9	—	—	—	—	—	—	—	4.8E+02	2.5E+02	6.8E+02	—	—	4.8E+02	2.5E+02
Methyltetrahydrofuran, 2-	96-47-9	1.9E+02	9.7E+01	8.0E+02	—	—	1.9E+02	9.7E+01	—	—	1.6E+04	—	—	—	—
Methyltetrahydropyran, 2-	10141-72-7	2.2E+02	1.1E+02	8.0E+02	—	—	2.2E+02	1.1E+02	—	—	1.6E+04	—	—	—	—
Metolachlor	51218-45-2	—	—	—	—	—	—	—	—	—	1.2E+04	5.3E+04	—	—	—
Metribuzin	21087-64-9	—	—	—	—	—	—	—	—	—	2.0E+03	8.9E+03	—	—	—
Mirex	2385-85-5	—	—	—	—	—	—	—	—	—	1.6E+01	7.1E+01	—	—	—
Molinate	2212-67-1	—	—	—	—	—	—	—	—	—	1.6E+02	7.1E+02	—	—	—

Table 6
Tier 1 Individual Residential Soil PCLs

Last Revised: March 1, 2022

Chemical of Concern	CAS	Carcinogenic							Noncarcinogenic						
		Air ¹ Soil _{Inh} -vp 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh} -vp 30 acre source area (mg/kg)	Soil _{Inh} (mg/kg)	Soil _{Derm} (mg/kg)	Veg _{Inh} (mg/kg)	Air ¹ Soil _{Inh} -v ¹ 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh} -v ¹ 30 acre source area (mg/kg)	Air ¹ Soil _{Inh} -vp 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh} -vp 30 acre source area (mg/kg)	Soil _{Inh} (mg/kg)	Soil _{Derm} (mg/kg)	Veg _{Inh} (mg/kg)	Air ¹ Soil _{Inh} -v ¹ 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh} -v ¹ 30 acre source area (mg/kg)
Molybdenum	7439-98-7	—	—	—	—	—	—	—	—	—	4.1E+02	6.8E+03	2.6E+02	—	—
Monocrotophos	2157-98-4	—	—	—	—	—	—	—	—	—	4.9E+01	2.1E+02	—	—	—
Morpholine	110-91-8	—	—	—	—	—	—	—	—	—	1.0E+06	—	—	—	—
Morpholine, N-butyl-	1005-67-0	—	—	—	—	—	—	—	—	—	1.9E+02	8.2E+02	—	—	—
MTBE (methyl tert-butyl ether)	1634-04-4	1.4E+03	7.1E+02	3.4E+03	—	—	1.4E+03	7.1E+02	4.6E+04	2.4E+04	8.2E+02	—	—	4.6E+04	2.4E+04
Naled	300-76-5	—	—	—	—	—	—	—	—	—	1.6E+02	7.1E+02	—	—	—
Naphthalene	91-20-3	—	—	—	—	—	—	—	2.7E+02	1.4E+02	1.6E+03	5.5E+03	—	2.7E+02	1.4E+02
Naphthoquinone, 1,4-	130-15-4	—	—	—	—	—	—	—	—	—	5.7E+02	2.5E+03	—	—	—
Naphthylamine, 1-	134-32-7	—	—	—	—	—	—	—	—	—	1.6E+03	7.1E+03	—	—	—
Naphthylamine, 2-	91-59-8	—	—	3.4E+00	1.2E+01	—	—	—	—	—	—	—	—	—	—
Napropamide	15299-99-7	—	—	—	—	—	—	—	—	—	8.2E+03	3.6E+04	—	—	—
Neopentyl glycol	126-30-7	—	—	—	—	—	—	—	—	—	2.5E+04	1.1E+05	—	—	—
Nickel and compounds	7440-02-0	1.3E+05	6.8E+04	—	—	—	—	—	2.2E+05	1.1E+05	1.6E+03	2.8E+03	4.6E+03	—	—
Nitrate-N	14797-55-8	—	—	—	—	—	—	—	—	—	1.3E+05	1.0E+06	—	—	—
Nitrite-N	14797-65-0	—	—	—	—	—	—	—	—	—	8.2E+03	3.6E+05	—	—	—
Nitroaniline, 2-	88-74-4	—	—	—	—	—	—	—	4.8E+01	2.4E+01	2.5E+01	1.1E+02	—	4.8E+01	2.4E+01
Nitroaniline, 3-	99-09-2	—	—	1.6E+02	5.5E+02	—	—	—	6.0E+01	3.1E+01	2.5E+01	1.1E+02	—	6.0E+01	3.1E+01
Nitroaniline, 4-	100-01-6	—	—	3.0E+02	1.0E+03	—	—	—	1.2E+03	6.2E+02	3.3E+02	1.4E+03	—	1.2E+03	6.2E+02
Nitrobenzene	98-95-3	6.6E+01	3.4E+01	—	—	—	6.6E+01	3.4E+01	1.0E+03	5.2E+02	1.6E+02	7.1E+02	—	1.0E+03	5.2E+02
Nitroglycerin	55-63-0	—	—	3.6E+02	1.2E+03	—	—	—	—	—	8.2E+00	3.6E+01	—	—	—
Nitrophenol, 2-	88-75-5	—	—	—	—	—	—	—	—	—	1.6E+02	7.1E+02	—	—	—
Nitrophenol, 3-	554-84-7	—	—	—	—	—	—	—	—	—	1.6E+02	7.1E+02	—	—	—
Nitrophenol, 4-	100-02-7	—	—	—	—	—	—	—	—	—	1.6E+02	7.1E+02	—	—	—
Nitropropane, 2-	79-46-9	6.2E-01	3.2E-01	—	—	—	6.2E-01	3.2E-01	3.1E+02	1.6E+02	1.1E+01	—	—	3.1E+02	1.6E+02
Nitroquinoline-N-oxide, 4-	56-57-5	1.9E+00	9.7E-01	6.5E-01	2.2E+00	—	1.9E+00	9.7E-01	—	—	—	—	—	—	—
Nitrosodiethanolamine	1116-54-7	—	—	2.2E+00	7.4E+00	—	—	—	—	—	—	—	—	—	—
Nitrosodiethylamine, n-	55-18-5	6.6E-02	3.4E-02	4.0E-02	—	—	6.6E-02	3.4E-02	—	—	—	—	—	—	—
Nitrosodimethylamine, n-	62-75-9	2.0E-01	1.0E-01	1.2E-01	—	—	2.0E-01	1.0E-01	4.7E+00	2.4E+00	6.6E-01	—	—	4.7E+00	2.4E+00
Nitrosodi-n-butylamine, n-	924-16-3	1.0E+00	5.3E-01	1.1E+00	3.8E+00	—	1.0E+00	5.3E-01	—	—	—	—	—	—	—
Nitrosodi-n-propylamine, n-	621-64-7	—	—	8.7E-01	7.4E-01	—	—	—	—	—	—	—	—	—	—
Nitrosodiphenylamine	86-30-6	—	—	1.2E+03	1.1E+03	—	—	—	—	—	—	—	—	—	—
Nitroso-methyl-ethyl-amine, n-	10595-95-6	—	—	2.8E-01	—	—	—	—	—	—	—	—	—	—	—
Nitrosomorpholine, N-	59-89-2	1.7E+00	8.8E-01	9.1E-01	3.1E+00	—	1.7E+00	8.8E-01	—	—	—	—	—	—	—
Nitroso-n-ethylurea, n-	759-73-9	—	—	4.3E-02	1.5E-01	—	—	—	—	—	—	—	—	—	—
Nitrosopiperidine, N-	100-75-4	1.3E+00	6.9E-01	6.5E-01	2.2E+00	—	1.3E+00	6.9E-01	—	—	—	—	—	—	—
Nitrosopyrrolidine, n-	930-55-2	5.8E+00	3.0E+00	2.9E+00	9.9E+00	—	5.8E+00	3.0E+00	—	—	—	—	—	—	—
Nitrotoluene, m-	99-08-1	—	—	—	—	—	—	—	—	—	8.2E+02	3.6E+03	—	—	—
Nitrotoluene, o-	88-72-2	—	—	2.8E+01	9.4E+01	—	—	—	—	—	7.4E+01	3.2E+02	—	—	—
Nitrotoluene, p-	99-99-0	—	—	3.8E+02	1.3E+03	—	—	—	—	—	3.3E+02	1.4E+03	—	—	—
Nonachlor, cis-	5103-73-1	1.2E+03	6.4E+02	1.7E-01	5.9E+01	9.7E+00	1.2E+03	6.4E+02	3.7E+03	1.9E+03	4.1E+01	1.8E+02	4.6E+01	3.7E+03	1.9E+03
Nonachlor, trans-	39765-80-5	1.2E+03	6.4E+02	1.7E+01	5.9E+01	9.7E+00	1.2E+03	6.4E+02	3.7E+03	1.9E+03	4.1E+01	1.8E+02	4.6E+01	3.7E+03	1.9E+03
Nonanal	124-19-6	—	—	—	—	—	—	—	—	—	1.6E+04	7.1E+04	—	—	—
Nonene, 1-n	124-11-8	—	—	—	—	—	—	—	—	—	8.2E+03	—	—	—	—
Nonylphenol, 4-n-	104-40-5	—	—	—	—	—	—	—	—	—	8.2E+03	3.6E+04	2.8E+05	—	—
Nonylphenol ethoxylate	9016-45-9	—	—	—	—	—	—	—	—	—	8.2E+03	3.6E+04	2.9E+05	—	—

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Tier 1 Individual Residential Soil PCLs

Last Revised: March 1, 2022

Chemical of Concern	CAS	Carcinogenic							Noncarcinogenic						
		Air ¹ Soil _{Inh-vp} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-vp} 30 acre source area (mg/kg)	Soil _{Inh} (mg/kg)	Soil _{Derm} (mg/kg)	Veg _{Inh} (mg/kg)	Air ¹ Soil _{Inh-v} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-v} 30 acre source area (mg/kg)	Air ¹ Soil _{Inh-vp} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-vp} 30 acre source area (mg/kg)	Soil _{Inh} (mg/kg)	Soil _{Derm} (mg/kg)	Veg _{Inh} (mg/kg)	Air ¹ Soil _{Inh-v} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-v} 30 acre source area (mg/kg)
Octamethylpyrophosphoramide	152-16-9	—	—	—	—	—	—	—	—	—	1.6E+02	7.1E+02	—	—	—
Octanone	106-68-3	—	—	—	—	—	—	—	9.0E+05	4.6E+05	4.9E+03	—	—	9.0E+05	4.6E+05
Oxamyl	23135-22-0	—	—	—	—	—	—	—	—	—	2.0E+03	8.9E+03	—	—	—
Oxychlordane	27304-13-8	1.2E+03	6.4E+02	1.7E+01	5.9E+01	9.7E+00	1.2E+03	6.4E+02	3.7E+03	1.9E+03	4.1E+01	1.8E+02	4.6E+01	3.7E+03	1.9E+03
Paraquat	1910-42-5	—	—	—	—	—	—	—	—	—	3.7E+02	1.6E+03	—	—	—
Parathion (ethyl parathion)	56-38-2	—	—	—	—	—	—	—	—	—	4.9E+02	2.1E+03	—	—	—
Pebulate	1114-71-2	—	—	—	—	—	—	—	—	—	4.1E+03	1.8E+04	—	—	—
Pendimethalin	40487-42-1	—	—	—	—	—	—	—	—	—	3.3E+03	1.4E+04	5.1E+04	—	—
Pentachlorobenzene	608-93-5	—	—	—	—	—	—	—	—	—	6.6E+01	2.8E+02	—	—	—
Pentachloroethane	76-01-7	9.4E+01	4.8E+01	6.7E+01	—	—	9.4E+01	4.8E+01	—	—	2.5E+03	—	—	—	—
Pentachloronitrobenzene	82-68-8	—	—	2.3E+01	8.0E+01	2.3E+01	—	—	—	—	2.5E+02	1.1E+03	4.8E+02	—	—
Pentachlorophenol	87-86-5	—	—	1.5E+01	2.1E+01	7.9E-01	—	—	—	—	4.1E+02	7.1E+02	4.2E+01	—	—
Pentadiene, 1,3-cis-	1574-41-0	—	—	—	—	—	—	—	2.8E+05	1.4E+05	4.9E+03	—	—	2.8E+05	1.4E+05
Pentadiene, 1,3-trans-	2004-70-8	—	—	—	—	—	—	—	2.8E+05	1.4E+05	4.9E+03	—	—	2.8E+05	1.4E+05
Pentaerythritol tetranitrate (PETN)	78-11-5	—	—	—	—	—	—	—	—	—	1.6E+02	7.1E+02	—	—	—
Pentane	109-66-0	—	—	—	—	—	—	—	3.7E+05	1.9E+05	4.9E+03	—	—	3.7E+05	1.9E+05
Pentane, 2-methyl-	107-83-5	—	—	—	—	—	—	—	2.8E+05	1.4E+05	4.9E+03	—	—	2.8E+05	1.4E+05
Pentane, 3-methyl-	96-14-0	—	—	—	—	—	—	—	2.8E+05	1.4E+05	4.9E+03	—	—	2.8E+05	1.4E+05
Pentenediol, 1,5-	111-29-5	—	—	—	—	—	—	—	1.0E+06	1.0E+06	4.1E+05	1.0E+06	—	1.0E+06	1.0E+06
Pentanol, 1-	71-41-0	—	—	—	—	—	—	—	—	—	2.7E+03	—	—	—	—
Pentanol, 4-methyl-2-	108-11-2	—	—	—	—	—	—	—	—	—	2.1E+03	—	—	—	—
Pentanone, 2-	107-87-9	—	—	—	—	—	—	—	—	—	3.3E+03	—	—	—	—
Pentene, 2-	109-68-2	—	—	—	—	—	—	—	2.8E+05	1.4E+05	4.9E+03	—	—	2.8E+05	1.4E+05
Pentyne, 1-	627-19-0	—	—	—	—	—	—	—	2.8E+05	1.4E+05	4.9E+03	—	—	2.8E+05	1.4E+05
Perchlorate	14797-73-0	—	—	—	—	—	—	—	—	—	5.7E+01	5.0E+02	—	—	—
Perfluorooctane sulfonic acid (1-Octanesulfonic acid, heptadecafluoro-1-) [PFOS]	1763-23-1	—	—	—	—	—	—	—	1.5E+02	7.9E+01	1.9E+00	8.2E+00	—	1.5E+02	8.0E+01
Perfluoroundecanoic acid (Undecanoic acid, uncosafluoro-) [PFUnDa]	2058-94-8	—	—	—	—	—	—	—	—	—	9.8E-01	4.3E+00	—	—	—
Perfluoropentanoic acid (Pentanoic acid, nonafluoro-) [PFPeA]	2706-90-3	—	—	—	—	—	—	—	—	—	3.1E-01	1.4E+00	—	—	—
Perfluorohexanoic acid (Hexanoic acid, undecafluoro-) [PFHxA]	307-24-4	—	—	—	—	—	—	—	—	—	3.1E-01	1.4E+00	—	—	—
Perfluorododecanoic acid (Dodecanoic acid, tricosafafluoro-) [PFDoA]	307-55-1	—	—	—	—	—	—	—	6.9E+01	3.6E+01	9.8E-01	4.3E+00	—	6.9E+01	3.6E+01
Perfluorooctanoic acid (Octanoic acid, pentadecafluoro-) [PFOA]	335-67-1	—	—	—	—	—	—	—	2.4E+00	1.2E+00	9.8E-01	4.3E+00	—	2.4E+00	1.2E+00
Perfluorodecanoic acid (Decanoic acid, nonadecafluoro-) [PFDA]	335-76-2	—	—	—	—	—	—	—	8.6E+01	4.4E+01	1.2E+00	5.3E+00	—	8.6E+01	4.4E+01
Perfluorodecane sulfonic acid (1-Decanesulfonic acid, heneicosafafluoro-) [PFDS]	335-77-3	—	—	—	—	—	—	—	—	—	9.8E-01	4.3E+00	—	—	—
Perfluorohexane sulfonic acid (1-Hexanesulfonic acid, tridecafluoro-) [PFHxS]	355-46-4	—	—	—	—	—	—	—	1.1E+01	5.8E+00	3.1E-01	1.4E+00	—	1.1E+01	5.8E+00
Perfluorobutyric acid (Butanoic acid, heptafluoro-) [PFBA]	375-22-4	—	—	—	—	—	—	—	2.0E+03	1.0E+03	2.4E+02	1.0E+03	—	2.0E+03	1.0E+03
Perfluorobutane sulfonic acid (1-Butanesulfonic acid, nonafluoro-) [PFBS]	375-73-5	—	—	—	—	—	—	—	1.1E+03	5.8E+02	1.1E+02	5.0E+02	—	1.1E+03	5.8E+02
Perfluoroheptanoic acid (Heptanoic acid, tridecafluoro-) [PFHpA]	375-85-9	—	—	—	—	—	—	—	—	—	1.9E+00	8.2E+00	—	—	—
Perfluorononanoic acid (Nonanoic acid, heptadecafluoro-) [PFNA]	375-95-1	—	—	—	—	—	—	—	1.7E+01	8.9E+00	9.8E-01	4.3E+00	—	1.7E+01	8.9E+00
Perfluorotetradecanoic acid (Tetradecanoic acid, heptacosafafluoro-) [PFTeDA]	376-06-7	—	—	—	—	—	—	—	—	—	9.8E-01	4.3E+00	1.4E+00	—	—
Perfluorotridecanoic acid (Tridecanoic acid, pentacosafafluoro-) [PFTriDA]	72629-94-8	—	—	—	—	—	—	—	—	—	9.8E-01	4.3E+00	2.5E+00	—	—

Table 6
Tier 1 Individual Residential Soil PCLs

Last Revised: March 1, 2022

Chemical of Concern	CAS	Carcinogenic							Noncarcinogenic						
		Air ¹ Soil _{Inh} -vp 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh} -vp 30 acre source area (mg/kg)	Soil _{Inh} (mg/kg)	Soil _{Derm} (mg/kg)	Veg _{Inh} (mg/kg)	Air ¹ Soil _{Inh} -v ¹ 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh} -v ¹ 30 acre source area (mg/kg)	Air ¹ Soil _{Inh} -vp 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh} -vp 30 acre source area (mg/kg)	Soil _{Inh} (mg/kg)	Soil _{Derm} (mg/kg)	Veg _{Inh} (mg/kg)	Air ¹ Soil _{Inh} -v ¹ 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh} -v ¹ 30 acre source area (mg/kg)
Perfluorooctane sulfonamide (1-Octanesulfonamide, heptadecafluoro-) [PFOSA]	754-91-6	—	—	—	—	—	—	—	6.3E-02	3.2E-02	9.8E-01	4.3E+00	—	6.3E-02	3.2E-02
Perylene	198-55-0	—	—	—	—	—	—	—	—	—	1.6E+03	7.1E+03	4.9E+04	—	—
Phenacetin	62-44-2	1.1E+04	5.6E+03	2.8E+03	9.4E+03	—	1.1E+04	5.6E+03	—	—	—	—	—	—	—
Phenanthrene	85-01-8	—	—	—	—	—	—	—	—	—	2.5E+03	8.2E+03	1.7E+04	—	—
Phenanthridine	229-87-8	—	—	—	—	—	—	—	—	—	2.5E+02	1.1E+03	—	—	—
Phenol	108-95-2	—	—	—	—	—	—	—	1.9E+03	1.0E+03	2.5E+04	1.1E+05	—	1.9E+03	1.0E+03
Phenol, 4-tert-butyl-	98-54-4	—	—	—	—	—	—	—	—	—	9.8E+03	4.3E+04	—	—	—
Phenothiazine	92-84-2	—	—	—	—	—	—	—	—	—	9.0E+01	3.9E+02	4.4E+02	—	—
Phenyl mercuric acetate	62-38-4	—	—	—	—	—	—	—	—	—	6.6E+00	2.8E+01	—	—	—
Phenylene diamine, m-	108-45-2	—	—	—	—	—	—	—	—	—	4.9E+02	2.1E+03	—	—	—
Phenylene diamine, p-	106-50-3	—	—	—	—	—	—	—	—	—	1.6E+04	6.8E+04	—	—	—
Phorate	298-02-2	—	—	—	—	—	—	—	—	—	1.6E+01	7.1E+01	—	—	—
Phosalone	2310-17-0	—	—	—	—	—	—	—	—	—	1.6E+02	7.1E+02	—	—	—
Phosdrin (mevinphos)	7786-34-7	—	—	—	—	—	—	—	—	—	2.0E+00	8.9E+00	—	—	—
Phosmet	732-11-6	—	—	—	—	—	—	—	—	—	1.6E+03	7.1E+03	—	—	—
Phosphine	7803-51-2	—	—	—	—	—	—	—	4.6E+00	2.4E+00	2.5E+01	2.1E+02	—	4.6E+00	2.4E+00
Phosphorotriethioic acid, S,S,S-tributyl ester	78-48-8	—	—	7.2E+01	2.5E+02	8.1E+02	—	—	—	—	4.1E+01	1.8E+02	9.2E+02	—	—
Phosphorus, total*	7723-14-0	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Phosphorus, white	7723-14-0	—	—	—	—	—	—	—	—	—	1.6E+00	1.4E+01	—	—	—
Phthalic anhydride	85-44-9	—	—	—	—	—	—	—	5.0E+04	2.6E+04	1.6E+05	7.1E+05	—	5.0E+04	2.6E+04
Picloram	1918-02-1	—	—	—	—	—	—	—	—	—	5.7E+03	2.5E+04	—	—	—
Picoline, 2- (2-methylpyridine)	109-06-8	—	—	—	—	—	—	—	—	—	7.4E+02	—	—	—	—
Polybrominated biphenyls (PBBs)	67774-32-7	—	—	6.8E-01	2.3E+00	9.9E-03	—	—	—	—	5.7E-01	2.5E+00	1.7E-02	—	—
Polychlorinated biphenyls (PCBs)	1336-36-3	5.4E+01	2.8E+01	3.0E+00	7.4E+00	1.3E+01	5.4E+01	2.8E+01	—	—	1.6E+00	5.1E+00	1.4E+01	—	—
Potassium*	7440-09-7	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Primene	68955-53-3	—	—	—	—	—	—	—	—	—	4.9E+02	2.1E+03	3.9E+03	—	—
Prometon (pramitol)	1610-18-0	—	—	—	—	—	—	—	—	—	1.2E+03	5.3E+03	—	—	—
Prometryn	7287-19-6	—	—	—	—	—	—	—	—	—	3.3E+03	1.4E+04	—	—	—
Pronamide	23950-58-5	—	—	—	—	—	—	—	—	—	6.1E+03	2.7E+04	—	—	—
Propanal (propionaldehyde)	123-38-6	—	—	—	—	—	—	—	1.2E+02	6.3E+01	6.6E+02	—	—	1.2E+02	6.3E+01
Propane, 1-bromo-	106-94-5	—	—	—	—	—	—	—	—	—	2.9E+03	—	—	—	—
Propanil	709-98-8	—	—	—	—	—	—	—	—	—	4.1E+02	1.8E+03	—	—	—
Propanoic acid (propionic acid)	79-09-4	—	—	—	—	—	—	—	—	—	4.1E+04	—	—	—	—
Propanol, 1-	71-23-8	—	—	—	—	—	—	—	—	—	1.6E+05	—	—	—	—
Propargite	2312-35-8	—	—	—	—	—	—	—	—	—	1.6E+03	7.1E+03	—	—	—
Propargyl alcohol	107-19-7	—	—	—	—	—	—	—	—	—	1.6E+02	—	—	—	—
Propazine	139-40-2	—	—	1.4E+02	4.7E+02	—	—	—	—	—	1.6E+03	7.1E+03	—	—	—
Propham	122-42-9	—	—	—	—	—	—	—	—	—	1.6E+03	7.1E+03	—	—	—
Propionitrile (propane nitrile)	107-12-0	—	—	—	—	—	—	—	—	—	3.3E+01	—	—	—	—
Propyl acetate, n-	109-60-4	—	—	—	—	—	—	—	—	—	7.4E+03	—	—	—	—
Propylbenzene, n-	103-65-1	—	—	—	—	—	—	—	6.3E+03	3.3E+03	3.3E+03	—	—	6.3E+03	3.3E+03
Propylene glycol	57-55-6	—	—	—	—	—	—	—	3.7E+02	1.9E+02	1.0E+06	1.0E+06	—	3.7E+02	1.9E+02
Propylene glycol monomethyl ether	107-98-2	—	—	—	—	—	—	—	2.3E+05	1.2E+05	5.7E+04	—	—	2.3E+05	1.2E+05
Propylene oxide	75-56-9	9.7E+01	5.0E+01	2.5E+01	—	—	9.7E+01	5.0E+01	4.6E+02	2.4E+02	—	—	—	4.6E+02	2.4E+02
Propylene tetramer	6842-15-5	—	—	—	—	—	—	—	1.5E+04	7.9E+03	8.2E+03	3.6E+04	—	1.5E+04	7.9E+03

Table 6
Tier 1 Individual Residential Soil PCLs

Last Revised: March 1, 2022

Chemical of Concern	CAS	Carcinogenic							Noncarcinogenic						
		Alr ¹ Soil _{Inh} -vp 0.5 acre source area (mg/kg)	Alr ¹ Soil _{Inh} -vp 30 acre source area (mg/kg)	Soil _{Inh} (mg/kg)	Soil _{Derm} (mg/kg)	Veg _{Inh} (mg/kg)	Alr ¹ Soil _{Inh} -v ¹ 0.5 acre source area (mg/kg)	Alr ¹ Soil _{Inh} -v ¹ 30 acre source area (mg/kg)	Alr ¹ Soil _{Inh} -vp 0.5 acre source area (mg/kg)	Alr ¹ Soil _{Inh} -vp 30 acre source area (mg/kg)	Soil _{Inh} (mg/kg)	Soil _{Derm} (mg/kg)	Veg _{Inh} (mg/kg)	Alr ¹ Soil _{Inh} -v ¹ 0.5 acre source area (mg/kg)	Alr ¹ Soil _{Inh} -v ¹ 30 acre source area (mg/kg)
Prothiofos (Tokuthion)	34643-46-4	—	—	—	—	—	—	—	—	—	8.2E+00	3.6E+01	4.9E+02	—	—
Pyrene	129-00-0	—	—	—	—	—	—	—	—	—	2.5E+03	8.2E+03	1.7E+04	—	—
Pyridine	110-86-1	—	—	—	—	—	—	—	—	—	8.2E+01	—	—	—	—
Quinoline	91-22-5	—	—	2.0E+00	6.9E+00	—	—	—	—	—	—	—	—	—	—
Ronnel	299-84-3	—	—	—	—	—	—	—	—	—	4.1E+03	1.8E+04	7.0E+03	—	—
Safrrole	94-59-7	6.7E+01	3.4E+01	2.8E+01	9.4E+01	—	6.7E+01	3.4E+01	—	—	—	—	—	—	—
Selenium	7782-49-2	—	—	—	—	—	—	—	—	—	4.1E+02	1.8E+04	1.3E+03	—	—
Selenourea	630-10-4	—	—	—	—	—	—	—	—	—	4.1E+02	—	—	—	—
Silver	7440-22-4	—	—	—	—	—	—	—	—	—	4.1E+02	7.1E+02	1.5E+02	—	—
Simazine	122-34-9	—	—	5.1E+01	1.7E+02	—	—	—	—	—	4.1E+02	1.8E+03	—	—	—
Sodium*	7440-23-5	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sodium hypochlorite	7681-52-9	—	—	—	—	—	—	—	3.0E+05	1.5E+05	1.7E+04	1.5E+05	—	—	—
Sodium polyacrylate	9003-04-7	—	—	—	—	—	—	—	1.2E+02	6.2E+01	4.1E+04	—	—	1.2E+02	6.2E+01
Strontium	7440-24-6	—	—	—	—	—	—	—	—	—	4.9E+04	4.3E+05	—	—	—
Strychnine	57-24-9	—	—	—	—	—	—	—	—	—	2.5E+01	1.1E+02	—	—	—
Styrene	100-42-5	—	—	—	—	—	—	—	1.1E+04	5.8E+03	1.6E+04	—	—	1.1E+04	5.8E+03
Sulfate*	14808-79-8	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sulfide*	18496-25-8	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sulfolane	126-33-0	—	—	—	—	—	—	—	8.6E+02	4.4E+02	1.1E+03	4.6E+03	—	8.6E+02	4.4E+02
Sulfur*	7704-34-9	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sulprofos (Bolstar)	35400-43-2	—	—	—	—	—	—	—	—	—	2.5E+02	1.1E+03	8.4E+03	—	—
Tebuconazole	107534-96-3	—	—	—	—	—	—	—	—	—	2.5E+03	1.1E+04	—	—	—
Tebuthiuron	34014-18-1	—	—	—	—	—	—	—	—	—	5.7E+03	2.5E+04	—	—	—
Terbufos	13071-79-9	—	—	—	—	—	—	—	—	—	2.0E+00	8.9E+00	—	—	—
Tert-amyl ethyl ether (TAEE)	919-94-8	—	—	—	—	—	—	—	—	—	3.3E+03	—	—	—	—
Tert-amyl-methyl ether (TAME)	994-05-8	—	—	—	—	—	—	—	—	—	3.3E+03	—	—	—	—
Tert-butyl alcohol (2-methyl-2-propanol)	75-65-0	—	—	—	—	—	—	—	—	—	7.4E+03	—	—	—	—
Tetrachlorobenzene, 1,2,3,4-	634-66-2	—	—	—	—	—	—	—	—	—	2.5E+01	1.1E+02	—	—	—
Tetrachlorobenzene, 1,2,3,5-	634-90-2	—	—	—	—	—	—	—	—	—	2.5E+01	1.1E+02	4.2E+01	—	—
Tetrachlorobenzene, 1,2,4,5-	95-94-3	—	—	—	—	—	—	—	—	—	2.5E+01	1.1E+02	—	—	—
Tetrachloroethane, 1,1,1,2-	630-20-6	9.1E+01	4.7E+01	2.3E+02	—	—	9.1E+01	4.7E+01	—	—	2.5E+03	—	—	—	—
Tetrachloroethane, 1,1,2,2-	79-34-5	—	—	3.0E+01	—	—	—	—	—	—	1.6E+03	—	—	—	—
Tetrachloroethylene [PCE]	127-18-4	9.4E+02	4.8E+02	2.9E+03	—	—	9.4E+02	4.8E+02	5.7E+03	2.9E+03	1.7E+03	—	—	5.7E+03	2.9E+03
Tetrachlorophenol, 2,3,4,5-	4901-51-3	—	—	—	—	—	—	—	—	—	2.5E+03	1.1E+04	5.0E+02	—	—
Tetrachlorophenol, 2,3,4,6-	58-90-2	—	—	—	—	—	—	—	—	—	2.5E+03	1.1E+04	2.0E+02	—	—
Tetrachlorophenol, 2,3,5,6-	935-95-5	—	—	—	—	—	—	—	—	—	2.5E+03	1.1E+04	2.3E+01	—	—
Tetrachlorvinphos (Stirophos)	22248-79-9	—	—	—	—	—	—	—	—	—	3.4E+03	1.5E+04	4.5E+04	—	—
Tetradifon	116-29-0	—	—	—	—	—	—	—	—	—	1.6E+03	7.1E+03	4.9E+03	—	—
Tetraethyl dithiopyrophosphate (sulfotep)	3689-24-5	—	—	—	—	—	—	—	—	—	4.1E+01	1.8E+02	—	—	—
Tetraethyl lead	78-00-2	—	—	—	—	—	—	—	—	—	8.2E-03	3.6E-02	—	—	—
Tetraethyl pyrophosphate (TEPP)	107-49-3	—	—	—	—	—	—	—	—	—	9.0E-01	3.9E+00	—	—	—
Tetraethylene glycol	112-60-7	—	—	—	—	—	—	—	—	—	2.7E+04	1.2E+05	—	—	—
Tetrahydrofuran	109-99-9	1.9E+02	9.7E+01	8.0E+02	—	—	1.9E+02	9.7E+01	3.1E+04	1.6E+04	7.4E+04	—	—	3.1E+04	1.6E+04
Tetrahydropyran	142-68-7	2.0E+02	1.0E+02	8.0E+02	—	—	2.0E+02	1.0E+02	—	—	1.6E+04	—	—	—	—
Tetraoxadodecane, 2,5,8,11-	112-49-2	—	—	—	—	—	—	—	—	—	2.0E+03	8.9E+03	—	—	—

Table 6
Tier 1 Individual Residential Soil PCLs

Last Revised: March 1, 2022

Chemical of Concern	CAS	Carcinogenic							Noncarcinogenic						
		Air ¹ Soil _{Inh-vp} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-vp} 30 acre source area (mg/kg)	Soil _{Inh} (mg/kg)	Soil _{Derm} (mg/kg)	Veg _{Inh} (mg/kg)	Air ¹ Soil _{Inh-v} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-v} 30 acre source area (mg/kg)	Air ¹ Soil _{Inh-vp} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-vp} 30 acre source area (mg/kg)	Soil _{Inh} (mg/kg)	Soil _{Derm} (mg/kg)	Veg _{Inh} (mg/kg)	Air ¹ Soil _{Inh-v} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-v} 30 acre source area (mg/kg)
Thallium	7440-28-0	—	—	—	—	—	—	—	—	—	5.5E+00	2.4E+02	3.7E+02	—	—
Thiofanox	39196-18-4	—	—	—	—	—	—	—	—	—	2.5E+01	1.1E+02	—	—	—
Thionazin	297-97-2	—	—	—	—	—	—	—	—	—	5.7E+00	2.5E+01	—	—	—
Thiophanate-methyl	23564-05-8	—	—	—	—	—	—	—	—	—	6.6E+03	2.8E+04	—	—	—
Thiram	137-26-8	—	—	—	—	—	—	—	—	—	4.1E+02	1.8E+03	—	—	—
Tin	7440-31-5	—	—	—	—	—	—	—	—	—	4.9E+04	2.1E+05	3.1E+05	—	—
Titanium	7440-32-6	—	—	—	—	—	—	—	—	—	4.1E+05	5.3E+05	1.0E+06	—	—
Toluene	108-88-3	—	—	—	—	—	—	—	6.3E+04	3.2E+04	6.6E+03	—	—	6.3E+04	3.2E+04
Toluene diisocyanate, 2,4/2,6-	26471-62-5	—	—	—	—	—	—	—	1.5E+02	7.5E+01	—	—	—	1.5E+02	7.5E+01
Toluenediamine, 2,4-	95-80-7	—	—	1.9E+00	6.5E+00	—	—	—	—	—	—	—	—	—	—
Toluenediamine, 2,6-	823-40-5	—	—	—	—	—	—	—	—	—	2.5E+03	1.1E+04	—	—	—
Toluidine, o-	95-53-4	1.4E+02	7.1E+01	3.8E+02	8.7E+01	—	1.4E+02	7.1E+01	—	—	—	—	—	—	—
Toluidine, p-	106-49-0	—	—	2.0E+02	1.1E+02	—	—	—	—	—	—	—	—	—	—
Toxaphene	8001-35-2	9.4E+02	4.8E+02	5.5E+00	1.9E+01	1.8E+00	9.6E+02	4.9E+02	—	—	2.5E+01	1.1E+02	1.6E+01	—	—
TPH, TX1005, C6-C12	TPH-1005-1	—	—	—	—	—	—	—	3.1E+03	1.6E+03	3.3E+03	—	—	3.1E+03	1.6E+03
TPH, TX1005, >C12-C28	TPH-1005-2	—	—	—	—	—	—	—	1.5E+04	7.8E+03	3.3E+03	1.4E+04	—	1.5E+04	7.8E+03
TPH, TX1005, >C12-C35	TPH-1005-3	—	—	—	—	—	—	—	1.5E+04	7.8E+03	3.3E+03	1.4E+04	—	1.5E+04	7.8E+03
TPH, TX1005, >C28-C35	TPH-1005-4	—	—	—	—	—	—	—	1.5E+04	7.8E+03	3.3E+03	1.4E+04	—	1.5E+04	7.8E+03
TP Silvex, 2,4,5-	93-72-1	—	—	—	—	—	—	—	—	—	6.6E+02	2.8E+03	—	—	—
Triadenol	55219-65-3	—	—	—	—	—	—	—	—	—	2.5E+03	1.1E+04	—	—	—
Triallate	2303-17-5	—	—	—	—	—	—	—	—	—	1.1E+03	4.6E+03	5.2E+02	—	—
Triaminotrinitrobenzene (TATB)	3058-38-6	—	—	—	—	—	—	—	—	—	2.5E+02	1.1E+03	—	—	—
Tributyltin oxide	56-35-9	—	—	—	—	—	—	—	—	—	2.5E+01	1.1E+02	—	—	—
Trichloro-1,2,2-trifluoroethane, 1,1,2-	76-13-1	—	—	—	—	—	—	—	7.7E+04	3.9E+04	1.0E+06	—	—	7.7E+04	3.9E+04
Trichlorobenzene, 1,2,3-	87-61-6	—	—	—	—	—	—	—	3.0E+02	1.6E+02	2.5E+02	1.1E+03	—	3.0E+02	1.6E+02
Trichlorobenzene, 1,2,4-	120-82-1	—	—	2.1E+02	7.2E+02	—	—	—	1.5E+02	7.8E+01	8.2E+02	3.6E+03	—	1.5E+02	7.8E+01
Trichlorobenzene, 1,3,5-	108-70-3	—	—	—	—	—	—	—	1.3E+02	6.5E+01	2.5E+02	1.1E+03	—	1.3E+02	6.5E+01
Trichloroethane, 1,1,1-	71-55-6	—	—	—	—	—	—	—	7.8E+04	4.0E+04	1.6E+05	—	—	7.8E+04	4.0E+04
Trichloroethane, 1,1,2-	79-00-5	2.2E+01	1.2E+01	1.1E+02	—	—	2.2E+01	1.2E+01	—	—	3.3E+02	—	—	—	—
Trichloroethylene [TCE]	79-01-6	8.7E+01	4.5E+01	1.3E+02	—	—	8.7E+01	4.5E+01	3.1E+01	1.6E+01	4.1E+01	—	—	3.1E+01	1.6E+01
Trichlorofluoromethane	75-69-4	—	—	—	—	—	—	—	—	—	2.5E+04	—	—	—	—
Trichloronate	327-98-0	—	—	—	—	—	—	—	—	—	2.5E+02	1.1E+03	4.4E+02	—	—
Trichlorophenol, 2,3,4-	15950-66-0	—	—	—	—	—	—	—	—	—	8.2E+03	3.6E+04	—	—	—
Trichlorophenol, 2,3,5-	933-78-8	—	—	—	—	—	—	—	—	—	8.2E+03	3.6E+04	—	—	—
Trichlorophenol, 2,3,6-	933-75-5	—	—	—	—	—	—	—	—	—	8.2E+03	3.6E+04	5.8E+02	—	—
Trichlorophenol, 2,4,5-	95-95-4	—	—	—	—	—	—	—	—	—	8.2E+03	3.6E+04	—	—	—
Trichlorophenol, 2,4,6-	88-06-2	2.0E+03	1.0E+03	5.5E+02	1.9E+03	—	2.0E+03	1.0E+03	—	—	8.2E+01	3.6E+02	—	—	—
Trichlorophenol, 3,4,5-	609-19-8	—	—	—	—	—	—	—	—	—	8.2E+03	3.6E+04	—	—	—
Trichlorophenoxyacetic acid, 2,4,5-	93-76-5	—	—	—	—	—	—	—	—	—	8.2E+02	3.6E+03	—	—	—
Trichloropropane, 1,1,2-	598-77-6	—	—	—	—	—	—	—	4.6E+00	2.4E+00	4.1E+02	—	—	4.6E+00	2.4E+00
Trichloropropane, 1,2,3-	96-18-4	—	—	2.0E-01	—	—	—	—	1.4E+01	7.2E+00	3.3E+02	—	—	1.4E+01	7.2E+00
Triethanolamine	102-71-6	—	—	—	—	—	—	—	3.9E+03	2.0E+03	1.6E+04	7.1E+04	—	3.9E+03	2.0E+03
Triethylamine	121-44-8	—	—	—	—	—	—	—	1.1E+02	5.5E+01	—	—	—	1.1E+02	5.5E+01
Triethylene glycol	112-27-6	—	—	—	—	—	—	—	—	—	1.6E+05	7.1E+05	—	—	—
Triethylphosphorothioate, O, O, O-	126-68-1	—	—	—	—	—	—	—	—	—	6.8E-01	3.0E+00	—	—	—

Table 6
Tier 1 Individual Residential Soil PCLs

Last Revised: March 1, 2022

Chemical of Concern	CAS	Carcinogenic							Noncarcinogenic						
		Alr ¹ Soil _{Inh-Vp} 0.5 acre source area (mg/kg)	Alr ¹ Soil _{Inh-Vp} 30 acre source area (mg/kg)	Soil _{Inh} (mg/kg)	Soil _{Derm} (mg/kg)	VegSoil _{Inh} (mg/kg)	Alr ¹ Soil _{Inh-V} 0.5 acre source area (mg/kg)	Alr ¹ Soil _{Inh-V} 30 acre source area (mg/kg)	Alr ¹ Soil _{Inh-Vp} 0.5 acre source area (mg/kg)	Alr ¹ Soil _{Inh-Vp} 30 acre source area (mg/kg)	Soil _{Inh} (mg/kg)	Soil _{Derm} (mg/kg)	VegSoil _{Inh} (mg/kg)	Alr ¹ Soil _{Inh-V} 0.5 acre source area (mg/kg)	Alr ¹ Soil _{Inh-V} 30 acre source area (mg/kg)
Trifluralin	1582-09-8	—	—	7.9E+02	2.7E+03	5.0E+02	—	—	—	—	6.1E+02	2.7E+03	7.7E+02	—	—
Trimethylamine	75-50-3	—	—	—	—	—	—	—	1.5E+02	7.6E+01	—	—	—	1.5E+02	7.6E+01
Trimethylbenzene, 1,2,3-	526-73-8	—	—	—	—	—	—	—	3.6E+03	1.9E+03	2.8E+03	—	—	3.6E+03	1.9E+03
Trimethylbenzene, 1,2,4-	95-63-6	—	—	—	—	—	—	—	4.0E+03	2.1E+03	2.8E+03	—	—	4.0E+03	2.1E+03
Trimethylbenzene, 1,3,5-	108-67-8	—	—	—	—	—	—	—	3.5E+03	1.8E+03	2.8E+03	—	—	3.5E+03	1.8E+03
Trinitrobenzene, 1,3,5-	99-35-4	—	—	—	—	—	—	—	—	—	2.5E+03	1.1E+04	—	—	—
Trinitrophenylmethyl nitramine (tetryl; nitramine)	479-45-8	—	—	—	—	—	—	—	—	—	1.6E+02	1.4E+03	—	—	—
Trinitrotoluene, 2,4,6-	118-96-7	—	—	2.0E+02	6.9E+02	—	—	—	—	—	4.1E+01	1.8E+02	—	—	—
Tungsten (as sodium tungstate dihydride)	7440-33-7	—	—	—	—	—	—	—	1.0E+06	1.0E+06	8.2E+01	7.1E+02	—	—	—
Uranium (soluble salts)	7440-61-1	—	—	—	—	—	—	—	3.9E+04	2.0E+04	2.5E+02	1.1E+04	2.9E+03	—	—
Valeric acid (pentanoic acid)	109-52-4	—	—	—	—	—	—	—	1.3E+02	6.8E+01	4.1E+04	1.8E+05	—	1.3E+02	6.8E+01
Vanadium	7440-62-2	—	—	—	—	—	—	—	2.9E+04	1.5E+04	1.5E+02	1.7E+02	2.4E+03	—	—
Vernam	1929-77-7	—	—	—	—	—	—	—	—	—	8.2E+01	3.6E+02	—	—	—
Vinyl acetate	108-05-4	—	—	—	—	—	—	—	3.1E+03	1.6E+03	8.2E+04	—	—	3.1E+03	1.6E+03
Vinyl chloride	75-01-4	4.3E+01	2.2E+01	4.0E+00	—	—	4.3E+01	2.2E+01	9.2E+02	4.7E+02	2.5E+02	—	—	9.2E+02	4.7E+02
Vinylcyclohexane	695-12-5	—	—	—	—	—	—	—	—	—	4.1E+04	—	—	—	—
Warfarin	81-81-2	—	—	—	—	—	—	—	—	—	2.5E+01	1.1E+02	—	—	—
Xylene, m-	108-38-3	—	—	—	—	—	—	—	9.4E+03	4.8E+03	1.6E+05	—	—	9.4E+03	4.8E+03
Xylene, o-	95-47-6	—	—	—	—	—	—	—	6.8E+04	3.5E+04	1.6E+05	—	—	6.8E+04	3.5E+04
Xylene, p-	106-42-3	—	—	—	—	—	—	—	9.4E+03	4.8E+03	1.6E+05	—	—	9.4E+03	4.8E+03
Xylenes	1330-20-7	—	—	—	—	—	—	—	9.4E+03	4.8E+03	1.6E+04	—	—	9.4E+03	4.8E+03
Zinc	7440-66-6	—	—	—	—	—	—	—	—	—	2.5E+04	2.1E+05	1.8E+04	—	—
6 C aliphatics (TPH) (>53% n-hexane content)	NA	—	—	—	—	—	—	—	1.0E+04	5.3E+03	4.9E+03	—	—	1.0E+04	5.3E+03
6 C aliphatics (TPH) (<53% n-hexane content)	NA	—	—	—	—	—	—	—	2.8E+05	1.5E+05	4.9E+03	—	—	2.8E+05	1.5E+05
>6-8 C aliphatics (TPH) (>53% n-hexane content)	NA	—	—	—	—	—	—	—	1.0E+04	5.3E+03	4.9E+03	—	—	1.0E+04	5.3E+03
>6-8 C aliphatics (TPH) (<53% n-hexane content)	NA	—	—	—	—	—	—	—	2.8E+05	1.5E+05	4.9E+03	—	—	2.8E+05	1.5E+05
>8-10 C aliphatics (TPH)	NA	—	—	—	—	—	—	—	7.7E+03	3.9E+03	8.2E+03	—	—	7.7E+03	3.9E+03
>10-12 C aliphatics (TPH)	NA	—	—	—	—	—	—	—	7.7E+03	3.9E+03	8.2E+03	3.6E+04	—	7.7E+03	3.9E+03
>12-16 C aliphatics (TPH)	NA	—	—	—	—	—	—	—	1.2E+04	6.2E+03	8.2E+03	3.6E+04	—	1.2E+04	6.2E+03
>16-21 C aliphatics (TPH)	NA	—	—	—	—	—	—	—	—	—	1.6E+05	7.1E+05	—	—	—
>16-21 C aliphatics (TPH) (for transformer mineral oil releases only)	NA	—	—	—	—	—	—	—	—	—	1.3E+05	7.1E+05	—	—	—

Table 6
Tier 1 Individual Residential Soil PCLs

Last Revised: March 1, 2022

Chemical of Concern	CAS	Carcinogenic							Noncarcinogenic						
		AlrSoil _{Inh-vp} 0.5 acre source area (mg/kg)	AlrSoil _{Inh-vp} 30 acre source area (mg/kg)	SoilSoil _{Ing} (mg/kg)	SoilSoil _{Derm} (mg/kg)	VegSoil _{Ing} (mg/kg)	AlrSoil _{Inh-v} ¹ 0.5 acre source area (mg/kg)	AlrSoil _{Inh-v} ¹ 30 acre source area (mg/kg)	AlrSoil _{Inh-vp} 0.5 acre source area (mg/kg)	AlrSoil _{Inh-vp} 30 acre source area (mg/kg)	SoilSoil _{Ing} (mg/kg)	SoilSoil _{Derm} (mg/kg)	VegSoil _{Ing} (mg/kg)	AlrSoil _{Inh-v} ¹ 0.5 acre source area (mg/kg)	AlrSoil _{Inh-v} ¹ 30 acre source area (mg/kg)
>21-35 C aliphatics (TPH)	NA	—	—	—	—	—	—	—	—	—	1.6E+05	5.7E+05	—	—	—
>21-35 C aliphatics (TPH) (for transformer mineral oil releases only)	NA	—	—	—	—	—	—	—	—	—	1.3E+05	5.7E+05	—	—	—
>7-8 C aromatics (TPH)	NA	—	—	—	—	—	—	—	2.9E+04	1.5E+04	8.2E+03	—	—	2.9E+04	1.5E+04
>8-10 C aromatics (TPH)	NA	—	—	—	—	—	—	—	3.1E+03	1.6E+03	3.3E+03	—	—	3.1E+03	1.6E+03
>10-12 C aromatics (TPH)	NA	—	—	—	—	—	—	—	6.6E+03	3.4E+03	3.3E+03	1.4E+04	—	6.6E+03	3.4E+03
>12-16 C aromatics (TPH)	NA	—	—	—	—	—	—	—	1.5E+04	7.8E+03	3.3E+03	1.4E+04	—	1.5E+04	7.8E+03
>16-21 C aromatics (TPH)	NA	—	—	—	—	—	—	—	—	—	2.5E+03	1.1E+04	—	—	—
>21-35 C aromatics (TPH)	NA	—	—	—	—	—	—	—	—	—	2.5E+03	1.1E+04	—	—	—
Footnotes															
1 For subsurface soils only															
2 Site-specific PCLs for mercury may vary based on the pH-dependent Kd value (see Figure:30 TAC §350.73(f)(1)(C)).															
* These compounds are not necessarily of concern from a human health standpoint, therefore calculation of human health-based values is not required. However, aesthetics and ecological criteria would still apply. See table entitled "Compounds for which Calculation of a Human Health PCL is Not Required" available on the TCEQ website at http://www.tceq.state.tx.us/remediation/trrp/trrp.html .															
NA = not applicable															
All values capped at 1E+06															

This table shows individual residential soil protective concentration levels with both carcinogenic and non-carcinogenic values depicted
end of worksheet

Table 7
Tier 1 Individual Commercial/Industrial Soil PCLs

Last Revised: March 1, 2022

Chemical of Concern	CAS	Carcinogenic						Noncarcinogenic					
		Air ¹ Soil _{Inh-vp} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-vp} 30 acre source area (mg/kg)	Soil _{Inh} (mg/kg)	Soil _{Derm} (mg/kg)	Air ¹ Soil _{Inh-v} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-v} 30 acre source area (mg/kg)	Air ¹ Soil _{Inh-vp} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-vp} 30 acre source area (mg/kg)	Soil _{Inh} (mg/kg)	Soil _{Derm} (mg/kg)	Air ¹ Soil _{Inh-v} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-v} 30 acre source area (mg/kg)
Acenaphthene	83-32-9	—	—	—	—	—	—	—	—	6.1E+04	9.4E+04	—	—
Acenaphthylene	208-96-8	—	—	—	—	—	—	—	—	6.1E+04	9.4E+04	—	—
Acetaldehyde	75-07-0	2.9E+02	1.5E+02	—	—	2.9E+02	1.5E+02	2.0E+02	1.0E+02	1.0E+05	—	2.0E+02	1.0E+02
Acetate, 2-ethoxyethanol	111-15-9	—	—	—	—	—	—	8.4E+03	4.3E+03	1.0E+05	—	8.4E+03	4.3E+03
Acetate, isoamyl	123-92-2	—	—	—	—	—	—	—	—	7.4E+04	—	—	—
Acetate, isobutyl	110-19-0	—	—	—	—	—	—	—	—	4.9E+04	—	—	—
Acetate, sec-butyl	105-46-4	—	—	—	—	—	—	—	—	4.9E+04	—	—	—
Acetic acid*	64-19-7	—	—	—	—	—	—	—	—	—	—	—	—
Acetone (2-propanone)	67-64-1	—	—	—	—	—	—	8.4E+05	4.3E+05	9.2E+05	—	8.4E+05	4.3E+05
Acetone cyanohydrin	75-86-5	—	—	—	—	—	—	6.1E+03	3.1E+03	3.1E+03	6.1E+03	6.1E+03	3.1E+03
Acetonitrile	75-05-8	—	—	—	—	—	—	1.8E+03	9.4E+02	3.3E+04	—	1.8E+03	9.4E+02
Acetophenone	98-86-2	—	—	—	—	—	—	—	—	1.0E+05	2.0E+05	—	—
Acetylaminofluorene, 2-	53-96-3	3.1E+01	1.6E+01	7.5E+00	1.5E+01	3.1E+01	1.6E+01	—	—	—	—	—	—
Acifluorfen, sodium	62476-59-9	—	—	—	—	—	—	—	—	1.3E+04	2.7E+04	—	—
Acridine	260-94-6	—	—	—	—	—	—	—	—	3.1E+03	6.1E+03	—	—
Acrolein	107-02-8	—	—	—	—	—	—	2.1E+02	1.1E+02	5.1E+02	—	2.1E+02	1.1E+02
Acrylamide	79-06-1	4.7E+01	2.4E+01	5.7E+01	1.1E+02	4.7E+01	2.4E+01	1.0E+03	5.2E+02	2.0E+03	4.1E+03	1.0E+03	5.2E+02
Acrylic acid	79-10-7	—	—	—	—	—	—	1.7E+02	8.7E+01	5.1E+05	—	1.7E+02	8.7E+01
Acrylonitrile	107-13-1	8.8E+00	4.6E+00	5.3E+01	—	8.8E+00	4.6E+00	4.3E+01	2.2E+01	1.0E+03	—	4.3E+01	2.2E+01
Adipic acid (hexanedioic acid)	124-04-9	—	—	—	—	—	—	—	—	1.0E+06	1.0E+06	—	—
Alachlor	15972-60-8	—	—	3.6E+02	7.2E+02	—	—	—	—	1.0E+04	2.0E+04	—	—
Aldicarb	116-06-3	—	—	—	—	—	—	—	—	1.0E+03	2.0E+03	—	—
Aldicarb sulfone	1646-88-4	—	—	—	—	—	—	—	—	1.0E+03	2.0E+03	—	—
Aldrin	309-00-2	1.4E+01	7.2E+00	1.7E+00	3.4E+00	1.4E+01	7.2E+00	—	—	3.1E+01	6.1E+01	—	—
Allyl alcohol	107-18-6	—	—	—	—	—	—	8.0E+00	4.1E+00	5.1E+03	—	8.0E+00	4.1E+00
Allyl chloride	107-05-1	—	—	—	—	—	—	2.1E+01	1.1E+01	1.0E+04	—	2.1E+01	1.1E+01
Aluminum	7429-90-5	—	—	—	—	—	—	1.0E+06	1.0E+06	1.0E+06	1.0E+06	—	—
Ametryn	834-12-8	—	—	—	—	—	—	—	—	9.2E+03	1.8E+04	—	—
Amino-2,6-dinitrotoluene, 4-	19406-51-0	—	—	9.5E+02	1.9E+03	—	—	—	—	5.1E+02	1.0E+03	—	—
Amino-4,6-dinitrotoluene, 2-	35572-78-2	—	—	9.5E+02	1.9E+03	—	—	—	—	5.1E+02	1.0E+03	—	—
Aminobiphenyl, 4- (1,1-biphenyl-4-amine)	92-67-1	—	—	4.7E+00	9.4E+00	—	—	—	—	—	—	—	—
Aminopyridine, 4-	504-24-5	—	—	—	—	—	—	—	—	2.0E+01	4.1E+01	—	—
Ammonia	7664-41-7	—	—	—	—	—	—	6.9E+03	3.5E+03	—	—	6.9E+03	3.5E+03
Ammonium polyphosphate*	6833-79-9	—	—	—	—	—	—	—	—	—	—	—	—
Ammonium salts*	AMMONIUM	—	—	—	—	—	—	—	—	—	—	—	—
Aniline	62-53-3	—	—	5.0E+03	1.0E+04	—	—	1.8E+02	9.4E+01	7.2E+03	1.4E+04	1.8E+02	9.4E+01
Anthracene	120-12-7	—	—	—	—	—	—	—	—	3.1E+05	4.7E+05	—	—
Anthraquinone, 9,10-	84-65-1	—	—	7.3E+02	1.5E+03	—	—	—	—	2.0E+04	4.1E+04	—	—
Antimony	7440-36-0	—	—	—	—	—	—	—	—	4.1E+02	1.2E+03	—	—

Table 7
Tier 1 Individual Commercial/Industrial Soil PCLs

Last Revised: March 1, 2022

Chemical of Concern	CAS	Carcinogenic						Noncarcinogenic					
		Air ¹ Soil _{Inh-vp} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-vp} 30 acre source area (mg/kg)	Soil _{Ing} (mg/kg)	Soil _{Derm} (mg/kg)	Air ¹ Soil _{Inh-v} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-v} 30 acre source area (mg/kg)	Air ¹ Soil _{Inh-vp} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-vp} 30 acre source area (mg/kg)	Soil _{Ing} (mg/kg)	Soil _{Derm} (mg/kg)	Air ¹ Soil _{Inh-v} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-v} 30 acre source area (mg/kg)
Aramite	140-57-8	1.0E+06	1.0E+06	1.1E+03	2.3E+03	—	—	—	—	5.1E+04	1.0E+05	—	—
Arsenic	7440-38-2	2.5E+05	1.3E+05	2.4E+02	1.3E+03	—	—	—	—	3.9E+02	2.0E+03	—	—
Arsine	7784-42-1	—	—	—	—	—	—	1.1E+00	5.5E-01	—	—	1.1E+00	5.5E-01
Atrazine	1912-24-9	—	—	1.3E+02	2.6E+02	—	—	—	—	3.6E+04	7.2E+04	—	—
Azinphos-methyl (guthion)	86-50-0	—	—	—	—	—	—	—	—	1.5E+03	3.1E+03	—	—
Azobenzene	103-33-3	2.3E+03	1.2E+03	2.6E+02	5.2E+02	2.3E+03	1.2E+03	—	—	—	—	—	—
Barium	7440-39-3	—	—	—	—	—	—	—	—	2.0E+05	2.9E+05	—	—
Bayleton	43121-43-3	—	—	—	—	—	—	—	—	3.1E+04	6.1E+04	—	—
Benefin (benfluralin)	1861-40-1	—	—	—	—	—	—	—	—	3.1E+05	6.1E+05	—	—
Benomyl	17804-35-2	—	—	—	—	—	—	—	—	5.1E+04	1.0E+05	—	—
Benz-a-anthracene	56-55-3	9.1E+03	4.7E+03	2.9E+02	4.4E+02	9.2E+03	4.7E+03	—	—	—	—	—	—
Benzaldehyde	100-52-7	—	—	—	—	—	—	—	—	1.0E+05	—	—	—
Benzene	71-43-2	2.7E+02	1.4E+02	1.9E+03	—	2.7E+02	1.4E+02	6.0E+03	3.1E+03	4.1E+03	—	6.0E+03	3.1E+03
Benzenedicarbonitrile, 1,3-	626-17-5	—	—	—	—	—	—	—	—	6.1E+03	1.2E+04	—	—
Benzenedicarboxylic acid, 1,2-disodecyl ester	26761-40-0	—	—	—	—	—	—	1.0E+06	1.0E+06	4.1E+04	8.2E+04	1.0E+06	1.0E+06
Benzenethiol	108-98-5	—	—	—	—	—	—	—	—	1.0E+03	—	—	—
Benzidine	92-87-5	1.1E-01	5.4E-02	1.2E-01	2.5E-01	1.1E-01	5.4E-02	—	—	3.1E+03	6.1E+03	—	—
Benzo-a-pyrene	50-32-8	2.0E+03	1.0E+03	2.9E+01	4.4E+01	2.1E+03	1.1E+03	8.7E+01	4.5E+01	3.1E+02	4.7E+02	8.9E+01	4.6E+01
Benzo-b-fluoranthene	205-99-2	1.5E+04	7.6E+03	2.9E+02	4.4E+02	1.5E+04	7.8E+03	—	—	—	—	—	—
Benzo-e-pyrene	192-97-2	—	—	—	—	—	—	—	—	3.1E+04	4.7E+04	—	—
Benzo-g,h,i-perylene	191-24-2	—	—	—	—	—	—	—	—	3.1E+04	4.7E+04	—	—
Benzoic acid	65-85-0	—	—	—	—	—	—	—	—	1.0E+06	1.0E+06	—	—
Benzo-j-fluoranthene	205-82-3	7.8E+03	4.0E+03	2.9E+02	4.4E+02	7.9E+03	4.1E+03	—	—	—	—	—	—
Benzo-k-fluoranthene	207-08-9	3.5E+05	1.8E+05	2.9E+03	4.4E+03	3.8E+05	1.9E+05	—	—	—	—	—	—
Benzophenone	119-61-9	—	—	—	—	—	—	—	—	6.8E+03	1.4E+04	—	—
Benzotrichloride	98-07-7	—	—	2.2E+00	4.4E+00	—	—	—	—	—	—	—	—
Benzoyl peroxide	94-36-0	—	—	—	—	—	—	—	—	5.1E+04	1.0E+05	—	—
Benzyl alcohol	100-51-6	—	—	—	—	—	—	—	—	1.0E+05	2.0E+05	—	—
Benzyl chloride	100-44-7	—	—	1.7E+02	—	—	—	4.3E+01	2.2E+01	2.0E+03	—	4.3E+01	2.2E+01
Benzyl dichloride	98-87-3	—	—	1.7E+02	3.4E+02	—	—	7.7E+01	4.0E+01	2.0E+03	4.1E+03	7.7E+01	4.0E+01
Beryllium	7440-41-7	1.6E+04	8.1E+03	—	—	—	—	2.7E+04	1.4E+04	2.0E+03	2.9E+02	—	—
Biphenyl, 1,1'-	92-52-4	—	—	—	—	—	—	—	—	5.1E+05	1.0E+05	—	—
Biphenyl, 1,1', 2-phenoxy-	6738-04-1	—	—	—	—	—	—	—	—	5.1E+04	1.0E+05	—	—
Biquinoline, 2,2'-	119-91-5	—	—	—	—	—	—	—	—	3.1E+03	6.1E+03	—	—
Bis (2-chloroethoxy) methane	111-91-1	1.9E+01	9.8E+00	2.6E+01	5.2E+01	1.9E+01	9.8E+00	—	—	3.1E+03	6.1E+03	—	—
Bis (2-chloroethyl) ether	111-44-4	6.0E+00	3.1E+00	2.6E+01	—	6.0E+00	3.1E+00	—	—	—	—	—	—
Bis (2-chloro-1-methylethyl) ether	108-60-1	3.5E+02	1.8E+02	4.1E+02	8.2E+02	3.5E+02	1.8E+02	—	—	4.1E+04	8.2E+04	—	—
Bis (2-chloromethyl) ether	542-88-1	9.7E-03	5.0E-03	1.3E-01	—	9.7E-03	5.0E-03	—	—	—	—	—	—
Bis (2-ethyl-hexyl) phthalate	117-81-7	—	—	2.0E+03	7.8E+02	—	—	—	—	2.0E+04	7.8E+03	—	—

Table 7
Tier 1 Individual Commercial/Industrial Soil PCLs

Last Revised: March 1, 2022

Chemical of Concern	CAS	Carcinogenic						Noncarcinogenic					
		Air ¹ Soil _{Inh-vp} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-vp} 30 acre source area (mg/kg)	Soil _{Ing} (mg/kg)	Soil _{Derm} (mg/kg)	Air ¹ Soil _{Inh-v} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-v} 30 acre source area (mg/kg)	Air ¹ Soil _{Inh-vp} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-vp} 30 acre source area (mg/kg)	Soil _{Ing} (mg/kg)	Soil _{Derm} (mg/kg)	Air ¹ Soil _{Inh-v} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-v} 30 acre source area (mg/kg)
Bismuth	7440-69-9	—	—	—	—	—	—	—	—	5.1E+05	1.0E+06	—	—
Bisphenol A	80-05-7	—	—	—	—	—	—	—	—	5.1E+04	1.0E+05	—	—
Boron	7440-42-8	—	—	—	—	—	—	1.0E+06	1.0E+06	2.0E+05	1.0E+06	—	—
Bromacil	314-40-9	—	—	—	—	—	—	—	—	1.0E+05	2.0E+05	—	—
Bromo-2-chloroethane, 1-	107-04-0	—	—	—	—	—	—	—	—	4.1E+04	—	—	—
Bromobenzene	108-86-1	—	—	—	—	—	—	1.4E+03	7.0E+02	8.2E+03	—	1.4E+03	7.0E+02
Bromodichloromethane	75-27-4	—	—	4.6E+02	—	—	—	—	—	8.2E+03	—	—	—
Bromoform	75-25-2	1.4E+03	7.2E+02	3.6E+03	—	1.4E+03	7.2E+02	—	—	2.0E+04	—	—	—
Bromomethane	74-83-9	—	—	—	—	—	—	8.4E+01	4.3E+01	1.4E+03	—	8.4E+01	4.3E+01
Bromophenyl phenylether, 4-	101-55-3	1.6E+01	8.4E+00	1.9E+00	3.8E+00	1.6E+01	8.4E+00	—	—	—	—	—	—
Butadiene, 1,3-	106-99-0	1.2E+03	6.2E+02	—	—	1.2E+03	6.2E+02	7.1E+02	3.6E+02	—	—	7.1E+02	3.6E+02
Butadiene, 2-methyl-1,3- (isoprene)	78-79-5	—	—	—	—	—	—	3.9E+05	2.0E+05	6.1E+04	—	3.9E+05	2.0E+05
Butanal (butyraldehyde)	123-72-8	—	—	—	—	—	—	2.1E+03	1.1E+03	6.1E+04	—	2.1E+03	1.1E+03
Butane, 2,3-dimethyl-	79-29-8	—	—	—	—	—	—	3.9E+05	2.0E+05	6.1E+04	—	3.9E+05	2.0E+05
Butanoic acid (butyric acid)	107-92-6	—	—	—	—	—	—	1.8E+02	9.3E+01	5.1E+05	1.0E+06	1.8E+02	9.3E+01
Butanol, 2-	78-92-2	—	—	—	—	—	—	1.0E+06	1.0E+06	1.0E+06	—	1.0E+06	1.0E+06
Butanol, 2-methyl-1-	137-32-6	—	—	—	—	—	—	—	—	1.0E+04	—	—	—
Butanol, 2-methyl-2-	75-85-4	—	—	—	—	—	—	—	—	1.0E+04	—	—	—
Butanol, n-	71-36-3	—	—	—	—	—	—	—	—	1.0E+05	—	—	—
Butene, 1-	106-98-9	—	—	—	—	—	—	1.1E+05	5.9E+04	6.1E+04	—	1.1E+05	5.9E+04
Butene, cis-2-	590-18-1	—	—	—	—	—	—	3.4E+04	1.8E+04	6.1E+04	—	3.4E+04	1.8E+04
Butene, trans-2-	624-64-6	—	—	—	—	—	—	3.4E+04	1.8E+04	6.1E+04	—	3.4E+04	1.8E+04
Butoxy ethanol, 2- (Ethylene glycol monobutyl ether; EGBE)	111-76-2	—	—	—	—	—	—	4.1E+05	2.1E+05	1.0E+05	2.0E+05	4.1E+05	2.1E+05
Butyl acetate	123-86-4	—	—	—	—	—	—	1.2E+05	6.0E+04	1.4E+05	—	1.2E+05	6.0E+04
Butyl acrylate	141-32-2	—	—	—	—	—	—	—	—	9.2E+03	—	—	—
Butyl benzyl phthalate	85-68-7	—	—	1.5E+04	3.0E+04	—	—	—	—	2.0E+05	4.1E+05	—	—
Butyl ether, n- (dibutyl ether)	142-96-1	—	—	—	—	—	—	—	—	1.0E+05	—	—	—
Butyl methacrylate	97-88-1	—	—	—	—	—	—	—	—	9.2E+04	3.7E+04	—	—
Butylate	2008-41-5	—	—	—	—	—	—	—	—	5.1E+04	1.0E+05	—	—
Butylbenzene, n-	104-51-8	—	—	—	—	—	—	—	—	5.1E+04	1.0E+05	—	—
Butylbenzene, sec-	135-98-8	—	—	—	—	—	—	—	—	4.1E+04	—	—	—
Butylbenzene, tert-	98-06-6	—	—	—	—	—	—	—	—	4.1E+04	—	—	—
Cacodylic acid	75-60-5	—	—	—	—	—	—	—	—	3.1E+03	6.1E+03	—	—
Cadmium	7440-43-9	7.7E+04	4.0E+04	—	—	—	—	1.5E+04	7.7E+03	1.0E+03	5.1E+03	—	—
Calcium*	7440-70-2	—	—	—	—	—	—	—	—	—	—	—	—
Caprolactam	105-60-2	—	—	—	—	—	—	—	—	5.1E+05	1.0E+06	—	—
Captan	133-06-2	—	—	8.2E+03	1.6E+04	—	—	—	—	1.3E+05	2.7E+05	—	—
Carbaryl	63-25-2	—	—	—	—	—	—	—	—	1.0E+05	2.0E+05	—	—
Carbazole	86-74-8	—	—	1.4E+03	2.9E+03	—	—	—	—	—	—	—	—

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Last Revised: March 1, 2022

Chemical of Concern	CAS	Carcinogenic						Noncarcinogenic					
		Air ¹ Soil _{Inh-vp} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-vp} 30 acre source area (mg/kg)	Soil _{Ing} (mg/kg)	Soil _{Derm} (mg/kg)	Air ¹ Soil _{Inh-v} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-v} 30 acre source area (mg/kg)	Air ¹ Soil _{Inh-vp} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-vp} 30 acre source area (mg/kg)	Soil _{Ing} (mg/kg)	Soil _{Derm} (mg/kg)	Air ¹ Soil _{Inh-v} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-v} 30 acre source area (mg/kg)
Carbofuran	1563-66-2	—	—	—	—	—	—	—	—	5.1E+03	1.0E+04	—	—
Carbon disulfide	75-15-0	—	—	—	—	—	—	1.5E+04	7.7E+03	1.0E+05	—	1.5E+04	7.7E+03
Carbon tetrachloride	56-23-5	1.0E+02	5.2E+01	4.1E+02	—	1.0E+02	5.2E+01	2.1E+03	1.1E+03	4.1E+03	—	2.1E+03	1.1E+03
Carbophenothion	786-19-6	—	—	—	—	—	—	—	—	1.3E+04	2.7E+04	—	—
Carbosulfan	55285-14-8	—	—	—	—	—	—	—	—	1.0E+04	2.0E+04	—	—
Carboxin	5234-68-4	—	—	—	—	—	—	—	—	1.0E+05	2.0E+05	—	—
Chloral	75-87-6	—	—	—	—	—	—	—	—	1.0E+05	—	—	—
Chloral hydrate (1,1-ethanediol, 2,2,2-trichloro-)	302-17-0	—	—	—	—	—	—	—	—	1.0E+05	2.0E+05	—	—
Chloramben (amiben; 3-amino-2,5-dichlorobenzoic acid)	133-90-4	—	—	—	—	—	—	—	—	1.5E+04	3.1E+04	—	—
Chlordane (technical)	12789-03-6	2.1E+03	1.1E+03	8.2E+01	4.1E+02	2.1E+03	1.1E+03	5.2E+03	2.7E+03	5.1E+02	2.6E+03	5.2E+03	2.7E+03
Chlordane, cis- (alpha chlordane)	5103-71-9	6.8E+03	3.5E+03	8.2E+01	1.6E+02	6.9E+03	3.5E+03	1.7E+04	8.7E+03	5.1E+02	1.0E+03	1.7E+04	8.9E+03
Chlordane, trans- (gamma chlordane)	5103-74-2	1.6E+03	8.3E+02	8.2E+01	1.6E+02	1.6E+03	8.4E+02	4.0E+03	2.1E+03	5.1E+02	1.0E+03	4.1E+03	2.1E+03
Chlorfenvinphos	470-90-6	—	—	—	—	—	—	4.3E+01	2.2E+01	7.2E+02	1.4E+03	4.3E+01	2.2E+01
Chloride*	16887-00-6	—	—	—	—	—	—	—	—	—	—	—	—
Chlorine	7782-50-5	—	—	—	—	—	—	1.9E+02	9.6E+01	1.0E+05	4.1E+05	1.9E+02	9.6E+01
Chloro-1,3-butadiene, 2-	126-99-8	2.0E+00	1.0E+00	—	—	2.0E+00	1.0E+00	4.3E+02	2.2E+02	—	—	4.3E+02	2.2E+02
Chloro-2-propanol, 1-	127-00-4	—	—	—	—	—	—	—	—	2.0E+04	—	—	—
Chloro-3-methylphenol, 4-	59-50-7	—	—	—	—	—	—	—	—	5.1E+03	1.0E+04	—	—
Chloroaniline, p-	106-47-8	—	—	1.4E+02	2.9E+02	—	—	—	—	4.1E+03	8.2E+03	—	—
Chlorobenzene	108-90-7	—	—	—	—	—	—	1.1E+03	5.5E+02	2.0E+04	—	1.1E+03	5.5E+02
Chlorobenzilate	510-15-6	5.9E+02	3.0E+02	1.1E+02	2.1E+02	5.9E+02	3.0E+02	—	—	2.0E+04	4.1E+04	—	—
Chlorobromomethane (bromochloromethane)	74-97-5	—	—	—	—	—	—	—	—	4.1E+04	—	—	—
Chlorodifluoromethane	75-45-6	—	—	—	—	—	—	1.0E+06	5.5E+05	—	—	1.0E+06	5.5E+05
Chloroethane (ethyl chloride)	75-00-3	—	—	—	—	—	—	2.1E+05	1.1E+05	4.1E+05	—	2.1E+05	1.1E+05
Chloroethanol, 2-	107-07-3	—	—	—	—	—	—	—	—	2.0E+04	—	—	—
Chloroethoxy ethene, 2- (2-chloroethylvinylether)	110-75-8	—	—	2.6E+01	—	—	—	6.4E+00	3.3E+00	2.0E+03	—	6.4E+00	3.3E+00
Chloroform	67-66-3	2.6E+01	1.3E+01	—	—	2.6E+01	1.3E+01	2.1E+03	1.1E+03	1.0E+04	—	2.1E+03	1.1E+03
Chlorohexane, 1-	544-10-5	—	—	—	—	—	—	2.1E+04	1.1E+04	4.1E+04	—	2.1E+04	1.1E+04
Chloromethane (methyl chloride)	74-87-3	3.3E+02	1.7E+02	2.2E+03	—	3.3E+02	1.7E+02	1.9E+03	9.9E+02	3.7E+03	—	1.9E+03	9.9E+02
Chloronaphthalene, 1- (Chloronaphthalene, alpha-)	90-13-1	—	—	—	—	—	—	—	—	8.2E+04	1.3E+05	—	—
Chloronaphthalene, 2- (chloronaphthalene, beta)	91-58-7	—	—	—	—	—	—	—	—	8.2E+04	1.3E+05	—	—
Chloronitrobenzene, p- (1-chloro-4-nitrobenzene)	100-00-5	—	—	4.5E+03	9.1E+03	—	—	8.8E+01	4.5E+01	1.0E+03	2.0E+03	8.8E+01	4.5E+01
Chlorophenol, 2-	95-57-8	—	—	—	—	—	—	—	—	5.1E+03	—	—	—
Chlorophenol, 3-	108-43-0	—	—	—	—	—	—	—	—	5.1E+03	1.0E+04	—	—
Chlorophenol, 4-	106-48-9	—	—	—	—	—	—	—	—	5.1E+03	1.0E+04	—	—
Chlorophenyl phenylether, 4-	7005-72-3	4.2E+00	2.2E+00	1.9E+00	3.8E+00	4.2E+00	2.2E+00	—	—	—	—	—	—
Chloropropane, 2-	75-29-6	—	—	—	—	—	—	2.1E+03	1.1E+03	3.1E+04	—	2.1E+03	1.1E+03
Chlorothalonil	1897-45-6	—	—	2.6E+03	5.2E+03	—	—	—	—	1.5E+04	3.1E+04	—	—
Chlorotoluene, o- (2-chlorotoluene)	95-49-8	—	—	—	—	—	—	1.8E+04	9.5E+03	2.0E+04	4.1E+04	1.8E+04	9.5E+03

Table 7
Tier 1 Individual Commercial/Industrial Soil PCLs

Last Revised: March 1, 2022

Chemical of Concern	CAS	Carcinogenic						Noncarcinogenic					
		Air ¹ Soil _{Inh-vp} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-vp} 30 acre source area (mg/kg)	Soil _{Inh} (mg/kg)	Soil _{Derm} (mg/kg)	Air ¹ Soil _{Inh-V} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-V} 30 acre source area (mg/kg)	Air ¹ Soil _{Inh-vp} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-vp} 30 acre source area (mg/kg)	Soil _{Inh} (mg/kg)	Soil _{Derm} (mg/kg)	Air ¹ Soil _{Inh-V} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-V} 30 acre source area (mg/kg)
Chlorotoluene, p- (4-chlorotoluene)	106-43-4	—	—	—	—	—	—	—	—	2.0E+04	—	—	—
Chlorpyrifos	2921-88-2	—	—	—	—	—	—	—	—	3.1E+03	6.1E+03	—	—
Chromium (III)	16065-83-1	—	—	—	—	—	—	1.9E+05	9.8E+04	1.0E+06	4.0E+05	—	—
Chromium (total)	7440-47-3	—	—	—	—	—	—	1.9E+05	9.8E+04	1.0E+06	4.0E+05	—	—
Chromium (VI)	18540-29-9	1.6E+04	8.5E+03	—	—	—	—	3.0E+05	1.5E+05	3.2E+03	1.5E+03	—	—
Chrysene	218-01-9	1.0E+06	7.3E+05	2.9E+04	4.4E+04	1.0E+06	7.5E+05	—	—	—	—	—	—
Cobalt	7440-48-4	6.3E+03	3.3E+03	—	—	—	—	8.5E+04	4.4E+04	1.0E+04	2.0E+05	—	—
Copolymer acrylamide	69418-26-4	—	—	—	—	—	—	—	—	2.0E+02	4.1E+02	—	—
Copper	7440-50-8	—	—	—	—	—	—	—	—	9.9E+04	1.0E+06	—	—
Coronene	191-07-1	—	—	—	—	—	—	—	—	2.0E+03	4.1E+03	—	—
Coumaphos	56-72-4	—	—	—	—	—	—	—	—	7.2E+03	1.4E+04	—	—
Cresol	1319-77-3	—	—	—	—	—	—	—	—	5.1E+04	1.0E+05	—	—
Cresol, m- (3-methylphenol)	108-39-4	—	—	—	—	—	—	—	—	5.1E+04	1.0E+05	—	—
Cresol, o- (2-methylphenol)	95-48-7	—	—	—	—	—	—	—	—	5.1E+04	1.0E+05	—	—
Cresol, p- (4-methylphenol)	106-44-5	—	—	—	—	—	—	—	—	5.1E+03	1.0E+04	—	—
Crotonaldehyde	123-73-9	—	—	1.5E+01	—	—	—	—	—	1.0E+03	—	—	—
Cumene (isopropylbenzene)	98-82-8	—	—	—	—	—	—	1.3E+04	6.7E+03	1.0E+05	—	1.3E+04	6.7E+03
Cyanazine	21725-46-2	—	—	3.4E+01	6.8E+01	—	—	—	—	2.0E+03	4.1E+03	—	—
Cyanide	57-12-5	—	—	—	—	—	—	1.0E+03	5.2E+02	6.1E+02	1.2E+04	1.0E+03	5.2E+02
Cyanogen	460-19-5	—	—	—	—	—	—	1.7E+01	8.8E+00	1.0E+03	—	1.7E+01	8.8E+00
Cycloate	1134-23-2	—	—	—	—	—	—	—	—	5.6E+04	1.1E+05	—	—
Cyclohexane	110-82-7	—	—	—	—	—	—	1.3E+05	6.6E+04	1.0E+06	—	1.3E+05	6.6E+04
Cyclohexanol	108-93-0	—	—	—	—	—	—	—	—	1.0E+06	1.0E+06	—	—
Cyclohexanone	108-94-1	—	—	—	—	—	—	4.9E+04	2.5E+04	1.0E+06	—	4.9E+04	2.5E+04
Cyclohexene, 1-methanol-3-	1679-51-2	—	—	—	—	—	—	—	—	2.0E+04	4.1E+04	—	—
Cyclohexene, 4-vinyl-1-	100-40-3	—	—	—	—	—	—	7.1E+03	3.6E+03	2.2E+04	—	7.1E+03	3.6E+03
Cyclopentane	287-92-3	—	—	—	—	—	—	5.2E+05	2.7E+05	6.1E+04	—	5.2E+05	2.7E+05
Cyclopentane, methyl-	96-37-7	—	—	—	—	—	—	2.1E+04	1.1E+04	1.0E+05	—	2.1E+04	1.1E+04
Cyclopentene	142-29-0	—	—	—	—	—	—	—	—	1.0E+06	—	—	—
Cyclotetramethylenetetranitramine (HMX)	2691-41-0	—	—	—	—	—	—	—	—	5.1E+04	1.5E+04	—	—
Cyclotrimethylenetrinitramine (RDX)	121-82-4	—	—	3.6E+02	7.2E+02	—	—	—	—	4.1E+03	8.2E+03	—	—
Cymene (isopropyltoluene)	99-87-6	—	—	—	—	—	—	—	—	1.0E+05	—	—	—
Cymoxanil	57966-95-7	—	—	—	—	—	—	—	—	1.3E+04	2.7E+04	—	—
Dacthal (DCPA)	1861-32-1	—	—	—	—	—	—	—	—	1.0E+04	2.0E+04	—	—
Dalapon, sodium salt (2,2-dichloropropanoic acid)	75-99-0	—	—	—	—	—	—	—	—	3.1E+04	6.1E+04	—	—
DDD	72-54-8	—	—	1.2E+02	7.9E+02	—	—	—	—	—	—	—	—
DDE	72-55-9	—	—	8.4E+01	5.6E+02	—	—	—	—	—	—	—	—
DDT	50-29-3	2.0E+03	1.0E+03	8.4E+01	5.6E+02	2.0E+03	1.0E+03	—	—	5.1E+02	3.4E+03	—	—
Demeton	8065-48-3	—	—	—	—	—	—	—	—	4.1E+01	8.2E+01	—	—

Table 7
Tier 1 Individual Commercial/Industrial Soil PCLs

Last Revised: March 1, 2022

Chemical of Concern	CAS	Carcinogenic						Noncarcinogenic					
		Air ¹ Soil _{Inh-vp} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-vp} 30 acre source area (mg/kg)	Soil _{Ing} (mg/kg)	Soil _{Derm} (mg/kg)	Air ¹ Soil _{Inh-v} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-v} 30 acre source area (mg/kg)	Air ¹ Soil _{Inh-vp} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-vp} 30 acre source area (mg/kg)	Soil _{Ing} (mg/kg)	Soil _{Derm} (mg/kg)	Air ¹ Soil _{Inh-v} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-v} 30 acre source area (mg/kg)
Desethylatrazine	6190-65-4	—	—	—	—	—	—	—	—	3.6E+04	7.2E+04	—	—
Diacetone alcohol (4-hydroxy-4-methyl-2-pentanone)	123-42-2	—	—	—	—	—	—	—	—	4.1E+04	8.2E+04	—	—
Diallate	2303-16-4	—	—	4.7E+02	9.4E+02	—	—	—	—	—	—	—	—
Diazinon	333-41-5	—	—	—	—	—	—	9.1E+01	4.7E+01	9.2E+02	1.8E+03	9.1E+01	4.7E+01
Dibenz(a,h)acridine	226-36-8	2.4E+04	1.2E+04	2.4E+01	4.8E+01	2.6E+04	1.3E+04	—	—	—	—	—	—
Dibenz(a,j)acridine	224-42-0	3.3E+04	1.7E+04	3.9E+01	6.0E+01	3.5E+04	1.8E+04	—	—	—	—	—	—
Dibenz-a,h-anthracene	53-70-3	4.5E+03	2.3E+03	2.9E+01	4.4E+01	4.8E+03	2.5E+03	—	—	—	—	—	—
Dibenzo(a,e)pyrene	192-65-4	9.5E+03	4.9E+03	3.9E+00	7.8E+00	1.2E+04	6.2E+03	—	—	—	—	—	—
Dibenzo(a,h)pyrene	189-64-0	9.2E+02	4.7E+02	3.9E-01	7.8E-01	1.2E+03	6.0E+02	—	—	—	—	—	—
Dibenzo(a,i)pyrene	189-55-9	9.2E+02	4.7E+02	3.9E-01	7.8E-01	1.2E+03	6.0E+02	—	—	—	—	—	—
Dibenzofuran	132-64-9	—	—	—	—	—	—	—	—	4.1E+03	8.2E+03	—	—
Dibenzothiophene	132-65-0	—	—	—	—	—	—	—	—	1.0E+04	6.1E+03	—	—
Dibromo-3-chloropropane, 1,2-	96-12-8	2.6E-01	1.4E-01	3.6E+01	7.2E+01	2.6E-01	1.4E-01	1.1E+01	5.8E+00	2.0E+02	4.1E+02	1.1E+01	5.8E+00
Dibromochloromethane (chlorodibromomethane)	124-48-1	—	—	3.4E+02	—	—	—	—	—	2.0E+04	—	—	—
Dibromofluoromethane	1868-53-7	—	—	—	—	—	—	—	—	2.0E+05	—	—	—
Dicamba	1918-00-9	—	—	—	—	—	—	—	—	3.1E+04	6.1E+04	—	—
Dichlormid	37764-25-3	—	—	—	—	—	—	—	—	2.6E+04	5.1E+04	—	—
Dichloro-2-butene, 1,4-	764-41-0	3.3E-01	1.7E-01	—	—	3.3E-01	1.7E-01	—	—	—	—	—	—
Dichloro-2-butene, 1,4- trans	110-57-6	3.4E-01	1.8E-01	—	—	3.4E-01	1.8E-01	—	—	—	—	—	—
Dichlorobenzene, 1,2-	95-50-1	—	—	—	—	—	—	1.1E+03	5.7E+02	9.2E+04	—	1.1E+03	5.7E+02
Dichlorobenzene, 1,3-	541-73-1	—	—	—	—	—	—	1.7E+02	8.8E+01	3.1E+04	—	1.7E+02	8.8E+01
Dichlorobenzene, 1,4-	106-46-7	—	—	1.2E+03	—	—	—	1.6E+04	8.5E+03	—	—	1.6E+04	8.5E+03
Dichlorobenzidine, 3,3-	91-94-1	—	—	6.4E+01	1.3E+02	—	—	—	—	—	—	—	—
Dichlorobutane, 2,3-	7581-97-7	—	—	—	—	—	—	1.5E+02	7.7E+01	1.0E+04	—	1.5E+02	7.7E+01
Dichlorodifluoromethane	75-71-8	—	—	—	—	—	—	2.1E+03	1.1E+03	2.0E+05	—	2.1E+03	1.1E+03
Dichloroethane, 1,1-	75-34-3	—	—	—	—	—	—	5.2E+04	2.7E+04	2.0E+05	—	5.2E+04	2.7E+04
Dichloroethane, 1,2-	107-06-2	1.8E+02	9.1E+01	3.1E+02	—	1.8E+02	9.1E+01	9.5E+02	4.9E+02	8.0E+04	—	9.5E+02	4.9E+02
Dichloroethylene, 1,1-	75-35-4	—	—	—	—	—	—	7.3E+03	3.8E+03	5.1E+04	—	7.3E+03	3.8E+03
Dichloroethylene, cis-1,2-	156-59-2	—	—	—	—	—	—	1.3E+03	6.6E+02	2.0E+03	—	1.3E+03	6.6E+02
Dichloroethylene, trans-1,2	156-60-5	—	—	—	—	—	—	1.3E+03	6.6E+02	2.0E+04	—	1.3E+03	6.6E+02
Dichlorofluoromethane	75-43-4	—	—	—	—	—	—	—	—	2.0E+05	—	—	—
Dichlorophenol, 2,3-	576-24-9	—	—	—	—	—	—	—	—	3.1E+03	6.1E+03	—	—
Dichlorophenol, 2,4-	120-83-2	—	—	—	—	—	—	—	—	3.1E+03	6.1E+03	—	—
Dichlorophenol, 2,5-	583-78-8	—	—	—	—	—	—	—	—	3.1E+03	6.1E+03	—	—
Dichlorophenol, 2,6-	87-65-0	—	—	—	—	—	—	—	—	1.0E+03	2.0E+03	—	—
Dichlorophenol, 3,4-	95-77-2	—	—	—	—	—	—	—	—	3.1E+03	6.1E+03	—	—
Dichlorophenol, 3,5-	591-35-5	—	—	—	—	—	—	—	—	3.1E+03	6.1E+03	—	—
Dichlorophenoxy, 2,4- butyric acid, 4- (2,4-DB)	94-82-6	—	—	—	—	—	—	—	—	8.2E+03	1.6E+04	—	—
Dichlorophenoxyacetic acid, 2,4- (2,4-D)	94-75-7	—	—	—	—	—	—	—	—	2.0E+05	8.2E+05	—	—

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Tier 1 Individual Commercial/Industrial Soil PCLs

Last Revised: March 1, 2022

Chemical of Concern	CAS	Carcinogenic						Noncarcinogenic					
		Air ¹ Soil _{Inh-vp} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-vp} 30 acre source area (mg/kg)	Soil _{Ing} (mg/kg)	Soil _{Derm} (mg/kg)	Air ¹ Soil _{Inh-v} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-v} 30 acre source area (mg/kg)	Air ¹ Soil _{Inh-vp} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-vp} 30 acre source area (mg/kg)	Soil _{Ing} (mg/kg)	Soil _{Derm} (mg/kg)	Air ¹ Soil _{Inh-v} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-v} 30 acre source area (mg/kg)
Dichloroprop (2-(2,4-dichlorophenoxy) propanoic acid)	120-36-5	—	—	—	—	—	—	—	—	1.0E+04	2.0E+04	—	—
Dichloropropane, 1,2-	78-87-5	6.5E+02	3.4E+02	7.7E+02	—	6.5E+02	3.4E+02	8.6E+01	4.4E+01	1.3E+05	—	8.6E+01	4.4E+01
Dichloropropane, 1,3-	142-28-9	1.5E+02	7.7E+01	2.9E+02	—	1.5E+02	7.7E+01	4.3E+02	2.2E+02	2.0E+04	—	4.3E+02	2.2E+02
Dichloropropane, 2,2-	594-20-7	—	—	4.2E+02	—	—	—	8.6E+01	4.4E+01	9.2E+04	—	8.6E+01	4.4E+01
Dichloropropanol, 2,3-	616-23-9	—	—	—	—	—	—	—	—	3.1E+03	6.1E+03	—	—
Dichloropropene, 1,1-	563-58-6	1.5E+02	7.7E+01	2.9E+02	—	1.5E+02	7.7E+01	4.3E+02	2.2E+02	3.1E+04	—	4.3E+02	2.2E+02
Dichloropropene, 1,3- (mixed isomers)	542-75-6	1.5E+02	7.7E+01	2.9E+02	—	1.5E+02	7.7E+01	4.3E+02	2.2E+02	3.1E+04	—	4.3E+02	2.2E+02
Dichloropropene, cis 1,3-	10061-01-5	—	—	5.3E+01	—	—	—	4.3E+02	2.2E+02	1.0E+02	—	4.3E+02	2.2E+02
Dichloropropene, trans 1,3-	10061-02-6	1.5E+02	7.7E+01	2.9E+02	—	1.5E+02	7.7E+01	4.3E+02	2.2E+02	3.1E+04	—	4.3E+02	2.2E+02
Dichlorvos	62-73-7	—	—	9.9E+01	2.0E+02	—	—	4.8E+05	2.5E+05	5.1E+02	1.0E+03	1.0E+06	8.7E+05
Dicrotophos (bidrin)	141-66-2	—	—	—	—	—	—	—	—	1.0E+02	2.0E+02	—	—
Dicyclopentadiene	77-73-6	—	—	—	—	—	—	—	—	8.2E+04	—	—	—
Dieldrin	60-57-1	5.3E+01	2.7E+01	1.8E+00	3.6E+00	5.3E+01	2.7E+01	—	—	5.1E+01	1.0E+02	—	—
Diethanolamine	111-42-2	—	—	—	—	—	—	4.9E+03	2.5E+03	5.1E+02	1.0E+03	4.9E+03	2.5E+03
Diethyldithiocarbamate, sodium salt	148-18-5	—	—	1.1E+02	—	—	—	—	—	3.1E+04	—	—	—
Diethyl phthalate	84-66-2	—	—	—	—	—	—	—	—	8.2E+05	1.0E+06	—	—
Diethylene glycol	111-46-6	—	—	—	—	—	—	—	—	1.0E+06	1.0E+06	—	—
Diethylene glycol monobutyl ether	112-34-5	—	—	—	—	—	—	2.8E+01	1.5E+01	3.1E+04	6.1E+04	2.8E+01	1.5E+01
Diethylhexyl adipate	103-23-1	—	—	2.4E+04	4.8E+04	—	—	—	—	6.1E+05	1.0E+06	—	—
Diethylstilbestrol	56-53-1	—	—	6.1E-03	1.2E-02	—	—	—	—	—	—	—	—
Diisobutylene (trimethyl-1-pentene, 2,4,4-)	107-39-1	—	—	—	—	—	—	4.3E+03	2.2E+03	6.1E+04	—	4.3E+03	2.2E+03
Diisopropylbenzene, p-	100-18-5	—	—	—	—	—	—	—	—	1.0E+04	2.0E+04	—	—
Diisopropyl ether (2,2'-oxybis-propane)	108-20-3	—	—	—	—	—	—	1.5E+04	7.7E+03	1.0E+05	—	1.5E+04	7.7E+03
Dimethenamid	87674-68-8	—	—	—	—	—	—	—	—	1.5E+04	3.1E+04	—	—
Dimethoate	60-51-5	—	—	—	—	—	—	—	—	2.0E+02	4.1E+02	—	—
Dimethoxybenzidine, 3,3'-	119-90-4	—	—	2.0E+03	4.1E+03	—	—	—	—	—	—	—	—
Dimethyl-2-nitrobenzene, 1,3-	81-20-9	—	—	—	—	—	—	3.8E+03	2.0E+03	2.0E+03	4.1E+03	3.9E+03	2.0E+03
Dimethyl-3-nitrobenzene, 1,2-	83-41-0	—	—	—	—	—	—	3.4E+03	1.7E+03	2.0E+03	4.1E+03	3.4E+03	1.7E+03
Dimethyl-4-nitrobenzene, 1-2-	99-51-4	—	—	—	—	—	—	3.5E+03	1.8E+03	2.0E+03	4.1E+03	3.5E+03	1.8E+03
Dimethyl-5-nitrobenzene, 1,3-	99-12-7	—	—	—	—	—	—	3.1E+03	1.6E+03	2.0E+03	4.1E+03	3.1E+03	1.6E+03
Dimethylphenethylamine, alpha, alpha-	122-09-8	—	—	—	—	—	—	—	—	2.0E+03	4.1E+03	—	—
Dimethyl phenol, 2,4-	105-67-9	—	—	—	—	—	—	—	—	2.0E+04	4.1E+04	—	—
Dimethylaminoazobenzene, p-	60-11-7	—	—	—	—	—	—	—	—	1.0E+01	2.0E+01	—	—
Dimethylbenz-a-anthracene, 7,12-	57-97-6	2.1E+02	1.1E+02	1.1E-01	1.8E-01	2.4E+02	1.2E+02	—	—	—	—	—	—
Dimethylbenzidine, 3,3'-	119-93-7	—	—	2.6E+00	5.2E+00	—	—	—	—	—	—	—	—
Dimethylformamide, N,N-	68-12-2	—	—	—	—	—	—	4.5E+03	2.3E+03	1.0E+05	—	4.5E+03	2.3E+03
Dimethylnaphthalene, 1,3-	575-41-7	—	—	—	—	—	—	—	—	4.1E+04	6.3E+04	—	—
Dimethylphthalate	131-11-3	—	—	—	—	—	—	—	—	8.2E+05	1.0E+06	—	—
Di-n-butyl phthalate	84-74-2	—	—	—	—	—	—	—	—	1.0E+05	2.0E+05	—	—

Table 7
Tier 1 Individual Commercial/Industrial Soil PCLs

Last Revised: March 1, 2022

Chemical of Concern	CAS	Carcinogenic						Noncarcinogenic					
		Air _{Soil} _{Inh-vp} 0.5 acre source area (mg/kg)	Air _{Soil} _{Inh-vp} 30 acre source area (mg/kg)	Soil _{Soil} _{Ing} (mg/kg)	Soil _{Soil} _{Derm} (mg/kg)	Air _{Soil} _{Inh-V} ¹ 0.5 acre source area (mg/kg)	Air _{Soil} _{Inh-V} ¹ 30 acre source area (mg/kg)	Air _{Soil} _{Inh-vp} 0.5 acre source area (mg/kg)	Air _{Soil} _{Inh-vp} 30 acre source area (mg/kg)	Soil _{Soil} _{Ing} (mg/kg)	Soil _{Soil} _{Derm} (mg/kg)	Air _{Soil} _{Inh-V} ¹ 0.5 acre source area (mg/kg)	Air _{Soil} _{Inh-V} ¹ 30 acre source area (mg/kg)
Dinitro-2-methylphenol, 4,6- (dinitro-o-cresol, 4, 6-)	534-52-1	—	—	—	—	—	—	—	—	1.0E+02	2.0E+02	—	—
Dinitrobenzene, 1,3- (dinitrobenzene, 2,4-)	99-65-0	—	—	—	—	—	—	—	—	1.0E+02	2.0E+02	—	—
Dinitrobenzene, 1,4-	100-25-4	—	—	—	—	—	—	—	—	1.0E+02	2.0E+02	—	—
Dinitrophenol, 2,4-	51-28-5	—	—	—	—	—	—	—	—	2.0E+03	4.1E+03	—	—
Dinitrophenol, 2,5-	329-71-5	—	—	—	—	—	—	—	—	2.0E+03	4.1E+03	—	—
Dinitrotoluene, 2,4-	121-14-2	—	—	4.2E+01	8.4E+01	—	—	—	—	2.0E+03	4.1E+03	—	—
Dinitrotoluene, 2,6-	606-20-2	—	—	4.2E+01	8.4E+01	—	—	—	—	1.0E+03	2.0E+03	—	—
Di-n-octyl phthalate	117-84-0	—	—	—	—	—	—	—	—	1.0E+04	2.0E+04	—	—
Dinoseb	88-85-7	—	—	—	—	—	—	—	—	1.0E+03	2.0E+03	—	—
Dioxane 1,4-	123-91-1	3.0E+02	1.6E+02	2.9E+02	—	3.0E+02	1.6E+02	5.9E+03	3.1E+03	3.1E+04	—	5.9E+03	3.1E+03
Dioxin (as 2,3,7,8-TCDD toxicity equivalent quotients (TEQs))	1746-01-6	—	—	—	—	—	—	—	—	—	—	—	—
Diphenyl ether	101-84-8	—	—	—	—	—	—	—	—	6.3E+03	1.3E+04	—	—
Diphenylamine	122-39-4	—	—	—	—	—	—	—	—	2.6E+04	5.1E+04	—	—
Diphenylhydrazine, 1,2-	122-66-7	2.4E+02	1.2E+02	3.6E+01	7.2E+01	2.4E+02	1.2E+02	—	—	—	—	—	—
Dipropylene glycol	110-98-5	—	—	—	—	—	—	—	—	1.2E+05	2.5E+05	—	—
Diquat	85-00-7	—	—	—	—	—	—	—	—	2.2E+03	4.5E+03	—	—
Disodium iminodiacetate (iminodiacetic acid, disodium salt)	142-73-4	—	—	—	—	—	—	—	—	1.0E+04	2.0E+04	—	—
Disulfoton	298-04-4	—	—	—	—	—	—	—	—	4.1E+01	8.2E+01	—	—
Diuron	330-54-1	—	—	—	—	—	—	—	—	2.0E+03	4.1E+03	—	—
Dodecylphenol, 4-	104-43-8	—	—	—	—	—	—	—	—	5.1E+04	1.0E+05	—	—
Endosulfan	115-29-7	—	—	—	—	—	—	—	—	6.1E+03	1.2E+04	—	—
Endosulfan I	959-98-8	—	—	—	—	—	—	—	—	2.0E+03	4.1E+03	—	—
Endosulfan II	33213-65-9	—	—	—	—	—	—	—	—	6.1E+03	1.2E+04	—	—
Endosulfan sulfate	1031-07-8	—	—	—	—	—	—	—	—	6.1E+03	1.2E+04	—	—
Endothall	145-73-3	—	—	—	—	—	—	—	—	2.0E+04	4.1E+04	—	—
Endrin	72-20-8	—	—	—	—	—	—	—	—	3.1E+02	6.1E+02	—	—
Endrin aldehyde	7421-93-4	—	—	—	—	—	—	—	—	3.1E+02	6.1E+02	—	—
Endrin ketone	53494-70-5	—	—	—	—	—	—	—	—	3.1E+02	6.1E+02	—	—
Epichlorohydrin	106-89-8	8.6E+02	4.4E+02	2.9E+03	—	8.6E+02	4.4E+02	3.7E+01	1.9E+01	6.1E+03	—	3.7E+01	1.9E+01
EPN (o-ethyl o-(4-nitrophenyl)phenylphosphonothioate)	2104-64-5	—	—	—	—	—	—	—	—	1.0E+01	2.0E+01	—	—
Esfenvalerate	66230-04-4	—	—	—	—	—	—	—	—	2.0E+03	4.1E+03	—	—
Ethalfuralin (sonolan)	55283-68-6	—	—	3.2E+02	6.4E+02	—	—	—	—	4.1E+04	8.2E+04	—	—
Ethanol	64-17-5	—	—	—	—	—	—	—	—	1.0E+06	—	—	—
Ethanol, 2-amino-	141-43-5	—	—	—	—	—	—	4.1E+03	2.1E+03	1.7E+03	3.5E+03	4.1E+03	2.1E+03
Ethanol, 2-(2-aminoethoxy)-	929-06-6	—	—	—	—	—	—	—	—	5.1E+02	1.0E+03	—	—
Ethanol, 2-(2-ethoxyethoxy)-	111-90-0	—	—	—	—	—	—	—	—	1.0E+06	1.0E+06	—	—
Ethanol, 2-(methylamino)-	109-83-1	—	—	—	—	—	—	9.0E+03	4.6E+03	1.6E+04	3.3E+04	9.0E+03	4.6E+03
Ethion	563-12-2	—	—	—	—	—	—	—	—	5.1E+02	1.0E+03	—	—
Ethoprop	13194-48-4	—	—	1.0E+03	2.0E+03	—	—	—	—	1.0E+02	2.0E+02	—	—

Table 7
Tier 1 Individual Commercial/Industrial Soil PCLs

Last Revised: March 1, 2022

Chemical of Concern	CAS	Carcinogenic						Noncarcinogenic					
		Air ¹ Soil _{Inh-vp} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-vp} 30 acre source area (mg/kg)	Soil _{Ing} (mg/kg)	Soil _{Derm} (mg/kg)	Air ¹ Soil _{Inh-V} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-V} 30 acre source area (mg/kg)	Air ¹ Soil _{Inh-vp} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-vp} 30 acre source area (mg/kg)	Soil _{Ing} (mg/kg)	Soil _{Derm} (mg/kg)	Air ¹ Soil _{Inh-V} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-V} 30 acre source area (mg/kg)
Ethoxy ethanol, 2-	110-80-5	—	—	—	—	—	—	3.5E+04	1.8E+04	9.2E+04	—	3.5E+04	1.8E+04
Ethyl acetate	141-78-6	—	—	—	—	—	—	5.1E+03	2.6E+03	9.2E+05	—	5.1E+03	2.6E+03
Ethyl acrylate	140-88-5	—	—	6.0E+02	—	—	—	3.4E+02	1.7E+02	5.1E+03	—	3.4E+02	1.7E+02
Ethyl benzene	100-41-4	—	—	—	—	—	—	4.1E+04	2.1E+04	1.0E+05	—	4.1E+04	2.1E+04
Ethyl dipropylthiocarbamate, S-	759-94-4	—	—	—	—	—	—	—	—	2.6E+04	5.1E+04	—	—
Ethyl ether	60-29-7	—	—	—	—	—	—	—	—	2.0E+05	—	—	—
Ethyl methacrylate	97-63-2	—	—	—	—	—	—	9.9E+03	5.1E+03	9.2E+04	—	9.9E+03	5.1E+03
Ethyl methanesulfonate	62-50-0	2.0E+02	1.0E+02	2.9E+02	5.8E+02	2.0E+02	1.0E+02	—	—	—	—	—	—
Ethyl tert-butyl ether (2-ethyl-2-ethoxypropane)	637-92-3	—	—	—	—	—	—	6.4E+03	3.3E+03	1.0E+03	—	6.4E+03	3.3E+03
Ethyl-1-hexanol, 2-	104-76-7	—	—	—	—	—	—	—	—	1.5E+05	3.1E+05	—	—
Ethyl-2-hexenal, 2-	645-62-5	—	—	—	—	—	—	—	—	1.5E+05	—	—	—
Ethyl-2-methyl benzene, 1-	611-14-3	—	—	—	—	—	—	1.2E+04	6.1E+03	5.1E+04	—	1.2E+04	6.1E+03
Ethyl-4-methyl benzene, 1-	622-96-8	—	—	—	—	—	—	1.0E+04	5.2E+03	5.1E+04	—	1.0E+04	5.2E+03
Ethylene*	74-85-1	—	—	—	—	—	—	—	—	—	—	—	—
Ethylene dibromide (dibromoethane, 1,2-)	106-93-4	2.2E+01	1.1E+01	1.4E+01	—	2.2E+01	1.1E+01	2.3E+03	1.2E+03	9.2E+03	—	2.3E+03	1.2E+03
Ethylene glycol	107-21-1	—	—	—	—	—	—	—	—	1.0E+06	1.0E+06	—	—
Ethylene oxide	75-21-8	4.3E+02	2.2E+02	2.8E+01	—	4.3E+02	2.2E+02	—	—	—	—	—	—
Ethylene thiourea	96-45-7	—	—	2.6E+02	5.2E+02	—	—	—	—	8.2E+01	1.6E+02	—	—
Ethylenediamine	107-15-3	—	—	—	—	—	—	—	—	9.2E+04	—	—	—
Ethylenimine	151-56-4	2.2E-01	1.1E-01	4.4E-01	—	2.2E-01	1.1E-01	—	—	—	—	—	—
Ethylhexyl acrylate, 2-	103-11-7	—	—	6.0E+02	1.2E+03	—	—	—	—	—	—	—	—
Famphur	52-85-7	—	—	—	—	—	—	—	—	3.1E+01	6.1E+01	—	—
Fensulfothion	115-90-2	—	—	—	—	—	—	—	—	1.0E+03	2.0E+03	—	—
Fenthion	55-38-9	—	—	—	—	—	—	—	—	7.2E+01	1.4E+02	—	—
Fenuron	101-42-8	—	—	—	—	—	—	—	—	7.2E+04	1.4E+05	—	—
Fluoranthene	206-44-0	—	—	—	—	—	—	—	—	4.1E+04	6.3E+04	—	—
Fluorene	86-73-7	—	—	—	—	—	—	—	—	4.1E+04	6.3E+04	—	—
Fluorine (soluble fluoride)	7782-41-4	—	—	—	—	—	—	1.0E+06	1.0E+06	6.1E+04	1.0E+06	—	—
Fluorochloridone	61213-25-0	—	—	—	—	—	—	—	—	7.7E+03	1.5E+04	—	—
Fonofos	944-22-9	—	—	—	—	—	—	—	—	2.0E+03	4.1E+03	—	—
Formaldehyde	50-00-0	—	—	—	—	—	—	1.4E+03	7.1E+02	2.0E+05	—	1.4E+03	7.1E+02
Formic acid	64-18-6	—	—	—	—	—	—	3.0E+02	1.5E+02	9.2E+05	—	3.0E+02	1.5E+02
Furan	110-00-9	—	—	—	—	—	—	—	—	1.0E+03	—	—	—
Furfural	98-01-1	—	—	—	—	—	—	—	—	3.1E+03	—	—	—
Glycidylaldehyde	765-34-4	—	—	—	—	—	—	2.1E+02	1.1E+02	4.1E+02	—	2.1E+02	1.1E+02
Glyphosate	1071-83-6	—	—	—	—	—	—	—	—	1.0E+06	1.0E+06	—	—
Heptachlor	76-44-8	1.5E+01	7.9E+00	6.4E+00	1.3E+01	1.5E+01	7.9E+00	—	—	5.1E+02	1.0E+03	—	—
Heptachlor epoxide	1024-57-3	4.0E+01	2.0E+01	3.1E+00	6.3E+00	4.0E+01	2.1E+01	—	—	1.3E+01	2.7E+01	—	—
Heptane, n-	142-82-5	—	—	—	—	—	—	1.9E+05	9.9E+04	6.1E+04	—	1.9E+05	9.9E+04

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Last Revised: March 1, 2022

Chemical of Concern	CAS	Carcinogenic						Noncarcinogenic					
		Air ¹ Soil _{Inh-vp} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-vp} 30 acre source area (mg/kg)	Soil _{Ing} (mg/kg)	Soil _{Derm} (mg/kg)	Air ¹ Soil _{Inh-v} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-v} 30 acre source area (mg/kg)	Air ¹ Soil _{Inh-vp} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-vp} 30 acre source area (mg/kg)	Soil _{Ing} (mg/kg)	Soil _{Derm} (mg/kg)	Air ¹ Soil _{Inh-v} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-v} 30 acre source area (mg/kg)
Heptanoic acid, n-	111-14-8	—	—	—	—	—	—	1.7E+02	8.8E+01	5.1E+05	1.0E+06	1.7E+02	8.8E+01
Hexachlorobenzene	118-74-1	3.2E+01	1.6E+01	1.8E+01	3.6E+01	3.2E+01	1.6E+01	—	—	8.2E+02	1.6E+03	—	—
Hexachlorobutadiene	87-68-3	4.9E+01	2.5E+01	3.7E+02	7.3E+02	4.9E+01	2.5E+01	—	—	1.0E+03	2.0E+03	—	—
Hexachlorocyclohexane, alpha (alpha-BHC)	319-84-6	2.3E+01	1.2E+01	4.5E+00	2.3E+01	2.3E+01	1.2E+01	—	—	8.2E+03	4.1E+04	—	—
Hexachlorocyclohexane, beta (beta-BHC)	319-85-7	1.2E+02	6.2E+01	1.6E+01	7.9E+01	1.2E+02	6.2E+01	—	—	—	—	—	—
Hexachlorocyclohexane, delta (delta-BHC)	319-86-8	1.7E+02	8.7E+01	1.6E+01	7.9E+01	1.7E+02	8.8E+01	—	—	3.1E+02	1.5E+03	—	—
Hexachlorocyclohexane, gamma (lindane; gamma-BHC)	58-89-9	—	—	2.2E+01	1.1E+02	—	—	—	—	3.1E+02	1.5E+03	—	—
Hexachlorocyclohexane, techn (technical-BHC)	608-73-1	1.5E+02	7.7E+01	1.6E+01	7.9E+01	1.5E+02	7.7E+01	—	—	—	—	—	—
Hexachlorocyclopentadiene	77-47-4	—	—	—	—	—	—	2.0E+01	1.0E+01	6.1E+03	1.2E+04	2.0E+01	1.0E+01
Hexachloroethane	67-72-1	—	—	7.2E+02	1.4E+03	—	—	6.9E+03	3.6E+03	7.2E+02	1.4E+03	6.9E+03	3.6E+03
Hexachlorophene	70-30-4	—	—	—	—	—	—	—	—	3.1E+02	6.1E+02	—	—
Hexachloropropylene	1888-71-7	—	—	7.2E+02	1.4E+03	—	—	7.1E+03	3.7E+03	7.2E+02	1.4E+03	7.1E+03	3.7E+03
Hexanal, 2-ethyl-	123-05-7	—	—	—	—	—	—	—	—	1.5E+05	3.1E+05	—	—
Hexane, n-	110-54-3	—	—	—	—	—	—	1.4E+04	7.4E+03	6.1E+04	—	1.4E+04	7.4E+03
Hexanediamine, 1,6-	124-09-4	—	—	—	—	—	—	—	—	5.1E+03	1.0E+04	—	—
Hexanedinitrile	111-69-3	—	—	—	—	—	—	1.4E+03	7.1E+02	1.4E+03	2.9E+03	1.4E+03	7.1E+02
Hexanediol, 1,6-	629-11-8	—	—	—	—	—	—	1.0E+06	1.0E+06	1.0E+06	1.0E+06	1.0E+06	1.0E+06
Hexanoic acid	142-62-1	—	—	—	—	—	—	1.9E+02	9.8E+01	6.5E+04	1.3E+05	1.9E+02	9.8E+01
Hexanone, 2-	591-78-6	—	—	—	—	—	—	1.2E+03	5.9E+02	5.1E+04	—	1.2E+03	5.9E+02
Hexazinone	51235-04-2	—	—	—	—	—	—	—	—	3.4E+04	6.7E+04	—	—
Hexene, 1-	592-41-6	—	—	—	—	—	—	2.4E+03	1.2E+03	3.4E+05	—	2.4E+03	1.2E+03
Hexene, cis-2-	7688-21-3	—	—	—	—	—	—	2.4E+03	1.2E+03	3.4E+05	—	2.4E+03	1.2E+03
Hexylene glycol (2-methyl-2,4-pentanediol)	107-41-5	—	—	—	—	—	—	—	—	3.1E+05	6.1E+05	—	—
Hydrazine	302-01-2	7.8E-01	4.0E-01	9.5E+00	—	7.8E-01	4.0E-01	4.1E+00	2.1E+00	—	—	4.1E+00	2.1E+00
Hydrocaproic acid, 6- (6-hydroxyhexanoic acid)	1191-25-9	—	—	—	—	—	—	2.3E+02	1.2E+02	6.5E+04	1.3E+05	2.3E+02	1.2E+02
Hydrogen chloride (hydrochloric acid)*	7647-01-0	—	—	—	—	—	—	—	—	—	—	—	—
Hydroquinone	123-31-9	—	—	4.8E+02	9.5E+02	—	—	—	—	4.1E+04	8.2E+04	—	—
Indene	95-13-6	—	—	—	—	—	—	1.6E+02	8.1E+01	2.0E+04	—	1.6E+02	8.1E+01
Indeno-1,2,3-cd-pyrene	193-39-5	5.6E+04	2.9E+04	2.9E+02	4.4E+02	6.2E+04	3.2E+04	—	—	—	—	—	—
Iron*	7439-89-6	—	—	—	—	—	—	—	—	—	—	—	—
Isoamyl alcohol	123-51-3	—	—	—	—	—	—	—	—	5.1E+03	—	—	—
Isobutyl alcohol	78-83-1	—	—	—	—	—	—	—	—	3.1E+05	—	—	—
Isobutylene (2-methyl-1-propene)	115-11-7	—	—	—	—	—	—	1.0E+06	1.0E+06	3.8E+03	—	1.0E+06	1.0E+06
Isobutyric acid (2-methylpropanoic acid)	79-31-2	—	—	—	—	—	—	—	—	5.1E+05	1.0E+06	—	—
Isodecanol	25339-17-7	—	—	—	—	—	—	—	—	1.6E+03	3.3E+03	—	—
Isodrin	465-73-6	2.9E+00	1.5E+00	1.7E-01	3.4E-01	2.9E+00	1.5E+00	—	—	3.1E+00	6.1E+00	—	—
Isopentane	78-78-4	—	—	—	—	—	—	5.2E+05	2.7E+05	6.1E+04	—	5.2E+05	2.7E+05
Isophorone	78-59-1	—	—	3.0E+04	6.0E+04	—	—	—	—	2.0E+05	4.1E+05	—	—
Isopropyl acetate	108-21-4	—	—	—	—	—	—	—	—	7.2E+04	—	—	—

Table 7
Tier 1 Individual Commercial/Industrial Soil PCLs

Last Revised: March 1, 2022

Chemical of Concern	CAS	Carcinogenic						Noncarcinogenic					
		Air ¹ Soil _{Inh-vp} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-vp} 30 acre source area (mg/kg)	Soil _{Inh} (mg/kg)	Soil _{Derm} (mg/kg)	Air ¹ Soil _{Inh-v} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-v} 30 acre source area (mg/kg)	Air ¹ Soil _{Inh-vp} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-vp} 30 acre source area (mg/kg)	Soil _{Inh} (mg/kg)	Soil _{Derm} (mg/kg)	Air ¹ Soil _{Inh-v} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-v} 30 acre source area (mg/kg)
Isopropyl alcohol	67-63-0	—	—	—	—	—	—	1.4E+04	7.0E+03	1.0E+06	—	1.4E+04	7.0E+03
Isosafrole	120-58-1	1.5E+02	7.9E+01	1.3E+02	2.6E+02	1.5E+02	7.9E+01	—	—	—	—	—	—
Kelthane (dicofol)	115-32-2	—	—	—	—	—	—	—	—	6.1E+03	1.2E+04	—	—
Kepone (chlordecone)	143-50-0	8.1E+01	4.2E+01	2.9E+00	5.7E+00	8.2E+01	4.2E+01	—	—	3.1E+02	6.1E+02	—	—
Lead (inorganic)	7439-92-1	—	—	—	—	—	—	—	—	—	—	—	—
Leptophos	21609-90-5	—	—	—	—	—	—	4.6E+01	2.3E+01	5.1E+00	1.0E+01	4.7E+01	2.4E+01
Limonene, d-*	5989-27-5	—	—	—	—	—	—	—	—	—	—	—	—
Lithium	7439-93-2	—	—	—	—	—	—	—	—	7.2E+03	1.4E+05	—	—
Magnesium*	7439-95-4	—	—	—	—	—	—	—	—	—	—	—	—
Malathion	121-75-5	—	—	—	—	—	—	2.8E+02	1.4E+02	2.0E+04	4.1E+04	2.8E+02	1.4E+02
Maleic anhydride	108-31-6	—	—	—	—	—	—	—	—	1.0E+05	2.0E+05	—	—
Maleic hydrazide	123-33-1	—	—	—	—	—	—	—	—	5.1E+05	1.0E+06	—	—
Malononitrile	109-77-3	—	—	—	—	—	—	—	—	1.0E+02	2.0E+02	—	—
Mancozeb	8018-01-7	—	—	—	—	—	—	—	—	3.1E+04	6.1E+04	—	—
Manganese	7439-96-5	—	—	—	—	—	—	1.0E+06	5.9E+05	1.4E+05	1.7E+05	—	—
MCPA (4-(chloro-2-methylphenoxy) acetic acid)	94-74-6	—	—	—	—	—	—	—	—	5.1E+02	1.0E+03	—	—
MCPP (2-(4-chloro-2-methylphenoxy) propanoic acid)	93-65-2	—	—	—	—	—	—	—	—	1.0E+03	2.0E+03	—	—
Mercury (pH = 4.9) ²	7439-97-6	—	—	—	—	—	—	6.4E+00	3.3E+00	3.1E+02	4.3E+02	6.4E+00	3.3E+00
Mercury (pH=6.8) ²	7439-97-6	—	—	—	—	—	—	2.2E+01	1.1E+01	3.1E+02	4.3E+02	2.2E+01	1.1E+01
Merphos	150-50-5	—	—	—	—	—	—	—	—	3.1E+01	6.1E+01	—	—
Methacrylic acid (2-methyl-2-propenoic acid)	79-41-4	—	—	—	—	—	—	—	—	1.0E+04	—	—	—
Methacrylonitrile	126-98-7	—	—	—	—	—	—	8.2E+02	4.2E+02	5.1E+04	—	8.2E+02	4.2E+02
Methanol	67-56-1	—	—	—	—	—	—	4.6E+05	2.4E+05	1.0E+06	—	4.6E+05	2.4E+05
Methapyrilene	91-80-5	—	—	6.1E+00	1.2E+01	—	—	—	—	—	—	—	—
Methomyl	16752-77-5	—	—	—	—	—	—	—	—	2.6E+04	5.1E+04	—	—
Methoxychlor	72-43-5	—	—	—	—	—	—	—	—	5.1E+03	1.0E+04	—	—
Methoxyethanol, 2-	109-86-4	—	—	—	—	—	—	4.3E+02	2.2E+02	2.8E+04	—	4.3E+02	2.2E+02
Methyl acetate (acetic acid, methyl ester)	79-20-9	—	—	—	—	—	—	—	—	1.0E+06	—	—	—
Methyl acrylate	96-33-3	—	—	—	—	—	—	4.3E+02	2.2E+02	2.0E+03	—	4.3E+02	2.2E+02
Methyl amyl ketone (2-heptanone)	110-43-0	—	—	—	—	—	—	1.6E+05	8.0E+04	5.1E+04	—	1.6E+05	8.0E+04
Methyl chrysene, 1-	3351-28-8	1.0E+06	1.0E+06	3.9E+03	6.0E+03	1.0E+06	1.0E+06	—	—	—	—	—	—
Methyl chrysene, 2-	3351-32-4	1.0E+06	1.0E+06	3.9E+03	6.0E+03	1.0E+06	1.0E+06	—	—	—	—	—	—
Methyl chrysene, 6-	1705-85-7	3.6E+05	1.9E+05	3.9E+02	6.0E+02	3.9E+05	2.0E+05	—	—	—	—	—	—
Methyl cyclohexane	108-87-2	—	—	—	—	—	—	6.4E+04	3.3E+04	1.0E+06	—	6.4E+04	3.3E+04
Methyl ethyl ketone (2-butanone)	78-93-3	—	—	—	—	—	—	2.8E+05	1.4E+05	6.1E+05	—	2.8E+05	1.5E+05
Methyl iodide (iodomethane)	74-88-4	—	—	—	—	—	—	—	—	1.4E+03	—	—	—
Methyl isobutyl ketone (4-methyl-2-pentanone)	108-10-1	—	—	—	—	—	—	8.1E+04	4.2E+04	8.2E+04	—	8.1E+04	4.2E+04
Methyl mercury	22967-92-6	—	—	—	—	—	—	—	—	1.0E+02	2.0E+03	—	—
Methyl methacrylate	80-62-6	—	—	—	—	—	—	1.5E+04	7.7E+03	1.0E+06	—	1.5E+04	7.7E+03

Table 7
Tier 1 Individual Commercial/Industrial Soil PCLs

Last Revised: March 1, 2022

Chemical of Concern	CAS	Carcinogenic						Noncarcinogenic					
		Air ¹ Soil _{Inh-vp} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-vp} 30 acre source area (mg/kg)	Soil _{Ing} (mg/kg)	Soil _{Derm} (mg/kg)	Air ¹ Soil _{Inh-v} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-v} 30 acre source area (mg/kg)	Air ¹ Soil _{Inh-vp} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-vp} 30 acre source area (mg/kg)	Soil _{Ing} (mg/kg)	Soil _{Derm} (mg/kg)	Air ¹ Soil _{Inh-v} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-v} 30 acre source area (mg/kg)
Methyl methanesulfonate	66-27-3	1.9E+02	9.7E+01	2.9E+02	5.8E+02	1.9E+02	9.7E+01	—	—	—	—	—	—
Methyl parathion	298-00-0	—	—	—	—	—	—	—	—	2.6E+02	5.1E+02	—	—
Methyl-1-butene, 2-	563-46-2	—	—	—	—	—	—	3.9E+05	2.0E+05	6.1E+04	—	3.9E+05	2.0E+05
Methyl-1-propanal, 2- (isobutyraldehyde)	78-84-2	—	—	—	—	—	—	—	—	4.1E+04	—	—	—
Methyl-2-butene, 2-	513-35-9	—	—	—	—	—	—	3.9E+05	2.0E+05	6.1E+04	—	3.9E+05	2.0E+05
Methyl-2-pentenal, 2-	623-36-9	—	—	1.5E+01	—	—	—	—	—	—	—	—	—
Methylcholanthrene, 3-	56-49-5	2.5E+03	1.3E+03	1.3E+00	2.0E+00	3.0E+03	1.5E+03	—	—	—	—	—	—
Methylene bromide (dibromomethane)	74-95-3	—	—	3.8E+03	—	—	—	1.1E+02	5.9E+01	6.1E+04	—	1.1E+02	5.9E+01
Methylene chloride (dichloromethane)	75-09-2	2.1E+04	1.1E+04	2.9E+05	—	2.1E+04	1.1E+04	2.8E+04	1.4E+04	2.1E+04	—	2.8E+04	1.4E+04
Methylene-bis (2-chloroaniline) 4,4'-	101-14-4	4.5E+03	2.3E+03	2.9E+02	5.7E+02	4.5E+03	2.3E+03	—	—	2.0E+03	4.1E+03	—	—
Methylmercury hydroxide	1184-57-2	—	—	—	—	—	—	—	—	1.0E+02	2.0E+02	—	—
Methylnaphthalene, 1-	90-12-0	—	—	9.9E+02	1.5E+03	—	—	—	—	7.2E+04	1.1E+05	—	—
Methylnaphthalene, 2-	91-57-6	—	—	—	—	—	—	—	—	4.1E+03	6.3E+03	—	—
Methylpyrrolidone, N-	872-50-4	—	—	—	—	—	—	—	—	2.0E+04	4.1E+04	—	—
Methylstyrene, alpha-	98-83-9	—	—	—	—	—	—	6.8E+02	3.5E+02	8.5E+03	—	6.8E+02	3.5E+02
Methyltetrahydrofuran, 2-	96-47-9	3.2E+02	1.6E+02	3.8E+03	—	3.2E+02	1.6E+02	—	—	2.0E+05	—	—	—
Methyltetrahydropyran, 2-	10141-72-7	3.7E+02	1.9E+02	3.8E+03	—	3.7E+02	1.9E+02	—	—	2.0E+05	—	—	—
Metolachlor	51218-45-2	—	—	—	—	—	—	—	—	1.5E+05	3.1E+05	—	—
Metribuzin	21087-64-9	—	—	—	—	—	—	—	—	2.6E+04	5.1E+04	—	—
Mirex	2385-85-5	—	—	—	—	—	—	—	—	2.0E+02	4.1E+02	—	—
Molinate	2212-67-1	—	—	—	—	—	—	—	—	2.0E+03	4.1E+03	—	—
Molybdenum	7439-98-7	—	—	—	—	—	—	—	—	5.1E+03	3.9E+04	—	—
Monocrotophos	2157-98-4	—	—	—	—	—	—	—	—	6.1E+02	1.2E+03	—	—
Morpholine	110-91-8	—	—	—	—	—	—	—	—	1.0E+06	—	—	—
Morpholine, N-butyl-	1005-67-0	—	—	—	—	—	—	—	—	2.4E+03	4.7E+03	—	—
MTBE (methyl tert-butyl ether)	1634-04-4	2.3E+03	1.2E+03	1.6E+04	—	2.3E+03	1.2E+03	6.4E+04	3.3E+04	1.0E+04	—	6.4E+04	3.3E+04
Naled	300-76-5	—	—	—	—	—	—	—	—	2.0E+03	4.1E+03	—	—
Naphthalene	91-20-3	—	—	—	—	—	—	3.7E+02	1.9E+02	2.0E+04	3.1E+04	3.7E+02	1.9E+02
Naphthoquinone, 1,4-	130-15-4	—	—	—	—	—	—	—	—	7.2E+03	1.4E+04	—	—
Naphthylamine, 1-	134-32-7	—	—	—	—	—	—	—	—	2.0E+04	4.1E+04	—	—
Naphthylamine, 2-	91-59-8	—	—	1.6E+01	3.2E+01	—	—	—	—	—	—	—	—
Napropamide	15299-99-7	—	—	—	—	—	—	—	—	1.0E+05	2.0E+05	—	—
Neopentyl glycol	126-30-7	—	—	—	—	—	—	—	—	3.1E+05	6.1E+05	—	—
Nickel and compounds	7440-02-0	2.2E+05	1.1E+05	—	—	—	—	3.1E+05	1.6E+05	2.0E+04	1.6E+04	—	—
Nitrate-N	14797-55-8	—	—	—	—	—	—	—	—	1.0E+06	1.0E+06	—	—
Nitrite-N	14797-65-0	—	—	—	—	—	—	—	—	1.0E+05	1.0E+06	—	—
Nitroaniline, 2-	88-74-4	—	—	—	—	—	—	6.7E+01	3.4E+01	3.1E+02	6.1E+02	6.7E+01	3.4E+01
Nitroaniline, 3-	99-09-2	—	—	7.5E+02	1.5E+03	—	—	8.4E+01	4.3E+01	3.1E+02	6.1E+02	8.4E+01	4.3E+01
Nitroaniline, 4-	100-01-6	—	—	1.4E+03	2.9E+03	—	—	1.7E+03	8.7E+02	4.1E+03	8.2E+03	1.7E+03	8.7E+02

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Last Revised: March 1, 2022

Chemical of Concern	CAS	Carcinogenic						Noncarcinogenic					
		Air ¹ Soil _{Inh-vp} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-vp} 30 acre source area (mg/kg)	Soil _{Ing} (mg/kg)	Soil _{Derm} (mg/kg)	Air ¹ Soil _{Inh-v} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-v} 30 acre source area (mg/kg)	Air ¹ Soil _{Inh-vp} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-vp} 30 acre source area (mg/kg)	Soil _{Ing} (mg/kg)	Soil _{Derm} (mg/kg)	Air ¹ Soil _{Inh-v} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-v} 30 acre source area (mg/kg)
Nitrobenzene	98-95-3	1.1E+02	5.7E+01	—	—	1.1E+02	5.7E+01	1.4E+03	7.3E+02	2.0E+03	4.1E+03	1.4E+03	7.3E+02
Nitroglycerin	55-63-0	—	—	1.7E+03	3.4E+03	—	—	—	—	1.0E+02	2.0E+02	—	—
Nitrophenol, 2-	88-75-5	—	—	—	—	—	—	—	—	2.0E+03	4.1E+03	—	—
Nitrophenol, 3-	554-84-7	—	—	—	—	—	—	—	—	2.0E+03	4.1E+03	—	—
Nitrophenol, 4-	100-02-7	—	—	—	—	—	—	—	—	2.0E+03	4.1E+03	—	—
Nitropropane, 2-	79-46-9	1.0E+00	5.3E-01	—	—	1.0E+00	5.3E-01	4.3E+02	2.2E+02	1.4E+02	—	4.3E+02	2.2E+02
Nitroquinoline-N-oxide, 4-	56-57-5	3.2E+00	1.6E+00	3.0E+00	6.1E+00	3.2E+00	1.6E+00	—	—	—	—	—	—
Nitrosodiethanolamine	1116-54-7	—	—	1.0E+01	2.0E+01	—	—	—	—	—	—	—	—
Nitrosodiethylamine, n-	55-18-5	1.1E-01	5.7E-02	1.9E-01	—	1.1E-01	5.7E-02	—	—	—	—	—	—
Nitrosodimethylamine, n-	62-75-9	3.3E-01	1.7E-01	5.6E-01	—	3.3E-01	1.7E-01	6.6E+00	3.4E+00	8.2E+00	—	6.6E+00	3.4E+00
Nitrosodi-n-butylamine, n-	924-16-3	1.7E+00	9.0E-01	5.3E+00	1.1E+01	1.7E+00	9.0E-01	—	—	—	—	—	—
Nitrosodi-n-propylamine, n-	621-64-7	—	—	4.1E+00	2.0E+00	—	—	—	—	—	—	—	—
Nitrosodiphenylamine	86-30-6	—	—	5.8E+03	2.9E+03	—	—	—	—	—	—	—	—
Nitroso-methyl-ethyl-amine, n-	10595-95-6	—	—	1.3E+00	—	—	—	—	—	—	—	—	—
Nitrosomorpholine, N-	59-89-2	2.9E+00	1.5E+00	4.3E+00	8.5E+00	2.9E+00	1.5E+00	—	—	—	—	—	—
Nitroso-n-ethylurea, n-	759-73-9	—	—	2.0E-01	4.1E-01	—	—	—	—	—	—	—	—
Nitrosopiperidine, N-	100-75-4	2.2E+00	1.2E+00	3.0E+00	6.1E+00	2.2E+00	1.2E+00	—	—	—	—	—	—
Nitrosopyrrolidine, n-	930-55-2	9.8E+00	5.0E+00	1.4E+01	2.7E+01	9.8E+00	5.0E+00	—	—	—	—	—	—
Nitrotoluene, m-	99-08-1	—	—	—	—	—	—	—	—	1.0E+04	2.0E+04	—	—
Nitrotoluene, o-	88-72-2	—	—	1.3E+02	2.6E+02	—	—	—	—	9.2E+02	1.8E+03	—	—
Nitrotoluene, p-	99-99-0	—	—	1.8E+03	3.6E+03	—	—	—	—	4.1E+03	8.2E+03	—	—
Nonachlor, cis-	5103-73-1	2.1E+03	1.1E+03	8.2E+01	1.6E+02	2.1E+03	1.1E+03	5.2E+03	2.7E+03	5.1E+02	1.0E+03	5.2E+03	2.7E+03
Nonachlor, trans-	39765-80-5	2.1E+03	1.1E+03	8.2E+01	1.6E+02	2.1E+03	1.1E+03	5.2E+03	2.7E+03	5.1E+02	1.0E+03	5.2E+03	2.7E+03
Nonanal	124-19-6	—	—	—	—	—	—	—	—	2.0E+05	4.1E+05	—	—
Nonene, 1-n	124-11-8	—	—	—	—	—	—	—	—	1.0E+05	—	—	—
Nonylphenol, 4-n-	104-40-5	—	—	—	—	—	—	—	—	1.0E+05	2.0E+05	—	—
Nonylphenol ethoxylate	9016-45-9	—	—	—	—	—	—	—	—	1.0E+05	2.0E+05	—	—
Octamethylpyrophosphoramide	152-16-9	—	—	—	—	—	—	—	—	2.0E+03	4.1E+03	—	—
Octanone	106-68-3	—	—	—	—	—	—	1.0E+06	6.5E+05	6.1E+04	—	1.0E+06	6.5E+05
Oxamyl	23135-22-0	—	—	—	—	—	—	—	—	2.6E+04	5.1E+04	—	—
Oxychlordane	27304-13-8	2.1E+03	1.1E+03	8.2E+01	1.6E+02	2.1E+03	1.1E+03	5.2E+03	2.7E+03	5.1E+02	1.0E+03	5.2E+03	2.7E+03
Paraquat	1910-42-5	—	—	—	—	—	—	—	—	4.6E+03	9.2E+03	—	—
Parathion (ethyl parathion)	56-38-2	—	—	—	—	—	—	—	—	6.1E+03	1.2E+04	—	—
Pebulate	1114-71-2	—	—	—	—	—	—	—	—	5.1E+04	1.0E+05	—	—
Pendimethalin	40487-42-1	—	—	—	—	—	—	—	—	4.1E+04	8.2E+04	—	—
Pentachlorobenzene	608-93-5	—	—	—	—	—	—	—	—	8.2E+02	1.6E+03	—	—
Pentachloroethane	76-01-7	1.6E+02	8.1E+01	3.2E+02	—	1.6E+02	8.1E+01	—	—	3.1E+04	—	—	—
Pentachloronitrobenzene	82-68-8	—	—	1.1E+02	2.2E+02	—	—	—	—	3.1E+03	6.1E+03	—	—
Pentachlorophenol	87-86-5	—	—	7.2E+01	5.7E+01	—	—	—	—	5.1E+03	4.1E+03	—	—

Table 7
Tier 1 Individual Commercial/Industrial Soil PCLs

Last Revised: March 1, 2022

Chemical of Concern	CAS	Carcinogenic						Noncarcinogenic					
		Air _{Soil} _{Inh-vp} 0.5 acre source area (mg/kg)	Air _{Soil} _{Inh-vp} 30 acre source area (mg/kg)	Soil _{Soil} _{Ing} (mg/kg)	Soil _{Soil} _{Derm} (mg/kg)	Air _{Soil} _{Inh-V} ¹ 0.5 acre source area (mg/kg)	Air _{Soil} _{Inh-V} ¹ 30 acre source area (mg/kg)	Air _{Soil} _{Inh-vp} 0.5 acre source area (mg/kg)	Air _{Soil} _{Inh-vp} 30 acre source area (mg/kg)	Soil _{Soil} _{Ing} (mg/kg)	Soil _{Soil} _{Derm} (mg/kg)	Air _{Soil} _{Inh-V} ¹ 0.5 acre source area (mg/kg)	Air _{Soil} _{Inh-V} ¹ 30 acre source area (mg/kg)
Pentadiene, 1,3-cis-	1574-41-0	—	—	—	—	—	—	3.9E+05	2.0E+05	6.1E+04	—	3.9E+05	2.0E+05
Pentadiene, 1,3-trans-	2004-70-8	—	—	—	—	—	—	3.9E+05	2.0E+05	6.1E+04	—	3.9E+05	2.0E+05
Pentaerythritol tetranitrate (PETN)	78-11-5	—	—	—	—	—	—	—	—	2.0E+03	4.1E+03	—	—
Pentane	109-66-0	—	—	—	—	—	—	5.2E+05	2.7E+05	6.1E+04	—	5.2E+05	2.7E+05
Pentane, 2-methyl-	107-83-5	—	—	—	—	—	—	3.9E+05	2.0E+05	6.1E+04	—	3.9E+05	2.0E+05
Pentane, 3-methyl-	96-14-0	—	—	—	—	—	—	3.9E+05	2.0E+05	6.1E+04	—	3.9E+05	2.0E+05
Pentenediol, 1,5-	111-29-5	—	—	—	—	—	—	1.0E+06	1.0E+06	1.0E+06	1.0E+06	1.0E+06	1.0E+06
Pentanol, 1-	71-41-0	—	—	—	—	—	—	—	—	3.4E+04	—	—	—
Pentanol, 4-methyl-2-	108-11-2	—	—	—	—	—	—	—	—	2.7E+04	—	—	—
Pentanone, 2-	107-87-9	—	—	—	—	—	—	—	—	4.1E+04	—	—	—
Pentene, 2-	109-68-2	—	—	—	—	—	—	3.9E+05	2.0E+05	6.1E+04	—	3.9E+05	2.0E+05
Pentyne, 1-	627-19-0	—	—	—	—	—	—	3.9E+05	2.0E+05	6.1E+04	—	3.9E+05	2.0E+05
Perchlorate	14797-73-0	—	—	—	—	—	—	—	—	7.2E+02	2.9E+03	—	—
Perfluorooctane sulfonic acid (1-Octanesulfonic acid, heptaecafluoro-1-) [PFOS]	1763-23-1	—	—	—	—	—	—	2.2E+02	1.1E+02	2.4E+01	4.7E+01	2.2E+02	1.1E+02
Perfluoroundecanoic acid (Undecanoic acid, uncosafluoro-) [PFUnDa]	2058-94-8	—	—	—	—	—	—	—	—	1.2E+01	2.5E+01	—	—
Perfluoropentanoic acid (Pentanoic acid, nonafluoro-) [PFPeA]	2706-90-3	—	—	—	—	—	—	—	—	3.9E+00	7.8E+00	—	—
Perfluorohexanoic acid (Hexanoic acid, undecafluoro-) [PFHxA]	307-24-4	—	—	—	—	—	—	—	—	3.9E+00	7.8E+00	—	—
Perfluorododecanoic acid (Dodecanoic acid, tricosafafluoro-) [PFDoA]	307-55-1	—	—	—	—	—	—	9.7E+01	5.0E+01	1.2E+01	2.5E+01	9.7E+01	5.0E+01
Perfluorooctanoic acid (Octanoic acid, pentadecafluoro-) [PFOA]	335-67-1	—	—	—	—	—	—	3.4E+00	1.7E+00	1.2E+01	2.5E+01	3.4E+00	1.7E+00
Perfluorodecanoic acid (Decanoic acid, nonadecafluoro-) [PFDA]	335-76-2	—	—	—	—	—	—	1.2E+02	6.2E+01	1.5E+01	3.1E+01	1.2E+02	6.2E+01
Perfluorodecane sulfonic acid (1-Decanesulfonic acid, heneicosafluoro-) [PFDS]	335-77-3	—	—	—	—	—	—	—	—	1.2E+01	2.5E+01	—	—
Perfluorohexane sulfonic acid (1-Hexanesulfonic acid, tridecafluoro-) [PFHxS]	355-46-4	—	—	—	—	—	—	1.6E+01	8.2E+00	3.9E+00	7.8E+00	1.6E+01	8.2E+00
Perfluorobutyric acid (Butanoic acid, heptafluoro-) [PFBA]	375-22-4	—	—	—	—	—	—	2.7E+03	1.4E+03	3.0E+03	5.9E+03	2.7E+03	1.4E+03
Perfluorobutane sulfonic acid (1-Butanesulfonic acid, nonafluoro-) [PFBS]	375-73-5	—	—	—	—	—	—	1.6E+03	8.2E+02	1.4E+03	2.9E+03	1.6E+03	8.2E+02
Perfluoroheptanoic acid (Heptanoic acid, tridecafluoro-) [PFHpA]	375-85-9	—	—	—	—	—	—	—	—	2.4E+01	4.7E+01	—	—
Perfluorononanoic acid (Nonanoic acid, heptaecafluoro-) [PFNA]	375-95-1	—	—	—	—	—	—	2.4E+01	1.2E+01	1.2E+01	2.5E+01	2.4E+01	1.2E+01
Perfluorotetradecanoic acid (Tetradecanoic acid, heptacosafluoro-) [PFTeDA]	376-06-7	—	—	—	—	—	—	—	—	1.2E+01	2.5E+01	—	—
Perfluorotridecanoic acid (Tridecanoic acid, pentacosafluoro-) [PFTrDA]	72629-94-8	—	—	—	—	—	—	—	—	1.2E+01	2.5E+01	—	—
Perfluorooctane sulfonamide (1-Octanesulfonamide, heptaecafluoro-) [PFOSA]	754-91-6	—	—	—	—	—	—	8.8E-02	4.5E-02	1.2E+01	2.5E+01	8.8E-02	4.5E-02
Perylene	198-55-0	—	—	—	—	—	—	—	—	2.0E+04	4.1E+04	—	—
Phenacetin	62-44-2	1.8E+04	9.4E+03	1.3E+04	2.6E+04	1.8E+04	9.4E+03	—	—	—	—	—	—
Phenanthrene	85-01-8	—	—	—	—	—	—	—	—	3.1E+04	4.7E+04	—	—
Phenanthridine	229-87-8	—	—	—	—	—	—	—	—	3.1E+03	6.1E+03	—	—
Phenol	108-95-2	—	—	—	—	—	—	2.7E+03	1.4E+03	3.1E+05	6.1E+05	2.7E+03	1.4E+03

Table 7
Tier 1 Individual Commercial/Industrial Soil PCLs

Last Revised: March 1, 2022

Chemical of Concern	CAS	Carcinogenic						Noncarcinogenic					
		Air ¹ Soil _{Inh-vp} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-vp} 30 acre source area (mg/kg)	Soil _{Inh} (mg/kg)	Soil _{Derm} (mg/kg)	Air ¹ Soil _{Inh-v} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-v} 30 acre source area (mg/kg)	Air ¹ Soil _{Inh-vp} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-vp} 30 acre source area (mg/kg)	Soil _{Inh} (mg/kg)	Soil _{Derm} (mg/kg)	Air ¹ Soil _{Inh-v} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-v} 30 acre source area (mg/kg)
Phenol, 4-tert-butyl-	98-54-4	—	—	—	—	—	—	—	—	1.2E+05	2.5E+05	—	—
Phenothiazine	92-84-2	—	—	—	—	—	—	—	—	1.1E+03	2.2E+03	—	—
Phenyl mercuric acetate	62-38-4	—	—	—	—	—	—	—	—	8.2E+01	1.6E+02	—	—
Phenylene diamine, m-	108-45-2	—	—	—	—	—	—	—	—	6.1E+03	1.2E+04	—	—
Phenylene diamine, p-	106-50-3	—	—	—	—	—	—	—	—	1.9E+05	3.9E+05	—	—
Phorate	298-02-2	—	—	—	—	—	—	—	—	2.0E+02	4.1E+02	—	—
Phosalone	2310-17-0	—	—	—	—	—	—	—	—	2.0E+03	4.1E+03	—	—
Phosdrin (mevinphos)	7786-34-7	—	—	—	—	—	—	—	—	2.6E+01	5.1E+01	—	—
Phosmet	732-11-6	—	—	—	—	—	—	—	—	2.0E+04	4.1E+04	—	—
Phosphine	7803-51-2	—	—	—	—	—	—	6.4E+00	3.3E+00	3.1E+02	1.2E+03	6.4E+00	3.3E+00
Phosphorotrithioic acid, S,S,S-tributyl ester	78-48-8			3.4E+02	6.8E+02					5.1E+02	1.0E+03		
Phosphorus, total*	7723-14-0	—	—	—	—	—	—	—	—	—	—	—	—
Phosphorus, white	7723-14-0	—	—	—	—	—	—	—	—	2.0E+01	8.2E+01	—	—
Phthalic anhydride	85-44-9	—	—	—	—	—	—	7.0E+04	3.6E+04	1.0E+06	1.0E+06	7.0E+04	3.6E+04
Picloram	1918-02-1	—	—	—	—	—	—	—	—	7.2E+04	1.4E+05	—	—
Picoline, 2- (2-methylpyridine)	109-06-8	—	—	—	—	—	—	—	—	9.2E+03	—	—	—
Polybrominated biphenyls (PBBs)	67774-32-7	—	—	3.2E+00	6.4E+00	—	—	—	—	7.2E+00	1.4E+01	—	—
Polychlorinated biphenyls (PCBs)	1336-36-3	9.1E+01	4.7E+01	1.4E+01	2.0E+01	9.1E+01	4.7E+01	—	—	2.0E+01	2.9E+01	—	—
Potassium*	7440-09-7	—	—	—	—	—	—	—	—	—	—	—	—
Primene	68955-53-3	—	—	—	—	—	—	—	—	6.1E+03	1.2E+04	—	—
Prometon (pramitol)	1610-18-0	—	—	—	—	—	—	—	—	1.5E+04	3.1E+04	—	—
Prometryn	7287-19-6	—	—	—	—	—	—	—	—	4.1E+04	8.2E+04	—	—
Pronamide	23950-58-5	—	—	—	—	—	—	—	—	7.7E+04	1.5E+05	—	—
Propanal (propionaldehyde)	123-38-6	—	—	—	—	—	—	1.7E+02	8.8E+01	8.2E+03	—	1.7E+02	8.8E+01
Propane, 1-bromo-	106-94-5	—	—	—	—	—	—	—	—	3.7E+04	—	—	—
Propanil	709-98-8	—	—	—	—	—	—	—	—	5.1E+03	1.0E+04	—	—
Propanoic acid (propionic acid)	79-09-4	—	—	—	—	—	—	—	—	5.1E+05	—	—	—
Propanol, 1-	71-23-8									1.0E+06			
Propargite	2312-35-8	—	—	—	—	—	—	—	—	2.0E+04	4.1E+04	—	—
Propargyl alcohol	107-19-7	—	—	—	—	—	—	—	—	2.0E+03	—	—	—
Propazine	139-40-2	—	—	6.4E+02	1.3E+03	—	—	—	—	2.0E+04	4.1E+04	—	—
Propham	122-42-9	—	—	—	—	—	—	—	—	2.0E+04	4.1E+04	—	—
Propionitrile (propane nitrile)	107-12-0	—	—	—	—	—	—	—	—	4.1E+02	—	—	—
Propyl acetate, n-	109-60-4	—	—	—	—	—	—	—	—	9.2E+04	—	—	—
Propylbenzene, n-	103-65-1	—	—	—	—	—	—	8.9E+03	4.6E+03	4.1E+04	—	8.9E+03	4.6E+03
Propylene glycol	57-55-6	—	—	—	—	—	—	5.1E+02	2.6E+02	1.0E+06	1.0E+06	5.1E+02	2.6E+02
Propylene glycol monomethyl ether	107-98-2	—	—	—	—	—	—	3.2E+05	1.7E+05	7.2E+05	—	3.2E+05	1.7E+05
Propylene oxide	75-56-9	1.6E+02	8.4E+01	1.2E+02	—	1.6E+02	8.4E+01	6.4E+02	3.3E+02	—	—	6.4E+02	3.3E+02
Propylene tetramer	6842-15-5	—	—	—	—	—	—	2.1E+04	1.1E+04	1.0E+05	2.0E+05	2.1E+04	1.1E+04

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Chemical of Concern	CAS	Carcinogenic						Noncarcinogenic					
		Air _{Soil} _{Inh-vp} 0.5 acre source area (mg/kg)	Air _{Soil} _{Inh-vp} 30 acre source area (mg/kg)	Soil _{Soil} _{Ing} (mg/kg)	Soil _{Soil} _{Derm} (mg/kg)	Air _{Soil} _{Inh-V} ¹ 0.5 acre source area (mg/kg)	Air _{Soil} _{Inh-V} ¹ 30 acre source area (mg/kg)	Air _{Soil} _{Inh-vp} 0.5 acre source area (mg/kg)	Air _{Soil} _{Inh-vp} 30 acre source area (mg/kg)	Soil _{Soil} _{Ing} (mg/kg)	Soil _{Soil} _{Derm} (mg/kg)	Air _{Soil} _{Inh-V} ¹ 0.5 acre source area (mg/kg)	Air _{Soil} _{Inh-V} ¹ 30 acre source area (mg/kg)
Prothiofos (Tokuthion)	34643-46-4	—	—	—	—	—	—	—	—	1.0E+02	2.0E+02	—	—
Pyrene	129-00-0	—	—	—	—	—	—	—	—	3.1E+04	4.7E+04	—	—
Pyridine	110-86-1	—	—	—	—	—	—	—	—	1.0E+03	—	—	—
Quinoline	91-22-5	—	—	9.5E+00	1.9E+01	—	—	—	—	—	—	—	—
Ronnel	299-84-3	—	—	—	—	—	—	—	—	5.1E+04	1.0E+05	—	—
Safrole	94-59-7	1.1E+02	5.8E+01	1.3E+02	2.6E+02	1.1E+02	5.8E+01	—	—	—	—	—	—
Selenium	7782-49-2	—	—	—	—	—	—	—	—	5.1E+03	1.0E+05	—	—
Selenourea	630-10-4	—	—	—	—	—	—	—	—	5.1E+03	—	—	—
Silver	7440-22-4	—	—	—	—	—	—	—	—	5.1E+03	4.1E+03	—	—
Simazine	122-34-9	—	—	2.4E+02	4.8E+02	—	—	—	—	5.1E+03	1.0E+04	—	—
Sodium*	7440-23-5	—	—	—	—	—	—	—	—	—	—	—	—
Sodium hypochlorite	7681-52-9	—	—	—	—	—	—	4.2E+05	2.2E+05	2.1E+05	8.6E+05	—	—
Sodium polyacrylate	9003-04-7	—	—	—	—	—	—	1.7E+02	8.7E+01	5.1E+05	—	1.7E+02	8.7E+01
Strontium	7440-24-6	—	—	—	—	—	—	—	—	6.1E+05	1.0E+06	—	—
Strychnine	57-24-9	—	—	—	—	—	—	—	—	3.1E+02	6.1E+02	—	—
Styrene	100-42-5	—	—	—	—	—	—	1.6E+04	8.1E+03	2.0E+05	—	1.6E+04	8.1E+03
Sulfate*	14808-79-8	—	—	—	—	—	—	—	—	—	—	—	—
Sulfide*	18496-25-8	—	—	—	—	—	—	—	—	—	—	—	—
Sulfolane	126-33-0	—	—	—	—	—	—	1.2E+03	6.2E+02	1.3E+04	2.7E+04	1.2E+03	6.2E+02
Sulfur*	7704-34-9	—	—	—	—	—	—	—	—	—	—	—	—
Sulprofos (Bolstar)	35400-43-2	—	—	—	—	—	—	—	—	3.1E+03	6.1E+03	—	—
Tebuconazole	107534-96-3	—	—	—	—	—	—	—	—	3.1E+04	6.1E+04	—	—
Tebuthiuron	34014-18-1	—	—	—	—	—	—	—	—	7.2E+04	1.4E+05	—	—
Terbufos	13071-79-9	—	—	—	—	—	—	—	—	2.6E+01	5.1E+01	—	—
Tert-amyl ethyl ether (TAAE)	919-94-8	—	—	—	—	—	—	—	—	4.1E+04	—	—	—
Tert-amyl-methyl ether (TAME)	994-05-8	—	—	—	—	—	—	—	—	4.1E+04	—	—	—
Tert-butyl alcohol (2-methyl-2-propanol)	75-65-0	—	—	—	—	—	—	—	—	9.2E+04	—	—	—
Tetrachlorobenzene, 1,2,3,4-	634-66-2	—	—	—	—	—	—	—	—	3.1E+02	6.1E+02	—	—
Tetrachlorobenzene, 1,2,3,5-	634-90-2	—	—	—	—	—	—	—	—	3.1E+02	6.1E+02	—	—
Tetrachlorobenzene, 1,2,4,5-	95-94-3	—	—	—	—	—	—	—	—	3.1E+02	6.1E+02	—	—
Tetrachloroethane, 1,1,1,2-	630-20-6	1.5E+02	7.8E+01	1.1E+03	—	1.5E+02	7.8E+01	—	—	3.1E+04	—	—	—
Tetrachloroethane, 1,1,2,2-	79-34-5	—	—	1.4E+02	—	—	—	—	—	2.0E+04	—	—	—
Tetrachloroethylene [PCE]	127-18-4	1.6E+03	8.1E+02	1.4E+04	—	1.6E+03	8.1E+02	8.0E+03	4.1E+03	2.1E+04	—	8.0E+03	4.1E+03
Tetrachlorophenol, 2,3,4,5-	4901-51-3	—	—	—	—	—	—	—	—	3.1E+04	6.1E+04	—	—
Tetrachlorophenol, 2,3,4,6-	58-90-2	—	—	—	—	—	—	—	—	3.1E+04	6.1E+04	—	—
Tetrachlorophenol, 2,3,5,6-	935-95-5	—	—	—	—	—	—	—	—	3.1E+04	6.1E+04	—	—
Tetrachlorvinphos (Stirophos)	22248-79-9	—	—	—	—	—	—	—	—	4.3E+04	8.6E+04	—	—
Tetradifon	116-29-0	—	—	—	—	—	—	—	—	2.0E+04	4.1E+04	—	—
Tetraethyl dithiopyrophosphate (sulfotep)	3689-24-5	—	—	—	—	—	—	—	—	5.1E+02	1.0E+03	—	—

Table 7
Tier 1 Individual Commercial/Industrial Soil PCLs

Last Revised: March 1, 2022

Chemical of Concern	CAS	Carcinogenic						Noncarcinogenic					
		Air _{Soil} _{Inh-vp} 0.5 acre source area (mg/kg)	Air _{Soil} _{Inh-vp} 30 acre source area (mg/kg)	Soil _{Soil} _{Ing} (mg/kg)	Soil _{Soil} _{Derm} (mg/kg)	Air _{Soil} _{Inh-V} ¹ 0.5 acre source area (mg/kg)	Air _{Soil} _{Inh-V} ¹ 30 acre source area (mg/kg)	Air _{Soil} _{Inh-vp} 0.5 acre source area (mg/kg)	Air _{Soil} _{Inh-vp} 30 acre source area (mg/kg)	Soil _{Soil} _{Ing} (mg/kg)	Soil _{Soil} _{Derm} (mg/kg)	Air _{Soil} _{Inh-V} ¹ 0.5 acre source area (mg/kg)	Air _{Soil} _{Inh-V} ¹ 30 acre source area (mg/kg)
Tetraethyl lead	78-00-2	—	—	—	—	—	—	—	—	1.0E-01	2.0E-01	—	—
Tetraethyl pyrophosphate (TEPP)	107-49-3	—	—	—	—	—	—	—	—	1.1E+01	2.2E+01	—	—
Tetraethylene glycol	112-60-7	—	—	—	—	—	—	—	—	3.4E+05	6.7E+05	—	—
Tetrahydrofuran	109-99-9	3.2E+02	1.6E+02	3.8E+03	—	3.2E+02	1.6E+02	4.3E+04	2.2E+04	9.2E+05	—	4.3E+04	2.2E+04
Tetrahydropyran	142-68-7	3.4E+02	1.7E+02	3.8E+03	—	3.4E+02	1.7E+02	—	—	2.0E+05	—	—	—
Tetraoxadodecane, 2,5,8,11-	112-49-2	—	—	—	—	—	—	—	—	2.6E+04	5.1E+04	—	—
Thallium	7440-28-0	—	—	—	—	—	—	—	—	6.8E+01	1.4E+03	—	—
Thiofanox	39196-18-4	—	—	—	—	—	—	—	—	3.1E+02	6.1E+02	—	—
Thionazin	297-97-2	—	—	—	—	—	—	—	—	7.2E+01	1.4E+02	—	—
Thiophanate-methyl	23564-05-8	—	—	—	—	—	—	—	—	8.2E+04	1.6E+05	—	—
Thiram	137-26-8	—	—	—	—	—	—	—	—	5.1E+03	1.0E+04	—	—
Tin	7440-31-5	—	—	—	—	—	—	—	—	6.1E+05	1.0E+06	—	—
Titanium	7440-32-6	—	—	—	—	—	—	—	—	1.0E+06	1.0E+06	—	—
Toluene	108-88-3	—	—	—	—	—	—	8.8E+04	4.5E+04	8.2E+04	—	8.8E+04	4.5E+04
Toluene diisocyanate, 2,4/2,6-	26471-62-5	—	—	—	—	—	—	2.0E+02	1.0E+02	—	—	2.0E+02	1.0E+02
Toluenediamine, 2,4-	95-80-7	—	—	8.9E+00	1.8E+01	—	—	—	—	—	—	—	—
Toluenediamine, 2,6-	823-40-5	—	—	—	—	—	—	—	—	3.1E+04	6.1E+04	—	—
Toluidine, o-	95-53-4	2.3E+02	1.2E+02	1.8E+03	2.4E+02	2.3E+02	1.2E+02	—	—	—	—	—	—
Toluidine, p-	106-49-0	—	—	9.5E+02	3.0E+02	—	—	—	—	—	—	—	—
Toxaphene	8001-35-2	1.6E+03	8.1E+02	2.6E+01	5.2E+01	1.6E+03	8.3E+02	—	—	3.2E+02	6.3E+02	—	—
TPH, TX1005, C6-C12	TPH-1005-1	—	—	—	—	—	—	4.3E+03	2.2E+03	4.1E+04	—	4.3E+03	2.2E+03
TPH, TX1005, >C12-C28	TPH-1005-2	—	—	—	—	—	—	2.1E+04	1.1E+04	4.1E+04	8.2E+04	2.1E+04	1.1E+04
TPH, TX1005, >C12-C35	TPH-1005-3	—	—	—	—	—	—	2.1E+04	1.1E+04	4.1E+04	8.2E+04	2.1E+04	1.1E+04
TPH, TX1005, >C28-C35	TPH-1005-4	—	—	—	—	—	—	2.1E+04	1.1E+04	4.1E+04	8.2E+04	2.1E+04	1.1E+04
TP Silvex, 2,4,5-	93-72-1	—	—	—	—	—	—	—	—	8.2E+03	1.6E+04	—	—
Triademenol	55219-65-3	—	—	—	—	—	—	—	—	3.1E+04	6.1E+04	—	—
Triallate	2303-17-5	—	—	—	—	—	—	—	—	1.3E+04	2.7E+04	—	—
Triaminotrinitrobenzene (TATB)	3058-38-6	—	—	—	—	—	—	—	—	3.1E+03	6.1E+03	—	—
Tributyltin oxide	56-35-9	—	—	—	—	—	—	—	—	3.1E+02	6.1E+02	—	—
Trichloro-1,2,2-trifluoroethane, 1,1,2-	76-13-1	—	—	—	—	—	—	1.1E+05	5.5E+04	1.0E+06	—	1.1E+05	5.5E+04
Trichlorobenzene, 1,2,3-	87-61-6	—	—	—	—	—	—	4.2E+02	2.2E+02	3.1E+03	6.1E+03	4.2E+02	2.2E+02
Trichlorobenzene, 1,2,4-	120-82-1	—	—	9.9E+02	2.0E+03	—	—	2.1E+02	1.1E+02	1.0E+04	2.0E+04	2.1E+02	1.1E+02
Trichlorobenzene, 1,3,5-	108-70-3	—	—	—	—	—	—	1.8E+02	9.1E+01	3.1E+03	6.1E+03	1.8E+02	9.1E+01
Trichloroethane, 1,1,1-	71-55-6	—	—	—	—	—	—	1.1E+05	5.6E+04	1.0E+06	—	1.1E+05	5.6E+04
Trichloroethane, 1,1,2-	79-00-5	3.8E+01	1.9E+01	5.0E+02	—	3.8E+01	1.9E+01	—	—	4.1E+03	—	—	—
Trichloroethylene [TCE]	79-01-6	1.5E+02	7.5E+01	6.2E+02	—	1.5E+02	7.5E+01	4.3E+01	2.2E+01	5.1E+02	—	4.3E+01	2.2E+01
Trichlorofluoromethane	75-69-4	—	—	—	—	—	—	—	—	3.1E+05	—	—	—
Trichloronate	327-98-0	—	—	—	—	—	—	—	—	3.1E+03	6.1E+03	—	—
Trichlorophenol, 2,3,4-	15950-66-0	—	—	—	—	—	—	—	—	1.0E+05	2.0E+05	—	—

Table 7
Tier 1 Individual Commercial/Industrial Soil PCLs

Last Revised: March 1, 2022

Chemical of Concern	CAS	Carcinogenic						Noncarcinogenic					
		Air ¹ Soil _{Inh-vp} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-vp} 30 acre source area (mg/kg)	Soil _{Inh} (mg/kg)	Soil _{Derm} (mg/kg)	Air ¹ Soil _{Inh-v} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-v} 30 acre source area (mg/kg)	Air ¹ Soil _{Inh-vp} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-vp} 30 acre source area (mg/kg)	Soil _{Inh} (mg/kg)	Soil _{Derm} (mg/kg)	Air ¹ Soil _{Inh-v} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-v} 30 acre source area (mg/kg)
Trichlorophenol, 2,3,5-	933-78-8	—	—	—	—	—	—	—	—	1.0E+05	2.0E+05	—	—
Trichlorophenol, 2,3,6-	933-75-5	—	—	—	—	—	—	—	—	1.0E+05	2.0E+05	—	—
Trichlorophenol, 2,4,5-	95-95-4	—	—	—	—	—	—	—	—	1.0E+05	2.0E+05	—	—
Trichlorophenol, 2,4,6-	88-06-2	3.3E+03	1.7E+03	2.6E+03	5.2E+03	3.3E+03	1.7E+03	—	—	1.0E+03	2.0E+03	—	—
Trichlorophenol, 3,4,5-	609-19-8	—	—	—	—	—	—	—	—	1.0E+05	2.0E+05	—	—
Trichlorophenoxyacetic acid, 2,4,5-	93-76-5	—	—	—	—	—	—	—	—	1.0E+04	2.0E+04	—	—
Trichloropropane, 1,1,2-	598-77-6	—	—	—	—	—	—	6.4E+00	3.3E+00	5.1E+03	—	6.4E+00	3.3E+00
Trichloropropane, 1,2,3-	96-18-4	—	—	9.5E-01	—	—	—	2.0E+01	1.0E+01	4.1E+03	—	2.0E+01	1.0E+01
Triethanolamine	102-71-6	—	—	—	—	—	—	5.4E+03	2.8E+03	2.0E+05	4.1E+05	5.4E+03	2.8E+03
Triethylamine	121-44-8	—	—	—	—	—	—	1.5E+02	7.7E+01	—	—	1.5E+02	7.7E+01
Triethylene glycol	112-27-6	—	—	—	—	—	—	—	—	1.0E+06	1.0E+06	—	—
Triethylphosphorothioate, O, O, O-	126-68-1	—	—	—	—	—	—	—	—	8.5E+00	1.7E+01	—	—
Trifluralin	1582-09-8	—	—	3.7E+03	7.4E+03	—	—	—	—	7.7E+03	1.5E+04	—	—
Trimethylamine	75-50-3	—	—	—	—	—	—	2.1E+02	1.1E+02	—	—	2.1E+02	1.1E+02
Trimethylbenzene, 1,2,3-	526-73-8	—	—	—	—	—	—	5.1E+03	2.6E+03	3.5E+04	—	5.1E+03	2.6E+03
Trimethylbenzene, 1,2,4-	95-63-6	—	—	—	—	—	—	5.6E+03	2.9E+03	3.5E+04	—	5.6E+03	2.9E+03
Trimethylbenzene, 1,3,5-	108-67-8	—	—	—	—	—	—	4.9E+03	2.5E+03	3.5E+04	—	4.9E+03	2.5E+03
Trinitrobenzene, 1,3,5-	99-35-4	—	—	—	—	—	—	—	—	3.1E+04	6.1E+04	—	—
Trinitrophenylmethylnitramine (tetryl; nitramine)	479-45-8	—	—	—	—	—	—	—	—	2.0E+03	8.2E+03	—	—
Trinitrotoluene, 2,4,6-	118-96-7	—	—	9.5E+02	1.9E+03	—	—	—	—	5.1E+02	1.0E+03	—	—
Tungsten (as sodium tungstate dihydride)	7440-33-7	—	—	—	—	—	—	1.0E+06	1.0E+06	1.0E+03	4.1E+03	—	—
Uranium (soluble salts)	7440-61-1	—	—	—	—	—	—	5.4E+04	2.8E+04	3.1E+03	6.1E+04	—	—
Valeric acid (pentanoic acid)	109-52-4	—	—	—	—	—	—	1.8E+02	9.5E+01	5.1E+05	1.0E+06	1.8E+02	9.5E+01
Vanadium	7440-62-2	—	—	—	—	—	—	4.1E+04	2.1E+04	1.8E+03	9.6E+02	—	—
Vernam	1929-77-7	—	—	—	—	—	—	—	—	1.0E+03	2.0E+03	—	—
Vinyl acetate	108-05-4	—	—	—	—	—	—	4.3E+03	2.2E+03	1.0E+06	—	4.3E+03	2.2E+03
Vinyl chloride	75-01-4	7.2E+01	3.7E+01	1.9E+01	—	7.2E+01	3.7E+01	1.3E+03	6.6E+02	3.1E+03	—	1.3E+03	6.6E+02
Vinylcyclohexane	695-12-5	—	—	—	—	—	—	—	—	5.1E+05	—	—	—
Warfarin	81-81-2	—	—	—	—	—	—	—	—	3.1E+02	6.1E+02	—	—
Xylene, m-	108-38-3	—	—	—	—	—	—	1.3E+04	6.7E+03	1.0E+06	—	1.3E+04	6.7E+03
Xylene, o-	95-47-6	—	—	—	—	—	—	9.5E+04	4.9E+04	1.0E+06	—	9.5E+04	4.9E+04
Xylene, p-	106-42-3	—	—	—	—	—	—	1.3E+04	6.7E+03	1.0E+06	—	1.3E+04	6.7E+03
Xylenes	1330-20-7	—	—	—	—	—	—	1.3E+04	6.7E+03	2.0E+05	—	1.3E+04	6.7E+03
Zinc	7440-66-6	—	—	—	—	—	—	—	—	3.1E+05	1.0E+06	—	—
6 C aliphatics (TPH) (>53% n-hexane content)	NA	—	—	—	—	—	—	1.4E+04	7.4E+03	6.1E+04	—	1.4E+04	7.4E+03
6 C aliphatics (TPH) (<53% n-hexane content)	NA	—	—	—	—	—	—	4.0E+05	2.0E+05	6.1E+04	—	4.0E+05	2.0E+05
>6-8 C aliphatics (TPH) (>53% n-hexane content)	NA	—	—	—	—	—	—	1.4E+04	7.4E+03	6.1E+04	—	1.4E+04	7.4E+03
>6-8 C aliphatics (TPH) (<53% n-hexane content)	NA	—	—	—	—	—	—	4.0E+05	2.0E+05	6.1E+04	—	4.0E+05	2.0E+05
>8-10 C aliphatics (TPH)	NA	—	—	—	—	—	—	1.1E+04	5.5E+03	1.0E+05	—	1.1E+04	5.5E+03

Table 7
Tier 1 Individual Commercial/Industrial Soil PCLs

Last Revised: March 1, 2022

Chemical of Concern	CAS	Carcinogenic						Noncarcinogenic					
		Air ¹ Soil _{Inh-vp} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-vp} 30 acre source area (mg/kg)	Soil _{Ing} (mg/kg)	Soil _{Derm} (mg/kg)	Air ¹ Soil _{Inh-v} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-v} 30 acre source area (mg/kg)	Air ¹ Soil _{Inh-vp} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-vp} 30 acre source area (mg/kg)	Soil _{Ing} (mg/kg)	Soil _{Derm} (mg/kg)	Air ¹ Soil _{Inh-v} 0.5 acre source area (mg/kg)	Air ¹ Soil _{Inh-v} 30 acre source area (mg/kg)
>10-12 C aliphatics (TPH)	NA	—	—	—	—	—	—	1.1E+04	5.5E+03	1.0E+05	2.0E+05	1.1E+04	5.5E+03
>12-16 C aliphatics (TPH)	NA	—	—	—	—	—	—	1.7E+04	8.7E+03	1.0E+05	2.0E+05	1.7E+04	8.7E+03
>16-21 C aliphatics (TPH)	NA	—	—	—	—	—	—	—	—	1.0E+06	1.0E+06	—	—
>16-21 C aliphatics (TPH) (for transformer mineral oil releases only)	NA	—	—	—	—	—	—	—	—	1.0E+06	1.0E+06	—	—
>21-35 C aliphatics (TPH)	NA	—	—	—	—	—	—	—	—	1.0E+06	1.0E+06	—	—
>21-35 C aliphatics (TPH) (for transformer mineral oil releases only)	NA	—	—	—	—	—	—	—	—	1.0E+06	1.0E+06	—	—
>7-8 C aromatics (TPH)	NA	—	—	—	—	—	—	4.1E+04	2.1E+04	1.0E+05	—	4.1E+04	2.1E+04
>8-10 C aromatics (TPH)	NA	—	—	—	—	—	—	4.3E+03	2.2E+03	4.1E+04	—	4.3E+03	2.2E+03
>10-12 C aromatics (TPH)	NA	—	—	—	—	—	—	9.2E+03	4.8E+03	4.1E+04	8.2E+04	9.2E+03	4.8E+03
>12-16 C aromatics (TPH)	NA	—	—	—	—	—	—	2.1E+04	1.1E+04	4.1E+04	8.2E+04	2.1E+04	1.1E+04
>16-21 C aromatics (TPH)	NA	—	—	—	—	—	—	—	—	3.1E+04	6.1E+04	—	—
>21-35 C aromatics (TPH)	NA	—	—	—	—	—	—	—	—	3.1E+04	6.1E+04	—	—
Footnotes													
1 For subsurface soils only													
2 Site-specific PCLs for mercury may vary based on the pH-dependent K _d value(see Figure:30 TAC §350.73(f)(1)(C)).													
* These compounds are not necessarily of concern from a human health standpoint, therefore calculation of human health-based values is not required. However, aesthetics and ecological criteria would still apply. See table entitled "Compounds for which Calculation of a Human Health PCL is Not Required" available on the TCEQ website at http://www.tceq.state.tx.us/remediation/trrp/trrp.html .													
NA = not applicable													
All values capped at 1E+06													

This table shows individual protective concentration levels for commercial/industrial properties with carcinogenic and non-carcinogenic values depicted.

end of worksheet

Table 8
Tier 1 Individual Residential and Commercial/Industrial Groundwater PCLs

Last Revised: March 1, 2022

Chemical of Concern	CAS	Residential								Commercial/Industrial							
		Carcinogenic		Noncarcinogenic		Carcinogenic	Noncarcinogenic	Carcinogenic	Noncarcinogenic	Carcinogenic		Noncarcinogenic		Carcinogenic	Noncarcinogenic	Carcinogenic	Noncarcinogenic
		GW _{Int} ¹ (mg/L)	GW _{Class 3} ² (mg/L)	GW _{Int} ¹ (mg/L)	GW _{Class 3} ² (mg/L)	Air _{GW_{Int}-V} ³⁰ 0.5 acre source area (mg/L)	Air _{GW_{Int}-V} ³⁰ acre source area (mg/L)	Air _{GW_{Int}-V} ³⁰ 0.5 acre source area (mg/L)	Air _{GW_{Int}-V} ³⁰ acre source area (mg/L)	GW _{Int} ¹ (mg/L)	GW _{Class 3} ² (mg/L)	GW _{Int} ¹ (mg/L)	GW _{Class 3} ² (mg/L)	Air _{GW_{Int}-V} ³⁰ 0.5 acre source area (mg/L)	Air _{GW_{Int}-V} ³⁰ acre source area (mg/L)	Air _{GW_{Int}-V} ³⁰ 0.5 acre source area (mg/L)	Air _{GW_{Int}-V} ³⁰ acre source area (mg/L)
Acenaphthene	83-32-9	—	—	1.5E+00	1.5E+02	—	—	—	—	—	—	4.4E+00	4.4E+02	—	—	—	—
Acenaphthylene	208-96-8	—	—	1.5E+00	1.5E+02	—	—	—	—	—	—	4.4E+00	4.4E+02	—	—	—	—
Acetaldehyde	75-07-0	—	—	2.4E+00	2.4E+02	2.8E+03	3.6E+02	2.4E+03	3.1E+02	—	—	7.3E+00	7.3E+02	4.7E+03	6.0E+02	3.3E+03	4.3E+02
Acetate, 2-ethoxyethanol	111-15-9	—	—	2.4E+00	2.4E+02	—	—	4.5E+05	5.8E+04	—	—	7.3E+00	7.3E+02	—	—	6.3E+05	8.1E+04
Acetate, isoamyl	123-92-2	—	—	1.8E+00	1.8E+02	—	—	—	—	—	—	5.3E+00	5.3E+02	—	—	—	—
Acetate, isobutyl	110-19-0	—	—	1.2E+00	1.2E+02	—	—	—	—	—	—	3.5E+00	3.5E+02	—	—	—	—
Acetate, sec-butyl	105-46-4	—	—	1.2E+00	1.2E+02	—	—	—	—	—	—	3.5E+00	3.5E+02	—	—	—	—
Acetic acid*	64-19-7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Acetone (2-propanone)	67-64-1	—	—	2.2E+01	2.2E+03	—	—	1.0E+06	1.0E+06	—	—	6.6E+01	6.6E+03	—	—	1.0E+06	1.0E+06
Acetone cyanohydrin	75-86-5	—	—	7.3E-02	7.3E+00	—	—	3.4E+05	4.4E+04	—	—	2.2E-01	2.2E+01	—	—	4.8E+05	6.2E+04
Acetonitrile	75-05-8	—	—	7.8E-01	7.8E+01	—	—	3.2E+04	4.2E+03	—	—	2.3E+00	2.3E+02	—	—	4.5E+04	5.8E+03
Acetophenone	98-86-2	—	—	2.4E+00	2.4E+02	—	—	—	—	—	—	7.3E+00	7.3E+02	—	—	—	—
Acetylaminofluorene, 2-	53-96-3	2.4E-04	2.4E-02	—	—	6.3E+02	1.0E+02	—	—	5.4E-04	5.4E-02	—	—	1.1E+03	1.8E+02	—	—
Acidfluorfen, sodium	62476-59-9	—	—	3.2E-01	3.2E+01	—	—	—	—	—	—	9.5E-01	9.5E+01	—	—	—	—
Acridine	260-94-6	—	—	7.3E-02	7.3E+00	—	—	—	—	—	—	2.2E-01	2.2E+01	—	—	—	—
Acrolein	107-02-8	—	—	1.2E-02	1.2E+00	—	—	9.5E+03	1.2E+03	—	—	3.7E-02	3.7E+00	—	—	1.3E+04	1.7E+03
Acrylamide	79-06-1	1.8E-03	1.8E-01	4.9E-02	4.9E+00	3.8E+03	5.0E+02	9.7E+04	1.3E+04	4.1E-03	4.1E-01	1.5E-01	1.5E+01	6.3E+03	8.4E+02	1.4E+05	1.8E+04
Acrylic acid	79-10-7	—	—	1.2E+01	1.2E+03	—	—	1.5E+04	2.0E+03	—	—	3.7E+01	3.7E+03	—	—	2.1E+04	2.7E+03
Acrylonitrile	107-13-1	1.7E-03	1.7E-01	2.4E-02	2.4E+00	5.8E+01	7.5E+00	3.4E+02	4.3E+01	3.8E-03	3.8E-01	7.3E-02	7.3E+00	9.7E+01	1.3E+01	4.7E+02	6.1E+01
Adipic acid (hexanedioic acid)	124-04-9	—	—	4.9E+01	4.9E+03	—	—	—	—	—	—	1.5E+02	1.5E+04	—	—	—	—
Alachlor	15972-60-8	1.1E-02	1.1E+00	2.4E-01	2.4E+01	—	—	—	—	2.6E-02	2.6E+00	7.3E-01	7.3E+01	—	—	—	—
Aldicarb	116-06-3	—	—	2.4E-02	2.4E+00	—	—	—	—	—	—	7.3E-02	7.3E+00	—	—	—	—
Aldicarb sulfone	1646-88-4	—	—	2.4E-02	2.4E+00	—	—	—	—	—	—	7.3E-02	7.3E+00	—	—	—	—
Aldrin	309-00-2	5.4E-05	5.4E-03	7.3E-04	7.3E-02	4.4E+00	5.7E-01	—	—	1.2E-04	1.2E-02	2.2E-03	2.2E-01	7.4E+00	9.6E-01	—	—
Allyl alcohol	107-18-6	—	—	1.2E-01	1.2E+01	—	—	3.0E+02	3.8E+01	—	—	3.7E-01	3.7E+01	—	—	4.1E+02	5.4E+01
Allyl chloride	107-05-1	—	—	2.4E-01	2.4E+01	—	—	9.1E+00	1.2E+00	—	—	7.3E-01	7.3E+01	—	—	1.3E+01	1.7E+00
Aluminum	7429-90-5	—	—	2.4E+01	2.4E+03	—	—	—	—	—	—	7.3E+01	7.3E+03	—	—	—	—
Ametryn	834-12-8	—	—	2.2E-01	2.2E+01	—	—	—	—	—	—	6.6E-01	6.6E+01	—	—	—	—
Amino-2,6-dinitrotoluene, 4-	19406-51-0	3.0E-02	3.0E+00	1.2E-02	1.2E+00	—	—	—	—	6.8E-02	6.8E+00	3.7E-02	3.7E+00	—	—	—	—
Amino-4,6-dinitrotoluene, 2-	35572-78-2	3.0E-02	3.0E+00	1.2E-02	1.2E+00	—	—	—	—	6.8E-02	6.8E+00	3.7E-02	3.7E+00	—	—	—	—
Aminobiphenyl, 4- (1,1-biphenyl-4-amine)	92-67-1	1.5E-04	1.5E-02	—	—	—	—	—	—	3.4E-04	3.4E-02	—	—	—	—	—	—
Aminopyridine, 4-	504-24-5	—	—	4.9E-04	4.9E-02	—	—	—	—	—	—	1.5E-03	1.5E-01	—	—	—	—
Ammonia	7664-41-7	—	—	—	—	—	—	8.7E+03	1.1E+03	—	—	—	—	—	—	1.2E+04	1.6E+03
Ammonium polyphosphate*	6833-79-9	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Ammonium salts*	AMMONIUM	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Aniline	62-53-3	1.6E-01	1.6E+01	1.7E-01	1.7E+01	—	—	1.1E+04	1.4E+03	3.6E-01	3.6E+01	5.1E-01	5.1E+01	—	—	1.6E+04	2.0E+03
Anthracene	120-12-7	—	—	7.3E+00	7.3E+02	—	—	—	—	—	—	2.2E+01	2.2E+03	—	—	—	—
Anthraquinone, 9,10-	84-65-1	2.3E-02	2.3E+00	4.9E-01	4.9E+01	—	—	—	—	5.2E-02	5.2E+00	1.5E+00	1.5E+02	—	—	—	—
Antimony	7440-36-0	—	—	9.8E-03	9.8E-01	—	—	—	—	—	—	2.9E-02	2.9E+00	—	—	—	—
Aramite	140-57-8	3.7E-02	3.7E+00	1.2E+00	1.2E+02	—	—	—	—	8.2E-02	8.2E+00	3.7E+00	3.7E+02	—	—	—	—
Arsenic	7440-38-2	6.1E-03	6.1E-01	7.3E-03	7.3E-01	—	—	—	—	1.4E-02	1.4E+00	2.2E-02	2.2E+00	—	—	—	—
Arsine	7784-42-1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Atrazine	1912-24-9	4.1E-03	4.1E-01	8.6E-01	8.6E+01	—	—	—	—	9.2E-03	9.2E-01	2.6E+00	2.6E+02	—	—	—	—
Azinphos-methyl (guthion)	86-50-0	—	—	3.7E-02	3.7E+00	—	—	—	—	—	—	1.1E-01	1.1E+01	—	—	—	—
Azobenzene	103-33-3	8.3E-03	8.3E-01	—	—	6.8E+02	8.8E+01	—	—	1.9E-02	1.9E+00	—	—	1.1E+03	1.5E+02	—	—
Barium	7440-39-3	—	—	4.9E+00	4.9E+02	—	—	—	—	—	—	1.5E+01	1.5E+03	—	—	—	—
Bayleton	43121-43-3	—	—	7.3E-01	7.3E+01	—	—	—	—	—	—	2.2E+00	2.2E+02	—	—	—	—
Benefin (benfluralin)	1861-40-1	—	—	7.3E+00	7.3E+02	—	—	—	—	—	—	2.2E+01	2.2E+03	—	—	—	—
Benomyl	17804-35-2	—	—	1.2E+00	1.2E+02	—	—	—	—	—	—	3.7E+00	3.7E+02	—	—	—	—
Benz-a-anthracene	56-55-3	9.1E-03	9.1E-01	—	—	3.0E+03	3.9E+02	—	—	2.0E-02	2.0E+00	—	—	5.0E+03	6.5E+02	—	—

Table 8
Tier 1 Individual Residential and Commercial/Industrial Groundwater PCLs

Last Revised: March 1, 2022

Chemical of Concern	CAS	Residential								Commercial/Industrial							
		Carcinogenic		Noncarcinogenic		Carcinogenic		Noncarcinogenic		Carcinogenic		Noncarcinogenic		Carcinogenic		Noncarcinogenic	
		GW _{Ing} ¹ (mg/L)	GW _{Class 3} ² (mg/L)	GW _{Ing} ¹ (mg/L)	GW _{Class 3} ² (mg/L)	Air _{GW_{Ing}-V} ^{0.5} acre source area (mg/L)	Air _{GW_{Ing}-V} ³⁰ acre source area (mg/L)	Air _{GW_{Ing}-V} ^{0.5} acre source area (mg/L)	Air _{GW_{Ing}-V} ³⁰ acre source area (mg/L)	GW _{Ing} ¹ (mg/L)	GW _{Class 3} ² (mg/L)	GW _{Ing} ¹ (mg/L)	GW _{Class 3} ² (mg/L)	Air _{GW_{Ing}-V} ^{0.5} acre source area (mg/L)	Air _{GW_{Ing}-V} ³⁰ acre source area (mg/L)	Air _{GW_{Ing}-V} ^{0.5} acre source area (mg/L)	Air _{GW_{Ing}-V} ³⁰ acre source area (mg/L)
Benzaldehyde	100-52-7	—	—	2.4E+00	2.4E+02	—	—	—	—	—	—	7.3E+00	7.3E+02	—	—	—	—
Benzene	71-43-2	6.1E-02	6.1E+00	9.8E-02	9.8E+00	1.8E+02	2.3E+01	4.7E+03	6.1E+02	1.4E-01	1.4E+01	2.9E-01	2.9E+01	3.0E+02	3.9E+01	6.6E+03	8.6E+02
Benzenedicarbonitrile, 1,3-	626-17-5	—	—	1.5E-01	1.5E+01	—	—	—	—	—	—	4.4E-01	4.4E+01	—	—	—	—
Benzenedicarboxylic acid, 1,2-disodecyl ester	26761-40-0	—	—	9.8E-01	9.8E+01	—	—	1.5E+05	1.9E+04	—	—	2.9E+00	2.9E+02	—	—	2.0E+05	2.6E+04
Benzenethiol	108-98-5	—	—	2.4E-02	2.4E+00	—	—	—	—	—	—	7.3E-02	7.3E+00	—	—	—	—
Benzidine	92-87-5	4.0E-06	4.0E-04	7.3E-02	7.3E+00	5.0E+00	8.4E-01	—	—	8.9E-06	8.9E-04	2.2E-01	2.2E+01	8.4E+00	1.4E+00	—	—
Benzo-a-pyrene	50-32-8	9.1E-04	9.1E-02	7.3E-03	7.3E-01	5.7E+02	7.4E+01	2.9E+01	3.8E+00	2.0E-03	2.0E-01	2.2E-02	2.2E+00	9.6E+02	1.2E+02	4.1E+01	5.3E+00
Benzo-b-fluoranthene	205-99-2	9.1E-03	9.1E-01	—	—	2.4E+03	3.1E+02	—	—	2.0E-02	2.0E+00	—	—	4.0E+03	5.2E+02	—	—
Benzo-e-pyrene	192-97-2	—	—	7.3E-01	7.3E+01	—	—	—	—	—	—	2.2E+00	2.2E+02	—	—	—	—
Benzo-g,h,i-perylene	191-24-2	—	—	7.3E-01	7.3E+01	—	—	—	—	—	—	2.2E+00	2.2E+02	—	—	—	—
Benzoic acid	65-85-0	—	—	9.8E+01	9.8E+03	—	—	—	—	—	—	2.9E+02	2.9E+04	—	—	—	—
Benzo-j-fluoranthene	205-82-3	9.1E-03	9.1E-01	—	—	1.5E+03	2.0E+02	—	—	2.0E-02	2.0E+00	—	—	2.6E+03	3.3E+02	—	—
Benzo-k-fluoranthene	207-08-9	9.1E-02	9.1E+00	—	—	1.4E+05	1.8E+04	—	—	2.0E-01	2.0E+01	—	—	2.4E+05	3.1E+04	—	—
Benzophenone	119-61-9	—	—	1.6E-01	1.6E+01	—	—	—	—	—	—	4.9E-01	4.9E+01	—	—	—	—
Benzotrichloride	98-07-7	7.0E-05	7.0E-03	—	—	—	—	—	—	1.6E-04	1.6E-02	—	—	—	—	—	—
Benzoyl peroxide	94-36-0	—	—	1.2E+00	1.2E+02	—	—	—	—	—	—	3.7E+00	3.7E+02	—	—	—	—
Benzyl alcohol	100-51-6	—	—	2.4E+00	2.4E+02	—	—	—	—	—	—	7.3E+00	7.3E+02	—	—	—	—
Benzyl chloride	100-44-7	5.4E-03	5.4E-01	4.9E-02	4.9E+00	—	—	1.0E+02	1.3E+01	1.2E-02	1.2E+00	1.5E-01	1.5E+01	—	—	1.4E+02	1.8E+01
Benzyl dichloride	98-87-3	5.4E-03	5.4E-01	4.9E-02	4.9E+00	—	—	2.0E+02	2.6E+01	1.2E-02	1.2E+00	1.5E-01	1.5E+01	—	—	2.8E+02	3.6E+01
Beryllium	7440-41-7	—	—	4.9E-02	4.9E+00	—	—	—	—	—	—	1.5E-01	1.5E+01	—	—	—	—
Biphenyl, 1,1'-	92-52-4	—	—	1.2E+01	1.2E+03	—	—	—	—	—	—	3.7E+01	3.7E+03	—	—	—	—
Biphenyl, 1,1'-, 2-phenoxy-	6738-04-1	—	—	1.2E+00	1.2E+02	—	—	—	—	—	—	3.7E+00	3.7E+02	—	—	—	—
Biquinoline, 2,2'-	119-91-5	—	—	7.3E-02	7.3E+00	—	—	—	—	—	—	2.2E-01	2.2E+01	—	—	—	—
Bis (2-chloroethoxy) methane	111-91-1	8.3E-04	8.3E-02	7.3E-02	7.3E+00	8.0E+01	1.0E+01	—	—	1.9E-03	1.9E-01	2.2E-01	2.2E+01	1.3E+02	1.7E+01	—	—
Bis (2-chloroethyl) ether	111-44-4	8.3E-04	8.3E-02	—	—	9.3E+01	1.2E+01	—	—	1.9E-03	1.9E-01	—	—	1.6E+02	2.0E+01	—	—
Bis (2-chloro-1-methylethyl) ether	108-60-1	1.3E-02	1.3E+00	9.8E-01	9.8E+01	8.7E+02	1.1E+02	—	—	2.9E-02	2.9E+00	2.9E+00	2.9E+02	1.5E+03	1.9E+02	—	—
Bis (2-chloromethyl) ether	542-88-1	4.1E-06	4.1E-04	—	—	8.5E-02	1.1E-02	—	—	9.3E-06	9.3E-04	—	—	1.4E-01	1.9E-02	—	—
Bis (2-ethyl-hexyl) phthalate	117-81-7	6.5E-02	6.5E+00	4.9E-01	4.9E+01	—	—	—	—	1.5E-01	1.5E+01	1.5E+00	1.5E+02	—	—	—	—
Bismuth	7440-69-9	—	—	1.2E+01	1.2E+03	—	—	—	—	—	—	3.7E+01	3.7E+03	—	—	—	—
Bisphenol A	80-05-7	—	—	1.2E+00	1.2E+02	—	—	—	—	—	—	3.7E+00	3.7E+02	—	—	—	—
Boron	7440-42-8	—	—	4.9E+00	4.9E+02	—	—	—	—	—	—	1.5E+01	1.5E+03	—	—	—	—
Bromacil	314-40-9	—	—	2.4E+00	2.4E+02	—	—	—	—	—	—	7.3E+00	7.3E+02	—	—	—	—
Bromo-2-chloroethane, 1-	107-04-0	—	—	9.8E-01	9.8E+01	—	—	—	—	—	—	2.9E+00	2.9E+02	—	—	—	—
Bromobenzene	108-86-1	—	—	2.0E-01	2.0E+01	—	—	2.3E+03	2.9E+02	—	—	5.8E-01	5.8E+01	—	—	3.2E+03	4.1E+02
Bromodichloromethane	75-27-4	1.5E-02	1.5E+00	2.0E-01	2.0E+01	—	—	—	—	3.3E-02	3.3E+00	5.8E-01	5.8E+01	—	—	—	—
Bromoform ³	75-25-2	1.2E-01	1.2E+01	4.9E-01	4.9E+01	5.1E+03	6.7E+02	—	—	2.6E-01	2.6E+01	1.5E+00	1.5E+02	8.6E+03	1.1E+03	—	—
Bromomethane	74-83-9	—	—	3.4E-02	3.4E+00	—	—	3.6E+01	4.6E+00	—	—	1.0E-01	1.0E+01	—	—	5.0E+01	6.5E+00
Bromophenyl phenylether, 4-	101-55-3	6.1E-05	6.1E-03	—	—	1.6E+00	2.0E-01	—	—	1.4E-04	1.4E-02	—	—	2.7E+00	3.4E-01	—	—
Butadiene, 1,3-	106-99-0	—	—	—	—	5.1E+01	6.6E+00	3.6E+01	4.7E+00	—	—	—	—	8.6E+01	1.1E+01	5.1E+01	6.6E+00
Butadiene, 2-methyl-1,3- (isoprene)	78-79-5	—	—	1.5E+00	1.5E+02	—	—	8.2E+04	1.1E+04	—	—	4.4E+00	4.4E+02	—	—	1.2E+05	1.5E+04
Butanal (butyraldehyde)	123-72-8	—	—	1.5E+00	1.5E+02	—	—	2.0E+04	2.6E+03	—	—	4.4E+00	4.4E+02	—	—	2.8E+04	3.6E+03
Butane, 2,3-dimethyl-	79-29-8	—	—	1.5E+00	1.5E+02	—	—	2.4E+03	3.0E+02	—	—	4.4E+00	4.4E+02	—	—	3.3E+03	4.3E+02
Butanoic acid (butyric acid)	107-92-6	—	—	1.2E+01	1.2E+03	—	—	1.9E+04	2.5E+03	—	—	3.7E+01	3.7E+03	—	—	2.7E+04	3.4E+03
Butanol, 2-	78-92-2	—	—	4.9E+01	4.9E+03	—	—	1.0E+06	1.0E+06	—	—	1.5E+02	1.5E+04	—	—	1.0E+06	1.0E+06
Butanol, 2-methyl-1-	137-32-6	—	—	2.4E-01	2.4E+01	—	—	—	—	—	—	7.3E-01	7.3E+01	—	—	—	—
Butanol, 2-methyl-2-	75-85-4	—	—	2.4E-01	2.4E+01	—	—	—	—	—	—	7.3E-01	7.3E+01	—	—	—	—
Butanol, n-	71-36-3	—	—	2.4E+00	2.4E+02	—	—	—	—	—	—	7.3E+00	7.3E+02	—	—	—	—
Butene, 1-	106-98-9	—	—	1.5E+00	1.5E+02	—	—	2.9E+03	3.8E+02	—	—	4.4E+00	4.4E+02	—	—	4.1E+03	5.3E+02
Butene, cis-2-	590-18-1	—	—	1.5E+00	1.5E+02	—	—	1.3E+03	1.7E+02	—	—	4.4E+00	4.4E+02	—	—	1.8E+03	2.3E+02
Butene, trans-2-	624-64-6	—	—	1.5E+00	1.5E+02	—	—	1.3E+03	1.7E+02	—	—	4.4E+00	4.4E+02	—	—	1.8E+03	2.3E+02

Table 8
Tier 1 Individual Residential and Commercial/Industrial Groundwater PCLs

Last Revised: March 1, 2022

Chemical of Concern	CAS	Residential								Commercial/Industrial							
		Carcinogenic		Noncarcinogenic		Carcinogenic	Noncarcinogenic	Carcinogenic	Noncarcinogenic	Carcinogenic		Noncarcinogenic		Carcinogenic	Noncarcinogenic	Carcinogenic	Noncarcinogenic
		GW _{Ing} ¹ (mg/L)	GW _{Class 3} ² (mg/L)	GW _{Ing} ¹ (mg/L)	GW _{Class 3} ² (mg/L)	Air _{GW_{Ing}-V} ¹ 0.5 acre source area (mg/L)	Air _{GW_{Ing}-V} ³⁰ acre source area (mg/L)	Air _{GW_{Ing}-V} ¹ 0.5 acre source area (mg/L)	Air _{GW_{Ing}-V} ³⁰ acre source area (mg/L)	GW _{Ing} ¹ (mg/L)	GW _{Class 3} ² (mg/L)	GW _{Ing} ¹ (mg/L)	GW _{Class 3} ² (mg/L)	Air _{GW_{Ing}-V} ¹ 0.5 acre source area (mg/L)	Air _{GW_{Ing}-V} ³⁰ acre source area (mg/L)	Air _{GW_{Ing}-V} ¹ 0.5 acre source area (mg/L)	Air _{GW_{Ing}-V} ³⁰ acre source area (mg/L)
Butoxy ethanol, 2- (Ethylene glycol monobutyl ether; EGBE)	111-76-2	—	—	2.4E+00	2.4E+02	—	—	1.0E+06	1.0E+06	—	—	7.3E+00	7.3E+02	—	—	1.0E+06	1.0E+06
Butyl acetate	123-86-4	—	—	3.4E+00	3.4E+02	—	—	7.0E+05	9.1E+04	—	—	1.0E+01	1.0E+03	—	—	9.8E+05	1.3E+05
Butyl acrylate	141-32-2	—	—	2.2E-01	2.2E+01	—	—	—	—	—	—	6.6E-01	6.6E+01	—	—	—	—
Butyl benzyl phthalate	85-68-7	4.8E-01	4.8E+01	4.9E+00	4.9E+02	—	—	—	—	1.1E+00	1.1E+02	1.5E+01	1.5E+03	—	—	—	—
Butyl ether, n- (dibutyl ether)	142-96-1	—	—	2.4E+00	2.4E+02	—	—	—	—	—	—	7.3E+00	7.3E+02	—	—	—	—
Butyl methacrylate	97-88-1	—	—	2.2E+00	2.2E+02	—	—	—	—	—	—	6.6E+00	6.6E+02	—	—	—	—
Butylate	2008-41-5	—	—	1.2E+00	1.2E+02	—	—	—	—	—	—	3.7E+00	3.7E+02	—	—	—	—
Butylbenzene, n-	104-51-8	—	—	1.2E+00	1.2E+02	—	—	—	—	—	—	3.7E+00	3.7E+02	—	—	—	—
Butylbenzene, sec-	135-98-8	—	—	9.8E-01	9.8E+01	—	—	—	—	—	—	2.9E+00	2.9E+02	—	—	—	—
Butylbenzene, tert-	98-06-6	—	—	9.8E-01	9.8E+01	—	—	—	—	—	—	2.9E+00	2.9E+02	—	—	—	—
Cacodylic acid	75-60-5	—	—	7.3E-02	7.3E+00	—	—	—	—	—	—	2.2E-01	2.2E+01	—	—	—	—
Cadmium	7440-43-9	—	—	2.4E-02	2.4E+00	—	—	—	—	—	—	7.3E-02	7.3E+00	—	—	—	—
Calcium*	7440-70-2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Caprolactam	105-60-2	—	—	1.2E+01	1.2E+03	—	—	—	—	—	—	3.7E+01	3.7E+03	—	—	—	—
Captan	133-06-2	2.6E-01	2.6E+01	3.2E+00	3.2E+02	—	—	—	—	5.8E-01	5.8E+01	9.5E+00	9.5E+02	—	—	—	—
Carbaryl	63-25-2	—	—	2.4E+00	2.4E+02	—	—	—	—	—	—	7.3E+00	7.3E+02	—	—	—	—
Carbazole	86-74-8	4.6E-02	4.6E+00	—	—	—	—	—	—	1.0E-01	1.0E+01	—	—	—	—	—	—
Carbofuran	1563-66-2	—	—	1.2E-01	1.2E+01	—	—	—	—	—	—	3.7E-01	3.7E+01	—	—	—	—
Carbon disulfide	75-15-0	—	—	2.4E+00	2.4E+02	—	—	4.9E+03	6.3E+02	—	—	7.3E+00	7.3E+02	—	—	6.8E+03	8.8E+02
Carbon tetrachloride	56-23-5	1.3E-02	1.3E+00	9.8E-02	9.8E+00	2.0E+01	2.5E+00	5.1E+02	6.6E+01	2.9E-02	2.9E+00	2.9E-01	2.9E+01	3.3E+01	4.3E+00	7.1E+02	9.2E+01
Carbophenothion	786-19-6	—	—	3.2E-01	3.2E+01	—	—	—	—	—	—	9.5E-01	9.5E+01	—	—	—	—
Carbosulfan	55285-14-8	—	—	2.4E-01	2.4E+01	—	—	—	—	—	—	7.3E-01	7.3E+01	—	—	—	—
Carboxin	5234-68-4	—	—	2.4E+00	2.4E+02	—	—	—	—	—	—	7.3E+00	7.3E+02	—	—	—	—
Chloral	75-87-6	—	—	2.4E+00	2.4E+02	—	—	—	—	—	—	7.3E+00	7.3E+02	—	—	—	—
Chloral hydrate (1,1-ethanediol, 2,2,2-trichloro-)	302-17-0	—	—	2.4E+00	2.4E+02	—	—	—	—	—	—	7.3E+00	7.3E+02	—	—	—	—
Chloramben (amiben; 3-amino-2,5-dichlorobenzoic acid)	133-90-4	—	—	3.7E-01	3.7E+01	—	—	—	—	—	—	1.1E+00	1.1E+02	—	—	—	—
Chlordane (technical)	12789-03-6	2.6E-03	2.6E-01	1.2E-02	1.2E+00	7.7E+02	9.9E+01	2.3E+03	3.0E+02	5.8E-03	5.8E-01	3.7E-02	3.7E+00	1.3E+03	1.7E+02	3.2E+03	4.2E+02
Chlordane, cis- (alpha chlordane)	5103-71-9	2.6E-03	2.6E-01	1.2E-02	1.2E+00	1.5E+02	2.0E+01	4.6E+02	6.0E+01	5.8E-03	5.8E-01	3.7E-02	3.7E+00	2.6E+02	3.3E+01	6.5E+02	8.4E+01
Chlordane, trans- (gamma chlordane)	5103-74-2	2.6E-03	2.6E-01	1.2E-02	1.2E+00	1.5E+02	2.0E+01	4.6E+02	6.0E+01	5.8E-03	5.8E-01	3.7E-02	3.7E+00	2.6E+02	3.3E+01	6.5E+02	8.4E+01
Chlorfenvinphos	470-90-6	—	—	1.7E-02	1.7E+00	—	—	—	—	—	—	5.1E-02	5.1E+00	—	—	—	—
Chloride*	16887-00-6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Chlorine	7782-50-5	—	—	2.4E+00	2.4E+02	—	—	1.3E+01	1.6E+00	—	—	7.3E+00	7.3E+02	—	—	1.8E+01	2.3E+00
Chloro-1,3-butadiene, 2-	126-99-8	—	—	—	—	2.8E-01	3.7E-02	7.3E+01	9.4E+00	—	—	—	—	4.7E-01	6.1E-02	1.0E+02	1.3E+01
Chloro-2-propanol, 1-	127-00-4	—	—	4.9E-01	4.9E+01	—	—	—	—	—	—	1.5E+00	1.5E+02	—	—	—	—
Chloro-3-methylphenol, 4-	59-50-7	—	—	1.2E-01	1.2E+01	—	—	—	—	—	—	3.7E-01	3.7E+01	—	—	—	—
Chloroaniline, p-	106-47-8	4.6E-03	4.6E-01	9.8E-02	9.8E+00	—	—	—	—	1.0E-02	1.0E+00	2.9E-01	2.9E+01	—	—	—	—
Chlorobenzene	108-90-7	—	—	4.9E-01	4.9E+01	—	—	1.2E+03	1.5E+02	—	—	1.5E+00	1.5E+02	—	—	1.6E+03	2.1E+02
Chlorobenzilate	510-15-6	3.4E-03	3.4E-01	4.9E-01	4.9E+01	7.0E+03	9.0E+02	—	—	7.6E-03	7.6E-01	1.5E+00	1.5E+02	1.2E+04	1.5E+03	—	—
Chlorobromomethane (bromochloromethane)	74-97-5	—	—	9.8E-01	9.8E+01	—	—	—	—	—	—	2.9E+00	2.9E+02	—	—	—	—
Chlorodifluoromethane	75-45-6	—	—	—	—	—	—	1.7E+05	2.2E+04	—	—	—	—	—	—	2.4E+05	3.1E+04
Chloroethane (ethyl chloride)	75-00-3	—	—	9.8E+00	9.8E+02	—	—	1.2E+05	1.5E+04	—	—	2.9E+01	2.9E+03	—	—	1.6E+05	2.1E+04
Chloroethanol, 2-	107-07-3	—	—	4.9E-01	4.9E+01	—	—	—	—	—	—	1.5E+00	1.5E+02	—	—	—	—
Chloroethoxy ethene, 2- (2-chloroethylvinylether)	110-75-8	8.3E-04	8.3E-02	4.9E-02	4.9E+00	—	—	2.0E+01	2.5E+00	1.9E-03	1.9E-01	1.5E-01	1.5E+01	—	—	2.7E+01	3.5E+00
Chloroform ³	67-66-3	—	—	2.4E-01	2.4E+01	2.0E+01	2.6E+00	1.9E+03	2.5E+02	—	—	7.3E-01	7.3E+01	3.3E+01	4.3E+00	2.7E+03	3.4E+02
Chlorohexane, 1-	544-10-5	—	—	9.8E-01	9.8E+01	—	—	7.3E+03	9.4E+02	—	—	2.9E+00	2.9E+02	—	—	1.0E+04	1.3E+03
Chloromethane (methyl chloride)	74-87-3	7.0E-02	7.0E+00	8.8E-02	8.8E+00	3.6E+01	4.7E+00	2.5E+02	3.2E+01	1.6E-01	1.6E+01	2.6E-01	2.6E+01	6.1E+01	7.9E+00	3.5E+02	4.5E+01
Chloronaphthalene, 1- (Chloronaphthalene, alpha-)	90-13-1	—	—	2.0E+00	2.0E+02	—	—	—	—	—	—	5.8E+00	5.8E+02	—	—	—	—
Chloronaphthalene, 2- (chloronaphthalene, beta)	91-58-7	—	—	2.0E+00	2.0E+02	—	—	—	—	—	—	5.8E+00	5.8E+02	—	—	—	—
Chloronitrobenzene, p- (1-chloro-4-nitrobenzene)	100-00-5	1.4E-01	1.4E+01	2.4E-02	2.4E+00	—	—	7.6E+02	9.9E+01	3.2E-01	3.2E+01	7.3E-02	7.3E+00	—	—	1.1E+03	1.4E+02
Chlorophenol, 2-	95-57-8	—	—	1.2E-01	1.2E+01	—	—	—	—	—	—	3.7E-01	3.7E+01	—	—	—	—

Table 8
Tier 1 Individual Residential and Commercial/Industrial Groundwater PCLs

Last Revised: March 1, 2022

Chemical of Concern	CAS	Residential								Commercial/Industrial							
		Carcinogenic		Noncarcinogenic		Carcinogenic		Noncarcinogenic		Carcinogenic		Noncarcinogenic		Carcinogenic		Noncarcinogenic	
		GW _{Intg} ¹ (mg/L)	GW _{Class 3} ² (mg/L)	GW _{Intg} ¹ (mg/L)	GW _{Class 3} ² (mg/L)	Air _{GW_{Intg}-V} ³⁰ 0.5 acre source area (mg/L)	Air _{GW_{Intg}-V} ³⁰ acre source area (mg/L)	Air _{GW_{Intg}-V} ³⁰ 0.5 acre source area (mg/L)	Air _{GW_{Intg}-V} ³⁰ acre source area (mg/L)	GW _{Intg} ¹ (mg/L)	GW _{Class 3} ² (mg/L)	GW _{Intg} ¹ (mg/L)	GW _{Class 3} ² (mg/L)	Air _{GW_{Intg}-V} ³⁰ 0.5 acre source area (mg/L)	Air _{GW_{Intg}-V} ³⁰ acre source area (mg/L)	Air _{GW_{Intg}-V} ³⁰ 0.5 acre source area (mg/L)	Air _{GW_{Intg}-V} ³⁰ acre source area (mg/L)
Chlorophenol, 3-	108-43-0	—	—	1.2E-01	1.2E+01	—	—	—	—	—	—	3.7E-01	3.7E+01	—	—	—	—
Chlorophenol, 4-	106-48-9	—	—	1.2E-01	1.2E+01	—	—	—	—	—	—	3.7E-01	3.7E+01	—	—	—	—
Chlorophenyl phenylether, 4-	7005-72-3	6.1E-05	6.1E-03	—	—	1.2E+00	1.6E-01	—	—	1.4E-04	1.4E-02	—	—	2.1E+00	2.7E-01	—	—
Chloropropane, 2-	75-29-6	—	—	7.3E-01	7.3E+01	—	—	4.7E+02	6.0E+01	—	—	2.2E+00	2.2E+02	—	—	6.5E+02	8.5E+01
Chlorothalonil	1897-45-6	8.3E-02	8.3E+00	3.7E-01	3.7E+01	—	—	—	—	1.9E-01	1.9E+01	1.1E+00	1.1E+02	—	—	—	—
Chlorotoluene, o- (2-chlorotoluene)	95-49-8	—	—	4.9E-01	4.9E+01	—	—	2.4E+04	3.1E+03	—	—	1.5E+00	1.5E+02	—	—	3.3E+04	4.3E+03
Chlorotoluene, p- (4-chlorotoluene)	106-43-4	—	—	4.9E-01	4.9E+01	—	—	—	—	—	—	1.5E+00	1.5E+02	—	—	—	—
Chlorpyrifos	2921-88-2	—	—	7.3E-02	7.3E+00	—	—	—	—	—	—	2.2E-01	2.2E+01	—	—	—	—
Chromium (III)	16065-83-1	—	—	3.7E+01	3.7E+03	—	—	—	—	—	—	1.1E+02	1.1E+04	—	—	—	—
Chromium (total)	7440-47-3	—	—	3.7E+01	3.7E+03	—	—	—	—	—	—	1.1E+02	1.1E+04	—	—	—	—
Chromium (VI)	18540-29-9	—	—	7.6E-02	7.6E+00	—	—	—	—	—	—	2.3E-01	2.3E+01	—	—	—	—
Chrysene	218-01-9	9.1E-01	9.1E+01	—	—	8.6E+05	1.1E+05	—	—	2.0E+00	2.0E+02	—	—	1.0E+06	1.9E+05	—	—
Cobalt	7440-48-4	—	—	2.4E-01	2.4E+01	—	—	—	—	—	—	7.3E-01	7.3E+01	—	—	—	—
Copolymer acrylamide	69418-26-4	—	—	4.9E-03	4.9E-01	—	—	—	—	—	—	1.5E-02	1.5E+00	—	—	—	—
Copper	7440-50-8	—	—	2.4E+00	2.4E+02	—	—	—	—	—	—	7.1E+00	7.1E+02	—	—	—	—
Coronene	191-07-1	—	—	4.9E-02	4.9E+00	—	—	—	—	—	—	1.5E-01	1.5E+01	—	—	—	—
Coumaphos	56-72-4	—	—	1.7E-01	1.7E+01	—	—	—	—	—	—	5.1E-01	5.1E+01	—	—	—	—
Cresol	1319-77-3	—	—	1.2E+00	1.2E+02	—	—	—	—	—	—	3.7E+00	3.7E+02	—	—	—	—
Cresol, m- (3-methylphenol)	108-39-4	—	—	1.2E+00	1.2E+02	—	—	—	—	—	—	3.7E+00	3.7E+02	—	—	—	—
Cresol, o- (2-methylphenol)	95-48-7	—	—	1.2E+00	1.2E+02	—	—	—	—	—	—	3.7E+00	3.7E+02	—	—	—	—
Cresol, p- (4-methylphenol)	106-44-5	—	—	1.2E-01	1.2E+01	—	—	—	—	—	—	3.7E-01	3.7E+01	—	—	—	—
Crotonaldehyde	123-73-9	4.8E-04	4.8E-02	2.4E-02	2.4E+00	—	—	—	—	1.1E-03	1.1E-01	7.3E-02	7.3E+00	—	—	—	—
Cumene (isopropylbenzene)	98-82-8	—	—	2.4E+00	2.4E+02	—	—	4.4E+03	5.7E+02	—	—	7.3E+00	7.3E+02	—	—	6.2E+03	8.0E+02
Cyanazine	21725-46-2	1.1E-03	1.1E-01	4.9E-02	4.9E+00	—	—	—	—	2.4E-03	2.4E-01	1.5E-01	1.5E+01	—	—	—	—
Cyanide	57-12-5	—	—	1.5E-02	1.5E+00	—	—	—	—	—	—	4.4E-02	4.4E+00	—	—	—	—
Cyanogen	460-19-5	—	—	2.4E-02	2.4E+00	—	—	7.3E+00	9.4E-01	—	—	7.3E-02	7.3E+00	—	—	1.0E+01	1.3E+00
Cycloate	1134-23-2	—	—	1.3E+00	1.3E+02	—	—	—	—	—	—	4.0E+00	4.0E+02	—	—	—	—
Cyclohexane	110-82-7	—	—	1.2E+02	1.2E+04	—	—	5.9E+03	7.7E+02	—	—	3.7E+02	3.7E+04	—	—	8.3E+03	1.1E+03
Cyclohexanol	108-93-0	—	—	1.2E+02	1.2E+04	—	—	—	—	—	—	3.7E+02	3.7E+04	—	—	—	—
Cyclohexanone	108-94-1	—	—	1.2E+02	1.2E+04	—	—	1.0E+06	1.8E+05	—	—	3.7E+02	3.7E+04	—	—	1.0E+06	2.5E+05
Cyclohexene, 1-methanol-3-	1679-51-2	—	—	4.9E-01	4.9E+01	—	—	—	—	—	—	1.5E+00	1.5E+02	—	—	—	—
Cyclohexene, 4-vinyl-1-	100-40-3	—	—	5.4E-01	5.4E+01	—	—	1.1E+03	1.4E+02	—	—	1.6E+00	1.6E+02	—	—	1.5E+03	2.0E+02
Cyclopentane	287-92-3	—	—	1.5E+00	1.5E+02	—	—	3.7E+04	4.8E+03	—	—	4.4E+00	4.4E+02	—	—	5.1E+04	6.7E+03
Cyclopentane, methyl-	96-37-7	—	—	2.4E+00	2.4E+02	—	—	6.8E+02	8.8E+01	—	—	7.3E+00	7.3E+02	—	—	9.5E+02	1.2E+02
Cyclopentene	142-29-0	—	—	1.2E+02	1.2E+04	—	—	—	—	—	—	3.7E+02	3.7E+04	—	—	—	—
Cyclotetramethylenetetranitramine (HMX)	2691-41-0	—	—	1.2E+00	1.2E+02	—	—	—	—	—	—	3.7E+00	3.7E+02	—	—	—	—
Cyclotrimethylenetrinitramine (RDX)	121-82-4	1.1E-02	1.1E+00	9.8E-02	9.8E+00	—	—	—	—	2.6E-02	2.6E+00	2.9E-01	2.9E+01	—	—	—	—
Cymene (isopropyltoluene)	99-87-6	—	—	2.4E+00	2.4E+02	—	—	—	—	—	—	7.3E+00	7.3E+02	—	—	—	—
Cymoxanil	57966-95-7	—	—	3.2E-01	3.2E+01	—	—	—	—	—	—	9.5E-01	9.5E+01	—	—	—	—
Dacthal (DCPA)	1861-32-1	—	—	2.4E-01	2.4E+01	—	—	—	—	—	—	7.3E-01	7.3E+01	—	—	—	—
Dalapon, sodium salt (2,2-dichloropropanoic acid)	75-99-0	—	—	7.3E-01	7.3E+01	—	—	—	—	—	—	2.2E+00	2.2E+02	—	—	—	—
DDD	72-54-8	3.8E-03	3.8E-01	—	—	—	—	—	—	8.5E-03	8.5E-01	—	—	—	—	—	—
DDE	72-55-9	2.7E-03	2.7E-01	—	—	—	—	—	—	6.0E-03	6.0E-01	—	—	—	—	—	—
DDT	50-29-3	2.7E-03	2.7E-01	1.2E-02	1.2E+00	6.2E+02	8.1E+01	—	—	6.0E-03	6.0E-01	3.7E-02	3.7E+00	1.0E+03	1.4E+02	—	—
Demeton	8065-48-3	—	—	9.8E-04	9.8E-02	—	—	—	—	—	—	2.9E-03	2.9E-01	—	—	—	—
Desethylatrazine	6190-65-4	—	—	8.6E-01	8.6E+01	—	—	—	—	—	—	2.6E+00	2.6E+02	—	—	—	—
Diacetone alcohol (4-hydroxy-4-methyl-2-pentanone)	123-42-2	—	—	9.8E-01	9.8E+01	—	—	—	—	—	—	2.9E+00	2.9E+02	—	—	—	—
Diallate	2303-16-4	1.5E-02	1.5E+00	—	—	—	—	—	—	3.4E-02	3.4E+00	—	—	—	—	—	—
Diazinon	333-41-5	—	—	2.2E-02	2.2E+00	—	—	4.0E+03	5.2E+02	—	—	6.6E-02	6.6E+00	—	—	5.6E+03	7.2E+02
Dibenz(a,h)acridine	226-36-8	7.6E-04	7.6E-02	—	—	8.1E+03	1.1E+03	—	—	1.7E-03	1.7E-01	—	—	1.4E+04	1.8E+03	—	—

Table 8
Tier 1 Individual Residential and Commercial/Industrial Groundwater PCLs

Last Revised: March 1, 2022

Chemical of Concern	CAS	Residential								Commercial/Industrial							
		Carcinogenic		Noncarcinogenic		Carcinogenic		Noncarcinogenic		Carcinogenic		Noncarcinogenic		Carcinogenic		Noncarcinogenic	
		GW _{Ing} ¹ (mg/L)	GW _{Class 3} ² (mg/L)	GW _{Ing} ¹ (mg/L)	GW _{Class 3} ² (mg/L)	Air _{GW_{Ing}-V} ³⁰ 0.5 acre source area (mg/L)	Air _{GW_{Ing}-V} ³⁰ acre source area (mg/L)	Air _{GW_{Ing}-V} ³⁰ 0.5 acre source area (mg/L)	Air _{GW_{Ing}-V} ³⁰ acre source area (mg/L)	GW _{Ing} ¹ (mg/L)	GW _{Class 3} ² (mg/L)	GW _{Ing} ¹ (mg/L)	GW _{Class 3} ² (mg/L)	Air _{GW_{Ing}-V} ³⁰ 0.5 acre source area (mg/L)	Air _{GW_{Ing}-V} ³⁰ acre source area (mg/L)	Air _{GW_{Ing}-V} ³⁰ 0.5 acre source area (mg/L)	Air _{GW_{Ing}-V} ³⁰ acre source area (mg/L)
Dibenz(a,j)acridine	224-42-0	1.3E-03	1.3E-01	—	—	1.0E+04	1.3E+03	—	—	2.8E-03	2.8E-01	—	—	1.7E+04	2.2E+03	—	—
Dibenz-a,h-anthracene	53-70-3	9.1E-04	9.1E-02	—	—	1.5E+03	2.0E+02	—	—	2.0E-03	2.0E-01	—	—	2.6E+03	3.3E+02	—	—
Dibenzo(a,e)pyrene	192-65-4	1.3E-04	1.3E-02	—	—	1.0E+03	1.3E+02	—	—	2.8E-04	2.8E-02	—	—	1.7E+03	2.2E+02	—	—
Dibenzo(a,h)pyrene	189-64-0	1.3E-05	1.3E-03	—	—	1.0E+02	1.3E+01	—	—	2.8E-05	2.8E-03	—	—	1.7E+02	2.2E+01	—	—
Dibenzo(a,i)pyrene	189-55-9	1.3E-05	1.3E-03	—	—	1.0E+02	1.3E+01	—	—	2.8E-05	2.8E-03	—	—	1.7E+02	2.2E+01	—	—
Dibenzofuran	132-64-9	—	—	9.8E-02	9.8E+00	—	—	—	—	—	—	2.9E-01	2.9E+01	—	—	—	—
Dibenzothioephene	132-65-0	—	—	2.4E-01	2.4E+01	—	—	—	—	—	—	7.3E-01	7.3E+01	—	—	—	—
Dibromo-3-chloropropane, 1,2-	96-12-8	1.1E-03	1.1E-01	4.9E-03	4.9E-01	6.2E-01	8.0E-02	3.2E+01	4.1E+00	2.6E-03	2.6E-01	1.5E-02	1.5E+00	1.0E+00	1.3E-01	4.4E+01	5.7E+00
Dibromochloromethane (chlorodibromomethane) ³	124-48-1	1.1E-02	1.1E+00	4.9E-01	4.9E+01	—	—	—	—	2.4E-02	2.4E+00	1.5E+00	1.5E+02	—	—	—	—
Dibromofluoromethane	1868-53-7	—	—	4.9E+00	4.9E+02	—	—	—	—	—	—	1.5E+01	1.5E+03	—	—	—	—
Dicamba	1918-00-9	—	—	7.3E-01	7.3E+01	—	—	—	—	—	—	2.2E+00	2.2E+02	—	—	—	—
Dichlormid	37764-25-3	—	—	6.1E-01	6.1E+01	—	—	—	—	—	—	1.8E+00	1.8E+02	—	—	—	—
Dichloro-2-butene, 1,4-	764-41-0	—	—	—	—	6.7E-01	8.7E-02	—	—	—	—	—	—	1.1E+00	1.5E-01	—	—
Dichloro-2-butene, 1,4- trans	110-57-6	—	—	—	—	6.5E-01	8.5E-02	—	—	—	—	—	—	1.1E+00	1.4E-01	—	—
Dichlorobenzene, 1,2-	95-50-1	—	—	2.2E+00	2.2E+02	—	—	1.2E+03	1.5E+02	—	—	6.6E+00	6.6E+02	—	—	1.6E+03	2.1E+02
Dichlorobenzene, 1,3-	541-73-1	—	—	7.3E-01	7.3E+01	—	—	1.9E+02	2.5E+01	—	—	2.2E+00	2.2E+02	—	—	2.7E+02	3.4E+01
Dichlorobenzene, 1,4-	106-46-7	3.8E-02	3.8E+00	—	—	—	—	1.7E+04	2.2E+03	8.5E-02	8.5E+00	—	—	—	—	2.4E+04	3.1E+03
Dichlorobenzidine, 3,3'-	91-94-1	2.0E-03	2.0E-01	—	—	—	—	—	—	4.5E-03	4.5E-01	—	—	—	—	—	—
Dichlorobutane, 2,3-	7581-97-7	—	—	2.4E-01	2.4E+01	—	—	1.4E+02	1.9E+01	—	—	7.3E-01	7.3E+01	—	—	2.0E+02	2.6E+01
Dichlorodifluoromethane	75-71-8	—	—	4.9E+00	4.9E+02	—	—	6.0E+01	7.8E+00	—	—	1.5E+01	1.5E+03	—	—	8.4E+01	1.1E+01
Dichloroethane, 1,1-	75-34-3	—	—	4.9E+00	4.9E+02	—	—	4.3E+04	5.6E+03	—	—	1.5E+01	1.5E+03	—	—	6.0E+04	7.8E+03
Dichloroethane, 1,2-	107-06-2	1.0E-02	1.0E+00	1.9E+00	1.9E+02	2.5E+02	3.3E+01	1.6E+03	2.1E+02	2.2E-02	2.2E+00	5.7E+00	5.7E+02	4.2E+02	5.5E+01	2.3E+03	2.9E+02
Dichloroethylene, 1,1-	75-35-4	—	—	1.2E+00	1.2E+02	—	—	1.7E+03	2.2E+02	—	—	3.7E+00	3.7E+02	—	—	2.3E+03	3.0E+02
Dichloroethylene, cis-1,2-	156-59-2	—	—	4.9E-02	4.9E+00	—	—	1.2E+03	1.6E+02	—	—	1.5E-01	1.5E+01	—	—	1.7E+03	2.2E+02
Dichloroethylene, trans-1,2	156-60-5	—	—	4.9E-01	4.9E+01	—	—	7.7E+02	9.9E+01	—	—	1.5E+00	1.5E+02	—	—	1.1E+03	1.4E+02
Dichlorofluoromethane	75-43-4	—	—	4.9E+00	4.9E+02	—	—	—	—	—	—	1.5E+01	1.5E+03	—	—	—	—
Dichlorophenol, 2,3-	576-24-9	—	—	7.3E-02	7.3E+00	—	—	—	—	—	—	2.2E-01	2.2E+01	—	—	—	—
Dichlorophenol, 2,4-	120-83-2	—	—	7.3E-02	7.3E+00	—	—	—	—	—	—	2.2E-01	2.2E+01	—	—	—	—
Dichlorophenol, 2,5-	583-78-8	—	—	7.3E-02	7.3E+00	—	—	—	—	—	—	2.2E-01	2.2E+01	—	—	—	—
Dichlorophenol, 2,6-	87-65-0	—	—	2.4E-02	2.4E+00	—	—	—	—	—	—	7.3E-02	7.3E+00	—	—	—	—
Dichlorophenol, 3,4-	95-77-2	—	—	7.3E-02	7.3E+00	—	—	—	—	—	—	2.2E-01	2.2E+01	—	—	—	—
Dichlorophenol, 3,5-	591-35-5	—	—	7.3E-02	7.3E+00	—	—	—	—	—	—	2.2E-01	2.2E+01	—	—	—	—
Dichlorophenoxy, 2,4- butyric acid, 4- (2,4-DB)	94-82-6	—	—	2.0E-01	2.0E+01	—	—	—	—	—	—	5.8E-01	5.8E+01	—	—	—	—
Dichlorophenoxyacetic acid, 2,4- (2,4-D)	94-75-7	—	—	4.9E+00	4.9E+02	—	—	—	—	—	—	1.5E+01	1.5E+03	—	—	—	—
Dichloroprop (2-(2,4-dichlorophenoxy) propanoic acid)	120-36-5	—	—	2.4E-01	2.4E+01	—	—	—	—	—	—	7.3E-01	7.3E+01	—	—	—	—
Dichloropropane, 1,2-	78-87-5	2.5E-02	2.5E+00	3.2E+00	3.2E+02	7.4E+02	9.5E+01	1.2E+02	1.5E+01	5.5E-02	5.5E+00	9.5E+00	9.5E+02	1.2E+03	1.6E+02	1.6E+02	2.1E+01
Dichloropropane, 1,3-	142-28-9	9.1E-03	9.1E-01	4.9E-01	4.9E+01	2.5E+02	3.3E+01	8.7E+02	1.1E+02	2.0E-02	2.0E+00	1.5E+00	1.5E+02	4.3E+02	5.5E+01	1.2E+03	1.6E+02
Dichloropropane, 2,2-	594-20-7	1.3E-02	1.3E+00	2.2E+00	2.2E+02	—	—	5.7E+01	7.3E+00	3.0E-02	3.0E+00	6.6E+00	6.6E+02	—	—	7.9E+01	1.0E+01
Dichloropropanol, 2,3-	616-23-9	—	—	7.3E-02	7.3E+00	—	—	—	—	—	—	2.2E-01	2.2E+01	—	—	—	—
Dichloropropene, 1,1-	563-58-6	9.1E-03	9.1E-01	7.3E-01	7.3E+01	1.9E+01	2.5E+00	6.6E+01	8.5E+00	2.0E-02	2.0E+00	2.2E+00	2.2E+02	3.2E+01	4.2E+00	9.2E+01	1.2E+01
Dichloropropene, 1,3- (mixed isomers)	542-75-6	9.1E-03	9.1E-01	7.3E-01	7.3E+01	1.8E+02	2.3E+01	6.1E+02	7.9E+01	2.0E-02	2.0E+00	2.2E+00	2.2E+02	3.0E+02	3.8E+01	8.5E+02	1.1E+02
Dichloropropene, cis 1,3-	10061-01-5	1.7E-03	1.7E-01	2.4E-03	2.4E-01	—	—	6.9E+02	8.9E+01	3.8E-03	3.8E-01	7.3E-03	7.3E-01	—	—	9.7E+02	1.2E+02
Dichloropropene, trans 1,3-	10061-02-6	9.1E-03	9.1E-01	7.3E-01	7.3E+01	1.9E+02	2.5E+01	6.5E+02	8.4E+01	2.0E-02	2.0E+00	2.2E+00	2.2E+02	3.2E+02	4.1E+01	9.1E+02	1.2E+02
Dichlorvos	62-73-7	3.1E-03	3.1E-01	1.2E-02	1.2E+00	—	—	1.0E+04	1.3E+03	7.0E-03	7.0E-01	3.7E-02	3.7E+00	—	—	1.4E+04	1.8E+03
Dicrotophos (bidrin)	141-66-2	—	—	2.4E-03	2.4E-01	—	—	—	—	—	—	7.3E-03	7.3E-01	—	—	—	—
Dicyclopentadiene	77-73-6	—	—	2.0E+00	2.0E+02	—	—	—	—	—	—	5.8E+00	5.8E+02	—	—	—	—
Diendrin	60-57-1	5.7E-05	5.7E-03	1.2E-03	1.2E-01	1.3E+02	1.6E+01	—	—	1.3E-04	1.3E-02	3.7E-03	3.7E-01	2.1E+02	2.8E+01	—	—
Diethanolamine	111-42-2	—	—	1.2E-02	1.2E+00	—	—	1.0E+06	1.0E+06	—	—	3.7E-02	3.7E+00	—	—	1.0E+06	1.0E+06
Diethyldithiocarbamate, sodium salt	148-18-5	3.4E-03	3.4E-01	7.3E-01	7.3E+01	—	—	—	—	7.6E-03	7.6E-01	2.2E+00	2.2E+02	—	—	—	—
Diethyl phthalate	84-66-2	—	—	2.0E+01	2.0E+03	—	—	—	—	—	—	5.8E+01	5.8E+03	—	—	—	—

Table 8
Tier 1 Individual Residential and Commercial/Industrial Groundwater PCLs

Last Revised: March 1, 2022

Chemical of Concern	CAS	Residential								Commercial/Industrial							
		Carcinogenic		Noncarcinogenic		Carcinogenic		Noncarcinogenic		Carcinogenic		Noncarcinogenic		Carcinogenic		Noncarcinogenic	
		GW _{Intg} ¹ (mg/L)	GW _{Class 3} ² (mg/L)	GW _{Intg} ¹ (mg/L)	GW _{Class 3} ² (mg/L)	Air _{GW_{Intg-V}} ¹ 0.5 acre source area (mg/L)	Air _{GW_{Intg-V}} ³⁰ acre source area (mg/L)	Air _{GW_{Intg-V}} ¹ 0.5 acre source area (mg/L)	Air _{GW_{Intg-V}} ³⁰ acre source area (mg/L)	GW _{Intg} ¹ (mg/L)	GW _{Class 3} ² (mg/L)	GW _{Intg} ¹ (mg/L)	GW _{Class 3} ² (mg/L)	Air _{GW_{Intg-V}} ^{0.5} acre source area (mg/L)	Air _{GW_{Intg-V}} ³⁰ acre source area (mg/L)	Air _{GW_{Intg-V}} ^{0.5} acre source area (mg/L)	Air _{GW_{Intg-V}} ³⁰ acre source area (mg/L)
Diethylene glycol	111-46-6	—	—	4.9E+01	4.9E+03	—	—	—	—	—	—	1.5E+02	1.5E+04	—	—	—	—
Diethylene glycol monobutyl ether	112-34-5	—	—	7.3E-01	7.3E+01	—	—	3.2E+03	4.1E+02	—	—	2.2E+00	2.2E+02	—	—	4.5E+03	5.8E+02
Diethylhexyl adipate	103-23-1	7.6E-01	7.6E+01	1.5E+01	1.5E+03	—	—	—	—	1.7E+00	1.7E+02	4.4E+01	4.4E+03	—	—	—	—
Diethylstilbestrol	56-53-1	1.9E-07	1.9E-05	—	—	—	—	—	—	4.3E-07	4.3E-05	—	—	—	—	—	—
Diisobutylene (trimethyl-1-pentene, 2,4,4-)	107-39-1	—	—	1.5E+00	1.5E+02	—	—	2.3E+01	3.0E+00	—	—	4.4E+00	4.4E+02	—	—	3.2E+01	4.2E+00
Diisopropylbenzene, p-	100-18-5	—	—	2.4E-01	2.4E+01	—	—	—	—	—	—	7.3E-01	7.3E+01	—	—	—	—
Diisopropyl ether (2,2'-oxybis-propane)	108-20-3	—	—	2.4E+00	2.4E+02	—	—	2.0E+04	2.5E+03	—	—	7.3E+00	7.3E+02	—	—	2.7E+04	3.5E+03
Dimethenamid	87674-68-8	—	—	3.7E-01	3.7E+01	—	—	—	—	—	—	1.1E+00	1.1E+02	—	—	—	—
Dimethoate	60-51-5	—	—	4.9E-03	4.9E-01	—	—	—	—	—	—	1.5E-02	1.5E+00	—	—	—	—
Dimethoxybenzidine, 3,3'-	119-90-4	6.5E-02	6.5E+00	—	—	—	—	—	—	1.5E-01	1.5E+01	—	—	—	—	—	—
Dimethyl-2-nitrobenzene, 1,3-	81-20-9	—	—	4.9E-02	4.9E+00	—	—	1.1E+04	1.4E+03	—	—	1.5E-01	1.5E+01	—	—	1.5E+04	2.0E+03
Dimethyl-3-nitrobenzene, 1,2-	83-41-0	—	—	4.9E-02	4.9E+00	—	—	1.3E+04	1.7E+03	—	—	1.5E-01	1.5E+01	—	—	1.9E+04	2.4E+03
Dimethyl-4-nitrobenzene, 1-2-	99-51-4	—	—	4.9E-02	4.9E+00	—	—	1.5E+04	1.9E+03	—	—	1.5E-01	1.5E+01	—	—	2.1E+04	2.7E+03
Dimethyl-5-nitrobenzene, 1,3-	99-12-7	—	—	4.9E-02	4.9E+00	—	—	9.5E+03	1.2E+03	—	—	1.5E-01	1.5E+01	—	—	1.3E+04	1.7E+03
Dimethylphenethylamine, alpha, alpha-	122-09-8	—	—	4.9E-02	4.9E+00	—	—	—	—	—	—	1.5E-01	1.5E+01	—	—	—	—
Dimethyl phenol, 2,4-	105-67-9	—	—	4.9E-01	4.9E+01	—	—	—	—	—	—	1.5E+00	1.5E+02	—	—	—	—
Dimethylaminoazobenzene, p-	60-11-7	—	—	2.4E-04	2.4E-02	—	—	—	—	—	—	7.3E-04	7.3E-02	—	—	—	—
Dimethylbenz-a-anthracene, 7,12-	57-97-6	3.7E-06	3.7E-04	—	—	3.3E+01	4.3E+00	—	—	8.2E-06	8.2E-04	—	—	5.5E+01	7.2E+00	—	—
Dimethylbenzidine, 3,3'-	119-93-7	8.3E-05	8.3E-03	—	—	—	—	—	—	1.9E-04	1.9E-02	—	—	—	—	—	—
Dimethylformamide, N,N-	68-12-2	—	—	2.4E+00	2.4E+02	—	—	3.7E+05	4.8E+04	—	—	7.3E+00	7.3E+02	—	—	5.2E+05	6.8E+04
Dimethylnaphthalene, 1,3-	575-41-7	—	—	9.8E-01	9.8E+01	—	—	—	—	—	—	2.9E+00	2.9E+02	—	—	—	—
Dimethylphthalate	131-11-3	—	—	2.0E+01	2.0E+03	—	—	—	—	—	—	5.8E+01	5.8E+03	—	—	—	—
Di-n-butyl phthalate	84-74-2	—	—	2.4E+00	2.4E+02	—	—	—	—	—	—	7.3E+00	7.3E+02	—	—	—	—
Dinitro-2-methylphenol, 4,6- (dinitro-o-cresol, 4, 6-)	534-52-1	—	—	2.4E-03	2.4E-01	—	—	—	—	—	—	7.3E-03	7.3E-01	—	—	—	—
Dinitrobenzene, 1,3- (dinitrobenzene, 2,4-)	99-65-0	—	—	2.4E-03	2.4E-01	—	—	—	—	—	—	7.3E-03	7.3E-01	—	—	—	—
Dinitrobenzene, 1,4-	100-25-4	—	—	2.4E-03	2.4E-01	—	—	—	—	—	—	7.3E-03	7.3E-01	—	—	—	—
Dinitrophenol, 2,4-	51-28-5	—	—	4.9E-02	4.9E+00	—	—	—	—	—	—	1.5E-01	1.5E+01	—	—	—	—
Dinitrophenol, 2,5-	329-71-5	—	—	4.9E-02	4.9E+00	—	—	—	—	—	—	1.5E-01	1.5E+01	—	—	—	—
Dinitrotoluene, 2,4-	121-14-2	1.3E-03	1.3E-01	4.9E-02	4.9E+00	—	—	—	—	3.0E-03	3.0E-01	1.5E-01	1.5E+01	—	—	—	—
Dinitrotoluene, 2,6-	606-20-2	1.3E-03	1.3E-01	2.4E-02	2.4E+00	—	—	—	—	3.0E-03	3.0E-01	7.3E-02	7.3E+00	—	—	—	—
Di-n-octyl phthalate	117-84-0	—	—	2.4E-01	2.4E+01	—	—	—	—	—	—	7.3E-01	7.3E+01	—	—	—	—
Dimoseb	88-85-7	—	—	2.4E-02	2.4E+00	—	—	—	—	—	—	7.3E-02	7.3E+00	—	—	—	—
Dioxane 1,4-	123-91-1	9.1E-03	9.1E-01	7.3E-01	7.3E+01	7.7E+03	1.0E+03	1.8E+05	2.3E+04	2.0E-02	2.0E+00	2.2E+00	2.2E+02	1.3E+04	1.7E+03	2.5E+05	3.3E+04
Dioxin (as 2,3,7,8-TCDD toxicity equivalent quotients (TEQs))	1746-01-6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Diphenyl ether	101-84-8	—	—	1.5E-01	1.5E+01	—	—	—	—	—	—	4.5E-01	4.5E+01	—	—	—	—
Diphenylamine	122-39-4	—	—	6.1E-01	6.1E+01	—	—	—	—	—	—	1.8E+00	1.8E+02	—	—	—	—
Diphenylhydrazine, 1,2-	122-66-7	1.1E-03	1.1E-01	—	—	3.8E+03	4.9E+02	—	—	2.6E-03	2.6E-01	—	—	6.4E+03	8.3E+02	—	—
Dipropylene glycol	110-98-5	—	—	2.9E+00	2.9E+02	—	—	—	—	—	—	8.8E+00	8.8E+02	—	—	—	—
Diquat	85-00-7	—	—	5.4E-02	5.4E+00	—	—	—	—	—	—	1.6E-01	1.6E+01	—	—	—	—
Disodium iminodiacetate (iminodiacetic acid, disodium salt)	142-73-4	—	—	2.4E-01	2.4E+01	—	—	—	—	—	—	7.3E-01	7.3E+01	—	—	—	—
Disulfoton	298-04-4	—	—	9.8E-04	9.8E-02	—	—	—	—	—	—	2.9E-03	2.9E-01	—	—	—	—
Diuron	330-54-1	—	—	4.9E-02	4.9E+00	—	—	—	—	—	—	1.5E-01	1.5E+01	—	—	—	—
Dodecylphenol, 4-	104-43-8	—	—	1.2E+00	1.2E+02	—	—	—	—	—	—	3.7E+00	3.7E+02	—	—	—	—
Endosulfan	115-29-7	—	—	1.5E-01	1.5E+01	—	—	—	—	—	—	4.4E-01	4.4E+01	—	—	—	—
Endosulfan I	959-98-8	—	—	4.9E-02	4.9E+00	—	—	—	—	—	—	1.5E-01	1.5E+01	—	—	—	—
Endosulfan II	33213-65-9	—	—	1.5E-01	1.5E+01	—	—	—	—	—	—	4.4E-01	4.4E+01	—	—	—	—
Endosulfan sulfate	1031-07-8	—	—	1.5E-01	1.5E+01	—	—	—	—	—	—	4.4E-01	4.4E+01	—	—	—	—
Endothall	145-73-3	—	—	4.9E-01	4.9E+01	—	—	—	—	—	—	1.5E+00	1.5E+02	—	—	—	—
Endrin	72-20-8	—	—	7.3E-03	7.3E-01	—	—	—	—	—	—	2.2E-02	2.2E+00	—	—	—	—
Endrin aldehyde	7421-93-4	—	—	7.3E-03	7.3E-01	—	—	—	—	—	—	2.2E-02	2.2E+00	—	—	—	—

Table 8
Tier 1 Individual Residential and Commercial/Industrial Groundwater PCLs

Last Revised: March 1, 2022

Chemical of Concern	CAS	Residential								Commercial/Industrial							
		Carcinogenic		Noncarcinogenic		Carcinogenic		Noncarcinogenic		Carcinogenic		Noncarcinogenic		Carcinogenic		Noncarcinogenic	
		GW _{Intg} ¹ (mg/L)	GW _{Class 3} ² (mg/L)	GW _{Intg} ¹ (mg/L)	GW _{Class 3} ² (mg/L)	Air _{GW_{Intg}-V} ¹ 0.5 acre source area (mg/L)	Air _{GW_{Intg}-V} ³⁰ acre source area (mg/L)	Air _{GW_{Intg}-V} ¹ 0.5 acre source area (mg/L)	Air _{GW_{Intg}-V} ³⁰ acre source area (mg/L)	GW _{Intg} ¹ (mg/L)	GW _{Class 3} ² (mg/L)	GW _{Intg} ¹ (mg/L)	GW _{Class 3} ² (mg/L)	Air _{GW_{Intg}-V} ^{0.5} acre source area (mg/L)	Air _{GW_{Intg}-V} ³⁰ acre source area (mg/L)	Air _{GW_{Intg}-V} ^{0.5} acre source area (mg/L)	Air _{GW_{Intg}-V} ³⁰ acre source area (mg/L)
Endrin ketone	53494-70-5	—	—	7.3E-03	7.3E-01	—	—	—	—	—	—	2.2E-02	2.2E+00	—	—	—	—
Epichlorohydrin	106-89-8	9.2E-02	9.2E+00	1.5E-01	1.5E+01	1.4E+04	1.8E+03	7.1E+02	9.1E+01	2.1E-01	2.1E+01	4.4E-01	4.4E+01	2.3E+04	3.0E+03	9.9E+02	1.3E+02
EPN (o-ethyl o-(4-nitrophenyl)phenylphosphonothioate)	2104-64-5	—	—	2.4E-04	2.4E-02	—	—	—	—	—	—	7.3E-04	7.3E-02	—	—	—	—
Esfenvalerate	66230-04-4	—	—	4.9E-02	4.9E+00	—	—	—	—	—	—	1.5E-01	1.5E+01	—	—	—	—
Ethalfuralin (sonolan)	55283-68-6	1.0E-02	1.0E+00	9.8E-01	9.8E+01	—	—	—	—	2.3E-02	2.3E+00	2.9E+00	2.9E+02	—	—	—	—
Ethanol	64-17-5	—	—	8.1E+02	8.1E+04	—	—	—	—	—	—	2.4E+03	2.4E+05	—	—	—	—
Ethanol, 2-amino-	141-43-5	—	—	4.2E-02	4.2E+00	—	—	4.2E+05	5.5E+04	—	—	1.2E-01	1.2E+01	—	—	5.9E+05	7.7E+04
Ethanol, 2-(2-aminoethoxy)-	929-06-6	—	—	1.2E-02	1.2E+00	—	—	—	—	—	—	3.7E-02	3.7E+00	—	—	—	—
Ethanol, 2-(2-ethoxyethoxy)-	111-90-0	—	—	4.9E+01	4.9E+03	—	—	—	—	—	—	1.5E+02	1.5E+04	—	—	—	—
Ethanol, 2-(methlamino)-	109-83-1	—	—	3.9E-01	3.9E+01	—	—	1.0E+06	1.3E+05	—	—	1.2E+00	1.2E+02	—	—	1.0E+06	1.8E+05
Ethion	563-12-2	—	—	1.2E-02	1.2E+00	—	—	—	—	—	—	3.7E-02	3.7E+00	—	—	—	—
Ethoprop	13194-48-4	3.2E-02	3.2E+00	2.4E-03	2.4E-01	—	—	—	—	7.3E-02	7.3E+00	7.3E-03	7.3E-01	—	—	—	—
Ethoxy ethanol, 2-	110-80-5	—	—	2.2E+00	2.2E+02	—	—	1.0E+06	4.3E+05	—	—	6.6E+00	6.6E+02	—	—	1.0E+06	6.1E+05
Ethyl acetate	141-78-6	—	—	2.2E+01	2.2E+03	—	—	5.3E+04	6.9E+03	—	—	6.6E+01	6.6E+03	—	—	7.4E+04	9.6E+03
Ethyl acrylate	140-88-5	1.9E-02	1.9E+00	1.2E-01	1.2E+01	—	—	1.1E+03	1.4E+02	4.3E-02	4.3E+00	3.7E-01	3.7E+01	—	—	1.5E+03	2.0E+02
Ethyl benzene	100-41-4	—	—	2.4E+00	2.4E+02	—	—	3.0E+04	3.8E+03	—	—	7.3E+00	7.3E+02	—	—	4.2E+04	5.4E+03
Ethyl dipropylthiocarbamate, S-	759-94-4	—	—	6.1E-01	6.1E+01	—	—	—	—	—	—	1.8E+00	1.8E+02	—	—	—	—
Ethyl ether	60-29-7	—	—	4.9E+00	4.9E+02	—	—	—	—	—	—	1.5E+01	1.5E+03	—	—	—	—
Ethyl methacrylate	97-63-2	—	—	2.2E+00	2.2E+02	—	—	5.7E+04	7.4E+03	—	—	6.6E+00	6.6E+02	—	—	8.0E+04	1.0E+04
Ethyl methanesulfonate	62-50-0	9.2E-03	9.2E-01	—	—	1.9E+04	2.4E+03	—	—	2.1E-02	2.1E+00	—	—	3.1E+04	4.0E+03	—	—
Ethyl tert-butyl ether (2-ethyl-2-ethoxypropane)	637-92-3	—	—	2.4E-02	2.4E+00	—	—	1.1E+04	1.4E+03	—	—	7.3E-02	7.3E+00	—	—	1.5E+04	2.0E+03
Ethyl-1-hexanol, 2-	104-76-7	—	—	3.7E+00	3.7E+02	—	—	—	—	—	—	1.1E+01	1.1E+03	—	—	—	—
Ethyl-2-hexenal, 2-	645-62-5	—	—	3.7E+00	3.7E+02	—	—	—	—	—	—	1.1E+01	1.1E+03	—	—	—	—
Ethyl-2-methyl benzene, 1-	611-14-3	—	—	1.2E+00	1.2E+02	—	—	9.2E+03	1.2E+03	—	—	3.7E+00	3.7E+02	—	—	1.3E+04	1.7E+03
Ethyl-4-methyl benzene, 1-	622-96-8	—	—	1.2E+00	1.2E+02	—	—	7.0E+03	9.0E+02	—	—	3.7E+00	3.7E+02	—	—	9.7E+03	1.3E+03
Ethylene*	74-85-1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Ethylene dibromide (dibromoethane, 1,2-)	106-93-4	4.6E-04	4.6E-02	2.2E-01	2.2E+01	7.6E+01	9.8E+00	9.6E+03	1.2E+03	1.0E-03	1.0E-01	6.6E-01	6.6E+01	1.3E+02	1.7E+01	1.3E+04	1.7E+03
Ethylene glycol	107-21-1	—	—	4.9E+01	4.9E+03	—	—	—	—	—	—	1.5E+02	1.5E+04	—	—	—	—
Ethylene oxide	75-21-8	8.9E-04	8.9E-02	—	—	3.0E+03	3.9E+02	—	—	2.0E-03	2.0E-01	—	—	5.0E+03	6.5E+02	—	—
Ethylene thiourea	96-45-7	8.3E-03	8.3E-01	2.0E-03	2.0E-01	—	—	—	—	1.9E-02	1.9E+00	5.8E-03	5.8E-01	—	—	—	—
Ethylenediamine	107-15-3	—	—	2.2E+00	2.2E+02	—	—	—	—	—	—	6.6E+00	6.6E+02	—	—	—	—
Ethylenimine	151-56-4	1.4E-05	1.4E-03	—	—	1.4E+01	1.8E+00	—	—	3.1E-05	3.1E-03	—	—	2.3E+01	3.0E+00	—	—
Ethylhexyl acrylate, 2-	103-11-7	1.9E-02	1.9E+00	—	—	—	—	—	—	4.3E-02	4.3E+00	—	—	—	—	—	—
Famphur	52-85-7	—	—	7.3E-04	7.3E-02	—	—	—	—	—	—	2.2E-03	2.2E-01	—	—	—	—
Fensulfothion	115-90-2	—	—	2.4E-02	2.4E+00	—	—	—	—	—	—	7.3E-02	7.3E+00	—	—	—	—
Fenthion	55-38-9	—	—	1.7E-03	1.7E-01	—	—	—	—	—	—	5.1E-03	5.1E-01	—	—	—	—
Fenuron	101-42-8	—	—	1.7E+00	1.7E+02	—	—	—	—	—	—	5.1E+00	5.1E+02	—	—	—	—
Fluoranthene	206-44-0	—	—	9.8E-01	9.8E+01	—	—	—	—	—	—	2.9E+00	2.9E+02	—	—	—	—
Fluorene	86-73-7	—	—	9.8E-01	9.8E+01	—	—	—	—	—	—	2.9E+00	2.9E+02	—	—	—	—
Fluorine (soluble fluoride)	7782-41-4	—	—	1.5E+00	1.5E+02	—	—	—	—	—	—	4.4E+00	4.4E+02	—	—	—	—
Fluorochloridone	61213-25-0	—	—	1.8E-01	1.8E+01	—	—	—	—	—	—	5.5E-01	5.5E+01	—	—	—	—
Fonofos	944-22-9	—	—	4.9E-02	4.9E+00	—	—	—	—	—	—	1.5E-01	1.5E+01	—	—	—	—
Formaldehyde	50-00-0	—	—	4.9E+00	4.9E+02	—	—	8.6E+04	1.1E+04	—	—	1.5E+01	1.5E+03	—	—	1.2E+05	1.6E+04
Formic acid	64-18-6	—	—	2.2E+01	2.2E+03	—	—	1.7E+04	2.3E+03	—	—	6.6E+01	6.6E+03	—	—	2.4E+04	3.2E+03
Furan	110-00-9	—	—	2.4E-02	2.4E+00	—	—	—	—	—	—	7.3E-02	7.3E+00	—	—	—	—
Furfural	98-01-1	—	—	7.3E-02	7.3E+00	—	—	—	—	—	—	2.2E-01	2.2E+01	—	—	—	—
Glycidylaldehyde	765-34-4	—	—	9.8E-03	9.8E-01	—	—	1.4E+04	1.9E+03	—	—	2.9E-02	2.9E+00	—	—	2.0E+04	2.6E+03
Glyphosate	1071-83-6	—	—	2.4E+01	2.4E+03	—	—	—	—	—	—	7.3E+01	7.3E+03	—	—	—	—
Heptachlor	76-44-8	2.0E-04	2.0E-02	1.2E-02	1.2E+00	6.3E+00	8.1E-01	—	—	4.5E-04	4.5E-02	3.7E-02	3.7E+00	1.1E+01	1.4E+00	—	—
Heptachlor epoxide	1024-57-3	1.0E-04	1.0E-02	3.2E-04	3.2E-02	1.2E+02	1.5E+01	—	—	2.2E-04	2.2E-02	9.5E-04	9.5E-02	2.0E+02	2.6E+01	—	—

Table 8
Tier 1 Individual Residential and Commercial/Industrial Groundwater PCLs

Last Revised: March 1, 2022

Chemical of Concern	CAS	Residential								Commercial/Industrial							
		Carcinogenic		Noncarcinogenic		Carcinogenic	Noncarcinogenic	Carcinogenic	Noncarcinogenic	Carcinogenic		Noncarcinogenic		Carcinogenic	Noncarcinogenic	Carcinogenic	Noncarcinogenic
		GW _{Intg} ¹ (mg/L)	GW _{Class 3} ² (mg/L)	GW _{Intg} ¹ (mg/L)	GW _{Class 3} ² (mg/L)	AirGW _{Intg-V} ³⁰ 0.5 acre source area (mg/L)	AirGW _{Intg-V} ³⁰ acre source area (mg/L)	AirGW _{Intg-V} ³⁰ 0.5 acre source area (mg/L)	AirGW _{Intg-V} ³⁰ acre source area (mg/L)	GW _{Intg} ¹ (mg/L)	GW _{Class 3} ² (mg/L)	GW _{Intg} ¹ (mg/L)	GW _{Class 3} ² (mg/L)	AirGW _{Intg-V} ³⁰ 0.5 acre source area (mg/L)	AirGW _{Intg-V} ³⁰ acre source area (mg/L)	AirGW _{Intg-V} ³⁰ 0.5 acre source area (mg/L)	AirGW _{Intg-V} ³⁰ acre source area (mg/L)
Heptane, n-	142-82-5	—	—	1.5E+00	1.5E+02	—	—	8.7E+02	1.1E+02	—	—	4.4E+00	4.4E+02	—	—	1.2E+03	1.6E+02
Heptanoic acid, n-	111-14-8	—	—	1.2E+01	1.2E+03	—	—	1.7E+04	2.1E+03	—	—	3.7E+01	3.7E+03	—	—	2.3E+04	3.0E+03
Hexachlorobenzene	118-74-1	5.7E-04	5.7E-02	2.0E-02	2.0E+00	5.7E+00	7.4E-01	—	—	1.3E-03	1.3E-01	5.8E-02	5.8E+00	9.6E+00	1.2E+00	—	—
Hexachlorobutadiene	87-68-3	1.2E-02	1.2E+00	2.4E-02	2.4E+00	8.9E+00	1.1E+00	—	—	2.6E-02	2.6E+00	7.3E-02	7.3E+00	1.5E+01	1.9E+00	—	—
Hexachlorocyclohexane, alpha (alpha-BHC)	319-84-6	1.4E-04	1.4E-02	2.0E-01	2.0E+01	1.5E+02	2.0E+01	—	—	3.2E-04	3.2E-02	5.8E-01	5.8E+01	2.6E+02	3.3E+01	—	—
Hexachlorocyclohexane, beta (beta-BHC)	319-85-7	5.1E-04	5.1E-02	—	—	1.1E+03	1.5E+02	—	—	1.1E-03	1.1E-01	—	—	1.9E+03	2.5E+02	—	—
Hexachlorocyclohexane, delta (delta-BHC)	319-86-8	5.1E-04	5.1E-02	7.3E-03	7.3E-01	3.6E+02	4.7E+01	—	—	1.1E-03	1.1E-01	2.2E-02	2.2E+00	6.1E+02	7.9E+01	—	—
Hexachlorocyclohexane, gamma (lindane; gamma-BHC)	58-89-9	7.0E-04	7.0E-02	7.3E-03	7.3E-01	—	—	—	—	1.6E-03	1.6E-01	2.2E-02	2.2E+00	—	—	—	—
Hexachlorocyclohexane, techn (technical-BHC)	608-73-1	5.1E-04	5.1E-02	—	—	9.9E+02	1.3E+02	—	—	1.1E-03	1.1E-01	—	—	1.7E+03	2.2E+02	—	—
Hexachlorocyclopentadiene	77-47-4	—	—	1.5E-01	1.5E+01	—	—	5.4E+00	7.0E-01	—	—	4.4E-01	4.4E+01	—	—	7.6E+00	9.8E-01
Hexachloroethane	67-72-1	2.3E-02	2.3E+00	1.7E-02	1.7E+00	—	—	7.3E+03	9.5E+02	5.1E-02	5.1E+00	5.1E-02	5.1E+00	—	—	1.0E+04	1.3E+03
Hexachlorophene	70-30-4	—	—	7.3E-03	7.3E-01	—	—	—	—	—	—	2.2E-02	2.2E+00	—	—	—	—
Hexachloropropylene	1888-71-7	2.3E-02	2.3E+00	1.7E-02	1.7E+00	—	—	2.1E+03	2.8E+02	5.1E-02	5.1E+00	5.1E-02	5.1E+00	—	—	3.0E+03	3.9E+02
Hexanal, 2-ethyl-	123-05-7	—	—	3.7E+00	3.7E+02	—	—	—	—	—	—	1.1E+01	1.1E+03	—	—	—	—
Hexane, n-	110-54-3	—	—	1.5E+00	1.5E+02	—	—	3.8E+01	4.9E+00	—	—	4.4E+00	4.4E+02	—	—	5.3E+01	6.9E+00
Hexanediamine, 1,6-	124-09-4	—	—	1.2E-01	1.2E+01	—	—	—	—	—	—	3.7E-01	3.7E+01	—	—	—	—
Hexanedinitrile	111-69-3	—	—	3.4E-02	3.4E+00	—	—	1.6E+05	2.1E+04	—	—	1.0E-01	1.0E+01	—	—	2.2E+05	2.9E+04
Hexanediol, 1,6-	629-11-8	—	—	1.2E+02	1.2E+04	—	—	1.0E+06	1.0E+06	—	—	3.7E+02	3.7E+04	—	—	1.0E+06	1.0E+06
Hexanoic acid	142-62-1	—	—	1.6E+00	1.6E+02	—	—	2.1E+04	2.7E+03	—	—	4.7E+00	4.7E+02	—	—	3.0E+04	3.8E+03
Hexanone, 2-	591-78-6	—	—	1.2E+00	1.2E+02	—	—	1.2E+04	1.5E+03	—	—	3.7E+00	3.7E+02	—	—	1.6E+04	2.1E+03
Hexazinone	51235-04-2	—	—	8.1E-01	8.1E+01	—	—	—	—	—	—	2.4E+00	2.4E+02	—	—	—	—
Hexene, 1-	592-41-6	—	—	8.1E+00	8.1E+02	—	—	3.4E+01	4.3E+00	—	—	2.4E+01	2.4E+03	—	—	4.7E+01	6.1E+00
Hexene, cis-2-	7688-21-3	—	—	8.1E+00	8.1E+02	—	—	4.8E+01	6.2E+00	—	—	2.4E+01	2.4E+03	—	—	6.7E+01	8.7E+00
Hexylene glycol (2-methyl-2,4-pentanediol)	107-41-5	—	—	7.3E+00	7.3E+02	—	—	—	—	—	—	2.2E+01	2.2E+03	—	—	—	—
Hydrazine	302-01-2	3.0E-04	3.0E-02	—	—	5.1E+01	6.7E+00	3.2E+02	4.2E+01	6.8E-04	6.8E-02	—	—	8.6E+01	1.1E+01	4.5E+02	5.9E+01
Hydrocaproic acid, 6- (6-hydroxyhexanoic acid)	1191-25-9	—	—	1.6E+00	1.6E+02	—	—	2.9E+04	4.2E+03	—	—	4.7E+00	4.7E+02	—	—	4.0E+04	5.9E+03
Hydrogen chloride (hydrochloric acid)*	7647-01-0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hydroquinone	123-31-9	1.5E-02	1.5E+00	9.8E-01	9.8E+01	—	—	—	—	3.4E-02	3.4E+00	2.9E+00	2.9E+02	—	—	—	—
Indene	95-13-6	—	—	4.9E-01	4.9E+01	—	—	2.7E+02	3.5E+01	—	—	1.5E+00	1.5E+02	—	—	3.8E+02	5.0E+01
Indeno-1,2,3-cd-pyrene	193-39-5	9.1E-03	9.1E-01	—	—	1.4E+04	1.8E+03	—	—	2.0E-02	2.0E+00	—	—	2.3E+04	3.0E+03	—	—
Iron*	7439-89-6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Isoamyl alcohol	123-51-3	—	—	1.2E-01	1.2E+01	—	—	—	—	—	—	3.7E-01	3.7E+01	—	—	—	—
Isobutyl alcohol	78-83-1	—	—	7.3E+00	7.3E+02	—	—	—	—	—	—	2.2E+01	2.2E+03	—	—	—	—
Isobutylene (2-methyl-1-propene)	115-11-7	—	—	9.0E-02	9.0E+00	—	—	6.1E+04	7.9E+03	—	—	2.7E-01	2.7E+01	—	—	8.5E+04	1.1E+04
Isobutyric acid (2-methylpropanoic acid)	79-31-2	—	—	1.2E+01	1.2E+03	—	—	—	—	—	—	3.7E+01	3.7E+03	—	—	—	—
Isodecanol	25339-17-7	—	—	3.9E-02	3.9E+00	—	—	—	—	—	—	1.2E-01	1.2E+01	—	—	—	—
Isodrin	465-73-6	5.4E-06	5.4E-04	7.3E-05	7.3E-03	3.4E-02	4.4E-03	—	—	1.2E-05	1.2E-03	2.2E-04	2.2E-02	5.7E-02	7.4E-03	—	—
Isopentane	78-78-4	—	—	1.5E+00	1.5E+02	—	—	2.5E+03	3.2E+02	—	—	4.4E+00	4.4E+02	—	—	3.4E+03	4.4E+02
Isophorone	78-59-1	9.6E-01	9.6E+01	4.9E+00	4.9E+02	—	—	—	—	2.2E+00	2.2E+02	1.5E+01	1.5E+03	—	—	—	—
Isopropyl acetate	108-21-4	—	—	1.7E+00	1.7E+02	—	—	—	—	—	—	5.1E+00	5.1E+02	—	—	—	—
Isopropyl alcohol	67-63-0	—	—	4.9E+01	4.9E+03	—	—	4.2E+05	5.5E+04	—	—	1.5E+02	1.5E+04	—	—	5.9E+05	7.6E+04
Isosafrole	120-58-1	4.1E-03	4.1E-01	—	—	4.3E+02	5.5E+01	—	—	9.3E-03	9.3E-01	—	—	7.2E+02	9.3E+01	—	—
Kelthane (dicofol)	115-32-2	—	—	1.5E-01	1.5E+01	—	—	—	—	—	—	4.4E-01	4.4E+01	—	—	—	—
Kepone (chlordecone)	143-50-0	9.1E-05	9.1E-03	7.3E-03	7.3E-01	2.4E+02	3.0E+01	—	—	2.0E-04	2.0E-02	2.2E-02	2.2E+00	4.0E+02	5.1E+01	—	—
Lead (inorganic)	7439-92-1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Leptophos	21609-90-5	—	—	1.2E-04	1.2E-02	—	—	6.4E+01	8.2E+00	—	—	3.7E-04	3.7E-02	—	—	8.9E+01	1.2E+01
Limonene, d-*	5989-27-5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Lithium	7439-93-2	—	—	1.7E-01	1.7E+01	—	—	—	—	—	—	5.1E-01	5.1E+01	—	—	—	—
Magnesium*	7439-95-4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Malathion	121-75-5	—	—	4.9E-01	4.9E+01	—	—	9.2E+03	1.2E+03	—	—	1.5E+00	1.5E+02	—	—	1.3E+04	1.7E+03

Table 8
Tier 1 Individual Residential and Commercial/Industrial Groundwater PCLs

Last Revised: March 1, 2022

Chemical of Concern	CAS	Residential								Commercial/Industrial							
		Carcinogenic		Noncarcinogenic		Carcinogenic	Noncarcinogenic	Carcinogenic	Noncarcinogenic	Carcinogenic		Noncarcinogenic		Carcinogenic	Noncarcinogenic	Carcinogenic	Noncarcinogenic
		GW _{Int} ¹ (mg/L)	GW _{Class 3} ² (mg/L)	GW _{Int} ¹ (mg/L)	GW _{Class 3} ² (mg/L)	AirGW _{Int-V} 0.5 acre source area (mg/L)	AirGW _{Int-V} 30 acre source area (mg/L)	AirGW _{Int-V} 0.5 acre source area (mg/L)	AirGW _{Int-V} 30 acre source area (mg/L)	GW _{Int} ¹ (mg/L)	GW _{Class 3} ² (mg/L)	GW _{Int} ¹ (mg/L)	GW _{Class 3} ² (mg/L)	AirGW _{Int-V} 0.5 acre source area (mg/L)	AirGW _{Int-V} 30 acre source area (mg/L)	AirGW _{Int-V} 0.5 acre source area (mg/L)	AirGW _{Int-V} 30 acre source area (mg/L)
Maleic anhydride	108-31-6	—	—	2.4E+00	2.4E+02	—	—	—	—	—	—	7.3E+00	7.3E+02	—	—	—	—
Maleic hydrazide	123-33-1	—	—	1.2E+01	1.2E+03	—	—	—	—	—	—	3.7E+01	3.7E+03	—	—	—	—
Malononitrile	109-77-3	—	—	2.4E-03	2.4E-01	—	—	—	—	—	—	7.3E-03	7.3E-01	—	—	—	—
Mancozeb	8018-01-7	—	—	7.3E-01	7.3E+01	—	—	—	—	—	—	2.2E+00	2.2E+02	—	—	—	—
Manganese	7439-96-5	—	—	1.1E+00	1.1E+02	—	—	—	—	—	—	1.0E+01	1.0E+03	—	—	—	—
MCPA (4-(chloro-2-methylphenoxy) acetic acid)	94-74-6	—	—	1.2E-02	1.2E+00	—	—	—	—	—	—	3.7E-02	3.7E+00	—	—	—	—
MCPP (2-(4-chloro-2-methylphenoxy) propanoic acid)	93-65-2	—	—	2.4E-02	2.4E+00	—	—	—	—	—	—	7.3E-02	7.3E+00	—	—	—	—
Mercury (pH = 4.9)	7439-97-6	—	—	7.3E-03	7.3E-01	—	—	7.3E+00	9.4E-01	—	—	2.2E-02	2.2E+00	—	—	1.0E+01	1.3E+00
Mercury (pH=6.8)	7439-97-6	—	—	7.3E-03	7.3E-01	—	—	7.3E+00	9.4E-01	—	—	2.2E-02	2.2E+00	—	—	1.0E+01	1.3E+00
Merphos	150-50-5	—	—	7.3E-04	7.3E-02	—	—	—	—	—	—	2.2E-03	2.2E-01	—	—	—	—
Methacrylic acid (2-methyl-2-propenoic acid)	79-41-4	—	—	2.4E-01	2.4E+01	—	—	—	—	—	—	7.3E-01	7.3E+01	—	—	—	—
Methacrylonitrile	126-98-7	—	—	1.2E+00	1.2E+02	—	—	1.1E+04	1.4E+03	—	—	3.7E+00	3.7E+02	—	—	1.6E+04	2.0E+03
Methanol	67-56-1	—	—	4.9E+01	4.9E+03	—	—	1.0E+06	1.0E+06	—	—	1.5E+02	1.5E+04	—	—	1.0E+06	1.0E+06
Methapyrilene	91-80-5	1.9E-04	1.9E-02	—	—	—	—	—	—	4.3E-04	4.3E-02	—	—	—	—	—	—
Methomyl	16752-77-5	—	—	6.1E-01	6.1E+01	—	—	—	—	—	—	1.8E+00	1.8E+02	—	—	—	—
Methoxychlor	72-43-5	—	—	1.2E-01	1.2E+01	—	—	—	—	—	—	3.7E-01	3.7E+01	—	—	—	—
Methoxyethanol, 2-	109-86-4	—	—	6.6E-01	6.6E+01	—	—	8.1E+01	1.1E+01	—	—	2.0E+00	2.0E+02	—	—	1.1E+02	1.5E+01
Methyl acetate (acetic acid, methyl ester)	79-20-9	—	—	2.4E+01	2.4E+03	—	—	—	—	—	—	7.3E+01	7.3E+03	—	—	—	—
Methyl acrylate	96-33-3	—	—	4.9E-02	4.9E+00	—	—	2.7E+03	3.4E+02	—	—	1.5E-01	1.5E+01	—	—	3.7E+03	4.8E+02
Methyl amyl ketone (2-heptanone)	110-43-0	—	—	1.2E+00	1.2E+02	—	—	1.0E+06	1.4E+05	—	—	3.7E+00	3.7E+02	—	—	1.0E+06	2.0E+05
Methyl chrysene, 1-	3351-28-8	1.3E-01	1.3E+01	—	—	8.0E+05	1.0E+05	—	—	2.8E-01	2.8E+01	—	—	1.0E+06	1.7E+05	—	—
Methyl chrysene, 2-	3351-32-4	1.3E-01	1.3E+01	—	—	8.0E+05	1.0E+05	—	—	2.8E-01	2.8E+01	—	—	1.0E+06	1.7E+05	—	—
Methyl chrysene, 6-	1705-85-7	1.3E-02	1.3E+00	—	—	8.0E+04	1.0E+04	—	—	2.8E-02	2.8E+00	—	—	1.3E+05	1.7E+04	—	—
Methyl cyclohexane	108-87-2	—	—	1.2E+02	1.2E+04	—	—	1.4E+03	1.8E+02	—	—	3.7E+02	3.7E+04	—	—	2.0E+03	2.6E+02
Methyl ethyl ketone (2-butanone)	78-93-3	—	—	1.5E+01	1.5E+03	—	—	1.0E+06	6.2E+05	—	—	4.4E+01	4.4E+03	—	—	1.0E+06	8.7E+05
Methyl iodide (iodomethane)	74-88-4	—	—	3.4E-02	3.4E+00	—	—	—	—	—	—	1.0E-01	1.0E+01	—	—	—	—
Methyl isobutyl ketone (4-methyl-2-pentanone)	108-10-1	—	—	2.0E+00	2.0E+02	—	—	6.7E+05	8.7E+04	—	—	5.8E+00	5.8E+02	—	—	9.4E+05	1.2E+05
Methyl mercury	22967-92-6	—	—	2.4E-03	2.4E-01	—	—	—	—	—	—	7.3E-03	7.3E-01	—	—	—	—
Methyl methacrylate	80-62-6	—	—	3.4E+01	3.4E+03	—	—	7.9E+04	1.0E+04	—	—	1.0E+02	1.0E+04	—	—	1.1E+05	1.4E+04
Methyl methanesulfonate	66-27-3	9.2E-03	9.2E-01	—	—	1.7E+04	2.2E+03	—	—	2.1E-02	2.1E+00	—	—	2.8E+04	3.7E+03	—	—
Methyl parathion	298-00-0	—	—	6.1E-03	6.1E-01	—	—	—	—	—	—	1.8E-02	1.8E+00	—	—	—	—
Methyl-1-butene, 2-	563-46-2	—	—	1.5E+00	1.5E+02	—	—	7.8E+03	1.0E+03	—	—	4.4E+00	4.4E+02	—	—	1.1E+04	1.4E+03
Methyl-1-propanal, 2- (isobutyraldehyde)	78-84-2	—	—	9.8E-01	9.8E+01	—	—	—	—	—	—	2.9E+00	2.9E+02	—	—	—	—
Methyl-2-butene, 2-	513-35-9	—	—	1.5E+00	1.5E+02	—	—	1.5E+04	1.9E+03	—	—	4.4E+00	4.4E+02	—	—	2.1E+04	2.7E+03
Methyl-2-pentenal, 2-	623-36-9	4.8E-04	4.8E-02	—	—	—	—	—	—	1.1E-03	1.1E-01	—	—	—	—	—	—
Methylcholanthrene, 3-	56-49-5	4.1E-05	4.1E-03	—	—	4.1E+02	5.4E+01	—	—	9.3E-05	9.3E-03	—	—	7.0E+02	9.0E+01	—	—
Methylene bromide (dibromomethane)	74-95-3	1.2E-01	1.2E+01	1.5E+00	1.5E+02	—	—	2.4E+02	3.1E+01	2.7E-01	2.7E+01	4.4E+00	4.4E+02	—	—	3.3E+02	4.3E+01
Methylene chloride (dichloromethane)	75-09-2	9.3E+00	9.3E+02	5.1E-01	5.1E+01	2.1E+04	2.8E+03	3.3E+04	4.3E+03	2.1E+01	2.1E+03	1.5E+00	1.5E+02	3.6E+04	4.6E+03	4.7E+04	6.0E+03
Methylene-bis (2-chloroaniline) 4,4'-	101-14-4	9.1E-03	9.1E-01	4.9E-02	4.9E+00	2.0E+04	2.6E+03	—	—	2.0E-02	2.0E+00	1.5E-01	1.5E+01	3.3E+04	4.3E+03	—	—
Methylmercury hydroxide	1184-57-2	—	—	2.4E-03	2.4E-01	—	—	—	—	—	—	7.3E-03	7.3E-01	—	—	—	—
Methylnaphthalene, 1-	90-12-0	3.1E-02	3.1E+00	1.7E+00	1.7E+02	—	—	—	—	7.0E-02	7.0E+00	5.1E+00	5.1E+02	—	—	—	—
Methylnaphthalene, 2-	91-57-6	—	—	9.8E-02	9.8E+00	—	—	—	—	—	—	2.9E-01	2.9E+01	—	—	—	—
Methylpyrrolidone, N-	872-50-4	—	—	4.9E-01	4.9E+01	—	—	—	—	—	—	1.5E+00	1.5E+02	—	—	—	—
Methylstyrene, alpha-	98-83-9	—	—	2.0E-01	2.0E+01	—	—	6.6E+02	8.5E+01	—	—	6.1E-01	6.1E+01	—	—	9.2E+02	1.2E+02
Methyltetrahydrofuran, 2-	96-47-9	1.2E-01	1.2E+01	4.9E+00	4.9E+02	1.8E+03	2.3E+02	—	—	2.7E-01	2.7E+01	1.5E+01	1.5E+03	3.1E+03	3.9E+02	—	—
Methyltetrahydropyran, 2-	10141-72-7	1.2E-01	1.2E+01	4.9E+00	4.9E+02	2.1E+03	2.7E+02	—	—	2.7E-01	2.7E+01	1.5E+01	1.5E+03	3.6E+03	4.6E+02	—	—
Metolachlor	51218-45-2	—	—	3.7E+00	3.7E+02	—	—	—	—	—	—	1.1E+01	1.1E+03	—	—	—	—
Metribuzin	21087-64-9	—	—	6.1E-01	6.1E+01	—	—	—	—	—	—	1.8E+00	1.8E+02	—	—	—	—
Mirex	2385-85-5	—	—	4.9E-03	4.9E-01	—	—	—	—	—	—	1.5E-02	1.5E+00	—	—	—	—
Molinate	2212-67-1	—	—	4.9E-02	4.9E+00	—	—	—	—	—	—	1.5E-01	1.5E+01	—	—	—	—

Table 8
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Last Revised: March 1, 2022

Chemical of Concern	CAS	Residential								Commercial/Industrial							
		Carcinogenic		Noncarcinogenic		Carcinogenic	Noncarcinogenic	Carcinogenic	Noncarcinogenic	Carcinogenic		Noncarcinogenic		Carcinogenic	Noncarcinogenic	Carcinogenic	Noncarcinogenic
		GW _{Ing} ¹ (mg/L)	GW _{Class 3} ² (mg/L)	GW _{Ing} ¹ (mg/L)	GW _{Class 3} ² (mg/L)	AirGW _{Ing-V} ¹ 0.5 acre source area (mg/L)	AirGW _{Ing-V} ³⁰ acre source area (mg/L)	AirGW _{Ing-V} ¹ 0.5 acre source area (mg/L)	AirGW _{Ing-V} ³⁰ acre source area (mg/L)	GW _{Ing} ¹ (mg/L)	GW _{Class 3} ² (mg/L)	GW _{Ing} ¹ (mg/L)	GW _{Class 3} ² (mg/L)	AirGW _{Ing-V} ¹ 0.5 acre source area (mg/L)	AirGW _{Ing-V} ³⁰ acre source area (mg/L)	AirGW _{Ing-V} ¹ 0.5 acre source area (mg/L)	AirGW _{Ing-V} ³⁰ acre source area (mg/L)
Molybdenum	7439-98-7	—	—	1.2E-01	1.2E+01	—	—	—	—	—	—	3.7E-01	3.7E+01	—	—	—	—
Monocrotaphos	2157-98-4	—	—	1.5E-02	1.5E+00	—	—	—	—	—	—	4.4E-02	4.4E+00	—	—	—	—
Morpholine	110-91-8	—	—	1.2E+04	1.2E+06	—	—	—	—	—	—	3.7E+04	3.7E+06	—	—	—	—
Morpholine, N-butyl-	1005-67-0	—	—	5.6E-02	5.6E+00	—	—	—	—	—	—	1.7E-01	1.7E+01	—	—	—	—
MTBE (methyl tert-butyl ether)	1634-04-4	5.1E-01	5.1E+01	2.4E-01	2.4E+01	4.0E+03	5.2E+02	1.4E+05	1.7E+04	1.1E+00	1.1E+02	7.3E-01	7.3E+01	6.8E+03	8.8E+02	1.9E+05	2.4E+04
Naled	300-76-5	—	—	4.9E-02	4.9E+00	—	—	—	—	—	—	1.5E-01	1.5E+01	—	—	—	—
Naphthalene	91-20-3	—	—	4.9E-01	4.9E+01	—	—	3.2E+02	4.1E+01	—	—	1.5E+00	1.5E+02	—	—	4.4E+02	5.7E+01
Naphthoquinone, 1,4-	130-15-4	—	—	1.7E-01	1.7E+01	—	—	—	—	—	—	5.1E-01	5.1E+01	—	—	—	—
Naphthylamine, 1-	134-32-7	—	—	4.9E-01	4.9E+01	—	—	—	—	—	—	1.5E+00	1.5E+02	—	—	—	—
Naphthylamine, 2-	91-59-8	5.1E-04	5.1E-02	—	—	—	—	—	—	1.1E-03	1.1E-01	—	—	—	—	—	—
Napropamide	15299-99-7	—	—	2.4E+00	2.4E+02	—	—	—	—	—	—	7.3E+00	7.3E+02	—	—	—	—
Neopentyl glycol	126-30-7	—	—	7.3E+00	7.3E+02	—	—	—	—	—	—	2.2E+01	2.2E+03	—	—	—	—
Nickel and compounds	7440-02-0	—	—	4.9E-01	4.9E+01	—	—	—	—	—	—	1.5E+00	1.5E+02	—	—	—	—
Nitrate-N	14797-55-8	—	—	3.9E+01	3.9E+03	—	—	—	—	—	—	1.2E+02	1.2E+04	—	—	—	—
Nitrite-N	14797-65-0	—	—	2.4E+00	2.4E+02	—	—	—	—	—	—	7.3E+00	7.3E+02	—	—	—	—
Nitroaniline, 2-	88-74-4	—	—	7.3E-03	7.3E-01	—	—	4.0E+03	5.2E+02	—	—	2.2E-02	2.2E+00	—	—	5.6E+03	7.2E+02
Nitroaniline, 3-	99-09-2	2.4E-02	2.4E+00	7.3E-03	7.3E-01	—	—	4.7E+03	6.1E+02	5.4E-02	5.4E+00	2.2E-02	2.2E+00	—	—	6.6E+03	8.6E+02
Nitroaniline, 4-	100-01-6	4.6E-02	4.6E+00	9.8E-02	9.8E+00	—	—	1.4E+05	1.9E+04	1.0E-01	1.0E+01	2.9E-01	2.9E+01	—	—	2.0E+05	2.6E+04
Nitrobenzene	98-95-3	—	—	4.9E-02	4.9E+00	7.2E+02	9.3E+01	1.1E+04	1.4E+03	—	—	1.5E-01	1.5E+01	1.2E+03	1.6E+02	1.6E+04	2.0E+03
Nitroglycerin	55-63-0	5.4E-02	5.4E+00	2.4E-03	2.4E-01	—	—	—	—	1.2E-01	1.2E+01	7.3E-03	7.3E-01	—	—	—	—
Nitrophenol, 2-	88-75-5	—	—	4.9E-02	4.9E+00	—	—	—	—	—	—	1.5E-01	1.5E+01	—	—	—	—
Nitrophenol, 3-	554-84-7	—	—	4.9E-02	4.9E+00	—	—	—	—	—	—	1.5E-01	1.5E+01	—	—	—	—
Nitrophenol, 4-	100-02-7	—	—	4.9E-02	4.9E+00	—	—	—	—	—	—	1.5E-01	1.5E+01	—	—	—	—
Nitropropane, 2-	79-46-9	—	—	3.4E-03	3.4E-01	8.1E+00	1.0E+00	4.0E+03	5.2E+02	—	—	1.0E-02	1.0E+00	1.4E+01	1.8E+00	5.6E+03	7.3E+02
Nitroquinoline-N-oxide, 4-	56-57-5	9.7E-05	9.7E-03	—	—	1.1E+04	1.1E+04	—	—	2.2E-04	2.2E-02	—	—	1.9E+04	1.8E+04	—	—
Nitrosodiethanolamine	1116-54-7	3.3E-04	3.3E-02	—	—	—	—	—	—	7.3E-04	7.3E-02	—	—	—	—	—	—
Nitrosodiethylamine, n-	55-18-5	6.1E-06	6.1E-04	—	—	7.4E+00	9.5E-01	—	—	1.4E-05	1.4E-03	—	—	1.2E+01	1.6E+00	—	—
Nitrosodimethylamine, n-	62-75-9	1.8E-05	1.8E-03	2.0E-04	2.0E-02	2.0E+01	2.6E+00	4.8E+02	6.3E+01	4.0E-05	4.0E-03	5.8E-04	5.8E-02	3.4E+01	4.4E+00	6.8E+02	8.8E+01
Nitrosodi-n-butylamine, n-	924-16-3	1.7E-04	1.7E-02	—	—	4.7E+00	6.1E-01	—	—	3.8E-04	3.8E-02	—	—	7.9E+00	1.0E+00	—	—
Nitrosodi-n-propylamine, n-	621-64-7	1.3E-04	1.3E-02	—	—	—	—	—	—	2.9E-04	2.9E-02	—	—	—	—	—	—
Nitrosodiphenylamine	86-30-6	1.9E-01	1.9E+01	—	—	—	—	—	—	4.2E-01	4.2E+01	—	—	—	—	—	—
Nitroso-methyl-ethyl-amine, n-	10595-95-6	4.1E-05	4.1E-03	—	—	—	—	—	—	9.3E-05	9.3E-03	—	—	—	—	—	—
Nitrosomorpholine, N-	59-89-2	1.4E-04	1.4E-02	—	—	2.7E+02	3.6E+01	—	—	3.1E-04	3.1E-02	—	—	4.6E+02	6.0E+01	—	—
Nitroso-n-ethylurea, n-	759-73-9	6.5E-06	6.5E-04	—	—	—	—	—	—	1.5E-05	1.5E-03	—	—	—	—	—	—
Nitrosopiperidine, N-	100-75-4	9.7E-05	9.7E-03	—	—	1.6E+02	2.1E+01	—	—	2.2E-04	2.2E-02	—	—	2.8E+02	3.6E+01	—	—
Nitrosopyrrolidine, n-	930-55-2	4.3E-04	4.3E-02	—	—	9.6E+02	1.2E+02	—	—	9.7E-04	9.7E-02	—	—	1.6E+03	2.1E+02	—	—
Nitrotoluene, m-	99-08-1	—	—	2.4E-01	2.4E+01	—	—	—	—	—	—	7.3E-01	7.3E+01	—	—	—	—
Nitrotoluene, o-	88-72-2	4.1E-03	4.1E-01	2.2E-02	2.2E+00	—	—	—	—	9.3E-03	9.3E-01	6.6E-02	6.6E+00	—	—	—	—
Nitrotoluene, p-	99-99-0	5.7E-02	5.7E+00	9.8E-02	9.8E+00	—	—	—	—	1.3E-01	1.3E+01	2.9E-01	2.9E+01	—	—	—	—
Nonachlor, cis-	5103-73-1	2.6E-03	2.6E-01	1.2E-02	1.2E+00	7.7E+02	9.9E+01	2.3E+03	3.0E+02	5.8E-03	5.8E-01	3.7E-02	3.7E+00	1.3E+03	1.7E+02	3.2E+03	4.2E+02
Nonachlor, trans-	39765-80-5	2.6E-03	2.6E-01	1.2E-02	1.2E+00	7.7E+02	9.9E+01	2.3E+03	3.0E+02	5.8E-03	5.8E-01	3.7E-02	3.7E+00	1.3E+03	1.7E+02	3.2E+03	4.2E+02
Nonanal	124-19-6	—	—	4.9E+00	4.9E+02	—	—	—	—	—	—	1.5E+01	1.5E+03	—	—	—	—
Nonene, 1-n	124-11-8	—	—	2.4E+00	2.4E+02	—	—	—	—	—	—	7.3E+00	7.3E+02	—	—	—	—
Nonylphenol, 4-n-	104-40-5	—	—	2.4E+00	2.4E+02	—	—	—	—	—	—	7.3E+00	7.3E+02	—	—	—	—
Nonylphenol ethoxylate	9016-45-9	—	—	2.4E+00	2.4E+02	—	—	—	—	—	—	7.3E+00	7.3E+02	—	—	—	—
Octamethylpyrophosphoramide	152-16-9	—	—	4.9E-02	4.9E+00	—	—	—	—	—	—	1.5E-01	1.5E+01	—	—	—	—
Octanone	106-68-3	—	—	1.5E+00	1.5E+02	—	—	1.0E+06	6.2E+05	—	—	4.4E+00	4.4E+02	—	—	1.0E+06	8.7E+05
Oxamyl	23135-22-0	—	—	6.1E-01	6.1E+01	—	—	—	—	—	—	1.8E+00	1.8E+02	—	—	—	—
Oxychlordan	27304-13-8	2.6E-03	2.6E-01	1.2E-02	1.2E+00	7.7E+02	9.9E+01	2.3E+03	3.0E+02	5.8E-03	5.8E-01	3.7E-02	3.7E+00	1.3E+03	1.7E+02	3.2E+03	4.2E+02
Paraquat	1910-42-5	—	—	1.1E-01	1.1E+01	—	—	—	—	—	—	3.3E-01	3.3E+01	—	—	—	—

Table 8
Tier 1 Individual Residential and Commercial/Industrial Groundwater PCLs

Last Revised: March 1, 2022

Chemical of Concern	CAS	Residential								Commercial/Industrial							
		Carcinogenic		Noncarcinogenic		Carcinogenic		Noncarcinogenic		Carcinogenic		Noncarcinogenic		Carcinogenic		Noncarcinogenic	
		GW _{Ing} ¹ (mg/L)	GW _{Class 3} ² (mg/L)	GW _{Ing} ¹ (mg/L)	GW _{Class 3} ² (mg/L)	AirGW _{inh-V} 0.5 acre source area (mg/L)	AirGW _{inh-V} 30 acre source area (mg/L)	AirGW _{inh-V} 0.5 acre source area (mg/L)	AirGW _{inh-V} 30 acre source area (mg/L)	GW _{Ing} ¹ (mg/L)	GW _{Class 3} ² (mg/L)	GW _{Ing} ¹ (mg/L)	GW _{Class 3} ² (mg/L)	AirGW _{inh-V} 0.5 acre source area (mg/L)	AirGW _{inh-V} 30 acre source area (mg/L)	AirGW _{inh-V} 0.5 acre source area (mg/L)	AirGW _{inh-V} 30 acre source area (mg/L)
Parathion (ethyl parathion)	56-38-2	—	—	1.5E-01	1.5E+01	—	—	—	—	—	—	4.4E-01	4.4E+01	—	—	—	—
Pebulate	1114-71-2	—	—	1.2E+00	1.2E+02	—	—	—	—	—	—	3.7E+00	3.7E+02	—	—	—	—
Pendimethalin	40487-42-1	—	—	9.8E-01	9.8E+01	—	—	—	—	—	—	2.9E+00	2.9E+02	—	—	—	—
Pentachlorobenzene	608-93-5	—	—	2.0E-02	2.0E+00	—	—	—	—	—	—	5.8E-02	5.8E+00	—	—	—	—
Pentachloroethane	76-01-7	1.0E-02	1.0E+00	7.3E-01	7.3E+01	3.0E+02	3.8E+01	—	—	2.3E-02	2.3E+00	2.2E+00	2.2E+02	5.0E+02	6.4E+01	—	—
Pentachloronitrobenzene	82-68-8	3.5E-03	3.5E-01	7.3E-02	7.3E+00	—	—	—	—	7.9E-03	7.9E-01	2.2E-01	2.2E+01	—	—	—	—
Pentachlorophenol	87-86-5	2.3E-03	2.3E-01	1.2E-01	1.2E+01	—	—	—	—	5.1E-03	5.1E-01	3.7E-01	3.7E+01	—	—	—	—
Pentadiene, 1,3-cis-	1574-41-0	—	—	1.5E+00	1.5E+02	—	—	4.3E+04	5.6E+03	—	—	4.4E+00	4.4E+02	—	—	6.0E+04	7.8E+03
Pentadiene, 1,3-trans-	2004-70-8	—	—	1.5E+00	1.5E+02	—	—	7.6E+04	9.8E+03	—	—	4.4E+00	4.4E+02	—	—	1.1E+05	1.4E+04
Pentaerythritol tetranitrate (PETN)	78-11-5	—	—	4.9E-02	4.9E+00	—	—	—	—	—	—	1.5E-01	1.5E+01	—	—	—	—
Pentane	109-66-0	—	—	1.5E+00	1.5E+02	—	—	3.4E+02	4.4E+01	—	—	4.4E+00	4.4E+02	—	—	4.8E+02	6.2E+01
Pentane, 2-methyl-	107-83-5	—	—	1.5E+00	1.5E+02	—	—	1.7E+03	2.3E+02	—	—	4.4E+00	4.4E+02	—	—	2.4E+03	3.2E+02
Pentane, 3-methyl-	96-14-0	—	—	1.5E+00	1.5E+02	—	—	2.2E+03	2.9E+02	—	—	4.4E+00	4.4E+02	—	—	3.1E+03	4.0E+02
Pentanediol, 1,5-	111-29-5	—	—	1.2E+02	1.2E+04	—	—	1.0E+06	1.0E+06	—	—	3.7E+02	3.7E+04	—	—	1.0E+06	1.0E+06
Pentanol, 1-	71-41-0	—	—	8.1E-01	8.1E+01	—	—	—	—	—	—	2.4E+00	2.4E+02	—	—	—	—
Pentanol, 4-methyl-2-	108-11-2	—	—	6.4E-01	6.4E+01	—	—	—	—	—	—	1.9E+00	1.9E+02	—	—	—	—
Pentanone, 2-	107-87-9	—	—	9.8E-01	9.8E+01	—	—	—	—	—	—	2.9E+00	2.9E+02	—	—	—	—
Pentene, 2-	109-68-2	—	—	1.5E+00	1.5E+02	—	—	1.4E+04	1.8E+03	—	—	4.4E+00	4.4E+02	—	—	2.0E+04	2.5E+03
Pentyne, 1-	627-19-0	—	—	1.5E+00	1.5E+02	—	—	7.2E+04	9.3E+03	—	—	4.4E+00	4.4E+02	—	—	1.0E+05	1.3E+04
Perchlorate	14797-73-0	—	—	1.7E-02	1.7E+00	—	—	—	—	—	—	5.1E-02	5.1E+00	—	—	—	—
Perfluorooctane sulfonic acid (1-Octanesulfonic acid, heptadecafluoro-1-) [PFOS]	1763-23-1	—	—	5.6E-04	5.6E-02	—	—	1.8E+03	2.4E+02	—	—	1.7E-03	1.7E-01	—	—	2.6E+03	3.4E+02
Perfluoroundecanoic acid (Undecanoic acid, uncosafluoro-) [PFUnDa]	2058-94-8	—	—	2.9E-04	2.9E-02	—	—	—	—	—	—	8.8E-04	8.8E-02	—	—	—	—
Perfluoropentanoic acid (Pentanoic acid, nonafluoro-) [PFPeA]	2706-90-3	—	—	9.3E-05	9.3E-03	—	—	—	—	—	—	2.8E-04	2.8E-02	—	—	—	—
Perfluorohexanoic acid (Hexanoic acid, undecafluoro-) [PFHxA]	307-24-4	—	—	9.3E-05	9.3E-03	—	—	—	—	—	—	2.8E-04	2.8E-02	—	—	—	—
Perfluorododecanoic acid (Dodecanoic acid, tricosfluoro-) [PFDoA]	307-55-1	—	—	2.9E-04	2.9E-02	—	—	5.5E+02	7.2E+01	—	—	8.8E-04	8.8E-02	—	—	7.8E+02	1.0E+02
Perfluorooctanoic acid (Octanoic acid, pentadecafluoro-) [PFOA]	335-67-1	—	—	2.9E-04	2.9E-02	—	—	9.0E+01	1.2E+01	—	—	8.8E-04	8.8E-02	—	—	1.3E+02	1.6E+01
Perfluorodecanoic acid (Decanoic acid, nonadecafluoro-) [PFDA]	335-76-2	—	—	3.7E-04	3.7E-02	—	—	1.3E+03	1.6E+02	—	—	1.1E-03	1.1E-01	—	—	1.8E+03	2.3E+02
Perfluorodecane sulfonic acid (1-Decanesulfonic acid, heneicosafluoro-) [PFDS]	335-77-3	—	—	2.9E-04	2.9E-02	—	—	—	—	—	—	8.8E-04	8.8E-02	—	—	—	—
Perfluorohexane sulfonic acid (1-Hexanesulfonic acid, tridecafluoro-) [PFHxS]	355-46-4	—	—	9.3E-05	9.3E-03	—	—	2.9E+02	5.7E+01	—	—	2.8E-04	2.8E-02	—	—	4.0E+02	7.9E+01
Perfluorobutyric acid (Butanoic acid, heptafluoro-) [PFBA]	375-22-4	—	—	7.1E-02	7.1E+00	—	—	8.5E+05	7.1E+05	—	—	2.1E-01	2.1E+01	—	—	1.0E+06	1.0E+06
Perfluorobutane sulfonic acid (1-Butanesulfonic acid, nonafluoro-) [PFBS]	375-73-5	—	—	3.4E-02	3.4E+00	—	—	5.4E+05	4.7E+05	—	—	1.0E-01	1.0E+01	—	—	7.6E+05	6.5E+05
Perfluoroheptanoic acid (Heptanoic acid, tridecafluoro-) [PFHpA]	375-85-9	—	—	5.6E-04	5.6E-02	—	—	—	—	—	—	1.7E-03	1.7E-01	—	—	—	—
Perfluorononanoic acid (Nonanoic acid, heptadecafluoro-) [PFNA]	375-95-1	—	—	2.9E-04	2.9E-02	—	—	6.5E+02	8.4E+01	—	—	8.8E-04	8.8E-02	—	—	9.1E+02	1.2E+02
Perfluorotetradecanoic acid (Tetradecanoic acid, heptacosfluoro-) [PFTeDA]	376-06-7	—	—	2.9E-04	2.9E-02	—	—	—	—	—	—	8.8E-04	8.8E-02	—	—	—	—
Perfluorotridecanoic acid (Tridecanoic acid, pentacosfluoro-) [PFTriDA]	72629-94-8	—	—	2.9E-04	2.9E-02	—	—	—	—	—	—	8.8E-04	8.8E-02	—	—	—	—
Perfluorooctane sulfonamide (1-Octanesulfonamide, heptadecafluoro-) [PFOSA]	754-91-6	—	—	2.9E-04	2.9E-02	—	—	5.3E-05	6.8E-06	—	—	8.8E-04	8.8E-02	—	—	7.4E-05	9.6E-06
Perylene	198-55-0	—	—	4.9E-01	4.9E+01	—	—	—	—	—	—	1.5E+00	1.5E+02	—	—	—	—
Phenacetin	62-44-2	4.1E-01	4.1E+01	—	—	1.0E+06	1.5E+05	—	—	9.3E-01	9.3E+01	—	—	1.0E+06	2.5E+05	—	—
Phenanthrene	85-01-8	—	—	7.3E-01	7.3E+01	—	—	—	—	—	—	2.2E+00	2.2E+02	—	—	—	—
Phenanthridine	229-87-8	—	—	7.3E-02	7.3E+00	—	—	—	—	—	—	2.2E-01	2.2E+01	—	—	—	—
Phenol	108-95-2	—	—	7.3E+00	7.3E+02	—	—	1.6E+05	2.1E+04	—	—	2.2E+01	2.2E+03	—	—	2.2E+05	2.9E+04
Phenol, 4-tert-butyl-	98-54-4	—	—	2.9E+00	2.9E+02	—	—	—	—	—	—	8.8E+00	8.8E+02	—	—	—	—
Phenothiazine	92-84-2	—	—	2.7E-02	2.7E+00	—	—	—	—	—	—	8.0E-02	8.0E+00	—	—	—	—
Phenyl mercuric acetate	62-38-4	—	—	2.0E-03	2.0E-01	—	—	—	—	—	—	5.8E-03	5.8E-01	—	—	—	—

Table 8
Tier 1 Individual Residential and Commercial/Industrial Groundwater PCLs

Last Revised: March 1, 2022

Chemical of Concern	CAS	Residential								Commercial/Industrial							
		Carcinogenic		Noncarcinogenic		Carcinogenic		Noncarcinogenic		Carcinogenic		Noncarcinogenic		Carcinogenic		Noncarcinogenic	
		GW _{Ing} ¹ (mg/L)	GW _{Class 3} ² (mg/L)	GW _{Ing} ¹ (mg/L)	GW _{Class 3} ² (mg/L)	AirGW _{Inh-V} ¹ 0.5 acre source area (mg/L)	AirGW _{Inh-V} ³⁰ acre source area (mg/L)	AirGW _{Inh-V} ¹ 0.5 acre source area (mg/L)	AirGW _{Inh-V} ³⁰ acre source area (mg/L)	GW _{Ing} ¹ (mg/L)	GW _{Class 3} ² (mg/L)	GW _{Ing} ¹ (mg/L)	GW _{Class 3} ² (mg/L)	AirGW _{Inh-V} ¹ 0.5 acre source area (mg/L)	AirGW _{Inh-V} ³⁰ acre source area (mg/L)	AirGW _{Inh-V} ¹ 0.5 acre source area (mg/L)	AirGW _{Inh-V} ³⁰ acre source area (mg/L)
Phenylene diamine, m-	108-45-2	—	—	1.5E-01	1.5E+01	—	—	—	—	—	—	4.4E-01	4.4E+01	—	—	—	—
Phenylene diamine, p-	106-50-3	—	—	4.6E+00	4.6E+02	—	—	—	—	—	—	1.4E+01	1.4E+03	—	—	—	—
Phorate	298-02-2	—	—	4.9E-03	4.9E-01	—	—	—	—	—	—	1.5E-02	1.5E+00	—	—	—	—
Phosalone	2310-17-0	—	—	4.9E-02	4.9E+00	—	—	—	—	—	—	1.5E-01	1.5E+01	—	—	—	—
Phosdrin (mevinphos)	7786-34-7	—	—	6.1E-04	6.1E-02	—	—	—	—	—	—	1.8E-03	1.8E-01	—	—	—	—
Phosmet	732-11-6	—	—	4.9E-01	4.9E+01	—	—	—	—	—	—	1.5E+00	1.5E+02	—	—	—	—
Phosphine	7803-51-2	—	—	7.3E-03	7.3E-01	—	—	2.9E-03	3.7E-04	—	—	2.2E-02	2.2E+00	—	—	4.0E-03	5.2E-04
Phosphorotrithioic acid, S,S,S-tributyl ester	78-48-8	1.1E-02	1.1E+00	1.2E-02	1.2E+00	—	—	—	—	2.4E-02	2.4E+00	3.7E-02	3.7E+00	—	—	—	—
Phosphorus, total*	7723-14-0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Phosphorus, white	7723-14-0	—	—	4.9E-04	4.9E-02	—	—	—	—	—	—	1.5E-03	1.5E-01	—	—	—	—
Phthalic anhydride	85-44-9	—	—	4.9E+01	4.9E+03	—	—	1.0E+06	4.0E+05	—	—	1.5E+02	1.5E+04	—	—	1.0E+06	5.6E+05
Picloram	1918-02-1	—	—	1.7E+00	1.7E+02	—	—	—	—	—	—	5.1E+00	5.1E+02	—	—	—	—
Picoline, 2- (2-methylpyridine)	109-06-8	—	—	2.2E-01	2.2E+01	—	—	—	—	—	—	6.6E-01	6.6E+01	—	—	—	—
Polybrominated biphenyls (PBBs)	67774-32-7	1.0E-04	1.0E-02	1.7E-04	1.7E-02	—	—	—	—	2.3E-04	2.3E-02	5.1E-04	5.1E-02	—	—	—	—
Polychlorinated biphenyls (PCBs)	1336-36-3	4.6E-04	4.6E-02	4.9E-04	4.9E-02	2.9E+00	3.8E-01	—	—	1.0E-03	1.0E-01	1.5E-03	1.5E-01	4.9E+00	6.4E-01	—	—
Potassium*	7440-09-7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Primene	68955-53-3	—	—	1.5E-01	1.5E+01	—	—	—	—	—	—	4.4E-01	4.4E+01	—	—	—	—
Prometon (pramitol)	1610-18-0	—	—	3.7E-01	3.7E+01	—	—	—	—	—	—	1.1E+00	1.1E+02	—	—	—	—
Prometryn	7287-19-6	—	—	9.8E-01	9.8E+01	—	—	—	—	—	—	2.9E+00	2.9E+02	—	—	—	—
Pronamide	23950-58-5	—	—	1.8E+00	1.8E+02	—	—	—	—	—	—	5.5E+00	5.5E+02	—	—	—	—
Propanal (propionaldehyde)	123-38-6	—	—	2.0E-01	2.0E+01	—	—	1.6E+03	2.1E+02	—	—	5.8E-01	5.8E+01	—	—	2.3E+03	3.0E+02
Propane, 1-bromo-	106-94-5	—	—	8.8E-01	8.8E+01	—	—	—	—	—	—	2.6E+00	2.6E+02	—	—	—	—
Propanil	709-98-8	—	—	1.2E-01	1.2E+01	—	—	—	—	—	—	3.7E-01	3.7E+01	—	—	—	—
Propanoic acid (propionic acid)	79-09-4	—	—	1.2E+01	1.2E+03	—	—	—	—	—	—	3.7E+01	3.7E+03	—	—	—	—
Propanol, 1-	71-23-8	—	—	4.9E+01	4.9E+03	—	—	—	—	—	—	1.5E+02	1.5E+04	—	—	—	—
Propargite	2312-35-8	—	—	4.9E-01	4.9E+01	—	—	—	—	—	—	1.5E+00	1.5E+02	—	—	—	—
Propargyl alcohol	107-19-7	—	—	4.9E-02	4.9E+00	—	—	—	—	—	—	1.5E-01	1.5E+01	—	—	—	—
Propazine	139-40-2	2.1E-02	2.1E+00	4.9E-01	4.9E+01	—	—	—	—	4.6E-02	4.6E+00	1.5E+00	1.5E+02	—	—	—	—
Propam	122-42-9	—	—	4.9E-01	4.9E+01	—	—	—	—	—	—	1.5E+00	1.5E+02	—	—	—	—
Propionitrile (propane nitrile)	107-12-0	—	—	9.8E-03	9.8E-01	—	—	—	—	—	—	2.9E-02	2.9E+00	—	—	—	—
Propyl acetate, n-	109-60-4	—	—	2.2E+00	2.2E+02	—	—	—	—	—	—	6.6E+00	6.6E+02	—	—	—	—
Propylbenzene, n-	103-65-1	—	—	9.8E-01	9.8E+01	—	—	6.0E+03	7.8E+02	—	—	2.9E+00	2.9E+02	—	—	8.5E+03	1.1E+03
Propylene glycol	57-55-6	—	—	4.9E+02	4.9E+04	—	—	5.0E+04	6.4E+03	—	—	1.5E+03	1.5E+05	—	—	7.0E+04	9.0E+03
Propylene glycol monomethyl ether	107-98-2	—	—	1.7E+01	1.7E+03	—	—	1.0E+06	1.0E+06	—	—	5.1E+01	5.1E+03	—	—	1.0E+06	1.0E+06
Propylene oxide	75-56-9	3.8E-03	3.8E-01	—	—	1.6E+03	2.0E+02	7.5E+03	9.7E+02	8.5E-03	8.5E-01	—	—	2.7E+03	3.4E+02	1.1E+04	1.4E+03
Propylene tetramer	6842-15-5	—	—	2.4E+00	2.4E+02	—	—	4.4E+01	5.7E+00	—	—	7.3E+00	7.3E+02	—	—	6.2E+01	8.0E+00
Prothiofos (Tokuthion)	34643-46-4	—	—	2.4E-03	2.4E-01	—	—	—	—	—	—	7.3E-03	7.3E-01	—	—	—	—
Pyrene	129-00-0	—	—	7.3E-01	7.3E+01	—	—	—	—	—	—	2.2E+00	2.2E+02	—	—	—	—
Pyridine	110-86-1	—	—	2.4E-02	2.4E+00	—	—	—	—	—	—	7.3E-02	7.3E+00	—	—	—	—
Quinoline	91-22-5	3.0E-04	3.0E-02	—	—	—	—	—	—	6.8E-04	6.8E-02	—	—	—	—	—	—
Ronnel	299-84-3	—	—	1.2E+00	1.2E+02	—	—	—	—	—	—	3.7E+00	3.7E+02	—	—	—	—
Safrole	94-59-7	4.1E-03	4.1E-01	—	—	1.9E+02	2.4E+01	—	—	9.3E-03	9.3E-01	—	—	3.2E+02	4.1E+01	—	—
Selenium	7782-49-2	—	—	1.2E-01	1.2E+01	—	—	—	—	—	—	3.7E-01	3.7E+01	—	—	—	—
Selenourea	630-10-4	—	—	1.2E-01	1.2E+01	—	—	—	—	—	—	3.7E-01	3.7E+01	—	—	—	—
Silver	7440-22-4	—	—	1.2E-01	1.2E+01	—	—	—	—	—	—	3.7E-01	3.7E+01	—	—	—	—
Simazine	122-34-9	7.6E-03	7.6E-01	1.2E-01	1.2E+01	—	—	—	—	1.7E-02	1.7E+00	3.7E-01	3.7E+01	—	—	—	—
Sodium*	7440-23-5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sodium hypochlorite	7681-52-9	—	—	5.1E+00	5.1E+02	—	—	—	—	—	—	1.5E+01	1.5E+03	—	—	—	—
Sodium polyacrylate	9003-04-7	—	—	1.2E+01	1.2E+03	—	—	1.5E+04	2.0E+03	—	—	3.7E+01	3.7E+03	—	—	2.1E+04	2.7E+03
Strontium	7440-24-6	—	—	1.5E+01	1.5E+03	—	—	—	—	—	—	4.4E+01	4.4E+03	—	—	—	—

Table 8
Tier 1 Individual Residential and Commercial/Industrial Groundwater PCLs

Last Revised: March 1, 2022

Chemical of Concern	CAS	Residential								Commercial/Industrial							
		Carcinogenic		Noncarcinogenic		Carcinogenic		Noncarcinogenic		Carcinogenic		Noncarcinogenic		Carcinogenic		Noncarcinogenic	
		GW _{Intg} ¹ (mg/L)	GW _{Class 3} ² (mg/L)	GW _{Intg} ¹ (mg/L)	GW _{Class 3} ² (mg/L)	Air _{GW_{Intg}-V} ^{0.5} 0.5 acre source area (mg/L)	Air _{GW_{Intg}-V} ³⁰ 30 acre source area (mg/L)	Air _{GW_{Intg}-V} ^{0.5} 0.5 acre source area (mg/L)	Air _{GW_{Intg}-V} ³⁰ 30 acre source area (mg/L)	GW _{Intg} ¹ (mg/L)	GW _{Class 3} ² (mg/L)	GW _{Intg} ¹ (mg/L)	GW _{Class 3} ² (mg/L)	Air _{GW_{Intg}-V} ^{0.5} 0.5 acre source area (mg/L)	Air _{GW_{Intg}-V} ³⁰ 30 acre source area (mg/L)	Air _{GW_{Intg}-V} ^{0.5} 0.5 acre source area (mg/L)	Air _{GW_{Intg}-V} ³⁰ 30 acre source area (mg/L)
Strychnine	57-24-9	—	—	7.3E-03	7.3E-01	—	—	—	—	—	—	2.2E-02	2.2E+00	—	—	—	—
Styrene	100-42-5	—	—	4.9E+00	4.9E+02	—	—	1.5E+04	2.0E+03	—	—	1.5E+01	1.5E+03	—	—	2.1E+04	2.7E+03
Sulfate*	14808-79-8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sulfide*	18496-25-8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sulfolane	126-33-0	—	—	3.2E-01	3.2E+01	—	—	1.3E+05	1.7E+04	—	—	9.5E-01	9.5E+01	—	—	1.8E+05	2.3E+04
Sulfur*	7704-34-9	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sulprofos (Bolstar)	35400-43-2	—	—	7.3E-02	7.3E+00	—	—	—	—	—	—	2.2E-01	2.2E+01	—	—	—	—
Tebuconazole	107534-96-3	—	—	7.3E-01	7.3E+01	—	—	—	—	—	—	2.2E+00	2.2E+02	—	—	—	—
Tebuthiuron	34014-18-1	—	—	1.7E+00	1.7E+02	—	—	—	—	—	—	5.1E+00	5.1E+02	—	—	—	—
Terbufos	13071-79-9	—	—	6.1E-04	6.1E-02	—	—	—	—	—	—	1.8E-03	1.8E-01	—	—	—	—
Tert-amyl ethyl ether (TAE)	919-94-8	—	—	9.8E-01	9.8E+01	—	—	—	—	—	—	2.9E+00	2.9E+02	—	—	—	—
Tert-amyl-methyl ether (TAME)	994-05-8	—	—	9.8E-01	9.8E+01	—	—	—	—	—	—	2.9E+00	2.9E+02	—	—	—	—
Tert-butyl alcohol (2-methyl-2-propanol)	75-65-0	—	—	2.2E+00	2.2E+02	—	—	—	—	—	—	6.6E+00	6.6E+02	—	—	—	—
Tetrachlorobenzene, 1,2,3,4-	634-66-2	—	—	7.3E-03	7.3E-01	—	—	—	—	—	—	2.2E-02	2.2E+00	—	—	—	—
Tetrachlorobenzene, 1,2,3,5-	634-90-2	—	—	7.3E-03	7.3E-01	—	—	—	—	—	—	2.2E-02	2.2E+00	—	—	—	—
Tetrachlorobenzene, 1,2,4,5-	95-94-3	—	—	7.3E-03	7.3E-01	—	—	—	—	—	—	2.2E-02	2.2E+00	—	—	—	—
Tetrachloroethane, 1,1,1,2-	630-20-6	3.5E-02	3.5E+00	7.3E-01	7.3E+01	1.1E+02	1.4E+01	—	—	7.9E-02	7.9E+00	2.2E+00	2.2E+02	1.9E+02	2.4E+01	—	—
Tetrachloroethane, 1,1,2,2-	79-34-5	4.6E-03	4.6E-01	4.9E-01	4.9E+01	—	—	—	—	1.0E-02	1.0E+00	1.5E+00	1.5E+02	—	—	—	—
Tetrachloroethylene [PCE]	127-18-4	4.3E-01	4.3E+01	5.1E-01	5.1E+01	5.0E+02	6.4E+01	3.0E+03	3.9E+02	9.7E-01	9.7E+01	1.5E+00	1.5E+02	8.4E+02	1.1E+02	4.2E+03	5.4E+02
Tetrachlorophenol, 2,3,4,5-	4901-51-3	—	—	7.3E-01	7.3E+01	—	—	—	—	—	—	2.2E+00	2.2E+02	—	—	—	—
Tetrachlorophenol, 2,3,4,6-	58-90-2	—	—	7.3E-01	7.3E+01	—	—	—	—	—	—	2.2E+00	2.2E+02	—	—	—	—
Tetrachlorophenol, 2,3,5,6-	935-95-5	—	—	7.3E-01	7.3E+01	—	—	—	—	—	—	2.2E+00	2.2E+02	—	—	—	—
Tetrachlorvinphos (Stirophos)	22248-79-9	—	—	1.0E+00	1.0E+02	—	—	—	—	—	—	3.1E+00	3.1E+02	—	—	—	—
Tetradifon	116-29-0	—	—	4.9E-01	4.9E+01	—	—	—	—	—	—	1.5E+00	1.5E+02	—	—	—	—
Tetraethyl dithiopyrophosphate (sulfotep)	3689-24-5	—	—	1.2E-02	1.2E+00	—	—	—	—	—	—	3.7E-02	3.7E+00	—	—	—	—
Tetraethyl lead	78-00-2	—	—	2.4E-06	2.4E-04	—	—	—	—	—	—	7.3E-06	7.3E-04	—	—	—	—
Tetraethyl pyrophosphate (TEPP)	107-49-3	—	—	2.7E-04	2.7E-02	—	—	—	—	—	—	8.0E-04	8.0E-02	—	—	—	—
Tetraethylene glycol	112-60-7	—	—	8.1E+00	8.1E+02	—	—	—	—	—	—	2.4E+01	2.4E+03	—	—	—	—
Tetrahydrofuran	109-99-9	1.2E-01	1.2E+01	2.2E+01	2.2E+03	2.2E+03	2.9E+02	3.6E+05	4.7E+04	2.7E-01	2.7E+01	6.6E+01	6.6E+03	3.7E+03	4.8E+02	5.1E+05	6.6E+04
Tetrahydropyran	142-68-7	1.2E-01	1.2E+01	4.9E+00	4.9E+02	2.6E+03	3.4E+02	—	—	2.7E-01	2.7E+01	1.5E+01	1.5E+03	4.4E+03	5.7E+02	—	—
Tetraoxadodecane, 2,5,8,11-	112-49-2	—	—	6.1E-01	6.1E+01	—	—	—	—	—	—	1.8E+00	1.8E+02	—	—	—	—
Thallium	7440-28-0	—	—	1.6E-03	1.6E-01	—	—	—	—	—	—	4.9E-03	4.9E-01	—	—	—	—
Thiofanox	39196-18-4	—	—	7.3E-03	7.3E-01	—	—	—	—	—	—	2.2E-02	2.2E+00	—	—	—	—
Thionazin	297-97-2	—	—	1.7E-03	1.7E-01	—	—	—	—	—	—	5.1E-03	5.1E-01	—	—	—	—
Thiophanate-methyl	23564-05-8	—	—	2.0E+00	2.0E+02	—	—	—	—	—	—	5.8E+00	5.8E+02	—	—	—	—
Thiram	137-26-8	—	—	1.2E-01	1.2E+01	—	—	—	—	—	—	3.7E-01	3.7E+01	—	—	—	—
Tin	7440-31-5	—	—	1.5E+01	1.5E+03	—	—	—	—	—	—	4.4E+01	4.4E+03	—	—	—	—
Titanium	7440-32-6	—	—	1.2E+02	1.2E+04	—	—	—	—	—	—	3.7E+02	3.7E+04	—	—	—	—
Toluene	108-88-3	—	—	2.0E+00	2.0E+02	—	—	6.4E+04	8.2E+03	—	—	5.8E+00	5.8E+02	—	—	8.9E+04	1.2E+04
Toluene diisocyanate, 2,4/2,6-	26471-62-5	—	—	—	—	—	—	1.8E+03	2.4E+02	—	—	—	—	—	—	2.6E+03	3.3E+02
Toluenediamine, 2,4-	95-80-7	2.9E-04	2.9E-02	—	—	—	—	—	—	6.4E-04	6.4E-02	—	—	—	—	—	—
Toluenediamine, 2,6-	823-40-5	—	—	7.3E-01	7.3E+01	—	—	—	—	—	—	2.2E+00	2.2E+02	—	—	—	—
Toluidine, o-	95-53-4	5.7E-02	5.7E+00	—	—	2.6E+03	3.4E+02	—	—	1.3E-01	1.3E+01	—	—	4.4E+03	5.7E+02	—	—
Toluidine, p-	106-49-0	3.0E-02	3.0E+00	—	—	—	—	—	—	6.8E-02	6.8E+00	—	—	—	—	—	—
Toxaphene	8001-35-2	8.3E-04	8.3E-02	7.6E-03	7.6E-01	1.8E+03	2.3E+02	—	—	1.9E-03	1.9E-01	2.3E-02	2.3E+00	3.0E+03	3.9E+02	—	—
TPH, TX1005, C6-C12	TPH-1005-1	—	—	9.8E-01	9.8E+01	—	—	1.8E+03	2.3E+02	—	—	2.9E+00	2.9E+02	—	—	2.5E+03	3.2E+02
TPH, TX1005, >C12-C28	TPH-1005-2	—	—	9.8E-01	9.8E+01	—	—	7.5E+03	9.7E+02	—	—	2.9E+00	2.9E+02	—	—	1.0E+04	1.4E+03
TPH, TX1005, >C12-C35	TPH-1005-3	—	—	9.8E-01	9.8E+01	—	—	7.5E+03	9.7E+02	—	—	2.9E+00	2.9E+02	—	—	1.0E+04	1.4E+03
TPH, TX1005, >C28-C35	TPH-1005-4	—	—	9.8E-01	9.8E+01	—	—	7.5E+03	9.7E+02	—	—	2.9E+00	2.9E+02	—	—	1.0E+04	1.4E+03
TP Silvex, 2,4,5-	93-72-1	—	—	2.0E-01	2.0E+01	—	—	—	—	—	—	5.8E-01	5.8E+01	—	—	—	—

Table 8
Tier 1 Individual Residential and Commercial/Industrial Groundwater PCLs

Last Revised: March 1, 2022

Chemical of Concern	CAS	Residential								Commercial/Industrial							
		Carcinogenic		Noncarcinogenic		Carcinogenic		Noncarcinogenic		Carcinogenic		Noncarcinogenic		Carcinogenic		Noncarcinogenic	
		GW _{Ing} ¹ (mg/L)	GW _{Class 3} ² (mg/L)	GW _{Ing} ¹ (mg/L)	GW _{Class 3} ² (mg/L)	Air _{GW_{Ing}-V} ³⁰ 0.5 acre source area (mg/L)	Air _{GW_{Ing}-V} ³⁰ acre source area (mg/L)	Air _{GW_{Ing}-V} ³⁰ 0.5 acre source area (mg/L)	Air _{GW_{Ing}-V} ³⁰ acre source area (mg/L)	GW _{Ing} ¹ (mg/L)	GW _{Class 3} ² (mg/L)	GW _{Ing} ¹ (mg/L)	GW _{Class 3} ² (mg/L)	Air _{GW_{Ing}-V} ³⁰ 0.5 acre source area (mg/L)	Air _{GW_{Ing}-V} ³⁰ acre source area (mg/L)	Air _{GW_{Ing}-V} ³⁰ 0.5 acre source area (mg/L)	Air _{GW_{Ing}-V} ³⁰ acre source area (mg/L)
Triademenol	55219-65-3	—	—	7.3E-01	7.3E+01	—	—	—	—	—	—	2.2E+00	2.2E+02	—	—	—	—
Triallate	2303-17-5	—	—	3.2E-01	3.2E+01	—	—	—	—	—	—	9.5E-01	9.5E+01	—	—	—	—
Triaminotrinrobenzene (TATB)	3058-38-6	—	—	7.3E-02	7.3E+00	—	—	—	—	—	—	2.2E-01	2.2E+01	—	—	—	—
Tributyltin oxide	56-35-9	—	—	7.3E-03	7.3E-01	—	—	—	—	—	—	2.2E-02	2.2E+00	—	—	—	—
Trichloro-1,2,2-trifluoroethane, 1,1,2-	76-13-1	—	—	7.3E+02	7.3E+04	—	—	1.5E+03	2.0E+02	—	—	2.2E+03	2.2E+05	—	—	2.1E+03	2.8E+02
Trichlorobenzene, 1,2,3-	87-61-6	—	—	7.3E-02	7.3E+00	—	—	1.3E+02	1.7E+01	—	—	2.2E-01	2.2E+01	—	—	1.9E+02	2.4E+01
Trichlorobenzene, 1,2,4-	120-82-1	3.1E-02	3.1E+00	2.4E-01	2.4E+01	—	—	1.6E+02	2.0E+01	7.0E-02	7.0E+00	7.3E-01	7.3E+01	—	—	2.2E+02	2.8E+01
Trichlorobenzene, 1,3,5-	108-70-3	—	—	7.3E-02	7.3E+00	—	—	1.0E+02	1.3E+01	—	—	2.2E-01	2.2E+01	—	—	1.4E+02	1.8E+01
Trichloroethane, 1,1,1-	71-55-6	—	—	4.9E+01	4.9E+03	—	—	4.1E+04	5.2E+03	—	—	1.5E+02	1.5E+04	—	—	5.7E+04	7.3E+03
Trichloroethane, 1,1,2-	79-00-5	1.6E-02	1.6E+00	9.8E-02	9.8E+00	8.0E+01	1.0E+01	—	—	3.6E-02	3.6E+00	2.9E-01	2.9E+01	1.3E+02	1.7E+01	—	—
Trichloroethylene [TCE]	79-01-6	2.0E-02	2.0E+00	1.2E-02	1.2E+00	6.7E+01	8.7E+00	2.4E+01	3.1E+00	4.4E-02	4.4E+00	3.7E-02	3.7E+00	1.1E+02	1.5E+01	3.3E+01	4.3E+00
Trichlorofluoromethane	75-69-4	—	—	7.3E+00	7.3E+02	—	—	—	—	—	—	2.2E+01	2.2E+03	—	—	—	—
Trichloronate	327-98-0	—	—	7.3E-02	7.3E+00	—	—	—	—	—	—	2.2E-01	2.2E+01	—	—	—	—
Trichlorophenol, 2,3,4-	15950-66-0	—	—	2.4E+00	2.4E+02	—	—	—	—	—	—	7.3E+00	7.3E+02	—	—	—	—
Trichlorophenol, 2,3,5-	933-78-8	—	—	2.4E+00	2.4E+02	—	—	—	—	—	—	7.3E+00	7.3E+02	—	—	—	—
Trichlorophenol, 2,3,6-	933-75-5	—	—	2.4E+00	2.4E+02	—	—	—	—	—	—	7.3E+00	7.3E+02	—	—	—	—
Trichlorophenol, 2,4,5-	95-95-4	—	—	2.4E+00	2.4E+02	—	—	—	—	—	—	7.3E+00	7.3E+02	—	—	—	—
Trichlorophenol, 2,4,6-	88-06-2	8.3E-02	8.3E+00	2.4E-02	2.4E+00	4.9E+04	6.4E+03	—	—	1.9E-01	1.9E+01	7.3E-02	7.3E+00	8.3E+04	1.1E+04	—	—
Trichlorophenol, 3,4,5-	609-19-8	—	—	2.4E+00	2.4E+02	—	—	—	—	—	—	7.3E+00	7.3E+02	—	—	—	—
Trichlorophenoxyacetic acid, 2,4,5-	93-76-5	—	—	2.4E-01	2.4E+01	—	—	—	—	—	—	7.3E-01	7.3E+01	—	—	—	—
Trichloropropane, 1,1,2-	598-77-6	—	—	1.2E-01	1.2E+01	—	—	2.7E+00	3.5E-01	—	—	3.7E-01	3.7E+01	—	—	3.8E+00	4.9E-01
Trichloropropane, 1,2,3-	96-18-4	3.0E-05	3.0E-03	9.8E-02	9.8E+00	—	—	3.2E+01	4.2E+00	6.8E-05	6.8E-03	2.9E-01	2.9E+01	—	—	4.5E+01	5.8E+00
Triethanolamine	102-71-6	—	—	4.9E+00	4.9E+02	—	—	1.0E+06	1.0E+06	—	—	1.5E+01	1.5E+03	—	—	1.0E+06	1.0E+06
Triethylamine	121-44-8	—	—	—	—	—	—	6.3E+02	8.1E+01	—	—	—	—	—	—	8.8E+02	1.1E+02
Triethylene glycol	112-27-6	—	—	4.9E+01	4.9E+03	—	—	—	—	—	—	1.5E+02	1.5E+04	—	—	—	—
Triethylphosphorothioate, O, O, O-	126-68-1	—	—	2.0E-04	2.0E-02	—	—	—	—	—	—	6.1E-04	6.1E-02	—	—	—	—
Trifluralin	1582-09-8	1.2E-01	1.2E+01	1.8E-01	1.8E+01	—	—	—	—	2.7E-01	2.7E+01	5.5E-01	5.5E+01	—	—	—	—
Trimethylamine	75-50-3	—	—	—	—	—	—	1.7E+03	2.2E+02	—	—	—	—	—	—	2.3E+03	3.0E+02
Trimethylbenzene, 1,2,3-	526-73-8	—	—	8.3E-01	8.3E+01	—	—	5.6E+03	7.3E+02	—	—	2.5E+00	2.5E+02	—	—	7.9E+03	1.0E+03
Trimethylbenzene, 1,2,4-	95-63-6	—	—	8.3E-01	8.3E+01	—	—	4.9E+03	6.3E+02	—	—	2.5E+00	2.5E+02	—	—	6.8E+03	8.8E+02
Trimethylbenzene, 1,3,5-	108-67-8	—	—	8.3E-01	8.3E+01	—	—	3.8E+03	4.9E+02	—	—	2.5E+00	2.5E+02	—	—	5.3E+03	6.8E+02
Trinitrobenzene, 1,3,5-	99-35-4	—	—	7.3E-01	7.3E+01	—	—	—	—	—	—	2.2E+00	2.2E+02	—	—	—	—
Trinitrophenylmethylnitramine (tetryl; nitramine)	479-45-8	—	—	4.9E-02	4.9E+00	—	—	—	—	—	—	1.5E-01	1.5E+01	—	—	—	—
Trinitrotoluene, 2,4,6-	118-96-7	3.0E-02	3.0E+00	1.2E-02	1.2E+00	—	—	—	—	6.8E-02	6.8E+00	3.7E-02	3.7E+00	—	—	—	—
Tungsten (as sodium tungstate dihydride)	7440-33-7	—	—	2.4E-02	2.4E+00	—	—	—	—	—	—	7.3E-02	7.3E+00	—	—	—	—
Uranium (soluble salts)	7440-61-1	—	—	7.3E-02	7.3E+00	—	—	—	—	—	—	2.2E-01	2.2E+01	—	—	—	—
Valeric acid (pentanoic acid)	109-52-4	—	—	1.2E+01	1.2E+03	—	—	2.0E+04	2.6E+03	—	—	3.7E+01	3.7E+03	—	—	2.8E+04	3.6E+03
Vanadium	7440-62-2	—	—	4.4E-02	4.4E+00	—	—	—	—	—	—	1.3E-01	1.3E+01	—	—	—	—
Vernam	1929-77-7	—	—	2.4E-02	2.4E+00	—	—	—	—	—	—	7.3E-02	7.3E+00	—	—	—	—
Vinyl acetate	108-05-4	—	—	2.4E+01	2.4E+03	—	—	1.4E+04	1.8E+03	—	—	7.3E+01	7.3E+03	—	—	2.0E+04	2.6E+03
Vinyl chloride	75-01-4	6.1E-04	6.1E-02	7.3E-02	7.3E+00	3.8E+00	4.9E-01	8.2E+01	1.1E+01	1.4E-03	1.4E-01	2.2E-01	2.2E+01	6.4E+00	8.3E-01	1.2E+02	1.5E+01
Vinylcyclohexane	695-12-5	—	—	1.2E+01	1.2E+03	—	—	—	—	—	—	3.7E+01	3.7E+03	—	—	—	—
Warfarin	81-81-2	—	—	7.3E-03	7.3E-01	—	—	—	—	—	—	2.2E-02	2.2E+00	—	—	—	—
Xylene, m-	108-38-3	—	—	4.9E+01	4.9E+03	—	—	1.1E+04	1.4E+03	—	—	1.5E+02	1.5E+04	—	—	1.5E+04	1.9E+03
Xylene, o-	95-47-6	—	—	4.9E+01	4.9E+03	—	—	7.6E+05	9.8E+04	—	—	1.5E+02	1.5E+04	—	—	1.0E+06	1.4E+05
Xylene, p-	106-42-3	—	—	4.9E+01	4.9E+03	—	—	9.4E+03	1.2E+03	—	—	1.5E+02	1.5E+04	—	—	1.3E+04	1.7E+03
Xylenes	1330-20-7	—	—	4.9E+00	4.9E+02	—	—	1.0E+04	1.3E+03	—	—	1.5E+01	1.5E+03	—	—	1.4E+04	1.9E+03
Zinc	7440-66-6	—	—	7.3E+00	7.3E+02	—	—	—	—	—	—	2.2E+01	2.2E+03	—	—	—	—
6 C aliphatics (TPH) (>53% n-hexane content)	NA	—	—	1.5E+00	1.5E+02	—	—	1.1E+02	1.4E+01	—	—	4.4E+00	4.4E+02	—	—	1.5E+02	1.9E+01
6 C aliphatics (TPH) (<53% n-hexane content)	NA	—	—	1.5E+00	1.5E+02	—	—	2.9E+03	3.8E+02	—	—	4.4E+00	4.4E+02	—	—	4.1E+03	5.3E+02

Table 8
Tier 1 Individual Residential and Commercial/Industrial Groundwater PCLs

Last Revised: March 1, 2022

Chemical of Concern	CAS	Residential								Commercial/Industrial							
		Carcinogenic		Noncarcinogenic		Carcinogenic		Noncarcinogenic		Carcinogenic		Noncarcinogenic		Carcinogenic		Noncarcinogenic	
		GW _{Ing} ¹ (mg/L)	GW _{Class 2} ² (mg/L)	GW _{Ing} ¹ (mg/L)	GW _{Class 2} ² (mg/L)	Air _{GW_{Ing}-V} ³ 0.5 acre source area (mg/L)	Air _{GW_{Ing}-V} ³⁰ acre source area (mg/L)	Air _{GW_{Ing}-V} ³ 0.5 acre source area (mg/L)	Air _{GW_{Ing}-V} ³⁰ acre source area (mg/L)	GW _{Ing} ¹ (mg/L)	GW _{Class 2} ² (mg/L)	GW _{Ing} ¹ (mg/L)	GW _{Class 2} ² (mg/L)	Air _{GW_{Ing}-V} ³ 0.5 acre source area (mg/L)	Air _{GW_{Ing}-V} ³⁰ acre source area (mg/L)	Air _{GW_{Ing}-V} ³ 0.5 acre source area (mg/L)	Air _{GW_{Ing}-V} ³⁰ acre source area (mg/L)
>6-8 C aliphatics (TPH) (>53% n-hexane content)	NA	—	—	1.5E+00	1.5E+02	—	—	7.1E+01	9.1E+00	—	—	4.4E+00	4.4E+02	—	—	9.9E+01	1.3E+01
>6-8 C aliphatics (TPH) (<53% n-hexane content)	NA	—	—	1.5E+00	1.5E+02	—	—	1.9E+03	2.5E+02	—	—	4.4E+00	4.4E+02	—	—	2.7E+03	3.5E+02
>8-10 C aliphatics (TPH)	NA	—	—	2.4E+00	2.4E+02	—	—	3.3E+01	4.3E+00	—	—	7.3E+00	7.3E+02	—	—	4.6E+01	6.0E+00
>10-12 C aliphatics (TPH)	NA	—	—	2.4E+00	2.4E+02	—	—	2.2E+01	2.8E+00	—	—	7.3E+00	7.3E+02	—	—	3.1E+01	4.0E+00
>12-16 C aliphatics (TPH)	NA	—	—	2.4E+00	2.4E+02	—	—	5.1E+00	6.6E-01	—	—	7.3E+00	7.3E+02	—	—	7.1E+00	9.2E-01
>16-21 C aliphatics (TPH)	NA	—	—	4.9E+01	4.9E+03	—	—	—	—	—	—	1.5E+02	1.5E+04	—	—	—	—
>16-21 C aliphatics (TPH) (for transformer mineral oil releases only)	NA	—	—	3.9E+01	3.9E+03	—	—	—	—	—	—	1.2E+02	1.2E+04	—	—	—	—
>21-35 C aliphatics (TPH)	NA	—	—	4.9E+01	4.9E+03	—	—	—	—	—	—	1.5E+02	1.5E+04	—	—	—	—
>21-35 C aliphatics (TPH) (for transformer mineral oil releases only)	NA	—	—	3.9E+01	3.9E+03	—	—	—	—	—	—	1.2E+02	1.2E+04	—	—	—	—
>7-8 C aromatics (TPH)	NA	—	—	2.4E+00	2.4E+02	—	—	2.9E+04	3.8E+03	—	—	7.3E+00	7.3E+02	—	—	4.1E+04	5.3E+03
>8-10 C aromatics (TPH)	NA	—	—	9.8E-01	9.8E+01	—	—	1.8E+03	2.3E+02	—	—	2.9E+00	2.9E+02	—	—	2.5E+03	3.2E+02
>10-12 C aromatics (TPH)	NA	—	—	9.8E-01	9.8E+01	—	—	4.3E+03	5.5E+02	—	—	2.9E+00	2.9E+02	—	—	6.0E+03	7.7E+02
>12-16 C aromatics (TPH)	NA	—	—	9.8E-01	9.8E+01	—	—	7.5E+03	9.7E+02	—	—	2.9E+00	2.9E+02	—	—	1.0E+04	1.4E+03
>16-21 C aromatics (TPH)	NA	—	—	7.3E-01	7.3E+01	—	—	—	—	—	—	2.2E+00	2.2E+02	—	—	—	—
>21-35 C aromatics (TPH)	NA	—	—	7.3E-01	7.3E+01	—	—	—	—	—	—	2.2E+00	2.2E+02	—	—	—	—
Footnotes																	
1 Based on primary MCLs when available																	
2 100 x ^{GW} GW _{Ing}																	
3 The total MCL for trihalomethanes (bromodichloromethane, bromoform, chloroform, and dibromochloromethane) is 0.08 mg/L.																	
* These compounds are not necessarily of concern from a human health standpoint, therefore calculation of human health-based values is not required. However, aesthetics and ecological criteria would still apply. See table entitled "Compounds for which Calculation of a Human Health PCL is Not Required" available on the TCEQ website at http://www.tceq.state.tx.us/remediation/trrp/trrp.html .																	
NA=Not applicable																	
All values capped at 1E+06																	

This table shows the residential and commercial/industrial groundwater protective concentration levels with carcinogenic and non-carcinogenic values depicted.

end of worksheet

Table 9
Individual RBELs Residential

Last Revised: March 1, 2022

Chemical of Concern	CAS	Soil									Groundwater				
		Carcinogenic					Noncarcinogenic				Carcinogenic		Noncarcinogenic		
		Air ¹ RBEL _{Inh} (mg/m3)	Soil ¹ RBEL _{Ing} (mg/kg)	Soil ¹ RBEL _{Derm} (mg/kg)	AbgVeg ¹ RBEL _{Ing} above-ground (mg/kg)	BgVeg ¹ RBEL _{Ing} below-ground (mg/kg)	Air ¹ RBEL _{Inh} (mg/m3)	Soil ¹ RBEL _{Ing} (mg/kg)	Soil ¹ RBEL _{Derm} (mg/kg)	AbgVeg ¹ RBEL _{Ing} above-ground (mg/kg)	BgVeg ¹ RBEL _{Ing} below-ground (mg/kg)	GW ¹ RBEL _{Ing} ¹ (mg/L)	GW ¹ RBEL _{Class 3} ² (mg/L)	GW ¹ RBEL _{Ing} ¹ (mg/L)	GW ¹ RBEL _{Class 3} ² (mg/L)
Acenaphthene	83-32-9	—	—	—	—	—	—	4.9E+03	1.6E+04	—	9.4E+02	—	—	1.5E+00	1.5E+02
Acenaphthylene	208-96-8	—	—	—	—	—	—	4.9E+03	1.6E+04	—	—	—	—	1.5E+00	1.5E+02
Acetaldehyde	75-07-0	1.1E-02	—	—	—	—	9.4E-03	8.2E+03	—	—	—	—	—	2.4E+00	2.4E+02
Acetate, 2-ethoxyethanol	111-15-9	—	—	—	—	—	6.3E-02	8.2E+03	—	—	—	—	—	2.4E+00	2.4E+02
Acetate, isoamyl	123-92-2	—	—	—	—	—	—	5.9E+03	—	—	—	—	—	1.8E+00	1.8E+02
Acetate, isobutyl	110-19-0	—	—	—	—	—	—	3.9E+03	—	—	—	—	—	1.2E+00	1.2E+02
Acetate, sec-butyl	105-46-4	—	—	—	—	—	—	3.9E+03	—	—	—	—	—	1.2E+00	1.2E+02
Acetic acid*	64-19-7	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Acetone (2-propanone)	67-64-1	—	—	—	—	—	3.2E+01	7.4E+04	—	—	—	—	—	2.2E+01	2.2E+03
Acetone cyanohydrin	75-86-5	—	—	—	—	—	6.3E-02	2.5E+02	1.1E+03	—	—	—	—	7.3E-02	7.3E+00
Acetonitrile	75-05-8	—	—	—	—	—	6.3E-02	2.6E+03	—	—	—	—	—	7.8E-01	7.8E+01
Acetophenone	98-86-2	—	—	—	—	—	—	8.2E+03	3.6E+04	—	—	—	—	2.4E+00	2.4E+02
Acetylaminofluorene, 2-	53-96-3	1.9E-05	1.6E+00	5.5E+00	—	—	—	—	—	—	—	2.4E-04	2.4E-02	—	—
Acifluorfen, sodium	62476-59-9	—	—	—	—	—	—	1.1E+03	4.6E+03	—	—	—	—	3.2E-01	3.2E+01
Acridine	260-94-6	—	—	—	—	—	—	2.5E+02	1.1E+03	—	—	—	—	7.3E-02	7.3E+00
Acrolein	107-02-8	—	—	—	—	—	2.8E-03	4.1E+01	—	—	—	—	—	1.2E-02	1.2E+00
Acrylamide	79-06-1	2.4E-04	1.2E+01	4.2E+01	—	—	6.3E-03	1.6E+02	7.1E+02	—	—	1.8E-03	1.8E-01	4.9E-02	4.9E+00
Acrylic acid	79-10-7	—	—	—	—	—	1.0E-03	4.1E+04	—	—	—	—	—	1.2E+01	1.2E+03
Acrylonitrile	107-13-1	3.6E-04	1.1E+01	—	—	—	2.1E-03	8.2E+01	—	—	—	1.7E-03	1.7E-01	2.4E-02	2.4E+00
Adipic acid (hexanedioic acid)	124-04-9	—	—	—	—	—	—	1.6E+05	7.1E+05	—	—	—	—	4.9E+01	4.9E+03
Alachlor	15972-60-8	—	7.6E+01	2.6E+02	—	—	—	8.2E+02	3.6E+03	—	—	1.1E-02	1.1E+00	2.4E-01	2.4E+01
Aldicarb	116-06-3	—	—	—	—	—	—	8.2E+01	3.6E+02	—	—	—	—	2.4E-02	2.4E+00
Aldicarb sulfone	1646-88-4	—	—	—	—	—	—	8.2E+01	3.6E+02	—	—	—	—	2.4E-02	2.4E+00
Aldrin	309-00-2	5.0E-06	3.6E-01	1.2E+00	—	3.4E-02	—	2.5E+00	1.1E+01	—	4.7E-01	5.4E-05	5.4E-03	7.3E-04	7.3E-02
Allyl alcohol	107-18-6	—	—	—	—	—	1.0E-04	4.1E+02	—	—	—	—	—	1.2E-01	1.2E+01
Allyl chloride	107-05-1	—	—	—	—	—	1.0E-03	8.2E+02	—	—	—	—	—	2.4E-01	2.4E+01
Aluminum	7429-90-5	—	—	—	—	—	5.2E-03	8.2E+04	3.6E+05	6.5E+03	1.6E+04	—	—	2.4E+01	2.4E+03
Ametryn	834-12-8	—	—	—	—	—	—	7.4E+02	3.2E+03	—	—	—	—	2.2E-01	2.2E+01
Amino-2,6-dinitrotoluene, 4-	19406-51-0	—	2.0E+02	6.9E+02	—	—	—	4.1E+01	1.8E+02	—	—	3.0E-02	3.0E+00	1.2E-02	1.2E+00
Amino-4,6-dinitrotoluene, 2-	35572-78-2	—	2.0E+02	6.9E+02	—	—	—	4.1E+01	1.8E+02	—	—	3.0E-02	3.0E+00	1.2E-02	1.2E+00
Aminobiphenyl, 4- (1,1-biphenyl-4-amine)	92-67-1	—	1.0E+00	3.4E+00	—	—	—	—	—	—	—	1.5E-04	1.5E-02	—	—
Aminopyridine, 4-	504-24-5	—	—	—	—	—	—	1.6E+00	7.1E+00	—	—	—	—	4.9E-04	4.9E-02
Ammonia	7664-41-7	—	—	—	—	—	3.3E-01	—	—	—	—	—	—	—	—
Ammonium polyphosphate*	6833-79-9	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Ammonium salts*	AMMONIUM	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Aniline	62-53-3	—	1.1E+03	3.6E+03	—	—	1.0E-03	5.7E+02	2.5E+03	—	—	1.6E-01	1.6E+01	1.7E-01	1.7E+01
Anthracene	120-12-7	—	—	—	—	—	—	2.5E+04	8.2E+04	—	4.7E+03	—	—	7.3E+00	7.3E+02
Anthraquinone, 9,10-	84-65-1	—	1.6E+02	5.3E+02	—	—	—	1.6E+03	7.1E+03	—	—	2.3E-02	2.3E+00	4.9E-01	4.9E+01
Antimony	7440-36-0	—	—	—	—	—	—	3.3E+01	2.1E+02	2.6E+00	6.3E+00	—	—	9.8E-03	9.8E-01
Aramite	140-57-8	3.4E-03	2.4E+02	8.3E+02	—	2.3E+01	—	4.1E+03	1.8E+04	—	7.8E+02	3.7E-02	3.7E+00	1.2E+00	1.2E+02
Arsenic	7440-38-2	1.6E-04	5.2E+01	4.6E+02	1.7E+00	3.9E+00	—	3.1E+01	3.6E+02	2.0E+00	4.7E+00	6.1E-03	6.1E-01	7.3E-03	7.3E-01
Arsine	7784-42-1	—	—	—	—	—	5.2E-05	—	—	—	—	—	—	—	—
Atrazine	1912-24-9	—	2.7E+01	9.4E+01	—	—	—	2.9E+03	1.2E+04	—	—	4.1E-03	4.1E-01	8.6E-01	8.6E+01

Table 9
Individual RBELs Residential

Last Revised: March 1, 2022

Chemical of Concern	CAS	Soil										Groundwater			
		Carcinogenic					Noncarcinogenic					Carcinogenic		Noncarcinogenic	
		Air ¹ RBEL _{Inh} (mg/m3)	Soil ¹ RBEL _{Ing} (mg/kg)	Soil ¹ RBEL _{Derm} (mg/kg)	AbgVeg ¹ RBEL _{Ing} above-ground (mg/kg)	BgVeg ¹ RBEL _{Ing} below-ground (mg/kg)	Air ¹ RBEL _{Inh} (mg/m3)	Soil ¹ RBEL _{Ing} (mg/kg)	Soil ¹ RBEL _{Derm} (mg/kg)	AbgVeg ¹ RBEL _{Ing} above-ground (mg/kg)	BgVeg ¹ RBEL _{Ing} below-ground (mg/kg)	GW ¹ RBEL _{Ing} (mg/L)	GW ² RBEL _{Class 3} (mg/L)	GW ¹ RBEL _{Ing} (mg/L)	GW ² RBEL _{Class 3} (mg/L)
Azinphos-methyl (guthion)	86-50-0	—	—	—	—	—	—	1.2E+02	5.3E+02	—	—	—	—	3.7E-02	3.7E+00
Azobenzene	103-33-3	7.8E-04	5.5E+01	1.9E+02	—	5.3E+00	—	—	—	—	—	8.3E-03	8.3E-01	—	—
Barium	7440-39-3	—	—	—	—	—	—	1.6E+04	5.0E+04	1.3E+03	3.1E+03	—	—	4.9E+00	4.9E+02
Bayleton	43121-43-3	—	—	—	—	—	—	2.5E+03	1.1E+04	—	—	—	—	7.3E-01	7.3E+01
Benefin (benfluralin)	1861-40-1	—	—	—	—	—	—	2.5E+04	1.1E+05	—	4.7E+03	—	—	7.3E+00	7.3E+02
Benomyl	17804-35-2	—	—	—	—	—	—	4.1E+03	1.8E+04	—	—	—	—	1.2E+00	1.2E+02
Benz-a-anthracene	56-55-3	4.1E-04	6.1E+01	1.6E+02	—	5.8E+00	—	—	—	—	—	9.1E-03	9.1E-01	—	—
Benzaldehyde	100-52-7	—	—	—	—	—	—	8.2E+03	—	—	—	—	—	2.4E+00	2.4E+02
Benzene	71-43-2	1.1E-02	4.0E+02	—	—	—	2.9E-01	3.3E+02	—	—	—	6.1E-02	6.1E+00	9.8E-02	9.8E+00
Benzenedicarbonitrile, 1,3-	626-17-5	—	—	—	—	—	—	4.9E+02	2.1E+03	—	—	—	—	1.5E-01	1.5E+01
Benzenedicarboxylic acid, 1,2-disodecyl ester	26761-40-0	—	—	—	—	—	5.2E-03	3.3E+03	1.4E+04	—	6.3E+02	—	—	9.8E-01	9.8E+01
Benzenethiol	108-98-5	—	—	—	—	—	—	8.2E+01	—	—	—	—	—	2.4E-02	2.4E+00
Benidine	92-87-5	3.6E-07	2.6E-02	9.0E-02	—	—	—	2.5E+02	1.1E+03	—	—	4.0E-06	4.0E-04	7.3E-02	7.3E+00
Benzo-a-pyrene	50-32-8	4.1E-05	6.1E+00	1.6E+01	—	5.8E-01	2.1E-06	2.5E+01	8.2E+01	—	4.7E+00	9.1E-04	9.1E-02	7.3E-03	7.3E-01
Benzo-b-fluoranthene	205-99-2	4.1E-04	6.1E+01	1.6E+02	—	5.8E+00	—	—	—	—	—	9.1E-03	9.1E-01	—	—
Benzo-e-pyrene	192-97-2	—	—	—	—	—	—	2.5E+03	8.2E+03	—	4.7E+02	—	—	7.3E-01	7.3E+01
Benzo-g,h,i-perylene	191-24-2	—	—	—	—	—	—	2.5E+03	8.2E+03	—	4.7E+02	—	—	7.3E-01	7.3E+01
Benzoic acid	65-85-0	—	—	—	—	—	—	3.3E+05	1.0E+06	—	—	—	—	9.8E+01	9.8E+03
Benzo-j-fluoranthene	205-82-3	4.1E-04	6.1E+01	1.6E+02	—	5.8E+00	—	—	—	—	—	9.1E-03	9.1E-01	—	—
Benzo-k-fluoranthene	207-08-9	4.1E-03	6.1E+02	1.6E+03	—	5.8E+01	—	—	—	—	—	9.1E-02	9.1E+00	—	—
Benzophenone	119-61-9	—	—	—	—	—	—	5.5E+02	2.4E+03	—	—	—	—	1.6E-01	1.6E+01
Benzotrichloride	98-07-7	—	4.7E-01	1.6E+00	—	—	—	—	—	—	—	7.0E-05	7.0E-03	—	—
Benzoyl peroxide	94-36-0	—	—	—	—	—	—	4.1E+03	1.8E+04	—	—	—	—	1.2E+00	1.2E+02
Benzyl alcohol	100-51-6	—	—	—	—	—	—	8.2E+03	3.6E+04	—	—	—	—	2.4E+00	2.4E+02
Benzyl chloride	100-44-7	—	3.6E+01	—	—	—	1.0E-03	1.6E+02	—	—	—	5.4E-03	5.4E-01	4.9E-02	4.9E+00
Benzyl dichloride	98-87-3	—	3.6E+01	1.2E+02	—	—	1.0E-03	1.6E+02	7.1E+02	—	—	5.4E-03	5.4E-01	4.9E-02	4.9E+00
Beryllium	7440-41-7	1.0E-05	—	—	—	—	2.1E-05	1.6E+02	5.0E+01	1.3E+01	3.1E+01	—	—	4.9E-02	4.9E+00
Biphenyl, 1,1'-	92-52-4	—	—	—	—	—	—	4.1E+04	1.8E+04	—	—	—	—	1.2E+01	1.2E+03
Biphenyl, 1,1'-, 2-phenoxy-	6738-04-1	—	—	—	—	—	—	4.1E+03	1.8E+04	—	7.8E+02	—	—	1.2E+00	1.2E+02
Biquinoline, 2,2'-	119-91-5	—	—	—	—	—	—	2.5E+02	1.1E+03	—	4.7E+01	—	—	7.3E-02	7.3E+00
Bis (2-chloroethoxy) methane	111-91-1	7.4E-05	5.5E+00	1.9E+01	—	—	—	2.5E+02	1.1E+03	—	—	8.3E-04	8.3E-02	7.3E-02	7.3E+00
Bis (2-chloroethyl) ether	111-44-4	7.4E-05	5.5E+00	—	—	—	—	—	—	—	—	8.3E-04	8.3E-02	—	—
Bis (2-chloro-1-methylethyl) ether	108-60-1	2.4E-03	8.7E+01	3.0E+02	—	—	—	3.3E+03	1.4E+04	—	—	1.3E-02	1.3E+00	9.8E-01	9.8E+01
Bis (2-chloromethyl) ether	542-88-1	3.9E-07	2.8E-02	—	—	—	—	—	—	—	—	4.1E-06	4.1E-04	—	—
Bis (2-ethyl-hexyl) phthalate	117-81-7	—	4.3E+02	2.8E+02	—	4.2E+01	—	1.6E+03	1.4E+03	—	3.1E+02	6.5E-02	6.5E+00	4.9E-01	4.9E+01
Bismuth	7440-69-9	—	—	—	—	—	—	4.1E+04	3.6E+05	3.3E+03	—	—	—	1.2E+01	1.2E+03
Bisphenol A	80-05-7	—	—	—	—	—	—	4.1E+03	1.8E+04	—	—	—	—	1.2E+00	1.2E+02
Boron	7440-42-8	—	—	—	—	—	2.1E-02	1.6E+04	7.1E+05	—	—	—	—	4.9E+00	4.9E+02
Bromacil	314-40-9	—	—	—	—	—	—	8.2E+03	3.6E+04	—	—	—	—	2.4E+00	2.4E+02
Bromo-2-chloroethane, 1-	107-04-0	—	—	—	—	—	—	3.3E+03	—	—	—	—	—	9.8E-01	9.8E+01
Bromobenzene	108-86-1	—	—	—	—	—	6.3E-02	6.6E+02	—	—	—	—	—	2.0E-01	2.0E+01
Bromodichloromethane	75-27-4	—	9.8E+01	—	—	—	—	6.6E+02	—	—	—	1.5E-02	1.5E+00	2.0E-01	2.0E+01
Bromoform ³	75-25-2	2.2E-02	7.7E+02	—	—	—	—	1.6E+03	—	—	—	1.2E-01	1.2E+01	4.9E-01	4.9E+01

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Individual RBELs Residential

Last Revised: March 1, 2022

Chemical of Concern	CAS	Soil										Groundwater			
		Carcinogenic					Noncarcinogenic					Carcinogenic		Noncarcinogenic	
		Air ¹ RBEL _{Inh} (mg/m3)	Soil ¹ RBEL _{Ing} (mg/kg)	Soil ¹ RBEL _{Derm} (mg/kg)	AbgVeg ¹ RBEL _{Ing} above-ground (mg/kg)	BgVeg ¹ RBEL _{Ing} below-ground (mg/kg)	Air ¹ RBEL _{Inh} (mg/m3)	Soil ¹ RBEL _{Ing} (mg/kg)	Soil ¹ RBEL _{Derm} (mg/kg)	AbgVeg ¹ RBEL _{Ing} above-ground (mg/kg)	BgVeg ¹ RBEL _{Ing} below-ground (mg/kg)	GW ¹ RBEL _{Ing} (mg/L)	GW ² RBEL _{Class 3} (mg/L)	GW ¹ RBEL _{Ing} (mg/L)	GW ² RBEL _{Class 3} (mg/L)
Bromomethane	74-83-9						4.1E-03	1.1E+02						3.4E-02	3.4E+00
Bromophenyl phenylether, 4-	101-55-3	7.4E-06	4.0E-01	1.4E+00	—	3.9E-02	—	—	—	—	—	6.1E-05	6.1E-03	—	—
Butadiene, 1,3-	106-99-0	4.9E-02	—	—	—	—	3.4E-02	—	—	—	—	—	—	—	—
Butadiene, 2-methyl-1,3- (isoprene)	78-79-5	—	—	—	—	—	1.9E+01	4.9E+03	—	—	—	—	—	1.5E+00	1.5E+02
Butanal (butyraldehyde)	123-72-8	—	—	—	—	—	1.0E-01	4.9E+03	—	—	—	—	—	1.5E+00	1.5E+02
Butane, 2,3-dimethyl-	79-29-8	—	—	—	—	—	1.9E+01	4.9E+03	—	—	—	—	—	1.5E+00	1.5E+02
Butanoic acid (butyric acid)	107-92-6	—	—	—	—	—	1.0E-03	4.1E+04	1.8E+05	—	—	—	—	1.2E+01	1.2E+03
Butanol, 2-	78-92-2	—	—	—	—	—	3.1E+01	1.6E+05	—	—	—	—	—	4.9E+01	4.9E+03
Butanol, 2-methyl-1-	137-32-6	—	—	—	—	—	—	8.2E+02	—	—	—	—	—	2.4E-01	2.4E+01
Butanol, 2-methyl-2-	75-85-4	—	—	—	—	—	—	8.2E+02	—	—	—	—	—	2.4E-01	2.4E+01
Butanol, n-	71-36-3	—	—	—	—	—	—	8.2E+03	—	—	—	—	—	2.4E+00	2.4E+02
Butene, 1-	106-98-9	—	—	—	—	—	5.5E+00	4.9E+03	—	—	—	—	—	1.5E+00	1.5E+02
Butene, cis-2-	590-18-1	—	—	—	—	—	1.7E+00	4.9E+03	—	—	—	—	—	1.5E+00	1.5E+02
Butene, trans-2-	624-64-6	—	—	—	—	—	1.7E+00	4.9E+03	—	—	—	—	—	1.5E+00	1.5E+02
Butoxy ethanol, 2- (Ethylene glycol monobutyl ether; EGBE)	111-76-2	—	—	—	—	—	1.7E+00	8.2E+03	3.6E+04	—	—	—	—	2.4E+00	2.4E+02
Butyl acetate	123-86-4	—	—	—	—	—	4.9E+00	1.1E+04	—	—	—	—	—	3.4E+00	3.4E+02
Butyl acrylate	141-32-2	—	—	—	—	—	—	7.4E+02	—	—	—	—	—	2.2E-01	2.2E+01
Butyl benzyl phthalate	85-68-7	—	3.2E+03	1.1E+04	—	3.1E+02	—	1.6E+04	7.1E+04	—	3.1E+03	4.8E-01	4.8E+01	4.9E+00	4.9E+02
Butyl ether, n- (dibutyl ether)	142-96-1	—	—	—	—	—	—	8.2E+03	—	—	—	—	—	2.4E+00	2.4E+02
Butyl methacrylate	97-88-1	—	—	—	—	—	—	7.4E+03	6.4E+03	—	—	—	—	2.2E+00	2.2E+02
Butylate	2008-41-5	—	—	—	—	—	—	4.1E+03	1.8E+04	—	—	—	—	1.2E+00	1.2E+02
Butylbenzene, n-	104-51-8	—	—	—	—	—	—	4.1E+03	1.8E+04	—	—	—	—	1.2E+00	1.2E+02
Butylbenzene, sec-	135-98-8	—	—	—	—	—	—	3.3E+03	—	—	—	—	—	9.8E-01	9.8E+01
Butylbenzene, tert-	98-06-6	—	—	—	—	—	—	3.3E+03	—	—	—	—	—	9.8E-01	9.8E+01
Cacodylic acid	75-60-5	—	—	—	—	—	—	2.5E+02	1.1E+03	—	—	—	—	7.3E-02	7.3E+00
Cadmium	7440-43-9	5.0E-05	—	—	—	—	1.1E-05	2.6E+02	2.3E+03	1.1E+01	2.6E+01	—	—	2.4E-02	2.4E+00
Calcium*	7440-70-2	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Caprolactam	105-60-2	—	—	—	—	—	—	4.1E+04	1.8E+05	—	—	—	—	1.2E+01	1.2E+03
Captan	133-06-2	—	1.7E+03	5.9E+03	—	—	—	1.1E+04	4.6E+04	—	—	2.6E-01	2.6E+01	3.2E+00	3.2E+02
Carbaryl	63-25-2	—	—	—	—	—	—	8.2E+03	3.6E+04	—	—	—	—	2.4E+00	2.4E+02
Carbazole	86-74-8	—	3.0E+02	1.0E+03	—	—	—	—	—	—	—	4.6E-02	4.6E+00	—	—
Carbofuran	1563-66-2	—	—	—	—	—	—	4.1E+02	1.8E+03	—	—	—	—	1.2E-01	1.2E+01
Carbon disulfide	75-15-0	—	—	—	—	—	7.3E-01	8.2E+03	—	—	—	—	—	2.4E+00	2.4E+02
Carbon tetrachloride	56-23-5	4.1E-03	8.7E+01	—	—	—	1.0E-01	3.3E+02	—	—	—	1.3E-02	1.3E+00	9.8E-02	9.8E+00
Carbophenothion	786-19-6	—	—	—	—	—	—	1.1E+03	4.6E+03	—	2.0E+02	—	—	3.2E-01	3.2E+01
Carbosulfan	55285-14-8	—	—	—	—	—	—	8.2E+02	3.6E+03	—	1.6E+02	—	—	2.4E-01	2.4E+01
Carboxin	5234-68-4	—	—	—	—	—	—	8.2E+03	3.6E+04	—	—	—	—	2.4E+00	2.4E+02
Chloral	75-87-6	—	—	—	—	—	—	8.2E+03	—	—	—	—	—	2.4E+00	2.4E+02
Chloral hydrate (1,1-ethanediol, 2,2,2-trichloro-)	302-17-0	—	—	—	—	—	—	8.2E+03	3.6E+04	—	—	—	—	2.4E+00	2.4E+02
Chloramben (amiben; 3-amino-2,5-dichlorobenzoic acid)	133-90-4	—	—	—	—	—	—	1.2E+03	5.3E+03	—	—	—	—	3.7E-01	3.7E+01
Chlordane (technical)	12789-03-6	2.4E-04	1.7E+01	1.5E+02	—	1.7E+00	7.3E-04	4.1E+01	4.4E+02	—	7.8E+00	2.6E-03	2.6E-01	1.2E-02	1.2E+00
Chlordane, cis- (alpha chlordane)	5103-71-9	2.4E-04	1.7E+01	5.9E+01	—	1.7E+00	7.3E-04	4.1E+01	1.8E+02	—	7.8E+00	2.6E-03	2.6E-01	1.2E-02	1.2E+00
Chlordane, trans- (gamma chlordane)	5103-74-2	2.4E-04	1.7E+01	5.9E+01	—	1.7E+00	7.3E-04	4.1E+01	1.8E+02	—	7.8E+00	2.6E-03	2.6E-01	1.2E-02	1.2E+00

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Chemical of Concern	CAS	Soil										Groundwater			
		Carcinogenic					Noncarcinogenic					Carcinogenic		Noncarcinogenic	
		Air ¹ RBEL _{Inh} (mg/m3)	Soil ¹ RBEL _{Ing} (mg/kg)	Soil ¹ RBEL _{Derm} (mg/kg)	AbgVeg ¹ RBEL _{Ing} above-ground (mg/kg)	BgVeg ¹ RBEL _{Ing} below-ground (mg/kg)	Air ¹ RBEL _{Inh} (mg/m3)	Soil ¹ RBEL _{Ing} (mg/kg)	Soil ¹ RBEL _{Derm} (mg/kg)	AbgVeg ¹ RBEL _{Ing} above-ground (mg/kg)	BgVeg ¹ RBEL _{Ing} below-ground (mg/kg)	GW ¹ RBEL _{Ing} ¹ (mg/L)	GW ² RBEL _{Class 3} ² (mg/L)	GW ¹ RBEL _{Ing} ¹ (mg/L)	GW ² RBEL _{Class 3} ² (mg/L)
Chlorfenvinphos	470-90-6	—	—	—	—	—	2.1E-03	5.7E+01	2.5E+02	—	1.1E+01	—	—	1.7E-02	1.7E+00
Chloride*	16887-00-6	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Chlorine	7782-50-5	—	—	—	—	—	9.1E-03	8.2E+03	7.1E+04	—	—	—	—	2.4E+00	2.4E+02
Chloro-1,3-butadiene, 2-	126-99-8	8.1E-05	—	—	—	—	2.1E-02	—	—	—	—	—	—	—	—
Chloro-2-propanol, 1-	127-00-4	—	—	—	—	—	—	1.6E+03	—	—	—	—	—	4.9E-01	4.9E+01
Chloro-3-methylphenol, 4-	59-50-7	—	—	—	—	—	—	4.1E+02	1.8E+03	—	—	—	—	1.2E-01	1.2E+01
Chloroaniline, p-	106-47-8	—	3.0E+01	1.0E+02	—	—	—	3.3E+02	1.4E+03	—	—	4.6E-03	4.6E-01	9.8E-02	9.8E+00
Chlorobenzene	108-90-7	—	—	—	—	—	5.2E-02	1.6E+03	—	—	—	—	—	4.9E-01	4.9E+01
Chlorobenzilate	510-15-6	3.1E-04	2.2E+01	7.7E+01	—	—	—	1.6E+03	7.1E+03	—	—	3.4E-03	3.4E-01	4.9E-01	4.9E+01
Chlorobromomethane (bromochloromethane)	74-97-5	—	—	—	—	—	—	3.3E+03	—	—	—	—	—	9.8E-01	9.8E+01
Chlorodifluoromethane	75-45-6	—	—	—	—	—	5.2E+01	—	—	—	—	—	—	—	—
Chloroethane (ethyl chloride)	75-00-3	—	—	—	—	—	1.0E+01	3.3E+04	—	—	—	—	—	9.8E+00	9.8E+02
Chloroethanol, 2-	107-07-3	—	—	—	—	—	—	1.6E+03	—	—	—	—	—	4.9E-01	4.9E+01
Chloroethoxy ethene, 2- (2-chloroethylvinylether)	110-75-8	—	5.5E+00	—	—	—	3.1E-04	1.6E+02	—	—	—	8.3E-04	8.3E-02	4.9E-02	4.9E+00
Chloroform ³	67-66-3	1.1E-03	—	—	—	—	1.0E-01	8.2E+02	—	—	—	—	—	2.4E-01	2.4E+01
Chlorohexane, 1-	544-10-5	—	—	—	—	—	1.0E+00	3.3E+03	—	—	—	—	—	9.8E-01	9.8E+01
Chloromethane (methyl chloride)	74-87-3	1.4E-02	4.7E+02	—	—	—	9.4E-02	2.9E+02	—	—	—	7.0E-02	7.0E+00	8.8E-02	8.8E+00
Chloronaphthalene, 1- (Chloronaphthalene, alpha-)	90-13-1	—	—	—	—	—	—	6.6E+03	2.2E+04	—	1.3E+03	—	—	2.0E+00	2.0E+02
Chloronaphthalene, 2- (chloronaphthalene, beta)	91-58-7	—	—	—	—	—	—	6.6E+03	2.2E+04	—	—	—	—	2.0E+00	2.0E+02
Chloronitrobenzene, p- (1-chloro-4-nitrobenzene)	100-00-5	—	9.6E+02	3.3E+03	—	—	6.3E-04	8.2E+01	3.6E+02	—	—	1.4E-01	1.4E+01	2.4E-02	2.4E+00
Chlorophenol, 2-	95-57-8	—	—	—	—	—	—	4.1E+02	—	—	—	—	—	1.2E-01	1.2E+01
Chlorophenol, 3-	108-43-0	—	—	—	—	—	—	4.1E+02	1.8E+03	—	—	—	—	1.2E-01	1.2E+01
Chlorophenol, 4-	106-48-9	—	—	—	—	—	—	4.1E+02	1.8E+03	—	—	—	—	1.2E-01	1.2E+01
Chlorophenyl phenylether, 4-	7005-72-3	7.4E-06	4.0E-01	1.4E+00	—	3.9E-02	—	—	—	—	—	6.1E-05	6.1E-03	—	—
Chloropropane, 2-	75-29-6	—	—	—	—	—	1.0E-01	2.5E+03	—	—	—	—	—	7.3E-01	7.3E+01
Chlorothalonil	1897-45-6	—	5.5E+02	1.9E+03	—	—	—	1.2E+03	5.3E+03	—	—	8.3E-02	8.3E+00	3.7E-01	3.7E+01
Chlorotoluene, o- (2-chlorotoluene)	95-49-8	—	—	—	—	—	8.3E-01	1.6E+03	7.1E+03	—	—	—	—	4.9E-01	4.9E+01
Chlorotoluene, p- (4-chlorotoluene)	106-43-4	—	—	—	—	—	—	1.6E+03	—	—	—	—	—	4.9E-01	4.9E+01
Chlorpyrifos	2921-88-2	—	—	—	—	—	—	2.5E+02	1.1E+03	—	4.7E+01	—	—	7.3E-02	7.3E+00
Chromium (III)	16065-83-1	—	—	—	—	—	1.5E-04	1.2E+05	6.9E+04	9.8E+03	2.3E+04	—	—	3.7E+01	3.7E+03
Chromium (total)	7440-47-3	—	—	—	—	—	1.5E-04	1.2E+05	6.9E+04	9.8E+03	2.3E+04	—	—	3.7E+01	3.7E+03
Chromium (VI)	18540-29-9	1.1E-05	—	—	—	—	2.3E-04	2.5E+02	2.7E+02	2.0E+01	4.8E+01	—	—	7.6E-02	7.6E+00
Chrysene	218-01-9	4.1E-02	6.1E+03	1.6E+04	—	5.8E+02	—	—	—	—	—	9.1E-01	9.1E+01	—	—
Cobalt	7440-48-4	4.1E-06	—	—	—	—	6.6E-05	8.2E+02	3.6E+04	6.5E+01	1.6E+02	—	—	2.4E-01	2.4E+01
Copolymer acrylamide	69418-26-4	—	—	—	—	—	—	1.6E+01	7.1E+01	—	—	—	—	4.9E-03	4.9E-01
Copper	7440-50-8	—	—	—	—	—	—	7.9E+03	3.4E+05	6.3E+02	1.5E+03	—	—	2.4E+00	2.4E+02
Coronene	191-07-1	—	—	—	—	—	—	1.6E+02	7.1E+02	—	3.1E+01	—	—	4.9E-02	4.9E+00
Coumaphos	56-72-4	—	—	—	—	—	—	5.7E+02	2.5E+03	—	1.1E+02	—	—	1.7E-01	1.7E+01
Cresol	1319-77-3	—	—	—	—	—	—	4.1E+03	1.8E+04	—	—	—	—	1.2E+00	1.2E+02
Cresol, m- (3-methylphenol)	108-39-4	—	—	—	—	—	—	4.1E+03	1.8E+04	—	—	—	—	1.2E+00	1.2E+02
Cresol, o- (2-methylphenol)	95-48-7	—	—	—	—	—	—	4.1E+03	1.8E+04	—	—	—	—	1.2E+00	1.2E+02
Cresol, p- (4-methylphenol)	106-44-5	—	—	—	—	—	—	4.1E+02	1.8E+03	—	—	—	—	1.2E-01	1.2E+01
Crotonaldehyde	123-73-9	—	3.2E+00	—	—	—	—	8.2E+01	—	—	—	4.8E-04	4.8E-02	2.4E-02	2.4E+00

Table 9
Individual RBELs Residential

Last Revised: March 1, 2022

Chemical of Concern	CAS	Soil										Groundwater			
		Carcinogenic					Noncarcinogenic					Carcinogenic		Noncarcinogenic	
		Air ¹ RBEL _{Inh} (mg/m3)	Soil ¹ RBEL _{Ing} (mg/kg)	Soil ¹ RBEL _{Derm} (mg/kg)	AbgVeg ¹ RBEL _{Ing} above-ground (mg/kg)	BgVeg ¹ RBEL _{Ing} below-ground (mg/kg)	Air ¹ RBEL _{Inh} (mg/m3)	Soil ¹ RBEL _{Ing} (mg/kg)	Soil ¹ RBEL _{Derm} (mg/kg)	AbgVeg ¹ RBEL _{Ing} above-ground (mg/kg)	BgVeg ¹ RBEL _{Ing} below-ground (mg/kg)	GW ¹ RBEL _{Ing} (mg/L)	GW ¹ RBEL _{Class 3} (mg/L)	GW ¹ RBEL _{Ing} (mg/L)	GW ¹ RBEL _{Class 3} (mg/L)
Cumene (isopropylbenzene)	98-82-8	—	—	—	—	—	4.2E-01	8.2E+03	—	—	—	—	—	2.4E+00	2.4E+02
Cyanazine	21725-46-2	—	7.2E+00	2.5E+01	—	—	—	1.6E+02	7.1E+02	—	—	1.1E-03	1.1E-01	4.9E-02	4.9E+00
Cyanide	57-12-5	—	—	—	—	—	8.3E-04	4.9E+01	2.1E+03	—	—	—	—	1.5E-02	1.5E+00
Cyanogen	460-19-5	—	—	—	—	—	8.3E-04	8.2E+01	—	—	—	—	—	2.4E-02	2.4E+00
Cycloate	1134-23-2	—	—	—	—	—	—	4.5E+03	2.0E+04	—	—	—	—	1.3E+00	1.3E+02
Cyclohexane	110-82-7	—	—	—	—	—	6.3E+00	4.1E+05	—	—	—	—	—	1.2E+02	1.2E+04
Cyclohexanol	108-93-0	—	—	—	—	—	—	4.1E+05	1.0E+06	—	—	—	—	1.2E+02	1.2E+04
Cyclohexanone	108-94-1	—	—	—	—	—	7.3E-01	4.1E+05	—	—	—	—	—	1.2E+02	1.2E+04
Cyclohexene, 1-methanol-3-	1679-51-2	—	—	—	—	—	—	1.6E+03	7.1E+03	—	—	—	—	4.9E-01	4.9E+01
Cyclohexene, 4-vinyl-1-	100-40-3	—	—	—	—	—	3.4E-01	1.8E+03	—	—	—	—	—	5.4E-01	5.4E+01
Cyclopentane	287-92-3	—	—	—	—	—	2.5E+01	4.9E+03	—	—	—	—	—	1.5E+00	1.5E+02
Cyclopentane, methyl-	96-37-7	—	—	—	—	—	1.0E+00	8.2E+03	—	—	—	—	—	2.4E+00	2.4E+02
Cyclopentene	142-29-0	—	—	—	—	—	—	4.1E+05	—	—	—	—	—	1.2E+02	1.2E+04
Cyclotetramethylenetetranitramine (HMX)	2691-41-0	—	—	—	—	—	—	4.1E+03	2.7E+03	—	—	—	—	1.2E+00	1.2E+02
Cyclotrimethylenetrinitramine (RDX)	121-82-4	—	7.6E+01	2.6E+02	—	—	—	3.3E+02	1.4E+03	—	—	1.1E-02	1.1E+00	9.8E-02	9.8E+00
Cymene (isopropyltoluene)	99-87-6	—	—	—	—	—	—	8.2E+03	—	—	—	—	—	2.4E+00	2.4E+02
Cymoxanil	57966-95-7	—	—	—	—	—	—	1.1E+03	4.6E+03	—	—	—	—	3.2E-01	3.2E+01
Dacthal (DCPA)	1861-32-1	—	—	—	—	—	—	8.2E+02	3.6E+03	—	1.6E+02	—	—	2.4E-01	2.4E+01
Dalapon, sodium salt (2,2-dichloropropanoic acid)	75-99-0	—	—	—	—	—	—	2.5E+03	1.1E+04	—	—	—	—	7.3E-01	7.3E+01
DDD	72-54-8	—	2.5E+01	2.9E+02	—	2.4E+00	—	—	—	—	—	3.8E-03	3.8E-01	—	—
DDE	72-55-9	—	1.8E+01	2.0E+02	—	1.7E+00	—	—	—	—	—	2.7E-03	2.7E-01	—	—
DDT	50-29-3	2.5E-04	1.8E+01	2.0E+02	—	1.7E+00	—	4.1E+01	5.9E+02	—	7.8E+00	2.7E-03	2.7E-01	1.2E-02	1.2E+00
Demeton	8065-48-3	—	—	—	—	—	—	3.3E+00	1.4E+01	—	—	—	—	9.8E-04	9.8E-02
Desethylatrazine	6190-65-4	—	—	—	—	—	—	2.9E+03	1.2E+04	—	—	—	—	8.6E-01	8.6E+01
Diacetone alcohol (4-hydroxy-4-methyl-2-pentanone)	123-42-2	—	—	—	—	—	—	3.3E+03	1.4E+04	—	—	—	—	9.8E-01	9.8E+01
Diallate	2303-16-4	—	1.0E+02	3.4E+02	—	9.6E+00	—	—	—	—	—	1.5E-02	1.5E+00	—	—
Diazinon	333-41-5	—	—	—	—	—	1.0E-04	7.4E+01	3.2E+02	—	—	—	—	2.2E-02	2.2E+00
Dibenz(a,h)acridine	226-36-8	2.2E-04	5.1E+00	1.7E+01	—	4.9E-01	—	—	—	—	—	7.6E-04	7.6E-02	—	—
Dibenz(a,j)acridine	224-42-0	2.8E-04	8.3E+00	2.2E+01	—	8.0E-01	—	—	—	—	—	1.3E-03	1.3E-01	—	—
Dibenz-a,h-anthracene	53-70-3	4.1E-05	6.1E+00	1.6E+01	—	5.8E-01	—	—	—	—	—	9.1E-04	9.1E-02	—	—
Dibenzo(a,e)pyrene	192-65-4	2.8E-05	8.3E-01	2.8E+00	—	8.0E-02	—	—	—	—	—	1.3E-04	1.3E-02	—	—
Dibenzo(a,h)pyrene	189-64-0	2.8E-06	8.3E-02	2.8E-01	—	8.0E-03	—	—	—	—	—	1.3E-05	1.3E-03	—	—
Dibenzo(a,i)pyrene	189-55-9	2.8E-06	8.3E-02	2.8E-01	—	8.0E-03	—	—	—	—	—	1.3E-05	1.3E-03	—	—
Dibenzofuran	132-64-9	—	—	—	—	—	—	3.3E+02	1.4E+03	—	—	—	—	9.8E-02	9.8E+00
Dibenzothiophene	132-65-0	—	—	—	—	—	—	8.2E+02	1.1E+03	—	1.6E+02	—	—	2.4E-01	2.4E+01
Dibromo-3-chloropropane, 1,2-	96-12-8	4.1E-06	7.6E+00	2.6E+01	—	—	2.1E-04	1.6E+01	7.1E+01	—	—	1.1E-03	1.1E-01	4.9E-03	4.9E-01
Dibromochloromethane (chlorodibromomethane) ³	124-48-1	—	7.2E+01	—	—	—	—	1.6E+03	—	—	—	1.1E-02	1.1E+00	4.9E-01	4.9E+01
Dibromofluoromethane	1868-53-7	—	—	—	—	—	—	1.6E+04	—	—	—	—	—	4.9E+00	4.9E+02
Dicamba	1918-00-9	—	—	—	—	—	—	2.5E+03	1.1E+04	—	—	—	—	7.3E-01	7.3E+01
Dichlormid	37764-25-3	—	—	—	—	—	—	2.0E+03	8.9E+03	—	—	—	—	6.1E-01	6.1E+01
Dichloro-2-butene, 1,4-	764-41-0	5.8E-06	—	—	—	—	—	—	—	—	—	—	—	—	—
Dichloro-2-butene, 1,4- trans	110-57-6	5.8E-06	—	—	—	—	—	—	—	—	—	—	—	—	—
Dichlorobenzene, 1,2-	95-50-1	—	—	—	—	—	3.1E-02	7.4E+03	—	—	—	—	—	2.2E+00	2.2E+02

Table 9
Individual RBELs Residential

Last Revised: March 1, 2022

Chemical of Concern	CAS	Soil										Groundwater			
		Carcinogenic					Noncarcinogenic					Carcinogenic		Noncarcinogenic	
		Air ¹ RBEL _{Inh} (mg/m3)	Soil ¹ RBEL _{Ing} (mg/kg)	Soil ¹ RBEL _{Derm} (mg/kg)	AbgVeg ¹ RBEL _{Ing} above-ground (mg/kg)	BgVeg ¹ RBEL _{Ing} below-ground (mg/kg)	Air ¹ RBEL _{Inh} (mg/kg)	Soil ¹ RBEL _{Ing} (mg/kg)	Soil ¹ RBEL _{Derm} (mg/kg)	AbgVeg ¹ RBEL _{Ing} above-ground (mg/kg)	BgVeg ¹ RBEL _{Ing} below-ground (mg/kg)	GW ¹ RBEL _{Ing} (mg/L)	GW ² RBEL _{Class 3} (mg/L)	GW ¹ RBEL _{Ing} (mg/L)	GW ² RBEL _{Class 3} (mg/L)
Dichlorobenzene, 1,3-	541-73-1	—	—	—	—	—	8.3E-03	2.5E+03	—	—	—	—	—	7.3E-01	7.3E+01
Dichlorobenzene, 1,4-	106-46-7	—	2.5E+02	—	—	—	5.5E-01	—	—	—	—	3.8E-02	3.8E+00	—	—
Dichlorobenzidine, 3,3'-	91-94-1	—	1.3E+01	4.6E+01	—	—	—	—	—	—	—	2.0E-03	2.0E-01	—	—
Dichlorobutane, 2,3-	7581-97-7	—	—	—	—	—	7.3E-03	8.2E+02	—	—	—	—	—	2.4E-01	2.4E+01
Dichlorodifluoromethane	75-71-8	—	—	—	—	—	1.0E-01	1.6E+04	—	—	—	—	—	4.9E+00	4.9E+02
Dichloroethane, 1,1-	75-34-3	—	—	—	—	—	2.5E+00	1.6E+04	—	—	—	—	—	4.9E+00	4.9E+02
Dichloroethane, 1,2-	107-06-2	7.2E-03	6.7E+01	—	—	—	4.6E-02	6.4E+03	—	—	—	1.0E-02	1.0E+00	1.9E+00	1.9E+02
Dichloroethylene, 1,1-	75-35-4	—	—	—	—	—	3.5E-01	4.1E+03	—	—	—	—	—	1.2E+00	1.2E+02
Dichloroethylene, cis-1,2-	156-59-2	—	—	—	—	—	6.3E-02	1.6E+02	—	—	—	—	—	4.9E-02	4.9E+00
Dichloroethylene, trans-1,2	156-60-5	—	—	—	—	—	6.3E-02	1.6E+03	—	—	—	—	—	4.9E-01	4.9E+01
Dichlorofluoromethane	75-43-4	—	—	—	—	—	—	1.6E+04	—	—	—	—	—	4.9E+00	4.9E+02
Dichlorophenol, 2,3-	576-24-9	—	—	—	—	—	—	2.5E+02	1.1E+03	—	—	—	—	7.3E-02	7.3E+00
Dichlorophenol, 2,4-	120-83-2	—	—	—	—	—	—	2.5E+02	1.1E+03	—	—	—	—	7.3E-02	7.3E+00
Dichlorophenol, 2,5-	583-78-8	—	—	—	—	—	—	2.5E+02	1.1E+03	—	—	—	—	7.3E-02	7.3E+00
Dichlorophenol, 2,6-	87-65-0	—	—	—	—	—	—	8.2E+01	3.6E+02	—	—	—	—	2.4E-02	2.4E+00
Dichlorophenol, 3,4-	95-77-2	—	—	—	—	—	—	2.5E+02	1.1E+03	—	—	—	—	7.3E-02	7.3E+00
Dichlorophenol, 3,5-	591-35-5	—	—	—	—	—	—	2.5E+02	1.1E+03	—	—	—	—	7.3E-02	7.3E+00
Dichlorophenoxy, 2,4- butyric acid, 4- (2,4-DB)	94-82-6	—	—	—	—	—	—	6.6E+02	2.8E+03	—	—	—	—	2.0E-01	2.0E+01
Dichlorophenoxyacetic acid, 2,4- (2,4-D)	94-75-7	—	—	—	—	—	—	1.6E+04	1.4E+05	—	—	—	—	4.9E+00	4.9E+02
Dichloroprop (2-(2,4-dichlorophenoxy) propanoic acid)	120-36-5	—	—	—	—	—	—	8.2E+02	3.6E+03	—	—	—	—	2.4E-01	2.4E+01
Dichloropropane, 1,2-	78-87-5	2.6E-02	1.6E+02	—	—	—	4.2E-03	1.1E+04	—	—	—	2.5E-02	2.5E+00	3.2E+00	3.2E+02
Dichloropropane, 1,3-	142-28-9	6.1E-03	6.1E+01	—	—	—	2.1E-02	1.6E+03	—	—	—	9.1E-03	9.1E-01	4.9E-01	4.9E+01
Dichloropropane, 2,2-	594-20-7	—	8.9E+01	—	—	—	4.2E-03	7.4E+03	—	—	—	1.3E-02	1.3E+00	2.2E+00	2.2E+02
Dichloropropanol, 2,3-	616-23-9	—	—	—	—	—	—	2.5E+02	1.1E+03	—	—	—	—	7.3E-02	7.3E+00
Dichloropropene, 1,1-	563-58-6	6.1E-03	6.1E+01	—	—	—	2.1E-02	2.5E+03	—	—	—	9.1E-03	9.1E-01	7.3E-01	7.3E+01
Dichloropropene, 1,3- (mixed isomers)	542-75-6	6.1E-03	6.1E+01	—	—	—	2.1E-02	2.5E+03	—	—	—	9.1E-03	9.1E-01	7.3E-01	7.3E+01
Dichloropropene, cis 1,3-	10061-01-5	—	1.1E+01	—	—	—	2.1E-02	8.2E+00	—	—	—	1.7E-03	1.7E-01	2.4E-03	2.4E-01
Dichloropropene, trans 1,3-	10061-02-6	6.1E-03	6.1E+01	—	—	—	2.1E-02	2.5E+03	—	—	—	9.1E-03	9.1E-01	7.3E-01	7.3E+01
Dichlorvos	62-73-7	—	2.1E+01	7.2E+01	—	—	5.2E-04	4.1E+01	1.8E+02	—	—	3.1E-03	3.1E-01	1.2E-02	1.2E+00
Dicrotophos (bidrin)	141-66-2	—	—	—	—	—	—	8.2E+00	3.6E+01	—	—	—	—	2.4E-03	2.4E-01
Dicyclopentadiene	77-73-6	—	—	—	—	—	—	6.6E+03	—	—	—	—	—	2.0E+00	2.0E+02
Dieldrin	60-57-1	5.3E-06	3.8E-01	1.3E+00	—	3.7E-02	—	4.1E+00	1.8E+01	—	7.8E-01	5.7E-05	5.7E-03	1.2E-03	1.2E-01
Diethanolamine	111-42-2	—	—	—	—	—	2.6E-02	4.1E+01	1.8E+02	—	—	—	—	1.2E-02	1.2E+00
Diethyldithiocarbamate, sodium salt	148-18-5	—	2.2E+01	—	—	—	—	2.5E+03	—	—	—	3.4E-03	3.4E-01	7.3E-01	7.3E+01
Diethyl phthalate	84-66-2	—	—	—	—	—	—	6.6E+04	2.8E+05	—	—	—	—	2.0E+01	2.0E+03
Diethylene glycol	111-46-6	—	—	—	—	—	—	1.6E+05	7.1E+05	—	—	—	—	4.9E+01	4.9E+03
Diethylene glycol monobutyl ether	112-34-5	—	—	—	—	—	1.0E-04	2.5E+03	1.1E+04	—	—	—	—	7.3E-01	7.3E+01
Diethylhexyl adipate	103-23-1	—	5.1E+03	1.7E+04	—	—	—	4.9E+04	2.1E+05	—	—	7.6E-01	7.6E+01	1.5E+01	1.5E+03
Diethylstilbestrol	56-53-1	—	1.3E-03	4.4E-03	—	1.2E-04	—	—	—	—	—	1.9E-07	1.9E-05	—	—
Diisobutylene (trimethyl-1-pentene, 2,4,4-)	107-39-1	—	—	—	—	—	2.1E-01	4.9E+03	—	—	—	—	—	1.5E+00	1.5E+02
Diisopropylbenzene, p-	100-18-5	—	—	—	—	—	—	8.2E+02	3.6E+03	—	—	—	—	2.4E-01	2.4E+01
Diisopropyl ether (2,2'-oxybis-propane)	108-20-3	—	—	—	—	—	7.3E-01	8.2E+03	—	—	—	—	—	2.4E+00	2.4E+02
Dimethenamid	87674-68-8	—	—	—	—	—	—	1.2E+03	5.3E+03	—	—	—	—	3.7E-01	3.7E+01

Table 9
Individual RBELs Residential

Last Revised: March 1, 2022

Chemical of Concern	CAS	Soil										Groundwater			
		Carcinogenic					Noncarcinogenic					Carcinogenic		Noncarcinogenic	
		Air ¹ RBEL _{Inh} (mg/m3)	Soil ² RBEL _{Ing} (mg/kg)	Soil ³ RBEL _{Derm} (mg/kg)	Abg ⁴ Veg ⁵ RBEL _{Ing} above-ground (mg/kg)	Bg ⁶ Veg ⁷ RBEL _{Ing} below-ground (mg/kg)	Air ¹ RBEL _{Inh} (mg/m3)	Soil ² RBEL _{Ing} (mg/kg)	Soil ³ RBEL _{Derm} (mg/kg)	Abg ⁴ Veg ⁵ RBEL _{Ing} above-ground (mg/kg)	Bg ⁶ Veg ⁷ RBEL _{Ing} below-ground (mg/kg)	GW ⁸ RBEL _{Ing} ¹ (mg/L)	GW ⁸ RBEL _{Class 3} ² (mg/L)	GW ⁸ RBEL _{Ing} ¹ (mg/L)	GW ⁸ RBEL _{Class 3} ² (mg/L)
Dimethoate	60-51-5	—	—	—	—	—	—	1.6E+01	7.1E+01	—	—	—	—	4.9E-03	4.9E-01
Dimethoxybenzidine, 3,3'-	119-90-4	—	4.3E+02	1.5E+03	—	—	—	—	—	—	—	6.5E-02	6.5E+00	—	—
Dimethyl-2-nitrobenzene, 1,3-	81-20-9	—	—	—	—	—	9.4E-03	1.6E+02	7.1E+02	—	—	—	—	4.9E-02	4.9E+00
Dimethyl-3-nitrobenzene, 1,2-	83-41-0	—	—	—	—	—	9.4E-03	1.6E+02	7.1E+02	—	—	—	—	4.9E-02	4.9E+00
Dimethyl-4-nitrobenzene, 1-2-	99-51-4	—	—	—	—	—	9.4E-03	1.6E+02	7.1E+02	—	—	—	—	4.9E-02	4.9E+00
Dimethyl-5-nitrobenzene, 1,3-	99-12-7	—	—	—	—	—	9.4E-03	1.6E+02	7.1E+02	—	—	—	—	4.9E-02	4.9E+00
Dimethylphenethylamine, alpha, alpha-	122-09-8	—	—	—	—	—	—	1.6E+02	7.1E+02	—	—	—	—	4.9E-02	4.9E+00
Dimethyl phenol, 2,4-	105-67-9	—	—	—	—	—	—	1.6E+03	7.1E+03	—	—	—	—	4.9E-01	4.9E+01
Dimethylaminoazobenzene, p-	60-11-7	—	—	—	—	—	—	8.2E-01	3.6E+00	—	1.6E-01	—	—	2.4E-04	2.4E-02
Dimethylbenz-a-anthracene, 7,12-	57-97-6	1.0E-06	2.4E-02	6.4E-02	—	2.3E-03	—	—	—	—	—	3.7E-06	3.7E-04	—	—
Dimethylbenzidine, 3,3'-	119-93-7	—	5.5E-01	1.9E+00	—	—	—	—	—	—	—	8.3E-05	8.3E-03	—	—
Dimethylformamide, N,N-	68-12-2	—	—	—	—	—	3.1E-02	8.2E+03	—	—	—	—	—	2.4E+00	2.4E+02
Dimethylnaphthalene, 1,3-	575-41-7	—	—	—	—	—	—	3.3E+03	1.1E+04	—	6.3E+02	—	—	9.8E-01	9.8E+01
Dimethylphthalate	131-11-3	—	—	—	—	—	—	6.6E+04	2.8E+05	—	—	—	—	2.0E+01	2.0E+03
Di-n-butyl phthalate	84-74-2	—	—	—	—	—	—	8.2E+03	3.6E+04	—	1.6E+03	—	—	2.4E+00	2.4E+02
Dinitro-2-methylphenol, 4,6- (dinitro-o-cresol, 4, 6-)	534-52-1	—	—	—	—	—	—	8.2E+00	3.6E+01	—	—	—	—	2.4E-03	2.4E-01
Dinitrobenzene, 1,3- (dinitrobenzene, 2,4-)	99-65-0	—	—	—	—	—	—	8.2E+00	3.6E+01	—	—	—	—	2.4E-03	2.4E-01
Dinitrobenzene, 1,4-	100-25-4	—	—	—	—	—	—	8.2E+00	3.6E+01	—	—	—	—	2.4E-03	2.4E-01
Dinitrophenol, 2,4-	51-28-5	—	—	—	—	—	—	1.6E+02	7.1E+02	—	—	—	—	4.9E-02	4.9E+00
Dinitrophenol, 2,5-	329-71-5	—	—	—	—	—	—	1.6E+02	7.1E+02	—	—	—	—	4.9E-02	4.9E+00
Dinitrotoluene, 2,4-	121-14-2	—	8.9E+00	3.1E+01	—	—	—	1.6E+02	7.1E+02	—	—	1.3E-03	1.3E-01	4.9E-02	4.9E+00
Dinitrotoluene, 2,6-	606-20-2	—	8.9E+00	3.1E+01	—	—	—	8.2E+01	3.6E+02	—	—	1.3E-03	1.3E-01	2.4E-02	2.4E+00
Di-n-octyl phthalate	117-84-0	—	—	—	—	—	—	8.2E+02	3.6E+03	—	1.6E+02	—	—	2.4E-01	2.4E+01
Dinoseb	88-85-7	—	—	—	—	—	—	8.2E+01	3.6E+02	—	—	—	—	2.4E-02	2.4E+00
Dioxane 1,4-	123-91-1	4.9E-03	6.1E+01	—	—	—	1.1E-01	2.5E+03	—	—	—	9.1E-03	9.1E-01	7.3E-01	7.3E+01
Dioxin (as 2,3,7,8-TCDD toxicity equivalent quotients (TEQs))	1746-01-6	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Diphenyl ether	101-84-8	—	—	—	—	—	—	5.1E+02	2.2E+03	—	9.7E+01	—	—	1.5E-01	1.5E+01
Diphenylamine	122-39-4	—	—	—	—	—	—	2.0E+03	8.9E+03	—	—	—	—	6.1E-01	6.1E+01
Diphenylhydrazine, 1,2-	122-66-7	1.1E-04	7.6E+00	2.6E+01	—	—	—	—	—	—	—	1.1E-03	1.1E-01	—	—
Dipropylene glycol	110-98-5	—	—	—	—	—	—	9.8E+03	4.3E+04	—	—	—	—	2.9E+00	2.9E+02
Diquat	85-00-7	—	—	—	—	—	—	1.8E+02	7.8E+02	—	—	—	—	5.4E-02	5.4E+00
Disodium iminodiacetate (iminodiacetic acid, disodium salt)	142-73-4	—	—	—	—	—	—	8.2E+02	3.6E+03	—	—	—	—	2.4E-01	2.4E+01
Disulfoton	298-04-4	—	—	—	—	—	—	3.3E+00	1.4E+01	—	—	—	—	9.8E-04	9.8E-02
Diuron	330-54-1	—	—	—	—	—	—	1.6E+02	7.1E+02	—	—	—	—	4.9E-02	4.9E+00
Dodecylphenol, 4-	104-43-8	—	—	—	—	—	—	4.1E+03	1.8E+04	—	7.8E+02	—	—	1.2E+00	1.2E+02
Endosulfan	115-29-7	—	—	—	—	—	—	4.9E+02	2.1E+03	—	—	—	—	1.5E-01	1.5E+01
Endosulfan I	959-98-8	—	—	—	—	—	—	1.6E+02	7.1E+02	—	3.1E+01	—	—	4.9E-02	4.9E+00
Endosulfan II	33213-65-9	—	—	—	—	—	—	4.9E+02	2.1E+03	—	9.4E+01	—	—	1.5E-01	1.5E+01
Endosulfan sulfate	1031-07-8	—	—	—	—	—	—	4.9E+02	2.1E+03	—	9.4E+01	—	—	1.5E-01	1.5E+01
Endothall	145-73-3	—	—	—	—	—	—	1.6E+03	7.1E+03	—	—	—	—	4.9E-01	4.9E+01
Endrin	72-20-8	—	—	—	—	—	—	2.5E+01	1.1E+02	—	4.7E+00	—	—	7.3E-03	7.3E-01
Endrin aldehyde	7421-93-4	—	—	—	—	—	—	2.5E+01	1.1E+02	—	4.7E+00	—	—	7.3E-03	7.3E-01
Endrin ketone	53494-70-5	—	—	—	—	—	—	2.5E+01	1.1E+02	—	4.7E+00	—	—	7.3E-03	7.3E-01

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Individual RBELs Residential

Last Revised: March 1, 2022

Chemical of Concern	CAS	Soil										Groundwater			
		Carcinogenic					Noncarcinogenic					Carcinogenic		Noncarcinogenic	
		Air ¹ RBEL _{Inh} (mg/m3)	Soil ¹ RBEL _{Ing} (mg/kg)	Soil ¹ RBEL _{Derm} (mg/kg)	Abg ¹ Veg ¹ RBEL _{Ing} above-ground (mg/kg)	Bg ¹ Veg ¹ RBEL _{Ing} below-ground (mg/kg)	Air ¹ RBEL _{Inh} (mg/m3)	Soil ¹ RBEL _{Ing} (mg/kg)	Soil ¹ RBEL _{Derm} (mg/kg)	Abg ¹ Veg ¹ RBEL _{Ing} above-ground (mg/kg)	Bg ¹ Veg ¹ RBEL _{Ing} below-ground (mg/kg)	GW ¹ RBEL _{Ing} ¹ (mg/L)	GW ¹ RBEL _{Class 3} ² (mg/L)	GW ¹ RBEL _{Ing} ¹ (mg/L)	GW ¹ RBEL _{Class 3} ² (mg/L)
Epichlorohydrin	106-89-8	2.0E-02	6.1E+02	—	—	—	1.0E-03	4.9E+02	—	—	—	9.2E-02	9.2E+00	1.5E-01	1.5E+01
EPN (o-ethyl o-(4-nitrophenyl)phenylphosphonothioate)	2104-64-5	—	—	—	—	—	—	8.2E-01	3.6E+00	—	—	—	—	2.4E-04	2.4E-02
Esfenvalerate	66230-04-4	—	—	—	—	—	—	1.6E+02	7.1E+02	—	3.1E+01	—	—	4.9E-02	4.9E+00
Ethalfuralin (sonolan)	55283-68-6	—	6.8E+01	2.3E+02	—	6.6E+00	—	3.3E+03	1.4E+04	—	6.3E+02	1.0E-02	1.0E+00	9.8E-01	9.8E+01
Ethanol	64-17-5	—	—	—	—	—	—	1.0E+06	—	—	—	—	—	8.1E+02	8.1E+04
Ethanol, 2-amino-	141-43-5	—	—	—	—	—	2.4E-02	1.4E+02	6.0E+02	—	—	—	—	4.2E-02	4.2E+00
Ethanol, 2-(2-aminoethoxy)-	929-06-6	—	—	—	—	—	—	4.1E+01	1.8E+02	—	—	—	—	1.2E-02	1.2E+00
Ethanol, 2-(2-ethoxyethoxy)-	111-90-0	—	—	—	—	—	—	1.6E+05	7.1E+05	—	—	—	—	4.9E+01	4.9E+03
Ethanol, 2-(methylamino)-	109-83-1	—	—	—	—	—	4.8E-02	1.3E+03	5.7E+03	—	—	—	—	3.9E-01	3.9E+01
Ethion	563-12-2	—	—	—	—	—	—	4.1E+01	1.8E+02	—	7.8E+00	—	—	1.2E-02	1.2E+00
Ethoprop	13194-48-4	—	2.2E+02	7.4E+02	—	—	—	8.2E+00	3.6E+01	—	—	3.2E-02	3.2E+00	2.4E-03	2.4E-01
Ethoxy ethanol, 2-	110-80-5	—	—	—	—	—	2.1E-01	7.4E+03	—	—	—	—	—	2.2E+00	2.2E+02
Ethyl acetate	141-78-6	—	—	—	—	—	2.4E-01	7.4E+04	—	—	—	—	—	2.2E+01	2.2E+03
Ethyl acrylate	140-88-5	—	1.3E+02	—	—	—	8.3E-03	4.1E+02	—	—	—	1.9E-02	1.9E+00	1.2E-01	1.2E+01
Ethyl benzene	100-41-4	—	—	—	—	—	2.0E+00	8.2E+03	—	—	—	—	—	2.4E+00	2.4E+02
Ethyl dipropylthiocarbamate, S-	759-94-4	—	—	—	—	—	—	2.0E+03	8.9E+03	—	—	—	—	6.1E-01	6.1E+01
Ethyl ether	60-29-7	—	—	—	—	—	—	1.6E+04	—	—	—	—	—	4.9E+00	4.9E+02
Ethyl methacrylate	97-63-2	—	—	—	—	—	3.1E-01	7.4E+03	—	—	—	—	—	2.2E+00	2.2E+02
Ethyl methanesulfonate	62-50-0	8.7E-04	6.1E+01	2.1E+02	—	—	—	—	—	—	—	9.2E-03	9.2E-01	—	—
Ethyl tert-butyl ether (2-ethyl-2-ethoxypropane)	637-92-3	—	—	—	—	—	3.1E-01	8.2E+01	—	—	—	—	—	2.4E-02	2.4E+00
Ethyl-1-hexanol, 2-	104-76-7	—	—	—	—	—	—	1.2E+04	5.3E+04	—	—	—	—	3.7E+00	3.7E+02
Ethyl-2-hexenal, 2-	645-62-5	—	—	—	—	—	—	1.2E+04	—	—	—	—	—	3.7E+00	3.7E+02
Ethyl-2-methyl benzene, 1-	611-14-3	—	—	—	—	—	4.2E-01	4.1E+03	—	—	—	—	—	1.2E+00	1.2E+02
Ethyl-4-methyl benzene, 1-	622-96-8	—	—	—	—	—	4.2E-01	4.1E+03	—	—	—	—	—	1.2E+00	1.2E+02
Ethylene*	74-85-1	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Ethylene dibromide (dibromoethane, 1,2-)	106-93-4	5.5E-04	3.0E+00	—	—	—	7.0E-02	7.4E+02	—	—	—	4.6E-04	4.6E-02	2.2E-01	2.2E+01
Ethylene glycol	107-21-1	—	—	—	—	—	—	1.6E+05	7.1E+05	—	—	—	—	4.9E+01	4.9E+03
Ethylene oxide	75-21-8	1.7E-02	6.0E+00	—	—	—	—	—	—	—	—	8.9E-04	8.9E-02	—	—
Ethylene thiourea	96-45-7	—	5.5E+01	1.9E+02	—	—	—	6.6E+00	2.8E+01	—	—	8.3E-03	8.3E-01	2.0E-03	2.0E-01
Ethylenediamine	107-15-3	—	—	—	—	—	—	7.4E+03	—	—	—	—	—	2.2E+00	2.2E+02
Ethylenimine	151-56-4	1.3E-06	9.3E-02	—	—	—	—	—	—	—	—	1.4E-05	1.4E-03	—	—
Ethylhexyl acrylate, 2-	103-11-7	—	1.3E+02	4.3E+02	—	—	—	—	—	—	—	1.9E-02	1.9E+00	—	—
Famphur	52-85-7	—	—	—	—	—	—	2.5E+00	1.1E+01	—	—	—	—	7.3E-04	7.3E-02
Fensulfothion	115-90-2	—	—	—	—	—	—	8.2E+01	3.6E+02	—	—	—	—	2.4E-02	2.4E+00
Fenthion	55-38-9	—	—	—	—	—	—	5.7E+00	2.5E+01	—	—	—	—	1.7E-03	1.7E-01
Fenuron	101-42-8	—	—	—	—	—	—	5.7E+03	2.5E+04	—	—	—	—	1.7E+00	1.7E+02
Fluoranthene	206-44-0	—	—	—	—	—	—	3.3E+03	1.1E+04	—	6.3E+02	—	—	9.8E-01	9.8E+01
Fluorene	86-73-7	—	—	—	—	—	—	3.3E+03	1.1E+04	—	6.3E+02	—	—	9.8E-01	9.8E+01
Fluorine (soluble fluoride)	7782-41-4	—	—	—	—	—	2.8E-02	4.9E+03	2.1E+05	—	—	—	—	1.5E+00	1.5E+02
Fluorochloridone	61213-25-0	—	—	—	—	—	—	6.1E+02	2.7E+03	—	—	—	—	1.8E-01	1.8E+01
Fonofos	944-22-9	—	—	—	—	—	—	1.6E+02	7.1E+02	—	—	—	—	4.9E-02	4.9E+00
Formaldehyde	50-00-0	—	—	—	—	—	1.1E-02	1.6E+04	—	—	—	—	—	4.9E+00	4.9E+02
Formic acid	64-18-6	—	—	—	—	—	3.1E-03	7.4E+04	—	—	—	—	—	2.2E+01	2.2E+03

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Chemical of Concern	CAS	Soil										Groundwater			
		Carcinogenic					Noncarcinogenic					Carcinogenic		Noncarcinogenic	
		Air ¹ RBEL _{Inh} (mg/m3)	Soil ¹ RBEL _{Ing} (mg/kg)	Soil ¹ RBEL _{Derm} (mg/kg)	AbgVeg ¹ RBEL _{Ing} above-ground (mg/kg)	BgVeg ¹ RBEL _{Ing} below-ground (mg/kg)	Air ¹ RBEL _{Inh} (mg/m3)	Soil ¹ RBEL _{Ing} (mg/kg)	Soil ¹ RBEL _{Derm} (mg/kg)	AbgVeg ¹ RBEL _{Ing} above-ground (mg/kg)	BgVeg ¹ RBEL _{Ing} below-ground (mg/kg)	GW ¹ RBEL _{Ing} (mg/L)	GW ² RBEL _{Class 3} (mg/L)	GW ¹ RBEL _{Ing} (mg/L)	GW ² RBEL _{Class 3} (mg/L)
Furan	110-00-9	—	—	—	—	—	—	8.2E+01	—	—	—	—	—	2.4E-02	2.4E+00
Furfural	98-01-1	—	—	—	—	—	—	2.5E+02	—	—	—	—	—	7.3E-02	7.3E+00
Glycidylaldehyde	765-34-4	—	—	—	—	—	1.0E-03	3.3E+01	—	—	—	—	—	9.8E-03	9.8E-01
Glyphosate	1071-83-6	—	—	—	—	—	—	8.2E+04	3.6E+05	—	—	—	—	2.4E+01	2.4E+03
Heptachlor	76-44-8	1.9E-05	1.3E+00	4.6E+00	—	1.3E-01	—	4.1E+01	1.8E+02	—	7.8E+00	2.0E-04	2.0E-02	1.2E-02	1.2E+00
Heptachlor epoxide	1024-57-3	9.4E-06	6.7E-01	2.3E+00	—	6.4E-02	—	1.1E+00	4.6E+00	—	2.0E-01	1.0E-04	1.0E-02	3.2E-04	3.2E-02
Heptane, n-	142-82-5	—	—	—	—	—	9.4E+00	4.9E+03	—	—	—	—	—	1.5E+00	1.5E+02
Heptanoic acid, n-	111-14-8	—	—	—	—	—	1.0E-03	4.1E+04	1.8E+05	—	—	—	—	1.2E+01	1.2E+03
Hexachlorobenzene	118-74-1	5.3E-05	3.8E+00	1.3E+01	—	3.7E-01	—	6.6E+01	2.8E+02	—	1.3E+01	5.7E-04	5.7E-02	2.0E-02	2.0E+00
Hexachlorobutadiene	87-68-3	1.1E-03	7.8E+01	2.7E+02	—	—	—	8.2E+01	3.6E+02	—	—	1.2E-02	1.2E+00	2.4E-02	2.4E+00
Hexachlorocyclohexane, alpha (alpha-BHC)	319-84-6	1.4E-05	9.6E-01	8.2E+00	—	9.3E-02	—	6.6E+02	7.1E+03	—	1.3E+02	1.4E-04	1.4E-02	2.0E-01	2.0E+01
Hexachlorocyclohexane, beta (beta-BHC)	319-85-7	4.6E-05	3.4E+00	2.9E+01	—	3.2E-01	—	—	—	—	—	5.1E-04	5.1E-02	—	—
Hexachlorocyclohexane, delta (delta-BHC)	319-86-8	4.8E-05	3.4E+00	2.9E+01	—	—	—	2.5E+01	2.7E+02	—	—	5.1E-04	5.1E-02	7.3E-03	7.3E-01
Hexachlorocyclohexane, gamma (lindane; gamma-BHC)	58-89-9	—	4.7E+00	4.0E+01	—	4.5E-01	—	2.5E+01	2.7E+02	—	4.7E+00	7.0E-04	7.0E-02	7.3E-03	7.3E-01
Hexachlorocyclohexane, techn (technical-BHC)	608-73-1	4.8E-05	3.4E+00	2.9E+01	—	3.2E-01	—	—	—	—	—	5.1E-04	5.1E-02	—	—
Hexachlorocyclopentadiene	77-47-4	—	—	—	—	—	2.1E-04	4.9E+02	2.1E+03	—	—	—	—	1.5E-01	1.5E+01
Hexachloroethane	67-72-1	—	1.5E+02	5.2E+02	—	—	3.1E-02	5.7E+01	2.5E+02	—	—	2.3E-02	2.3E+00	1.7E-02	1.7E+00
Hexachlorophene	70-30-4	—	—	—	—	—	—	2.5E+01	1.1E+02	—	4.7E+00	—	—	7.3E-03	7.3E-01
Hexachloropropylene	1888-71-7	—	1.5E+02	5.2E+02	—	—	3.1E-02	5.7E+01	2.5E+02	—	—	2.3E-02	2.3E+00	1.7E-02	1.7E+00
Hexanal, 2-ethyl-	123-05-7	—	—	—	—	—	—	1.2E+04	5.3E+04	—	—	—	—	3.7E+00	3.7E+02
Hexane, n-	110-54-3	—	—	—	—	—	7.0E-01	4.9E+03	—	—	—	—	—	1.5E+00	1.5E+02
Hexanediamine, 1,6-	124-09-4	—	—	—	—	—	—	4.1E+02	1.8E+03	—	—	—	—	1.2E-01	1.2E+01
Hexanedinitrile	111-69-3	—	—	—	—	—	6.3E-03	1.1E+02	5.0E+02	—	—	—	—	3.4E-02	3.4E+00
Hexanediol, 1,6-	629-11-8	—	—	—	—	—	1.9E+01	4.1E+05	1.0E+06	—	—	—	—	1.2E+02	1.2E+04
Hexanoic acid	142-62-1	—	—	—	—	—	1.0E-03	5.2E+03	2.3E+04	—	—	—	—	1.6E+00	1.6E+02
Hexanone, 2-	591-78-6	—	—	—	—	—	3.1E-02	4.1E+03	—	—	—	—	—	1.2E+00	1.2E+02
Hexazinone	51235-04-2	—	—	—	—	—	—	2.7E+03	1.2E+04	—	—	—	—	8.1E-01	8.1E+01
Hexene, 1-	592-41-6	—	—	—	—	—	1.1E-01	2.7E+04	—	—	—	—	—	8.1E+00	8.1E+02
Hexene, cis-2-	7688-21-3	—	—	—	—	—	1.1E-01	2.7E+04	—	—	—	—	—	8.1E+00	8.1E+02
Hexylene glycol (2-methyl-2,4-pentanediol)	107-41-5	—	—	—	—	—	—	2.5E+04	1.1E+05	—	—	—	—	7.3E+00	7.3E+02
Hydrazine	302-01-2	5.0E-06	2.0E+00	—	—	—	3.1E-05	—	—	—	—	3.0E-04	3.0E-02	—	—
Hydrocaproic acid, 6- (6-hydroxyhexanoic acid)	1191-25-9	—	—	—	—	—	1.0E-03	5.2E+03	2.3E+04	—	—	—	—	1.6E+00	1.6E+02
Hydrogen chloride (hydrochloric acid)*	7647-01-0	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hydroquinone	123-31-9	—	1.0E+02	3.5E+02	—	—	—	3.3E+03	1.4E+04	—	—	1.5E-02	1.5E+00	9.8E-01	9.8E+01
Indene	95-13-6	—	—	—	—	—	3.1E-03	1.6E+03	—	—	—	—	—	4.9E-01	4.9E+01
Indeno-1,2,3-cd-pyrene	193-39-5	4.1E-04	6.1E+01	1.6E+02	—	5.8E+00	—	—	—	—	—	9.1E-03	9.1E-01	—	—
Iron*	7439-89-6	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Isoamyl alcohol	123-51-3	—	—	—	—	—	—	4.1E+02	—	—	—	—	—	1.2E-01	1.2E+01
Isobutyl alcohol	78-83-1	—	—	—	—	—	—	2.5E+04	—	—	—	—	—	7.3E+00	7.3E+02
Isobutylene (2-methyl-1-propene)	115-11-7	—	—	—	—	—	1.1E+02	3.0E+02	—	—	—	—	—	9.0E-02	9.0E+00
Isobutyric acid (2-methylpropanoic acid)	79-31-2	—	—	—	—	—	—	4.1E+04	1.8E+05	—	—	—	—	1.2E+01	1.2E+03
Isodecanol	25339-17-7	—	—	—	—	—	—	1.3E+02	5.7E+02	—	2.5E+01	—	—	3.9E-02	3.9E+00
Isodrin	465-73-6	5.0E-07	3.6E-02	1.2E-01	—	—	—	2.5E-01	1.1E+00	—	—	5.4E-06	5.4E-04	7.3E-05	7.3E-03

Table 9
Individual RBELs Residential

Last Revised: March 1, 2022

Chemical of Concern	CAS	Soil										Groundwater			
		Carcinogenic					Noncarcinogenic					Carcinogenic		Noncarcinogenic	
		Air ¹ RBEL _{Inh} (mg/m3)	Soil ¹ RBEL _{Ing} (mg/kg)	Soil ¹ RBEL _{Derm} (mg/kg)	AbgVeg ¹ RBEL _{Ing} above-ground (mg/kg)	BgVeg ¹ RBEL _{Ing} below-ground (mg/kg)	Air ¹ RBEL _{Inh} (mg/m3)	Soil ¹ RBEL _{Ing} (mg/kg)	Soil ¹ RBEL _{Derm} (mg/kg)	AbgVeg ¹ RBEL _{Ing} above-ground (mg/kg)	BgVeg ¹ RBEL _{Ing} below-ground (mg/kg)	GW ¹ RBEL _{Ing} (mg/L)	GW ² RBEL _{Class 3} (mg/L)	GW ¹ RBEL _{Ing} (mg/L)	GW ² RBEL _{Class 3} (mg/L)
Isopentane	78-78-4	—	—	—	—	—	2.5E+01	4.9E+03	—	—	—	—	—	1.5E+00	1.5E+02
Isophorone	78-59-1	—	6.4E+03	2.2E+04	—	—	—	1.6E+04	7.1E+04	—	—	9.6E-01	9.6E+01	4.9E+00	4.9E+02
Isopropyl acetate	108-21-4	—	—	—	—	—	—	5.7E+03	—	—	—	—	—	1.7E+00	1.7E+02
Isopropyl alcohol	67-63-0	—	—	—	—	—	2.1E-01	1.6E+05	—	—	—	—	—	4.9E+01	4.9E+03
Isosafrole	120-58-1	3.9E-04	2.8E+01	9.4E+01	—	—	—	—	—	—	—	4.1E-03	4.1E-01	—	—
Kelthane (dicofol)	115-32-2	—	—	—	—	—	—	4.9E+02	2.1E+03	—	9.4E+01	—	—	1.5E-01	1.5E+01
Kepone (chlordecone)	143-50-0	5.3E-06	6.1E-01	2.1E+00	—	5.8E-02	—	2.5E+01	1.1E+02	—	4.7E+00	9.1E-05	9.1E-03	7.3E-03	7.3E-01
Lead (inorganic)	7439-92-1	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Leptophos	21609-90-5	—	—	—	—	—	1.9E-06	4.1E-01	1.8E+00	—	7.8E-02	—	—	1.2E-04	1.2E-02
Limonene, d-*	5989-27-5	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Lithium	7439-93-2	—	—	—	—	—	—	5.7E+02	2.5E+04	4.6E+01	1.1E+02	—	—	1.7E-01	1.7E+01
Magnesium*	7439-95-4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Malathion	121-75-5	—	—	—	—	—	2.1E-04	1.6E+03	7.1E+03	—	—	—	—	4.9E-01	4.9E+01
Maleic anhydride	108-31-6	—	—	—	—	—	—	8.2E+03	3.6E+04	—	—	—	—	2.4E+00	2.4E+02
Maleic hydrazide	123-33-1	—	—	—	—	—	—	4.1E+04	1.8E+05	—	—	—	—	1.2E+01	1.2E+03
Malononitrile	109-77-3	—	—	—	—	—	—	8.2E+00	3.6E+01	—	—	—	—	2.4E-03	2.4E-01
Mancozeb	8018-01-7	—	—	—	—	—	—	2.5E+03	1.1E+04	—	—	—	—	7.3E-01	7.3E+01
Manganese	7439-96-5	—	—	—	—	—	8.8E-04	1.1E+04	3.0E+04	9.1E+02	2.2E+03	—	—	1.1E+00	1.1E+02
MCPA (4-(chloro-2-methylphenoxy) acetic acid)	94-74-6	—	—	—	—	—	—	4.1E+01	1.8E+02	—	—	—	—	1.2E-02	1.2E+00
MCPP (2-(4-chloro-2-methylphenoxy) propanoic acid)	93-65-2	—	—	—	—	—	—	8.2E+01	3.6E+02	—	—	—	—	2.4E-02	2.4E+00
Mercury (pH = 4.9)	7439-97-6	—	—	—	—	—	3.1E-04	2.5E+01	7.5E+01	2.0E+00	—	—	—	7.3E-03	7.3E-01
Mercury (pH=6.8)	7439-97-6	—	—	—	—	—	3.1E-04	2.5E+01	7.5E+01	2.0E+00	—	—	—	7.3E-03	7.3E-01
Merphos	150-50-5	—	—	—	—	—	—	2.5E+00	1.1E+01	—	—	—	—	7.3E-04	7.3E-02
Methacrylic acid (2-methyl-2-propenoic acid)	79-41-4	—	—	—	—	—	—	8.2E+02	—	—	—	—	—	2.4E-01	2.4E+01
Methacrylonitrile	126-98-7	—	—	—	—	—	3.1E-02	4.1E+03	—	—	—	—	—	1.2E+00	1.2E+02
Methanol	67-56-1	—	—	—	—	—	7.5E+00	1.6E+05	—	—	—	—	—	4.9E+01	4.9E+03
Methapyrilene	91-80-5	—	1.3E+00	4.4E+00	—	—	—	—	—	—	—	1.9E-04	1.9E-02	—	—
Methomyl	16752-77-5	—	—	—	—	—	—	2.0E+03	8.9E+03	—	—	—	—	6.1E-01	6.1E+01
Methoxychlor	72-43-5	—	—	—	—	—	—	4.1E+02	1.8E+03	—	7.8E+01	—	—	1.2E-01	1.2E+01
Methoxyethanol, 2-	109-86-4	—	—	—	—	—	2.1E-02	2.2E+03	—	—	—	—	—	6.6E-01	6.6E+01
Methyl acetate (acetic acid, methyl ester)	79-20-9	—	—	—	—	—	—	8.2E+04	—	—	—	—	—	2.4E+01	2.4E+03
Methyl acrylate	96-33-3	—	—	—	—	—	2.1E-02	1.6E+02	—	—	—	—	—	4.9E-02	4.9E+00
Methyl amyl ketone (2-heptanone)	110-43-0	—	—	—	—	—	2.9E+00	4.1E+03	—	—	—	—	—	1.2E+00	1.2E+02
Methyl chrysene, 1-	3351-28-8	2.8E-02	8.3E+02	2.2E+03	—	8.0E+01	—	—	—	—	—	1.3E-01	1.3E+01	—	—
Methyl chrysene, 2-	3351-32-4	2.8E-02	8.3E+02	2.2E+03	—	8.0E+01	—	—	—	—	—	1.3E-01	1.3E+01	—	—
Methyl chrysene, 6-	1705-85-7	2.8E-03	8.3E+01	2.2E+02	—	8.0E+00	—	—	—	—	—	1.3E-02	1.3E+00	—	—
Methyl cyclohexane	108-87-2	—	—	—	—	—	3.1E+00	4.1E+05	—	—	—	—	—	1.2E+02	1.2E+04
Methyl ethyl ketone (2-butanone)	78-93-3	—	—	—	—	—	9.2E+00	4.9E+04	—	—	—	—	—	1.5E+01	1.5E+03
Methyl iodide (iodomethane)	74-88-4	—	—	—	—	—	—	1.1E+02	—	—	—	—	—	3.4E-02	3.4E+00
Methyl isobutyl ketone (4-methyl-2-pentanone)	108-10-1	—	—	—	—	—	3.1E+00	6.6E+03	—	—	—	—	—	2.0E+00	2.0E+02
Methyl mercury	22967-92-6	—	—	—	—	—	—	8.2E+00	3.6E+02	—	—	—	—	2.4E-03	2.4E-01
Methyl methacrylate	80-62-6	—	—	—	—	—	7.3E-01	1.1E+05	—	—	—	—	—	3.4E+01	3.4E+03
Methyl methanesulfonate	66-27-3	8.7E-04	6.1E+01	2.1E+02	—	—	—	—	—	—	—	9.2E-03	9.2E-01	—	—

Table 9
Individual RBELs Residential

Last Revised: March 1, 2022

Chemical of Concern	CAS	Soil										Groundwater			
		Carcinogenic					Noncarcinogenic					Carcinogenic		Noncarcinogenic	
		Air ¹ RBEL _{Inh} (mg/m3)	Soil ¹ RBEL _{Ing} (mg/kg)	Soil ¹ RBEL _{Derm} (mg/kg)	AbgVeg ¹ RBEL _{Ing} above-ground (mg/kg)	BgVeg ¹ RBEL _{Ing} below-ground (mg/kg)	Air ¹ RBEL _{Inh} (mg/m3)	Soil ¹ RBEL _{Ing} (mg/kg)	Soil ¹ RBEL _{Derm} (mg/kg)	AbgVeg ¹ RBEL _{Ing} above-ground (mg/kg)	BgVeg ¹ RBEL _{Ing} below-ground (mg/kg)	GW ¹ RBEL _{Ing} ¹ (mg/L)	GW ¹ RBEL _{Class 3} ² (mg/L)	GW ¹ RBEL _{Ing} ¹ (mg/L)	GW ¹ RBEL _{Class 3} ² (mg/L)
Methyl parathion	298-00-0	—	—	—	—	—	—	2.0E+01	8.9E+01	—	—	—	—	6.1E-03	6.1E-01
Methyl-1-butene, 2-	563-46-2	—	—	—	—	—	1.9E+01	4.9E+03	—	—	—	—	—	1.5E+00	1.5E+02
Methyl-1-propanal, 2- (isobutyraldehyde)	78-84-2	—	—	—	—	—	—	3.3E+03	—	—	—	—	—	9.8E-01	9.8E+01
Methyl-2-butene, 2-	513-35-9	—	—	—	—	—	1.9E+01	4.9E+03	—	—	—	—	—	1.5E+00	1.5E+02
Methyl-2-pentenal, 2-	623-36-9	—	3.2E+00	—	—	—	—	—	—	—	—	4.8E-04	4.8E-02	—	—
Methylcholanthrene, 3-	56-49-5	1.2E-05	2.8E-01	7.3E-01	—	2.7E-02	—	—	—	—	—	4.1E-05	4.1E-03	—	—
Methylene bromide (dibromomethane)	74-95-3	—	8.1E+02	—	—	—	4.2E-03	4.9E+03	—	—	—	1.2E-01	1.2E+01	1.5E+00	1.5E+02
Methylene chloride (dichloromethane)	75-09-2	8.7E-01	6.2E+04	—	—	—	1.4E+00	1.7E+03	—	—	—	9.3E+00	9.3E+02	5.1E-01	5.1E+01
Methylene-bis (2-chloroaniline) 4,4'-	101-14-4	6.6E-04	6.1E+01	2.1E+02	—	—	—	1.6E+02	7.1E+02	—	—	9.1E-03	9.1E-01	4.9E-02	4.9E+00
Methylmercury hydroxide	1184-57-2	—	—	—	—	—	—	8.2E+00	3.6E+01	—	—	—	—	2.4E-03	2.4E-01
Methylnaphthalene, 1-	90-12-0	—	2.1E+02	5.5E+02	—	—	—	5.7E+03	1.9E+04	—	—	3.1E-02	3.1E+00	1.7E+00	1.7E+02
Methylnaphthalene, 2-	91-57-6	—	—	—	—	—	—	3.3E+02	1.1E+03	—	—	—	—	9.8E-02	9.8E+00
Methylpyrrolidone, N-	872-50-4	—	—	—	—	—	—	1.6E+03	7.1E+03	—	—	—	—	4.9E-01	4.9E+01
Methylstyrene, alpha-	98-83-9	—	—	—	—	—	2.6E-02	6.8E+02	—	—	—	—	—	2.0E-01	2.0E+01
Methyltetrahydrofuran, 2-	96-47-9	1.3E-02	8.0E+02	—	—	—	—	1.6E+04	—	—	—	1.2E-01	1.2E+01	4.9E+00	4.9E+02
Methyltetrahydropyran, 2-	10141-72-7	1.3E-02	8.0E+02	—	—	—	—	1.6E+04	—	—	—	1.2E-01	1.2E+01	4.9E+00	4.9E+02
Metolachlor	51218-45-2	—	—	—	—	—	—	1.2E+04	5.3E+04	—	—	—	—	3.7E+00	3.7E+02
Metribuzin	21087-64-9	—	—	—	—	—	—	2.0E+03	8.9E+03	—	—	—	—	6.1E-01	6.1E+01
Mirex	2385-85-5	—	—	—	—	—	—	1.6E+01	7.1E+01	—	—	—	—	4.9E-03	4.9E-01
Molinate	2212-67-1	—	—	—	—	—	—	1.6E+02	7.1E+02	—	—	—	—	4.9E-02	4.9E+00
Molybdenum	7439-98-7	—	—	—	—	—	—	4.1E+02	6.8E+03	3.3E+01	7.8E+01	—	—	1.2E-01	1.2E+01
Monocrotophos	2157-98-4	—	—	—	—	—	—	4.9E+01	2.1E+02	—	—	—	—	1.5E-02	1.5E+00
Morpholine	110-91-8	—	—	—	—	—	—	1.0E+06	—	—	—	—	—	1.2E+04	1.2E+06
Morpholine, N-butyl-	1005-67-0	—	—	—	—	—	—	1.9E+02	8.2E+02	—	—	—	—	5.6E-02	5.6E+00
MTBE (methyl tert-butyl ether)	1634-04-4	9.4E-02	3.4E+03	—	—	—	3.1E+00	8.2E+02	—	—	—	5.1E-01	5.1E+01	2.4E-01	2.4E+01
Naled	300-76-5	—	—	—	—	—	—	1.6E+02	7.1E+02	—	—	—	—	4.9E-02	4.9E+00
Naphthalene	91-20-3	—	—	—	—	—	3.1E-03	1.6E+03	5.5E+03	—	—	—	—	4.9E-01	4.9E+01
Naphthoquinone, 1,4-	130-15-4	—	—	—	—	—	—	5.7E+02	2.5E+03	—	—	—	—	1.7E-01	1.7E+01
Naphthylamine, 1-	134-32-7	—	—	—	—	—	—	1.6E+03	7.1E+03	—	—	—	—	4.9E-01	4.9E+01
Naphthylamine, 2-	91-59-8	—	3.4E+00	1.2E+01	—	—	—	—	—	—	—	5.1E-04	5.1E-02	—	—
Napropamide	15299-99-7	—	—	—	—	—	—	8.2E+03	3.6E+04	—	—	—	—	2.4E+00	2.4E+02
Neopentyl glycol	126-30-7	—	—	—	—	—	—	2.5E+04	1.1E+05	—	—	—	—	7.3E+00	7.3E+02
Nickel and compounds	7440-02-0	1.4E-04	—	—	—	—	2.4E-04	1.6E+03	2.8E+03	1.3E+02	3.1E+02	—	—	4.9E-01	4.9E+01
Nitrate-N	14797-55-8	—	—	—	—	—	—	1.3E+05	1.0E+06	—	—	—	—	3.9E+01	3.9E+03
Nitrite-N	14797-65-0	—	—	—	—	—	—	8.2E+03	3.6E+05	—	—	—	—	2.4E+00	2.4E+02
Nitroaniline, 2-	88-74-4	—	—	—	—	—	2.1E-04	2.5E+01	1.1E+02	—	—	—	—	7.3E-03	7.3E-01
Nitroaniline, 3-	99-09-2	—	1.6E+02	5.5E+02	—	—	2.1E-04	2.5E+01	1.1E+02	—	—	2.4E-02	2.4E+00	7.3E-03	7.3E-01
Nitroaniline, 4-	100-01-6	—	3.0E+02	1.0E+03	—	—	6.3E-03	3.3E+02	1.4E+03	—	—	4.6E-02	4.6E+00	9.8E-02	9.8E+00
Nitrobenzene	98-95-3	6.1E-04	—	—	—	—	9.4E-03	1.6E+02	7.1E+02	—	—	—	—	4.9E-02	4.9E+00
Nitroglycerin	55-63-0	—	3.6E+02	1.2E+03	—	—	—	8.2E+00	3.6E+01	—	—	5.4E-02	5.4E+00	2.4E-03	2.4E-01
Nitrophenol, 2-	88-75-5	—	—	—	—	—	—	1.6E+02	7.1E+02	—	—	—	—	4.9E-02	4.9E+00
Nitrophenol, 3-	554-84-7	—	—	—	—	—	—	1.6E+02	7.1E+02	—	—	—	—	4.9E-02	4.9E+00
Nitrophenol, 4-	100-02-7	—	—	—	—	—	—	1.6E+02	7.1E+02	—	—	—	—	4.9E-02	4.9E+00

Table 9
Individual RBELs Residential

Last Revised: March 1, 2022

Chemical of Concern	CAS	Soil										Groundwater			
		Carcinogenic					Noncarcinogenic					Carcinogenic		Noncarcinogenic	
		Air ¹ RBEL _{Inh} (mg/m3)	Soil ¹ RBEL _{Ing} (mg/kg)	Soil ¹ RBEL _{Derm} (mg/kg)	AbgVeg ¹ RBEL _{Ing} above-ground (mg/kg)	BgVeg ¹ RBEL _{Ing} below-ground (mg/kg)	Air ¹ RBEL _{Inh} (mg/m3)	Soil ¹ RBEL _{Ing} (mg/kg)	Soil ¹ RBEL _{Derm} (mg/kg)	AbgVeg ¹ RBEL _{Ing} above-ground (mg/kg)	BgVeg ¹ RBEL _{Ing} below-ground (mg/kg)	GW ¹ RBEL _{Ing} (mg/L)	GW ¹ RBEL _{Class 3} (mg/L)	GW ¹ RBEL _{Ing} (mg/L)	GW ¹ RBEL _{Class 3} (mg/L)
Nitropropane, 2-	79-46-9	4.2E-05					2.1E-02	1.1E+01						3.4E-03	3.4E-01
Nitroquinoline-N-oxide, 4-	56-57-5	9.0E-06	6.5E-01	2.2E+00	—	—	—	—	—	—	—	9.7E-05	9.7E-03	—	—
Nitrosodiethanolamine	1116-54-7	—	2.2E+00	7.4E+00	—	—	—	—	—	—	—	3.3E-04	3.3E-02	—	—
Nitrosodiethylamine, n-	55-18-5	5.7E-07	4.0E-02	—	—	—	—	—	—	—	—	6.1E-06	6.1E-04	—	—
Nitrosodimethylamine, n-	62-75-9	1.7E-06	1.2E-01	—	—	—	4.2E-05	6.6E-01	—	—	—	1.8E-05	1.8E-03	2.0E-04	2.0E-02
Nitrosodi-n-butylamine, n-	924-16-3	1.5E-05	1.1E+00	3.8E+00	—	—	—	—	—	—	—	1.7E-04	1.7E-02	—	—
Nitrosodi-n-propylamine, n-	621-64-7	—	8.7E-01	7.4E-01	—	—	—	—	—	—	—	1.3E-04	1.3E-02	—	—
Nitrosodiphenylamine	86-30-6	—	1.2E+03	1.1E+03	—	—	—	—	—	—	—	1.9E-01	1.9E+01	—	—
Nitroso-methyl-ethyl-amine, n-	10595-95-6	—	2.8E-01	—	—	—	—	—	—	—	—	4.1E-05	4.1E-03	—	—
Nitrosomorpholine, N-	59-89-2	1.3E-05	9.1E-01	3.1E+00	—	—	—	—	—	—	—	1.4E-04	1.4E-02	—	—
Nitroso-n-ethylurea, n-	759-73-9	—	4.3E-02	1.5E-01	—	—	—	—	—	—	—	6.5E-06	6.5E-04	—	—
Nitrosopiperidine, N-	100-75-4	9.0E-06	6.5E-01	2.2E+00	—	—	—	—	—	—	—	9.7E-05	9.7E-03	—	—
Nitrosopyrrolidine, n-	930-55-2	4.0E-05	2.9E+00	9.9E+00	—	—	—	—	—	—	—	4.3E-04	4.3E-02	—	—
Nitrotoluene, m-	99-08-1	—	—	—	—	—	—	8.2E+02	3.6E+03	—	—	—	—	2.4E-01	2.4E+01
Nitrotoluene, o-	88-72-2	—	2.8E+01	9.4E+01	—	—	—	7.4E+01	3.2E+02	—	—	4.1E-03	4.1E-01	2.2E-02	2.2E+00
Nitrotoluene, p-	99-99-0	—	3.8E+02	1.3E+03	—	—	—	3.3E+02	1.4E+03	—	—	5.7E-02	5.7E+00	9.8E-02	9.8E+00
Nonachlor, cis-	5103-73-1	2.4E-04	1.7E+01	5.9E+01	—	1.7E+00	7.3E-04	4.1E+01	1.8E+02	—	7.8E+00	2.6E-03	2.6E-01	1.2E-02	1.2E+00
Nonachlor, trans-	39765-80-5	2.4E-04	1.7E+01	5.9E+01	—	1.7E+00	7.3E-04	4.1E+01	1.8E+02	—	7.8E+00	2.6E-03	2.6E-01	1.2E-02	1.2E+00
Nonanal	124-19-6	—	—	—	—	—	—	1.6E+04	7.1E+04	—	—	—	—	4.9E+00	4.9E+02
Nonene, 1-n	124-11-8	—	—	—	—	—	—	8.2E+03	—	—	—	—	—	2.4E+00	2.4E+02
Nonylphenol, 4-n-	104-40-5	—	—	—	—	—	—	8.2E+03	3.6E+04	—	1.6E+03	—	—	2.4E+00	2.4E+02
Nonylphenol ethoxylate	9016-45-9	—	—	—	—	—	—	8.2E+03	3.6E+04	—	1.6E+03	—	—	2.4E+00	2.4E+02
Octamethylpyrophosphoramide	152-16-9	—	—	—	—	—	—	1.6E+02	7.1E+02	—	—	—	—	4.9E-02	4.9E+00
Octanone	106-68-3	—	—	—	—	—	1.9E+01	4.9E+03	—	—	—	—	—	1.5E+00	1.5E+02
Oxamyl	23135-22-0	—	—	—	—	—	—	2.0E+03	8.9E+03	—	—	—	—	6.1E-01	6.1E+01
Oxychlordan	27304-13-8	2.4E-04	1.7E+01	5.9E+01	—	1.7E+00	7.3E-04	4.1E+01	1.8E+02	—	7.8E+00	2.6E-03	2.6E-01	1.2E-02	1.2E+00
Paraquat	1910-42-5	—	—	—	—	—	—	3.7E+02	1.6E+03	—	—	—	—	1.1E-01	1.1E+01
Parathion (ethyl parathion)	56-38-2	—	—	—	—	—	—	4.9E+02	2.1E+03	—	—	—	—	1.5E-01	1.5E+01
Pebulate	1114-71-2	—	—	—	—	—	—	4.1E+03	1.8E+04	—	—	—	—	1.2E+00	1.2E+02
Pendimethalin	40487-42-1	—	—	—	—	—	—	3.3E+03	1.4E+04	—	6.3E+02	—	—	9.8E-01	9.8E+01
Pentachlorobenzene	608-93-5	—	—	—	—	—	—	6.6E+01	2.8E+02	—	—	—	—	2.0E-02	2.0E+00
Pentachloroethane	76-01-7	3.3E-03	6.7E+01	—	—	—	—	2.5E+03	—	—	—	1.0E-02	1.0E+00	7.3E-01	7.3E+01
Pentachloronitrobenzene	82-68-8	—	2.3E+01	8.0E+01	—	2.2E+00	—	2.5E+02	1.1E+03	—	4.7E+01	3.5E-03	3.5E-01	7.3E-02	7.3E+00
Pentachlorophenol	87-86-5	—	1.5E+01	2.1E+01	—	1.5E+00	—	4.1E+02	7.1E+02	—	7.8E+01	2.3E-03	2.3E-01	1.2E-01	1.2E+01
Pentadiene, 1,3-cis-	1574-41-0	—	—	—	—	—	1.9E+01	4.9E+03	—	—	—	—	—	1.5E+00	1.5E+02
Pentadiene, 1,3-trans-	2004-70-8	—	—	—	—	—	1.9E+01	4.9E+03	—	—	—	—	—	1.5E+00	1.5E+02
Pentaerythritol tetranitrate (PETN)	78-11-5	—	—	—	—	—	—	1.6E+02	7.1E+02	—	—	—	—	4.9E-02	4.9E+00
Pentane	109-66-0	—	—	—	—	—	2.5E+01	4.9E+03	—	—	—	—	—	1.5E+00	1.5E+02
Pentane, 2-methyl-	107-83-5	—	—	—	—	—	1.9E+01	4.9E+03	—	—	—	—	—	1.5E+00	1.5E+02
Pentane, 3-methyl-	96-14-0	—	—	—	—	—	1.9E+01	4.9E+03	—	—	—	—	—	1.5E+00	1.5E+02
Pentanediol, 1,5-	111-29-5	—	—	—	—	—	1.9E+01	4.1E+05	1.0E+06	—	—	—	—	1.2E+02	1.2E+04
Pentanol, 1-	71-41-0	—	—	—	—	—	—	2.7E+03	—	—	—	—	—	8.1E-01	8.1E+01
Pentanol, 4-methyl-2-	108-11-2	—	—	—	—	—	—	2.1E+03	—	—	—	—	—	6.4E-01	6.4E+01

Table 9
Individual RBELs Residential

Last Revised: March 1, 2022

Chemical of Concern	CAS	Soil										Groundwater			
		Carcinogenic					Noncarcinogenic					Carcinogenic		Noncarcinogenic	
		Air ¹ RBEL _{Inh} (mg/m3)	Soil ¹ RBEL _{Ing} (mg/kg)	Soil ¹ RBEL _{Derm} (mg/kg)	AbgVeg ¹ RBEL _{Ing} above-ground (mg/kg)	BgVeg ¹ RBEL _{Ing} below-ground (mg/kg)	Air ¹ RBEL _{Inh} (mg/m3)	Soil ¹ RBEL _{Ing} (mg/kg)	Soil ¹ RBEL _{Derm} (mg/kg)	AbgVeg ¹ RBEL _{Ing} above-ground (mg/kg)	BgVeg ¹ RBEL _{Ing} below-ground (mg/kg)	GW ¹ RBEL _{Ing} ¹ (mg/L)	GW ¹ RBEL _{Class 3} ² (mg/L)	GW ¹ RBEL _{Ing} ¹ (mg/L)	GW ¹ RBEL _{Class 3} ² (mg/L)
Phosphorus, white	7723-14-0	—	—	—	—	—	—	1.6E+00	1.4E+01	—	—	—	—	4.9E-04	4.9E-02
Phthalic anhydride	85-44-9	—	—	—	—	—	1.3E-01	1.6E+05	7.1E+05	—	—	—	—	4.9E+01	4.9E+03
Picloram	1918-02-1	—	—	—	—	—	—	5.7E+03	2.5E+04	—	—	—	—	1.7E+00	1.7E+02
Picoline, 2- (2-methylpyridine)	109-06-8	—	—	—	—	—	—	7.4E+02	—	—	—	—	—	2.2E-01	2.2E+01
Polybrominated biphenyls (PBBs)	67774-32-7	—	6.8E-01	2.3E+00	—	6.6E-02	—	5.7E-01	2.5E+00	—	1.1E-01	1.0E-04	1.0E-02	1.7E-04	1.7E-02
Polychlorinated biphenyls (PCBs)	1336-36-3	4.3E-05	3.0E+00	7.4E+00	—	2.9E-01	—	1.6E+00	5.1E+00	—	3.1E-01	4.6E-04	4.6E-02	4.9E-04	4.9E-02
Potassium*	7440-09-7	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Primene	68955-53-3	—	—	—	—	—	—	4.9E+02	2.1E+03	—	9.4E+01	—	—	1.5E-01	1.5E+01
Prometon (pramitol)	1610-18-0	—	—	—	—	—	—	1.2E+03	5.3E+03	—	—	—	—	3.7E-01	3.7E+01
Prometryn	7287-19-6	—	—	—	—	—	—	3.3E+03	1.4E+04	—	—	—	—	9.8E-01	9.8E+01
Pronamide	23950-58-5	—	—	—	—	—	—	6.1E+03	2.7E+04	—	—	—	—	1.8E+00	1.8E+02
Propanal (propionaldehyde)	123-38-6	—	—	—	—	—	8.3E-03	6.6E+02	—	—	—	—	—	2.0E-01	2.0E+01
Propane, 1-bromo-	106-94-5	—	—	—	—	—	—	2.9E+03	—	—	—	—	—	8.8E-01	8.8E+01
Propanil	709-98-8	—	—	—	—	—	—	4.1E+02	1.8E+03	—	—	—	—	1.2E-01	1.2E+01
Propanoic acid (propionic acid)	79-09-4	—	—	—	—	—	—	4.1E+04	—	—	—	—	—	1.2E+01	1.2E+03
Propanol, 1-	71-23-8	—	—	—	—	—	—	1.6E+05	—	—	—	—	—	4.9E+01	4.9E+03
Propargite	2312-35-8	—	—	—	—	—	—	1.6E+03	7.1E+03	—	—	—	—	4.9E-01	4.9E+01
Propargyl alcohol	107-19-7	—	—	—	—	—	—	1.6E+02	—	—	—	—	—	4.9E-02	4.9E+00
Propazine	139-40-2	—	1.4E+02	4.7E+02	—	—	—	1.6E+03	7.1E+03	—	—	2.1E-02	2.1E+00	4.9E-01	4.9E+01
Propham	122-42-9	—	—	—	—	—	—	1.6E+03	7.1E+03	—	—	—	—	4.9E-01	4.9E+01
Propionitrile (propane nitrile)	107-12-0	—	—	—	—	—	—	3.3E+01	—	—	—	—	—	9.8E-03	9.8E-01
Propyl acetate, n-	109-60-4	—	—	—	—	—	—	7.4E+03	—	—	—	—	—	2.2E+00	2.2E+02
Propylbenzene, n-	103-65-1	—	—	—	—	—	4.2E-01	3.3E+03	—	—	—	—	—	9.8E-01	9.8E+01
Propylene glycol	57-55-6	—	—	—	—	—	3.1E-03	1.0E+06	1.0E+06	—	—	—	—	4.9E+02	4.9E+04
Propylene glycol monomethyl ether	107-98-2	—	—	—	—	—	2.1E+00	5.7E+04	—	—	—	—	—	1.7E+01	1.7E+03
Propylene oxide	75-56-9	6.6E-03	2.5E+01	—	—	—	3.1E-02	—	—	—	—	3.8E-03	3.8E-01	—	—
Propylene tetramer	6842-15-5	—	—	—	—	—	1.0E+00	8.2E+03	3.6E+04	—	—	—	—	2.4E+00	2.4E+02
Prothiofos (Tokuthion)	34643-46-4	—	—	—	—	—	—	8.2E+00	3.6E+01	—	1.6E+00	—	—	2.4E-03	2.4E-01
Pyrene	129-00-0	—	—	—	—	—	—	2.5E+03	8.2E+03	—	4.7E+02	—	—	7.3E-01	7.3E+01
Pyridine	110-86-1	—	—	—	—	—	—	8.2E+01	—	—	—	—	—	2.4E-02	2.4E+00
Quinoline	91-22-5	—	2.0E+00	6.9E+00	—	—	—	—	—	—	—	3.0E-04	3.0E-02	—	—
Ronnel	299-84-3	—	—	—	—	—	—	4.1E+03	1.8E+04	—	7.8E+02	—	—	1.2E+00	1.2E+02
Safrole	94-59-7	3.9E-04	2.8E+01	9.4E+01	—	—	—	—	—	—	—	4.1E-03	4.1E-01	—	—
Selenium	7782-49-2	—	—	—	—	—	—	4.1E+02	1.8E+04	3.3E+01	7.8E+01	—	—	1.2E-01	1.2E+01
Selenourea	630-10-4	—	—	—	—	—	—	4.1E+02	—	—	—	—	—	1.2E-01	1.2E+01
Silver	7440-22-4	—	—	—	—	—	—	4.1E+02	7.1E+02	3.3E+01	7.8E+01	—	—	1.2E-01	1.2E+01
Simazine	122-34-9	—	5.1E+01	1.7E+02	—	—	—	4.1E+02	1.8E+03	—	—	7.6E-03	7.6E-01	1.2E-01	1.2E+01
Sodium*	7440-23-5	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sodium hypochlorite	7681-52-9	—	—	—	—	—	3.2E-04	1.7E+04	1.5E+05	—	—	—	—	5.1E+00	5.1E+02
Sodium polyacrylate	9003-04-7	—	—	—	—	—	1.0E-03	4.1E+04	—	—	—	—	—	1.2E+01	1.2E+03
Strontium	7440-24-6	—	—	—	—	—	—	4.9E+04	4.3E+05	3.9E+03	9.4E+03	—	—	1.5E+01	1.5E+03
Strychnine	57-24-9	—	—	—	—	—	—	2.5E+01	1.1E+02	—	—	—	—	7.3E-03	7.3E-01
Styrene	100-42-5	—	—	—	—	—	4.9E-01	1.6E+04	—	—	—	—	—	4.9E+00	4.9E+02

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Individual RBELs Residential

Last Revised: March 1, 2022

Chemical of Concern	CAS	Soil										Groundwater			
		Carcinogenic					Noncarcinogenic					Carcinogenic		Noncarcinogenic	
		Air ¹ RBEL _{Inh} (mg/m3)	Soil ¹ RBEL _{Ing} (mg/kg)	Soil ¹ RBEL _{Derm} (mg/kg)	AbgVeg ¹ RBEL _{Ing} above-ground (mg/kg)	BgVeg ¹ RBEL _{Ing} below-ground (mg/kg)	Air ¹ RBEL _{Inh} (mg/m3)	Soil ¹ RBEL _{Ing} (mg/kg)	Soil ¹ RBEL _{Derm} (mg/kg)	AbgVeg ¹ RBEL _{Ing} above-ground (mg/kg)	BgVeg ¹ RBEL _{Ing} below-ground (mg/kg)	GW ¹ RBEL _{Ing} (mg/L)	GW ² RBEL _{Class 3} (mg/L)	GW ¹ RBEL _{Ing} (mg/L)	GW ² RBEL _{Class 3} (mg/L)
Sulfate*	14808-79-8	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sulfide*	18496-25-8	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sulfolane	126-33-0	—	—	—	—	—	6.7E-03	1.1E+03	4.6E+03	—	—	—	—	3.2E-01	3.2E+01
Sulfur*	7704-34-9	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sulprofos (Bolstar)	35400-43-2	—	—	—	—	—	—	2.5E+02	1.1E+03	—	4.7E+01	—	—	7.3E-02	7.3E+00
Tebuconazole	107534-96-3	—	—	—	—	—	—	2.5E+03	1.1E+04	—	—	—	—	7.3E-01	7.3E+01
Tebuthiuron	34014-18-1	—	—	—	—	—	—	5.7E+03	2.5E+04	—	—	—	—	1.7E+00	1.7E+02
Terbufos	13071-79-9	—	—	—	—	—	—	2.0E+00	8.9E+00	—	—	—	—	6.1E-04	6.1E-02
Tert-amyl ethyl ether (TAEE)	919-94-8	—	—	—	—	—	—	3.3E+03	—	—	—	—	—	9.8E-01	9.8E+01
Tert-amyl-methyl ether (TAME)	994-05-8	—	—	—	—	—	—	3.3E+03	—	—	—	—	—	9.8E-01	9.8E+01
Tert-butyl alcohol (2-methyl-2-propanol)	75-65-0	—	—	—	—	—	—	7.4E+03	—	—	—	—	—	2.2E+00	2.2E+02
Tetrachlorobenzene, 1,2,3,4-	634-66-2	—	—	—	—	—	—	2.5E+01	1.1E+02	—	—	—	—	7.3E-03	7.3E-01
Tetrachlorobenzene, 1,2,3,5-	634-90-2	—	—	—	—	—	—	2.5E+01	1.1E+02	—	4.7E+00	—	—	7.3E-03	7.3E-01
Tetrachlorobenzene, 1,2,4,5-	95-94-3	—	—	—	—	—	—	2.5E+01	1.1E+02	—	—	—	—	7.3E-03	7.3E-01
Tetrachloroethane, 1,1,1,2-	630-20-6	3.3E-03	2.3E+02	—	—	—	—	2.5E+03	—	—	—	3.5E-02	3.5E+00	7.3E-01	7.3E+01
Tetrachloroethane, 1,1,2,2-	79-34-5	—	3.0E+01	—	—	—	—	1.6E+03	—	—	—	4.6E-03	4.6E-01	4.9E-01	4.9E+01
Tetrachloroethylene [PCE]	127-18-4	6.4E-02	2.9E+03	—	—	—	3.9E-01	1.7E+03	—	—	—	4.3E-01	4.3E+01	5.1E-01	5.1E+01
Tetrachlorophenol, 2,3,4,5-	4901-51-3	—	—	—	—	—	—	2.5E+03	1.1E+04	—	4.7E+02	—	—	7.3E-01	7.3E+01
Tetrachlorophenol, 2,3,4,6-	58-90-2	—	—	—	—	—	—	2.5E+03	1.1E+04	—	4.7E+02	—	—	7.3E-01	7.3E+01
Tetrachlorophenol, 2,3,5,6-	935-95-5	—	—	—	—	—	—	2.5E+03	1.1E+04	—	4.7E+02	—	—	7.3E-01	7.3E+01
Tetrachlorvinphos (Stiropfos)	22248-79-9	—	—	—	—	—	—	3.4E+03	1.5E+04	—	6.6E+02	—	—	1.0E+00	1.0E+02
Tetradifon	116-29-0	—	—	—	—	—	—	1.6E+03	7.1E+03	—	3.1E+02	—	—	4.9E-01	4.9E+01
Tetraethyl dithiopyrophosphate (sulfotep)	3689-24-5	—	—	—	—	—	—	4.1E+01	1.8E+02	—	—	—	—	1.2E-02	1.2E+00
Tetraethyl lead	78-00-2	—	—	—	—	—	—	8.2E-03	3.6E-02	—	—	—	—	2.4E-06	2.4E-04
Tetraethyl pyrophosphate (TEPP)	107-49-3	—	—	—	—	—	—	9.0E-01	3.9E+00	—	—	—	—	2.7E-04	2.7E-02
Tetraethylene glycol	112-60-7	—	—	—	—	—	—	2.7E+04	1.2E+05	—	—	—	—	8.1E+00	8.1E+02
Tetrahydrofuran	109-99-9	1.3E-02	8.0E+02	—	—	—	2.1E+00	7.4E+04	—	—	—	1.2E-01	1.2E+01	2.2E+01	2.2E+03
Tetrahydropyran	142-68-7	1.3E-02	8.0E+02	—	—	—	—	1.6E+04	—	—	—	1.2E-01	1.2E+01	4.9E+00	4.9E+02
Tetraoxadodecane, 2,5,8,11-	112-49-2	—	—	—	—	—	—	2.0E+03	8.9E+03	—	—	—	—	6.1E-01	6.1E+01
Thallium	7440-28-0	—	—	—	—	—	—	5.5E+00	2.4E+02	4.4E-01	1.0E+00	—	—	1.6E-03	1.6E-01
Thiofanox	39196-18-4	—	—	—	—	—	—	2.5E+01	1.1E+02	—	—	—	—	7.3E-03	7.3E-01
Thionazin	297-97-2	—	—	—	—	—	—	5.7E+00	2.5E+01	—	—	—	—	1.7E-03	1.7E-01
Thiophanate-methyl	23564-05-8	—	—	—	—	—	—	6.6E+03	2.8E+04	—	—	—	—	2.0E+00	2.0E+02
Thiram	137-26-8	—	—	—	—	—	—	4.1E+02	1.8E+03	—	—	—	—	1.2E-01	1.2E+01
Tin	7440-31-5	—	—	—	—	—	—	4.9E+04	2.1E+05	3.9E+03	9.4E+03	—	—	1.5E+01	1.5E+03
Titanium	7440-32-6	—	—	—	—	—	—	4.1E+05	5.3E+05	3.3E+04	7.8E+04	—	—	1.2E+02	1.2E+04
Toluene	108-88-3	—	—	—	—	—	4.3E+00	6.6E+03	—	—	—	—	—	2.0E+00	2.0E+02
Toluene diisocyanate, 2,4/2,6-	26471-62-5	—	—	—	—	—	7.3E-05	—	—	—	—	—	—	—	—
Toluenediamine, 2,4-	95-80-7	—	1.9E+00	6.5E+00	—	—	—	—	—	—	—	2.9E-04	2.9E-02	—	—
Toluenediamine, 2,6-	823-40-5	—	—	—	—	—	—	2.5E+03	1.1E+04	—	—	—	—	7.3E-01	7.3E+01
Toluidine, o-	95-53-4	4.8E-04	3.8E+02	8.7E+01	—	—	—	—	—	—	—	5.7E-02	5.7E+00	—	—
Toluidine, p-	106-49-0	—	2.0E+02	1.1E+02	—	—	—	—	—	—	—	3.0E-02	3.0E+00	—	—
Toxaphene	8001-35-2	7.6E-05	5.5E+00	1.9E+01	—	5.3E-01	—	2.5E+01	1.1E+02	—	4.8E+00	8.3E-04	8.3E-02	7.6E-03	7.6E-01

Table 9
Individual RBELs Residential

Last Revised: March 1, 2022

Chemical of Concern	CAS	Soil										Groundwater			
		Carcinogenic					Noncarcinogenic					Carcinogenic		Noncarcinogenic	
		Air ¹ RBEL _{Inh} (mg/m3)	Soil ¹ RBEL _{Ing} (mg/kg)	Soil ¹ RBEL _{Derm} (mg/kg)	AbgVeg ¹ RBEL _{Ing} above-ground (mg/kg)	BgVeg ¹ RBEL _{Ing} below-ground (mg/kg)	Air ¹ RBEL _{Inh} (mg/m3)	Soil ¹ RBEL _{Ing} (mg/kg)	Soil ¹ RBEL _{Derm} (mg/kg)	AbgVeg ¹ RBEL _{Ing} above-ground (mg/kg)	BgVeg ¹ RBEL _{Ing} below-ground (mg/kg)	GW ¹ RBEL _{Ing} (mg/L)	GW ² RBEL _{Class 3} (mg/L)	GW ¹ RBEL _{Ing} (mg/L)	GW ² RBEL _{Class 3} (mg/L)
TPH, TX1005, C6-C12	TPH-1005-1	—	—	—	—	—	2.1E-01	3.3E+03	—	—	—	—	—	9.8E-01	9.8E+01
TPH, TX1005, >C12-C28	TPH-1005-2	—	—	—	—	—	2.1E-01	3.3E+03	1.4E+04	—	—	—	—	9.8E-01	9.8E+01
TPH, TX1005, >C12-C35	TPH-1005-3	—	—	—	—	—	2.1E-01	3.3E+03	1.4E+04	—	—	—	—	9.8E-01	9.8E+01
TPH, TX1005, >C28-C35	TPH-1005-4	—	—	—	—	—	2.1E-01	3.3E+03	1.4E+04	—	—	—	—	9.8E-01	9.8E+01
TP Silvex, 2,4,5-	93-72-1	—	—	—	—	—	—	6.6E+02	2.8E+03	—	—	—	—	2.0E-01	2.0E+01
Triademenol	55219-65-3	—	—	—	—	—	—	2.5E+03	1.1E+04	—	—	—	—	7.3E-01	7.3E+01
Triallate	2303-17-5	—	—	—	—	—	—	1.1E+03	4.6E+03	—	2.0E+02	—	—	3.2E-01	3.2E+01
Triaminotrinrobenzene (TATB)	3058-38-6	—	—	—	—	—	—	2.5E+02	1.1E+03	—	—	—	—	7.3E-02	7.3E+00
Tributyltin oxide	56-35-9	—	—	—	—	—	—	2.5E+01	1.1E+02	—	4.7E+00	—	—	7.3E-03	7.3E-01
Trichloro-1,2,2-trifluoroethane, 1,1,2-	76-13-1	—	—	—	—	—	5.2E+00	1.0E+06	—	—	—	—	—	7.3E+02	7.3E+04
Trichlorobenzene, 1,2,3-	87-61-6	—	—	—	—	—	2.1E-03	2.5E+02	1.1E+03	—	—	—	—	7.3E-02	7.3E+00
Trichlorobenzene, 1,2,4-	120-82-1	—	2.1E+02	7.2E+02	—	—	2.1E-03	8.2E+02	3.6E+03	—	—	3.1E-02	3.1E+00	2.4E-01	2.4E+01
Trichlorobenzene, 1,3,5-	108-70-3	—	—	—	—	—	2.1E-03	2.5E+02	1.1E+03	—	—	—	—	7.3E-02	7.3E+00
Trichloroethane, 1,1,1-	71-55-6	—	—	—	—	—	5.3E+00	1.6E+05	—	—	—	—	—	4.9E+01	4.9E+03
Trichloroethane, 1,1,2-	79-00-5	1.5E-03	1.1E+02	—	—	—	—	3.3E+02	—	—	—	1.6E-02	1.6E+00	9.8E-02	9.8E+00
Trichloroethylene [TCE]	79-01-6	5.9E-03	1.3E+02	—	—	—	2.1E-03	4.1E+01	—	—	—	2.0E-02	2.0E+00	1.2E-02	1.2E+00
Trichlorofluoromethane	75-69-4	—	—	—	—	—	—	2.5E+04	—	—	—	—	—	7.3E+00	7.3E+02
Trichloronate	327-98-0	—	—	—	—	—	—	2.5E+02	1.1E+03	—	4.7E+01	—	—	7.3E-02	7.3E+00
Trichlorophenol, 2,3,4-	15950-66-0	—	—	—	—	—	—	8.2E+03	3.6E+04	—	—	—	—	2.4E+00	2.4E+02
Trichlorophenol, 2,3,5-	933-78-8	—	—	—	—	—	—	8.2E+03	3.6E+04	—	—	—	—	2.4E+00	2.4E+02
Trichlorophenol, 2,3,6-	933-75-5	—	—	—	—	—	—	8.2E+03	3.6E+04	—	1.6E+03	—	—	2.4E+00	2.4E+02
Trichlorophenol, 2,4,5-	95-95-4	—	—	—	—	—	—	8.2E+03	3.6E+04	—	—	—	—	2.4E+00	2.4E+02
Trichlorophenol, 2,4,6-	88-06-2	7.8E-03	5.5E+02	1.9E+03	—	—	—	8.2E+01	3.6E+02	—	—	8.3E-02	8.3E+00	2.4E-02	2.4E+00
Trichlorophenol, 3,4,5-	609-19-8	—	—	—	—	—	—	8.2E+03	3.6E+04	—	—	—	—	2.4E+00	2.4E+02
Trichlorophenoxyacetic acid, 2,4,5-	93-76-5	—	—	—	—	—	—	8.2E+02	3.6E+03	—	—	—	—	2.4E-01	2.4E+01
Trichloropropane, 1,1,2-	598-77-6	—	—	—	—	—	3.1E-04	4.1E+02	—	—	—	—	—	1.2E-01	1.2E+01
Trichloropropane, 1,2,3-	96-18-4	—	2.0E-01	—	—	—	3.1E-04	3.3E+02	—	—	—	3.0E-05	3.0E-03	9.8E-02	9.8E+00
Triethanolamine	102-71-6	—	—	—	—	—	2.6E-02	1.6E+04	7.1E+04	—	—	—	—	4.9E+00	4.9E+02
Triethylamine	121-44-8	—	—	—	—	—	7.3E-03	—	—	—	—	—	—	—	—
Triethylene glycol	112-27-6	—	—	—	—	—	—	1.6E+05	7.1E+05	—	—	—	—	4.9E+01	4.9E+03
Triethylphosphorothioate, O, O, O-	126-68-1	—	—	—	—	—	—	6.8E-01	3.0E+00	—	—	—	—	2.0E-04	2.0E-02
Trifluralin	1582-09-8	—	7.9E+02	2.7E+03	—	7.6E+01	—	6.1E+02	2.7E+03	—	1.2E+02	1.2E-01	1.2E+01	1.8E-01	1.8E+01
Trimethylamine	75-50-3	—	—	—	—	—	7.3E-03	—	—	—	—	—	—	—	—
Trimethylbenzene, 1,2,3-	526-73-8	—	—	—	—	—	1.9E-01	2.8E+03	—	—	—	—	—	8.3E-01	8.3E+01
Trimethylbenzene, 1,2,4-	95-63-6	—	—	—	—	—	1.9E-01	2.8E+03	—	—	—	—	—	8.3E-01	8.3E+01
Trimethylbenzene, 1,3,5-	108-67-8	—	—	—	—	—	1.9E-01	2.8E+03	—	—	—	—	—	8.3E-01	8.3E+01
Trinitrobenzene, 1,3,5-	99-35-4	—	—	—	—	—	—	2.5E+03	1.1E+04	—	—	—	—	7.3E-01	7.3E+01
Trinitrophenylmethyl nitramine (tetryl; nitramine)	479-45-8	—	—	—	—	—	—	1.6E+02	1.4E+03	—	—	—	—	4.9E-02	4.9E+00
Trinitrotoluene, 2,4,6-	118-96-7	—	2.0E+02	6.9E+02	—	—	—	4.1E+01	1.8E+02	—	—	3.0E-02	3.0E+00	1.2E-02	1.2E+00
Tungsten (as sodium tungstate dihydride)	7440-33-7	—	—	—	—	—	5.5E-03	8.2E+01	7.1E+02	6.5E+00	1.6E+01	—	—	2.4E-02	2.4E+00
Uranium (soluble salts)	7440-61-1	—	—	—	—	—	4.2E-05	2.5E+02	1.1E+04	2.0E+01	4.7E+01	—	—	7.3E-02	7.3E+00
Valeric acid (pentanoic acid)	109-52-4	—	—	—	—	—	1.0E-03	4.1E+04	1.8E+05	—	—	—	—	1.2E+01	1.2E+03
Vanadium	7440-62-2	—	—	—	—	—	3.1E-05	1.5E+02	1.7E+02	1.2E+01	2.8E+01	—	—	4.4E-02	4.4E+00

Table 9
Individual RBELs Residential

Last Revised: March 1, 2022

Chemical of Concern	CAS	Soil										Groundwater			
		Carcinogenic					Noncarcinogenic					Carcinogenic		Noncarcinogenic	
		Air ¹ RBEL _{Inh} (mg/m3)	Soil ¹ RBEL _{Ing} (mg/kg)	Soil ¹ RBEL _{Derm} (mg/kg)	AbgVeg ¹ RBEL _{Ing} above-ground (mg/kg)	BgVeg ¹ RBEL _{Ing} below-ground (mg/kg)	Air ¹ RBEL _{Inh} (mg/m3)	Soil ¹ RBEL _{Ing} (mg/kg)	Soil ¹ RBEL _{Derm} (mg/kg)	AbgVeg ¹ RBEL _{Ing} above-ground (mg/kg)	BgVeg ¹ RBEL _{Ing} below-ground (mg/kg)	GW ¹ RBEL _{Ing} (mg/L)	GW ² RBEL _{Class 3} (mg/L)	GW ¹ RBEL _{Ing} (mg/L)	GW ² RBEL _{Class 3} (mg/L)
Vernam	1929-77-7	—	—	—	—	—	—	8.2E+01	3.6E+02	—	—	—	—	2.4E-02	2.4E+00
Vinyl acetate	108-05-4	—	—	—	—	—	2.1E-01	8.2E+04	—	—	—	—	—	2.4E+01	2.4E+03
Vinyl chloride	75-01-4	2.9E-03	4.0E+00	—	—	—	6.3E-02	2.5E+02	—	—	—	6.1E-04	6.1E-02	7.3E-02	7.3E+00
Vinylcyclohexane	695-12-5	—	—	—	—	—	—	4.1E+04	—	—	—	—	—	1.2E+01	1.2E+03
Warfarin	81-81-2	—	—	—	—	—	—	2.5E+01	1.1E+02	—	—	—	—	7.3E-03	7.3E-01
Xylene, m-	108-38-3	—	—	—	—	—	6.4E-01	1.6E+05	—	—	—	—	—	4.9E+01	4.9E+03
Xylene, o-	95-47-6	—	—	—	—	—	6.4E-01	1.6E+05	—	—	—	—	—	4.9E+01	4.9E+03
Xylene, p-	106-42-3	—	—	—	—	—	6.4E-01	1.6E+05	—	—	—	—	—	4.9E+01	4.9E+03
Xylenes	1330-20-7	—	—	—	—	—	6.4E-01	1.6E+04	—	—	—	—	—	4.9E+00	4.9E+02
Zinc	7440-66-6	—	—	—	—	—	—	2.5E+04	2.1E+05	2.0E+03	4.7E+03	—	—	7.3E+00	7.3E+02
6 C aliphatics (TPH) (>53% n-hexane content)	NA	—	—	—	—	—	7.0E-01	4.9E+03	—	—	—	—	—	1.5E+00	1.5E+02
6 C aliphatics (TPH) (<53% n-hexane content)	NA	—	—	—	—	—	1.9E+01	4.9E+03	—	—	—	—	—	1.5E+00	1.5E+02
>6-8 C aliphatics (TPH) (>53% n-hexane content)	NA	—	—	—	—	—	7.0E-01	4.9E+03	—	—	—	—	—	1.5E+00	1.5E+02
>6-8 C aliphatics (TPH) (<53% n-hexane content)	NA	—	—	—	—	—	1.9E+01	4.9E+03	—	—	—	—	—	1.5E+00	1.5E+02
>8-10 C aliphatics (TPH)	NA	—	—	—	—	—	5.2E-01	8.2E+03	—	—	—	—	—	2.4E+00	2.4E+02
>10-12 C aliphatics (TPH)	NA	—	—	—	—	—	5.2E-01	8.2E+03	3.6E+04	—	—	—	—	2.4E+00	2.4E+02
>12-16 C aliphatics (TPH)	NA	—	—	—	—	—	5.2E-01	8.2E+03	3.6E+04	—	—	—	—	2.4E+00	2.4E+02
>16-21 C aliphatics (TPH)	NA	—	—	—	—	—	—	1.6E+05	7.1E+05	—	—	—	—	4.9E+01	4.9E+03
>16-21 C aliphatics (TPH) (for transformer mineral oil releases only)	NA	—	—	—	—	—	—	1.3E+05	7.1E+05	—	—	—	—	3.9E+01	3.9E+03
>21-35 C aliphatics (TPH)	NA	—	—	—	—	—	—	1.6E+05	5.7E+05	—	—	—	—	4.9E+01	4.9E+03
>21-35 C aliphatics (TPH) (for transformer mineral oil releases only)	NA	—	—	—	—	—	—	1.3E+05	5.7E+05	—	—	—	—	3.9E+01	3.9E+03
>7-8 C aromatics (TPH)	NA	—	—	—	—	—	2.0E+00	8.2E+03	—	—	—	—	—	2.4E+00	2.4E+02
>8-10 C aromatics (TPH)	NA	—	—	—	—	—	2.1E-01	3.3E+03	—	—	—	—	—	9.8E-01	9.8E+01
>10-12 C aromatics (TPH)	NA	—	—	—	—	—	2.1E-01	3.3E+03	1.4E+04	—	—	—	—	9.8E-01	9.8E+01
>12-16 C aromatics (TPH)	NA	—	—	—	—	—	2.1E-01	3.3E+03	1.4E+04	—	—	—	—	9.8E-01	9.8E+01
>16-21 C aromatics (TPH)	NA	—	—	—	—	—	—	2.5E+03	1.1E+04	—	—	—	—	7.3E-01	7.3E+01
>21-35 C aromatics (TPH)	NA	—	—	—	—	—	—	2.5E+03	1.1E+04	—	—	—	—	7.3E-01	7.3E+01
Footnotes															
1 Based on primary MCLs when available															
2 100 x ^{GW} GW _{Ing}															
3 The total MCL for trihalomethanes (bromodichloromethane, bromoform, chloroform, and dibromochloromethane) is 0.08 mg/L.															
* These compounds are not necessarily of concern from a human health standpoint, therefore calculation of human health-based values is not required. However, aesthetics and ecological criteria would still apply. See table entitled "Compounds for which Calculation of a Human Health PCL is Not Required" available on the TCEQ website at http://www.tceq.state.tx.us/remediation/trrp/trrp.html .															
NA = not applicable															
All values capped at 1E+06															

This table shows the residential risk-based exposure limits for soil and groundwater with carcinogenic and non-carcinogenic values depicted.

end of worksheet

Last Revised: March 1, 2022

Last Revised: March 1, 2022

Table 10
Individual RBELs Commercial/Industrial

Last Revised: March 1, 2022

Chemical of Concern	CAS	Soil						Groundwater			
		Carcinogenic			Noncarcinogenic			Carcinogenic		Noncarcinogenic	
		Air RBEL _{Inh} (mg/m ³)	Soil RBEL _{Ing} (mg/kg)	Soil RBEL _{Derm} (mg/kg)	Air RBEL _{Inh} (mg/m ³)	Soil RBEL _{Ing} (mg/kg)	Soil RBEL _{Derm} (mg/kg)	GW RBEL _{Ing} ¹ (mg/L)	GW RBEL _{Class 3} ² (mg/L)	GW RBEL _{Ing} ¹ (mg/L)	GW RBEL _{Class 3} ² (mg/L)
Ammonium salts*	AMMONIUM	—	—	—	—	—	—	—	—	—	—
Aniline	62-53-3	—	5.0E+03	1.0E+04	1.5E-03	7.2E+03	1.4E+04	3.6E-01	3.6E+01	5.1E-01	5.1E+01
Anthracene	120-12-7	—	—	—	—	3.1E+05	4.7E+05	—	—	2.2E+01	2.2E+03
Anthraquinone, 9,10-	84-65-1	—	7.3E+02	1.5E+03	—	2.0E+04	4.1E+04	5.2E-02	5.2E+00	1.5E+00	1.5E+02
Antimony	7440-36-0	—	—	—	—	4.1E+02	1.2E+03	—	—	2.9E-02	2.9E+00
Aramite	140-57-8	5.8E-03	1.1E+03	2.3E+03	—	5.1E+04	1.0E+05	8.2E-02	8.2E+00	3.7E+00	3.7E+02
Arsenic	7440-38-2	2.7E-04	2.4E+02	1.3E+03	—	3.9E+02	2.0E+03	1.4E-02	1.4E+00	2.2E-02	2.2E+00
Arsine	7784-42-1	—	—	—	7.3E-05	—	—	—	—	—	—
Atrazine	1912-24-9	—	1.3E+02	2.6E+02	—	3.6E+04	7.2E+04	9.2E-03	9.2E-01	2.6E+00	2.6E+02
Azinphos-methyl (guthion)	86-50-0	—	—	—	—	1.5E+03	3.1E+03	—	—	1.1E-01	1.1E+01
Azobenzene	103-33-3	1.3E-03	2.6E+02	5.2E+02	—	—	—	1.9E-02	1.9E+00	—	—
Barium	7440-39-3	—	—	—	—	2.0E+05	2.9E+05	—	—	1.5E+01	1.5E+03
Bayleton	43121-43-3	—	—	—	—	3.1E+04	6.1E+04	—	—	2.2E+00	2.2E+02
Benefin (benfluralin)	1861-40-1	—	—	—	—	3.1E+05	6.1E+05	—	—	2.2E+01	2.2E+03
Benomyl	17804-35-2	—	—	—	—	5.1E+04	1.0E+05	—	—	3.7E+00	3.7E+02
Benz-a-anthracene	56-55-3	6.8E-04	2.9E+02	4.4E+02	—	—	—	2.0E-02	2.0E+00	—	—
Benzaldehyde	100-52-7	—	—	—	—	1.0E+05	—	—	—	7.3E+00	7.3E+02
Benzene	71-43-2	1.9E-02	1.9E+03	—	4.1E-01	4.1E+03	—	1.4E-01	1.4E+01	2.9E-01	2.9E+01
Benzenedicarbonitrile, 1,3-	626-17-5	—	—	—	—	6.1E+03	1.2E+04	—	—	4.4E-01	4.4E+01
Benzenedicarboxylic acid, 1,2-disodecyl ester	26761-40-0	—	—	—	7.3E-03	4.1E+04	8.2E+04	—	—	2.9E+00	2.9E+02
Benzenethiol	108-98-5	—	—	—	—	1.0E+03	—	—	—	7.3E-02	7.3E+00
Benzidine	92-87-5	6.1E-07	1.2E-01	2.5E-01	—	3.1E+03	6.1E+03	8.9E-06	8.9E-04	2.2E-01	2.2E+01
Benzo-a-pyrene	50-32-8	6.8E-05	2.9E+01	4.4E+01	2.9E-06	3.1E+02	4.7E+02	2.0E-03	2.0E-01	2.2E-02	2.2E+00
Benzo-b-fluoranthene	205-99-2	6.8E-04	2.9E+02	4.4E+02	—	—	—	2.0E-02	2.0E+00	—	—
Benzo-e-pyrene	192-97-2	—	—	—	—	3.1E+04	4.7E+04	—	—	2.2E+00	2.2E+02
Benzo-g,h,i-perylene	191-24-2	—	—	—	—	3.1E+04	4.7E+04	—	—	2.2E+00	2.2E+02
Benzoic acid	65-85-0	—	—	—	—	1.0E+06	1.0E+06	—	—	2.9E+02	2.9E+04
Benzo-j-fluoranthene	205-82-3	6.8E-04	2.9E+02	4.4E+02	—	—	—	2.0E-02	2.0E+00	—	—
Benzo-k-fluoranthene	207-08-9	6.8E-03	2.9E+03	4.4E+03	—	—	—	2.0E-01	2.0E+01	—	—
Benzophenone	119-61-9	—	—	—	—	6.8E+03	1.4E+04	—	—	4.9E-01	4.9E+01
Benzotrichloride	98-07-7	—	2.2E+00	4.4E+00	—	—	—	1.6E-04	1.6E-02	—	—
Benzoyl peroxide	94-36-0	—	—	—	—	5.1E+04	1.0E+05	—	—	3.7E+00	3.7E+02
Benzyl alcohol	100-51-6	—	—	—	—	1.0E+05	2.0E+05	—	—	7.3E+00	7.3E+02
Benzyl chloride	100-44-7	—	1.7E+02	—	1.5E-03	2.0E+03	—	1.2E-02	1.2E+00	1.5E-01	1.5E+01

Table 10
Individual RBELs Commercial/Industrial

Last Revised: March 1, 2022

Chemical of Concern	CAS	Soil						Groundwater			
		Carcinogenic			Noncarcinogenic			Carcinogenic		Noncarcinogenic	
		Air ¹ RBEL _{Inh} (mg/m ³)	Soil ¹ RBEL _{Ing} (mg/kg)	Soil ¹ RBEL _{Derm} (mg/kg)	Air ¹ RBEL _{Inh} (mg/m ³)	Soil ¹ RBEL _{Ing} (mg/kg)	Soil ¹ RBEL _{Derm} (mg/kg)	GW ¹ RBEL _{Ing} (mg/L)	GW ² RBEL _{Class 3} (mg/L)	GW ¹ RBEL _{Ing} (mg/L)	GW ² RBEL _{Class 3} (mg/L)
Benzyl dichloride	98-87-3	—	1.7E+02	3.4E+02	1.5E-03	2.0E+03	4.1E+03	1.2E-02	1.2E+00	1.5E-01	1.5E+01
Beryllium	7440-41-7	1.7E-05	—	—	2.9E-05	2.0E+03	2.9E+02	—	—	1.5E-01	1.5E+01
Biphenyl, 1,1-	92-52-4	—	—	—	—	5.1E+05	1.0E+05	—	—	3.7E+01	3.7E+03
Biphenyl, 1,1'-, 2-phenoxy-	6738-04-1	—	—	—	—	5.1E+04	1.0E+05	—	—	3.7E+00	3.7E+02
Biquinoline, 2,2'-	119-91-5	—	—	—	—	3.1E+03	6.1E+03	—	—	2.2E-01	2.2E+01
Bis (2-chloroethoxy) methane	111-91-1	1.2E-04	2.6E+01	5.2E+01	—	3.1E+03	6.1E+03	1.9E-03	1.9E-01	2.2E-01	2.2E+01
Bis (2-chloroethyl) ether	111-44-4	1.2E-04	2.6E+01	—	—	—	—	1.9E-03	1.9E-01	—	—
Bis (2-chloro-1-methylethyl) ether	108-60-1	4.1E-03	4.1E+02	8.2E+02	—	4.1E+04	8.2E+04	2.9E-02	2.9E+00	2.9E+00	2.9E+02
Bis (2-chloromethyl) ether	542-88-1	6.6E-07	1.3E-01	—	—	—	—	9.3E-06	9.3E-04	—	—
Bis (2-ethyl-hexyl) phthalate	117-81-7	—	2.0E+03	7.8E+02	—	2.0E+04	7.8E+03	1.5E-01	1.5E+01	1.5E+00	1.5E+02
Bismuth	7440-69-9	—	—	—	—	5.1E+05	1.0E+06	—	—	3.7E+01	3.7E+03
Bisphenol A	80-05-7	—	—	—	—	5.1E+04	1.0E+05	—	—	3.7E+00	3.7E+02
Boron	7440-42-8	—	—	—	2.9E-02	2.0E+05	1.0E+06	—	—	1.5E+01	1.5E+03
Bromacil	314-40-9	—	—	—	—	1.0E+05	2.0E+05	—	—	7.3E+00	7.3E+02
Bromo-2-chloroethane, 1-	107-04-0	—	—	—	—	4.1E+04	—	—	—	2.9E+00	2.9E+02
Bromobenzene	108-86-1	—	—	—	8.8E-02	8.2E+03	—	—	—	5.8E-01	5.8E+01
Bromodichloromethane	75-27-4	—	4.6E+02	—	—	8.2E+03	—	3.3E-02	3.3E+00	5.8E-01	5.8E+01
Bromoform ³	75-25-2	3.7E-02	3.6E+03	—	—	2.0E+04	—	2.6E-01	2.6E+01	1.5E+00	1.5E+02
Bromomethane	74-83-9	—	—	—	5.7E-03	1.4E+03	—	—	—	1.0E-01	1.0E+01
Bromophenyl phenylether, 4-	101-55-3	1.2E-05	1.9E+00	3.8E+00	—	—	—	1.4E-04	1.4E-02	—	—
Butadiene, 1,3-	106-99-0	8.2E-02	—	—	4.8E-02	—	—	—	—	—	—
Butadiene, 2-methyl-1,3- (isoprene)	78-79-5	—	—	—	2.6E+01	6.1E+04	—	—	—	4.4E+00	4.4E+02
Butanal (butyraldehyde)	123-72-8	—	—	—	1.5E-01	6.1E+04	—	—	—	4.4E+00	4.4E+02
Butane, 2,3-dimethyl-	79-29-8	—	—	—	2.6E+01	6.1E+04	—	—	—	4.4E+00	4.4E+02
Butanoic acid (butyric acid)	107-92-6	—	—	—	1.5E-03	5.1E+05	1.0E+06	—	—	3.7E+01	3.7E+03
Butanol, 2-	78-92-2	—	—	—	4.4E+01	1.0E+06	—	—	—	1.5E+02	1.5E+04
Butanol, 2-methyl-1-	137-32-6	—	—	—	—	1.0E+04	—	—	—	7.3E-01	7.3E+01
Butanol, 2-methyl-2-	75-85-4	—	—	—	—	1.0E+04	—	—	—	7.3E-01	7.3E+01
Butanol, n-	71-36-3	—	—	—	—	1.0E+05	—	—	—	7.3E+00	7.3E+02
Butene, 1-	106-98-9	—	—	—	7.7E+00	6.1E+04	—	—	—	4.4E+00	4.4E+02
Butene, cis-2-	590-18-1	—	—	—	2.3E+00	6.1E+04	—	—	—	4.4E+00	4.4E+02
Butene, trans-2-	624-64-6	—	—	—	2.3E+00	6.1E+04	—	—	—	4.4E+00	4.4E+02
Butoxy ethanol, 2- (Ethylene glycol monobutyl ether; EGBE)	111-76-2	—	—	—	2.3E+00	1.0E+05	2.0E+05	—	—	7.3E+00	7.3E+02
Butyl acetate	123-86-4	—	—	—	6.9E+00	1.4E+05	—	—	—	1.0E+01	1.0E+03

Table 10
Individual RBELs Commercial/Industrial

Last Revised: March 1, 2022

Chemical of Concern	CAS	Soil						Groundwater			
		Carcinogenic			Noncarcinogenic			Carcinogenic		Noncarcinogenic	
		Air RBEL _{Inh} (mg/m ³)	Soil RBEL _{Ing} (mg/kg)	Soil RBEL _{Derm} (mg/kg)	Air RBEL _{Inh} (mg/m ³)	Soil RBEL _{Ing} (mg/kg)	Soil RBEL _{Derm} (mg/kg)	GW RBEL _{Ing} ¹ (mg/L)	GW RBEL _{Class 3} ² (mg/L)	GW RBEL _{Ing} ¹ (mg/L)	GW RBEL _{Class 3} ² (mg/L)
Butyl acrylate	141-32-2	—	—	—	—	9.2E+03	—	—	—	6.6E-01	6.6E+01
Butyl benzyl phthalate	85-68-7	—	1.5E+04	3.0E+04	—	2.0E+05	4.1E+05	1.1E+00	1.1E+02	1.5E+01	1.5E+03
Butyl ether, n- (dibutyl ether)	142-96-1	—	—	—	—	1.0E+05	—	—	—	7.3E+00	7.3E+02
Butyl methacrylate	97-88-1	—	—	—	—	9.2E+04	3.7E+04	—	—	6.6E+00	6.6E+02
Butylate	2008-41-5	—	—	—	—	5.1E+04	1.0E+05	—	—	3.7E+00	3.7E+02
Butylbenzene, n-	104-51-8	—	—	—	—	5.1E+04	1.0E+05	—	—	3.7E+00	3.7E+02
Butylbenzene, sec-	135-98-8	—	—	—	—	4.1E+04	—	—	—	2.9E+00	2.9E+02
Butylbenzene, tert-	98-06-6	—	—	—	—	4.1E+04	—	—	—	2.9E+00	2.9E+02
Cacodylic acid	75-60-5	—	—	—	—	3.1E+03	6.1E+03	—	—	2.2E-01	2.2E+01
Cadmium	7440-43-9	8.3E-05	—	—	1.6E-05	1.0E+03	5.1E+03	—	—	7.3E-02	7.3E+00
Calcium*	7440-70-2	—	—	—	—	—	—	—	—	—	—
Caprolactam	105-60-2	—	—	—	—	5.1E+05	1.0E+06	—	—	3.7E+01	3.7E+03
Captan	133-06-2	—	8.2E+03	1.6E+04	—	1.3E+05	2.7E+05	5.8E-01	5.8E+01	9.5E+00	9.5E+02
Carbaryl	63-25-2	—	—	—	—	1.0E+05	2.0E+05	—	—	7.3E+00	7.3E+02
Carbazole	86-74-8	—	1.4E+03	2.9E+03	—	—	—	1.0E-01	1.0E+01	—	—
Carbofuran	1563-66-2	—	—	—	—	5.1E+03	1.0E+04	—	—	3.7E-01	3.7E+01
Carbon disulfide	75-15-0	—	—	—	1.0E+00	1.0E+05	—	—	—	7.3E+00	7.3E+02
Carbon tetrachloride	56-23-5	6.8E-03	4.1E+02	—	1.5E-01	4.1E+03	—	2.9E-02	2.9E+00	2.9E-01	2.9E+01
Carbophenothion	786-19-6	—	—	—	—	1.3E+04	2.7E+04	—	—	9.5E-01	9.5E+01
Carbosulfan	55285-14-8	—	—	—	—	1.0E+04	2.0E+04	—	—	7.3E-01	7.3E+01
Carboxin	5234-68-4	—	—	—	—	1.0E+05	2.0E+05	—	—	7.3E+00	7.3E+02
Chloral	75-87-6	—	—	—	—	1.0E+05	—	—	—	7.3E+00	7.3E+02
Chloral hydrate (1,1-ethanediol, 2,2,2-trichloro-)	302-17-0	—	—	—	—	1.0E+05	2.0E+05	—	—	7.3E+00	7.3E+02
Chloramben (amiben; 3-amino-2,5-dichlorobenzoic acid)	133-90-4	—	—	—	—	1.5E+04	3.1E+04	—	—	1.1E+00	1.1E+02
Chlordane (technical)	12789-03-6	4.1E-04	8.2E+01	4.1E+02	1.0E-03	5.1E+02	2.6E+03	5.8E-03	5.8E-01	3.7E-02	3.7E+00
Chlordane, cis- (alpha chlordane)	5103-71-9	4.1E-04	8.2E+01	1.6E+02	1.0E-03	5.1E+02	1.0E+03	5.8E-03	5.8E-01	3.7E-02	3.7E+00
Chlordane, trans- (gamma chlordane)	5103-74-2	4.1E-04	8.2E+01	1.6E+02	1.0E-03	5.1E+02	1.0E+03	5.8E-03	5.8E-01	3.7E-02	3.7E+00
Chlorfenvinphos	470-90-6	—	—	—	2.9E-03	7.2E+02	1.4E+03	—	—	5.1E-02	5.1E+00
Chloride*	16887-00-6	—	—	—	—	—	—	—	—	—	—
Chlorine	7782-50-5	—	—	—	1.3E-02	1.0E+05	4.1E+05	—	—	7.3E+00	7.3E+02
Chloro-1,3-butadiene, 2-	126-99-8	1.4E-04	—	—	2.9E-02	—	—	—	—	—	—
Chloro-2-propanol, 1-	127-00-4	—	—	—	—	2.0E+04	—	—	—	1.5E+00	1.5E+02
Chloro-3-methylphenol, 4-	59-50-7	—	—	—	—	5.1E+03	1.0E+04	—	—	3.7E-01	3.7E+01
Chloroaniline, p-	106-47-8	—	1.4E+02	2.9E+02	—	4.1E+03	8.2E+03	1.0E-02	1.0E+00	2.9E-01	2.9E+01

Table 10
Individual RBELs Commercial/Industrial

Last Revised: March 1, 2022

Chemical of Concern	CAS	Soil						Groundwater			
		Carcinogenic			Noncarcinogenic			Carcinogenic		Noncarcinogenic	
		Air RBEL _{Inh} (mg/m ³)	Soil RBEL _{Ing} (mg/kg)	Soil RBEL _{Derm} (mg/kg)	Air RBEL _{Inh} (mg/m ³)	Soil RBEL _{Ing} (mg/kg)	Soil RBEL _{Derm} (mg/kg)	GW RBEL _{Ing} ¹ (mg/L)	GW RBEL _{Class 3} ² (mg/L)	GW RBEL _{Ing} ¹ (mg/L)	GW RBEL _{Class 3} ² (mg/L)
Chlorobenzene	108-90-7	—	—	—	7.3E-02	2.0E+04	—	—	—	1.5E+00	1.5E+02
Chlorobenzilate	510-15-6	5.2E-04	1.1E+02	2.1E+02	—	2.0E+04	4.1E+04	7.6E-03	7.6E-01	1.5E+00	1.5E+02
Chlorobromomethane (bromochloromethane)	74-97-5	—	—	—	—	4.1E+04	—	—	—	2.9E+00	2.9E+02
Chlorodifluoromethane	75-45-6	—	—	—	7.3E+01	—	—	—	—	—	—
Chloroethane (ethyl chloride)	75-00-3	—	—	—	1.5E+01	4.1E+05	—	—	—	2.9E+01	2.9E+03
Chloroethanol, 2-	107-07-3	—	—	—	—	2.0E+04	—	—	—	1.5E+00	1.5E+02
Chloroethoxy ethene, 2- (2-chloroethylvinylether)	110-75-8	—	2.6E+01	—	4.4E-04	2.0E+03	—	1.9E-03	1.9E-01	1.5E-01	1.5E+01
Chloroform ³	67-66-3	1.8E-03	—	—	1.4E-01	1.0E+04	—	—	—	7.3E-01	7.3E+01
Chlorohexane, 1-	544-10-5	—	—	—	1.5E+00	4.1E+04	—	—	—	2.9E+00	2.9E+02
Chloromethane (methyl chloride)	74-87-3	2.3E-02	2.2E+03	—	1.3E-01	3.7E+03	—	1.6E-01	1.6E+01	2.6E-01	2.6E+01
Chloronaphthalene, 1- (Chloronaphthalene, alpha-)	90-13-1	—	—	—	—	8.2E+04	1.3E+05	—	—	5.8E+00	5.8E+02
Chloronaphthalene, 2- (chloronaphthalene, beta)	91-58-7	—	—	—	—	8.2E+04	1.3E+05	—	—	5.8E+00	5.8E+02
Chloronitrobenzene, p- (1-chloro-4-nitrobenzene)	100-00-5	—	4.5E+03	9.1E+03	8.8E-04	1.0E+03	2.0E+03	3.2E-01	3.2E+01	7.3E-02	7.3E+00
Chlorophenol, 2-	95-57-8	—	—	—	—	5.1E+03	—	—	—	3.7E-01	3.7E+01
Chlorophenol, 3-	108-43-0	—	—	—	—	5.1E+03	1.0E+04	—	—	3.7E-01	3.7E+01
Chlorophenol, 4-	106-48-9	—	—	—	—	5.1E+03	1.0E+04	—	—	3.7E-01	3.7E+01
Chlorophenyl phenylether, 4-	7005-72-3	1.2E-05	1.9E+00	3.8E+00	—	—	—	1.4E-04	1.4E-02	—	—
Chloropropane, 2-	75-29-6	—	—	—	1.5E-01	3.1E+04	—	—	—	2.2E+00	2.2E+02
Chlorothalonil	1897-45-6	—	2.6E+03	5.2E+03	—	1.5E+04	3.1E+04	1.9E-01	1.9E+01	1.1E+00	1.1E+02
Chlorotoluene, o- (2-chlorotoluene)	95-49-8	—	—	—	1.2E+00	2.0E+04	4.1E+04	—	—	1.5E+00	1.5E+02
Chlorotoluene, p- (4-chlorotoluene)	106-43-4	—	—	—	—	2.0E+04	—	—	—	1.5E+00	1.5E+02
Chlorpyrifos	2921-88-2	—	—	—	—	3.1E+03	6.1E+03	—	—	2.2E-01	2.2E+01
Chromium (III)	16065-83-1	—	—	—	2.0E-04	1.0E+06	4.0E+05	—	—	1.1E+02	1.1E+04
Chromium (total)	7440-47-3	—	—	—	2.0E-04	1.0E+06	4.0E+05	—	—	1.1E+02	1.1E+04
Chromium (VI)	18540-29-9	1.8E-05	—	—	3.2E-04	3.2E+03	1.5E+03	—	—	2.3E-01	2.3E+01
Chrysene	218-01-9	6.8E-02	2.9E+04	4.4E+04	—	—	—	2.0E+00	2.0E+02	—	—
Cobalt	7440-48-4	6.8E-06	—	—	9.2E-05	1.0E+04	2.0E+05	—	—	7.3E-01	7.3E+01
Copolymer acrylamide	69418-26-4	—	—	—	—	2.0E+02	4.1E+02	—	—	1.5E-02	1.5E+00
Copper	7440-50-8	—	—	—	—	9.9E+04	1.0E+06	—	—	7.1E+00	7.1E+02
Coronene	191-07-1	—	—	—	—	2.0E+03	4.1E+03	—	—	1.5E-01	1.5E+01
Coumaphos	56-72-4	—	—	—	—	7.2E+03	1.4E+04	—	—	5.1E-01	5.1E+01
Cresol	1319-77-3	—	—	—	—	5.1E+04	1.0E+05	—	—	3.7E+00	3.7E+02
Cresol, m- (3-methylphenol)	108-39-4	—	—	—	—	5.1E+04	1.0E+05	—	—	3.7E+00	3.7E+02
Cresol, o- (2-methylphenol)	95-48-7	—	—	—	—	5.1E+04	1.0E+05	—	—	3.7E+00	3.7E+02

Table 10
Individual RBELs Commercial/Industrial

Last Revised: March 1, 2022

Chemical of Concern	CAS	Soil						Groundwater			
		Carcinogenic			Noncarcinogenic			Carcinogenic		Noncarcinogenic	
		Air RBEL _{Inh} (mg/m ³)	Soil RBEL _{Ing} (mg/kg)	Soil RBEL _{Derm} (mg/kg)	Air RBEL _{Inh} (mg/m ³)	Soil RBEL _{Ing} (mg/kg)	Soil RBEL _{Derm} (mg/kg)	GW RBEL _{Ing} ¹ (mg/L)	GW RBEL _{Class 3} ² (mg/L)	GW RBEL _{Ing} ¹ (mg/L)	GW RBEL _{Class 3} ² (mg/L)
Cresol, p- (4-methylphenol)	106-44-5	—	—	—	—	5.1E+03	1.0E+04	—	—	3.7E-01	3.7E+01
Crotonaldehyde	123-73-9	—	1.5E+01	—	—	1.0E+03	—	1.1E-03	1.1E-01	7.3E-02	7.3E+00
Cumene (isopropylbenzene)	98-82-8	—	—	—	5.8E-01	1.0E+05	—	—	—	7.3E+00	7.3E+02
Cyanazine	21725-46-2	—	3.4E+01	6.8E+01	—	2.0E+03	4.1E+03	2.4E-03	2.4E-01	1.5E-01	1.5E+01
Cyanide	57-12-5	—	—	—	1.2E-03	6.1E+02	1.2E+04	—	—	4.4E-02	4.4E+00
Cyanogen	460-19-5	—	—	—	1.2E-03	1.0E+03	—	—	—	7.3E-02	7.3E+00
Cycloate	1134-23-2	—	—	—	—	5.6E+04	1.1E+05	—	—	4.0E+00	4.0E+02
Cyclohexane	110-82-7	—	—	—	8.8E+00	1.0E+06	—	—	—	3.7E+02	3.7E+04
Cyclohexanol	108-93-0	—	—	—	—	1.0E+06	1.0E+06	—	—	3.7E+02	3.7E+04
Cyclohexanone	108-94-1	—	—	—	1.0E+00	1.0E+06	—	—	—	3.7E+02	3.7E+04
Cyclohexene, 1-methanol-3-	1679-51-2	—	—	—	—	2.0E+04	4.1E+04	—	—	1.5E+00	1.5E+02
Cyclohexene, 4-vinyl-1-	100-40-3	—	—	—	4.8E-01	2.2E+04	—	—	—	1.6E+00	1.6E+02
Cyclopentane	287-92-3	—	—	—	3.5E+01	6.1E+04	—	—	—	4.4E+00	4.4E+02
Cyclopentane, methyl-	96-37-7	—	—	—	1.5E+00	1.0E+05	—	—	—	7.3E+00	7.3E+02
Cyclopentene	142-29-0	—	—	—	—	1.0E+06	—	—	—	3.7E+02	3.7E+04
Cyclotetramethylenetetranitramine (HMX)	2691-41-0	—	—	—	—	5.1E+04	1.5E+04	—	—	3.7E+00	3.7E+02
Cyclotrimethylenetrinitramine (RDX)	121-82-4	—	3.6E+02	7.2E+02	—	4.1E+03	8.2E+03	2.6E-02	2.6E+00	2.9E-01	2.9E+01
Cymene (isopropyltoluene)	99-87-6	—	—	—	—	1.0E+05	—	—	—	7.3E+00	7.3E+02
Cymoxanil	57966-95-7	—	—	—	—	1.3E+04	2.7E+04	—	—	9.5E-01	9.5E+01
Dacthal (DCPA)	1861-32-1	—	—	—	—	1.0E+04	2.0E+04	—	—	7.3E-01	7.3E+01
Dalapon, sodium salt (2,2-dichloropropanoic acid)	75-99-0	—	—	—	—	3.1E+04	6.1E+04	—	—	2.2E+00	2.2E+02
DDD	72-54-8	—	1.2E+02	7.9E+02	—	—	—	8.5E-03	8.5E-01	—	—
DDE	72-55-9	—	8.4E+01	5.6E+02	—	—	—	6.0E-03	6.0E-01	—	—
DDT	50-29-3	4.2E-04	8.4E+01	5.6E+02	—	5.1E+02	3.4E+03	6.0E-03	6.0E-01	3.7E-02	3.7E+00
Demeton	8065-48-3	—	—	—	—	4.1E+01	8.2E+01	—	—	2.9E-03	2.9E-01
Desethylatrazine	6190-65-4	—	—	—	—	3.6E+04	7.2E+04	—	—	2.6E+00	2.6E+02
Diacetone alcohol (4-hydroxy-4-methyl-2-pentanone)	123-42-2	—	—	—	—	4.1E+04	8.2E+04	—	—	2.9E+00	2.9E+02
Diallate	2303-16-4	—	4.7E+02	9.4E+02	—	—	—	3.4E-02	3.4E+00	—	—
Diazinon	333-41-5	—	—	—	1.5E-04	9.2E+02	1.8E+03	—	—	6.6E-02	6.6E+00
Dibenz(a,h)acridine	226-36-8	3.7E-04	2.4E+01	4.8E+01	—	—	—	1.7E-03	1.7E-01	—	—
Dibenz(a,j)acridine	224-42-0	4.6E-04	3.9E+01	6.0E+01	—	—	—	2.8E-03	2.8E-01	—	—
Dibenz-a,h-anthracene	53-70-3	6.8E-05	2.9E+01	4.4E+01	—	—	—	2.0E-03	2.0E-01	—	—
Dibenzo(a,e)pyrene	192-65-4	4.6E-05	3.9E+00	7.8E+00	—	—	—	2.8E-04	2.8E-02	—	—
Dibenzo(a,h)pyrene	189-64-0	4.6E-06	3.9E-01	7.8E-01	—	—	—	2.8E-05	2.8E-03	—	—

Table 10
Individual RBELs Commercial/Industrial

Last Revised: March 1, 2022

Chemical of Concern	CAS	Soil						Groundwater			
		Carcinogenic			Noncarcinogenic			Carcinogenic		Noncarcinogenic	
		Air RBEL _{Inh} (mg/m ³)	Soil RBEL _{Ing} (mg/kg)	Soil RBEL _{Derm} (mg/kg)	Air RBEL _{Inh} (mg/m ³)	Soil RBEL _{Ing} (mg/kg)	Soil RBEL _{Derm} (mg/kg)	GW RBEL _{Ing} ¹ (mg/L)	GW RBEL _{Class 3} ² (mg/L)	GW RBEL _{Ing} ¹ (mg/L)	GW RBEL _{Class 3} ² (mg/L)
Dibenzo(a,i)pyrene	189-55-9	4.6E-06	3.9E-01	7.8E-01	—	—	—	2.8E-05	2.8E-03	—	—
Dibenzofuran	132-64-9	—	—	—	—	4.1E+03	8.2E+03	—	—	2.9E-01	2.9E+01
Dibenzothiophene	132-65-0	—	—	—	—	1.0E+04	6.1E+03	—	—	7.3E-01	7.3E+01
Dibromo-3-chloropropane, 1,2-	96-12-8	6.8E-06	3.6E+01	7.2E+01	2.9E-04	2.0E+02	4.1E+02	2.6E-03	2.6E-01	1.5E-02	1.5E+00
Dibromochloromethane (chlorodibromomethane) ³	124-48-1	—	3.4E+02	—	—	2.0E+04	—	2.4E-02	2.4E+00	1.5E+00	1.5E+02
Dibromofluoromethane	1868-53-7	—	—	—	—	2.0E+05	—	—	—	1.5E+01	1.5E+03
Dicamba	1918-00-9	—	—	—	—	3.1E+04	6.1E+04	—	—	2.2E+00	2.2E+02
Dichlormid	37764-25-3	—	—	—	—	2.6E+04	5.1E+04	—	—	1.8E+00	1.8E+02
Dichloro-2-butene, 1,4-	764-41-0	9.7E-06	—	—	—	—	—	—	—	—	—
Dichloro-2-butene, 1,4- trans	110-57-6	9.7E-06	—	—	—	—	—	—	—	—	—
Dichlorobenzene, 1,2-	95-50-1	—	—	—	4.4E-02	9.2E+04	—	—	—	6.6E+00	6.6E+02
Dichlorobenzene, 1,3-	541-73-1	—	—	—	1.2E-02	3.1E+04	—	—	—	2.2E+00	2.2E+02
Dichlorobenzene, 1,4-	106-46-7	—	1.2E+03	—	7.7E-01	—	—	8.5E-02	8.5E+00	—	—
Dichlorobenzidine, 3,3'-	91-94-1	—	6.4E+01	1.3E+02	—	—	—	4.5E-03	4.5E-01	—	—
Dichlorobutane, 2,3-	7581-97-7	—	—	—	1.0E-02	1.0E+04	—	—	—	7.3E-01	7.3E+01
Dichlorodifluoromethane	75-71-8	—	—	—	1.5E-01	2.0E+05	—	—	—	1.5E+01	1.5E+03
Dichloroethane, 1,1-	75-34-3	—	—	—	3.5E+00	2.0E+05	—	—	—	1.5E+01	1.5E+03
Dichloroethane, 1,2-	107-06-2	1.2E-02	3.1E+02	—	6.4E-02	8.0E+04	—	2.2E-02	2.2E+00	5.7E+00	5.7E+02
Dichloroethylene, 1,1-	75-35-4	—	—	—	5.0E-01	5.1E+04	—	—	—	3.7E+00	3.7E+02
Dichloroethylene, cis-1,2-	156-59-2	—	—	—	8.8E-02	2.0E+03	—	—	—	1.5E-01	1.5E+01
Dichloroethylene, trans-1,2	156-60-5	—	—	—	8.8E-02	2.0E+04	—	—	—	1.5E+00	1.5E+02
Dichlorofluoromethane	75-43-4	—	—	—	—	2.0E+05	—	—	—	1.5E+01	1.5E+03
Dichlorophenol, 2,3-	576-24-9	—	—	—	—	3.1E+03	6.1E+03	—	—	2.2E-01	2.2E+01
Dichlorophenol, 2,4-	120-83-2	—	—	—	—	3.1E+03	6.1E+03	—	—	2.2E-01	2.2E+01
Dichlorophenol, 2,5-	583-78-8	—	—	—	—	3.1E+03	6.1E+03	—	—	2.2E-01	2.2E+01
Dichlorophenol, 2,6-	87-65-0	—	—	—	—	1.0E+03	2.0E+03	—	—	7.3E-02	7.3E+00
Dichlorophenol, 3,4-	95-77-2	—	—	—	—	3.1E+03	6.1E+03	—	—	2.2E-01	2.2E+01
Dichlorophenol, 3,5-	591-35-5	—	—	—	—	3.1E+03	6.1E+03	—	—	2.2E-01	2.2E+01
Dichlorophenoxy, 2,4- butyric acid, 4- (2,4-DB)	94-82-6	—	—	—	—	8.2E+03	1.6E+04	—	—	5.8E-01	5.8E+01
Dichlorophenoxyacetic acid, 2,4- (2,4-D)	94-75-7	—	—	—	—	2.0E+05	8.2E+05	—	—	1.5E+01	1.5E+03
Dichloroprop (2-(2,4-dichlorophenoxy) propanoic acid)	120-36-5	—	—	—	—	1.0E+04	2.0E+04	—	—	7.3E-01	7.3E+01
Dichloropropane, 1,2-	78-87-5	4.4E-02	7.7E+02	—	5.8E-03	1.3E+05	—	5.5E-02	5.5E+00	9.5E+00	9.5E+02
Dichloropropane, 1,3-	142-28-9	1.0E-02	2.9E+02	—	2.9E-02	2.0E+04	—	2.0E-02	2.0E+00	1.5E+00	1.5E+02
Dichloropropane, 2,2-	594-20-7	—	4.2E+02	—	5.8E-03	9.2E+04	—	3.0E-02	3.0E+00	6.6E+00	6.6E+02

Table 10
Individual RBELs Commercial/Industrial

Last Revised: March 1, 2022

Chemical of Concern	CAS	Soil						Groundwater			
		Carcinogenic			Noncarcinogenic			Carcinogenic		Noncarcinogenic	
		Air RBEL _{Inh} (mg/m ³)	Soil RBEL _{Ing} (mg/kg)	Soil RBEL _{Derm} (mg/kg)	Air RBEL _{Inh} (mg/m ³)	Soil RBEL _{Ing} (mg/kg)	Soil RBEL _{Derm} (mg/kg)	GW RBEL _{Ing} ¹ (mg/L)	GW RBEL _{Class 3} ² (mg/L)	GW RBEL _{Ing} ¹ (mg/L)	GW RBEL _{Class 3} ² (mg/L)
Dichloropropanol, 2,3-	616-23-9	—	—	—	—	3.1E+03	6.1E+03	—	—	2.2E-01	2.2E+01
Dichloropropene, 1,1-	563-58-6	1.0E-02	2.9E+02	—	2.9E-02	3.1E+04	—	2.0E-02	2.0E+00	2.2E+00	2.2E+02
Dichloropropene, 1,3- (mixed isomers)	542-75-6	1.0E-02	2.9E+02	—	2.9E-02	3.1E+04	—	2.0E-02	2.0E+00	2.2E+00	2.2E+02
Dichloropropene, cis 1,3-	10061-01-5	—	5.3E+01	—	2.9E-02	1.0E+02	—	3.8E-03	3.8E-01	7.3E-03	7.3E-01
Dichloropropene, trans 1,3-	10061-02-6	1.0E-02	2.9E+02	—	2.9E-02	3.1E+04	—	2.0E-02	2.0E+00	2.2E+00	2.2E+02
Dichlorvos	62-73-7	—	9.9E+01	2.0E+02	7.3E-04	5.1E+02	1.0E+03	7.0E-03	7.0E-01	3.7E-02	3.7E+00
Dicrotophos (bidrin)	141-66-2	—	—	—	—	1.0E+02	2.0E+02	—	—	7.3E-03	7.3E-01
Dicyclopentadiene	77-73-6	—	—	—	—	8.2E+04	—	—	—	5.8E+00	5.8E+02
Dieldrin	60-57-1	8.9E-06	1.8E+00	3.6E+00	—	5.1E+01	1.0E+02	1.3E-04	1.3E-02	3.7E-03	3.7E-01
Diethanolamine	111-42-2	—	—	—	3.7E-02	5.1E+02	1.0E+03	—	—	3.7E-02	3.7E+00
Diethyldithiocarbamate, sodium salt	148-18-5	—	1.1E+02	—	—	3.1E+04	—	7.6E-03	7.6E-01	2.2E+00	2.2E+02
Diethyl phthalate	84-66-2	—	—	—	—	8.2E+05	1.0E+06	—	—	5.8E+01	5.8E+03
Diethylene glycol	111-46-6	—	—	—	—	1.0E+06	1.0E+06	—	—	1.5E+02	1.5E+04
Diethylene glycol monobutyl ether	112-34-5	—	—	—	1.5E-04	3.1E+04	6.1E+04	—	—	2.2E+00	2.2E+02
Diethylhexyl adipate	103-23-1	—	2.4E+04	4.8E+04	—	6.1E+05	1.0E+06	1.7E+00	1.7E+02	4.4E+01	4.4E+03
Diethylstilbestrol	56-53-1	—	6.1E-03	1.2E-02	—	—	—	4.3E-07	4.3E-05	—	—
Diisobutylene (trimethyl-1-pentene, 2,4,4-)	107-39-1	—	—	—	2.9E-01	6.1E+04	—	—	—	4.4E+00	4.4E+02
Diisopropylbenzene, p-	100-18-5	—	—	—	—	1.0E+04	2.0E+04	—	—	7.3E-01	7.3E+01
Diisopropyl ether (2,2'-oxybis-propane)	108-20-3	—	—	—	1.0E+00	1.0E+05	—	—	—	7.3E+00	7.3E+02
Dimethenamid	87674-68-8	—	—	—	—	1.5E+04	3.1E+04	—	—	1.1E+00	1.1E+02
Dimethoate	60-51-5	—	—	—	—	2.0E+02	4.1E+02	—	—	1.5E-02	1.5E+00
Dimethoxybenzidine, 3,3'-	119-90-4	—	2.0E+03	4.1E+03	—	—	—	1.5E-01	1.5E+01	—	—
Dimethyl-2-nitrobenzene, 1,3-	81-20-9	—	—	—	1.3E-02	2.0E+03	4.1E+03	—	—	1.5E-01	1.5E+01
Dimethyl-3-nitrobenzene, 1,2-	83-41-0	—	—	—	1.3E-02	2.0E+03	4.1E+03	—	—	1.5E-01	1.5E+01
Dimethyl-4-nitrobenzene, 1-2-	99-51-4	—	—	—	1.3E-02	2.0E+03	4.1E+03	—	—	1.5E-01	1.5E+01
Dimethyl-5-nitrobenzene, 1,3-	99-12-7	—	—	—	1.3E-02	2.0E+03	4.1E+03	—	—	1.5E-01	1.5E+01
Dimethylphenethylamine, alpha, alpha-	122-09-8	—	—	—	—	2.0E+03	4.1E+03	—	—	1.5E-01	1.5E+01
Dimethyl phenol, 2,4-	105-67-9	—	—	—	—	2.0E+04	4.1E+04	—	—	1.5E+00	1.5E+02
Dimethylaminoazobenzene, p-	60-11-7	—	—	—	—	1.0E+01	2.0E+01	—	—	7.3E-04	7.3E-02
Dimethylbenz-a-anthracene, 7,12-	57-97-6	1.7E-06	1.1E-01	1.8E-01	—	—	—	8.2E-06	8.2E-04	—	—
Dimethylbenzidine, 3,3'-	119-93-7	—	2.6E+00	5.2E+00	—	—	—	1.9E-04	1.9E-02	—	—
Dimethylformamide, N,N-	68-12-2	—	—	—	4.4E-02	1.0E+05	—	—	—	7.3E+00	7.3E+02
Dimethylnaphthalene, 1,3-	575-41-7	—	—	—	—	4.1E+04	6.3E+04	—	—	2.9E+00	2.9E+02
Dimethylphthalate	131-11-3	—	—	—	—	8.2E+05	1.0E+06	—	—	5.8E+01	5.8E+03

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Chemical of Concern	CAS	Soil						Groundwater			
		Carcinogenic			Noncarcinogenic			Carcinogenic		Noncarcinogenic	
		Air RBEL _{Inh} (mg/m ³)	Soil RBEL _{Ing} (mg/kg)	Soil RBEL _{Derm} (mg/kg)	Air RBEL _{Inh} (mg/m ³)	Soil RBEL _{Ing} (mg/kg)	Soil RBEL _{Derm} (mg/kg)	GW RBEL _{Ing} ¹ (mg/L)	GW RBEL _{Class 3} ² (mg/L)	GW RBEL _{Ing} ¹ (mg/L)	GW RBEL _{Class 3} ² (mg/L)
Di-n-butyl phthalate	84-74-2	—	—	—	—	1.0E+05	2.0E+05	—	—	7.3E+00	7.3E+02
Dinitro-2-methylphenol, 4,6- (dinitro-o-cresol, 4, 6-)	534-52-1	—	—	—	—	1.0E+02	2.0E+02	—	—	7.3E-03	7.3E-01
Dinitrobenzene, 1,3- (dinitrobenzene, 2,4-)	99-65-0	—	—	—	—	1.0E+02	2.0E+02	—	—	7.3E-03	7.3E-01
Dinitrobenzene, 1,4-	100-25-4	—	—	—	—	1.0E+02	2.0E+02	—	—	7.3E-03	7.3E-01
Dinitrophenol, 2,4-	51-28-5	—	—	—	—	2.0E+03	4.1E+03	—	—	1.5E-01	1.5E+01
Dinitrophenol, 2,5-	329-71-5	—	—	—	—	2.0E+03	4.1E+03	—	—	1.5E-01	1.5E+01
Dinitrotoluene, 2,4-	121-14-2	—	4.2E+01	8.4E+01	—	2.0E+03	4.1E+03	3.0E-03	3.0E-01	1.5E-01	1.5E+01
Dinitrotoluene, 2,6-	606-20-2	—	4.2E+01	8.4E+01	—	1.0E+03	2.0E+03	3.0E-03	3.0E-01	7.3E-02	7.3E+00
Di-n-octyl phthalate	117-84-0	—	—	—	—	1.0E+04	2.0E+04	—	—	7.3E-01	7.3E+01
Dinoseb	88-85-7	—	—	—	—	1.0E+03	2.0E+03	—	—	7.3E-02	7.3E+00
Dioxane 1,4-	123-91-1	8.2E-03	2.9E+02	—	1.6E-01	3.1E+04	—	2.0E-02	2.0E+00	2.2E+00	2.2E+02
Dioxin (as 2,3,7,8-TCDD toxicity equivalent quotients (TEQs))	1746-01-6	—	—	—	—	—	—	—	—	—	—
Diphenyl ether	101-84-8	—	—	—	—	6.3E+03	1.3E+04	—	—	4.5E-01	4.5E+01
Diphenylamine	122-39-4	—	—	—	—	2.6E+04	5.1E+04	—	—	1.8E+00	1.8E+02
Diphenylhydrazine, 1,2-	122-66-7	1.9E-04	3.6E+01	7.2E+01	—	—	—	2.6E-03	2.6E-01	—	—
Dipropylene glycol	110-98-5	—	—	—	—	1.2E+05	2.5E+05	—	—	8.8E+00	8.8E+02
Diquat	85-00-7	—	—	—	—	2.2E+03	4.5E+03	—	—	1.6E-01	1.6E+01
Disodium iminodiacetate (iminodiacetic acid, disodium salt)	142-73-4	—	—	—	—	1.0E+04	2.0E+04	—	—	7.3E-01	7.3E+01
Disulfoton	298-04-4	—	—	—	—	4.1E+01	8.2E+01	—	—	2.9E-03	2.9E-01
Diuron	330-54-1	—	—	—	—	2.0E+03	4.1E+03	—	—	1.5E-01	1.5E+01
Dodecylphenol, 4-	104-43-8	—	—	—	—	5.1E+04	1.0E+05	—	—	3.7E+00	3.7E+02
Endosulfan	115-29-7	—	—	—	—	6.1E+03	1.2E+04	—	—	4.4E-01	4.4E+01
Endosulfan I	959-98-8	—	—	—	—	2.0E+03	4.1E+03	—	—	1.5E-01	1.5E+01
Endosulfan II	33213-65-9	—	—	—	—	6.1E+03	1.2E+04	—	—	4.4E-01	4.4E+01
Endosulfan sulfate	1031-07-8	—	—	—	—	6.1E+03	1.2E+04	—	—	4.4E-01	4.4E+01
Endothall	145-73-3	—	—	—	—	2.0E+04	4.1E+04	—	—	1.5E+00	1.5E+02
Endrin	72-20-8	—	—	—	—	3.1E+02	6.1E+02	—	—	2.2E-02	2.2E+00
Endrin aldehyde	7421-93-4	—	—	—	—	3.1E+02	6.1E+02	—	—	2.2E-02	2.2E+00
Endrin ketone	53494-70-5	—	—	—	—	3.1E+02	6.1E+02	—	—	2.2E-02	2.2E+00
Epichlorohydrin	106-89-8	3.4E-02	2.9E+03	—	1.5E-03	6.1E+03	—	2.1E-01	2.1E+01	4.4E-01	4.4E+01
EPN (o-ethyl o-(4-nitrophenyl)phenylphosphonothioate)	2104-64-5	—	—	—	—	1.0E+01	2.0E+01	—	—	7.3E-04	7.3E-02
Esfenvalerate	66230-04-4	—	—	—	—	2.0E+03	4.1E+03	—	—	1.5E-01	1.5E+01
Ethalfuralin (sonolan)	55283-68-6	—	3.2E+02	6.4E+02	—	4.1E+04	8.2E+04	2.3E-02	2.3E+00	2.9E+00	2.9E+02
Ethanol	64-17-5	—	—	—	—	1.0E+06	—	—	—	2.4E+03	2.4E+05

Table 10
Individual RBELs Commercial/Industrial

Last Revised: March 1, 2022

Chemical of Concern	CAS	Soil						Groundwater			
		Carcinogenic			Noncarcinogenic			Carcinogenic		Noncarcinogenic	
		Air RBEL _{Inh} (mg/m ³)	Soil RBEL _{Ing} (mg/kg)	Soil RBEL _{Derm} (mg/kg)	Air RBEL _{Inh} (mg/m ³)	Soil RBEL _{Ing} (mg/kg)	Soil RBEL _{Derm} (mg/kg)	GW RBEL _{Ing} ¹ (mg/L)	GW RBEL _{Class 3} ² (mg/L)	GW RBEL _{Ing} ¹ (mg/L)	GW RBEL _{Class 3} ² (mg/L)
Ethanol, 2-amino-	141-43-5	—	—	—	3.4E-02	1.7E+03	3.5E+03	—	—	1.2E-01	1.2E+01
Ethanol, 2-(2-aminoethoxy)-	929-06-6	—	—	—	—	5.1E+02	1.0E+03	—	—	3.7E-02	3.7E+00
Ethanol, 2-(2-ethoxyethoxy)-	111-90-0	—	—	—	—	1.0E+06	1.0E+06	—	—	1.5E+02	1.5E+04
Ethanol, 2-(methylamino)-	109-83-1	—	—	—	6.7E-02	1.6E+04	3.3E+04	—	—	1.2E+00	1.2E+02
Ethion	563-12-2	—	—	—	—	5.1E+02	1.0E+03	—	—	3.7E-02	3.7E+00
Ethoprop	13194-48-4	—	1.0E+03	2.0E+03	—	1.0E+02	2.0E+02	7.3E-02	7.3E+00	7.3E-03	7.3E-01
Ethoxy ethanol, 2-	110-80-5	—	—	—	2.9E-01	9.2E+04	—	—	—	6.6E+00	6.6E+02
Ethyl acetate	141-78-6	—	—	—	3.4E-01	9.2E+05	—	—	—	6.6E+01	6.6E+03
Ethyl acrylate	140-88-5	—	6.0E+02	—	1.2E-02	5.1E+03	—	4.3E-02	4.3E+00	3.7E-01	3.7E+01
Ethyl benzene	100-41-4	—	—	—	2.8E+00	1.0E+05	—	—	—	7.3E+00	7.3E+02
Ethyl dipropylthiocarbamate, S-	759-94-4	—	—	—	—	2.6E+04	5.1E+04	—	—	1.8E+00	1.8E+02
Ethyl ether	60-29-7	—	—	—	—	2.0E+05	—	—	—	1.5E+01	1.5E+03
Ethyl methacrylate	97-63-2	—	—	—	4.4E-01	9.2E+04	—	—	—	6.6E+00	6.6E+02
Ethyl methanesulfonate	62-50-0	1.5E-03	2.9E+02	5.8E+02	—	—	—	2.1E-02	2.1E+00	—	—
Ethyl tert-butyl ether (2-ethyl-2-ethoxypropane)	637-92-3	—	—	—	4.4E-01	1.0E+03	—	—	—	7.3E-02	7.3E+00
Ethyl-1-hexanol, 2-	104-76-7	—	—	—	—	1.5E+05	3.1E+05	—	—	1.1E+01	1.1E+03
Ethyl-2-hexenal, 2-	645-62-5	—	—	—	—	1.5E+05	—	—	—	1.1E+01	1.1E+03
Ethyl-2-methyl benzene, 1-	611-14-3	—	—	—	5.8E-01	5.1E+04	—	—	—	3.7E+00	3.7E+02
Ethyl-4-methyl benzene, 1-	622-96-8	—	—	—	5.8E-01	5.1E+04	—	—	—	3.7E+00	3.7E+02
Ethylene*	74-85-1	—	—	—	—	—	—	—	—	—	—
Ethylene dibromide (dibromoethane, 1,2-)	106-93-4	9.3E-04	1.4E+01	—	9.8E-02	9.2E+03	—	1.0E-03	1.0E-01	6.6E-01	6.6E+01
Ethylene glycol	107-21-1	—	—	—	—	1.0E+06	1.0E+06	—	—	1.5E+02	1.5E+04
Ethylene oxide	75-21-8	2.9E-02	2.8E+01	—	—	—	—	2.0E-03	2.0E-01	—	—
Ethylene thiourea	96-45-7	—	2.6E+02	5.2E+02	—	8.2E+01	1.6E+02	1.9E-02	1.9E+00	5.8E-03	5.8E-01
Ethylenediamine	107-15-3	—	—	—	—	9.2E+04	—	—	—	6.6E+00	6.6E+02
Ethylenimine	151-56-4	2.2E-06	4.4E-01	—	—	—	—	3.1E-05	3.1E-03	—	—
Ethylhexyl acrylate, 2-	103-11-7	—	6.0E+02	1.2E+03	—	—	—	4.3E-02	4.3E+00	—	—
Famphur	52-85-7	—	—	—	—	3.1E+01	6.1E+01	—	—	2.2E-03	2.2E-01
Fensulfothion	115-90-2	—	—	—	—	1.0E+03	2.0E+03	—	—	7.3E-02	7.3E+00
Fenthion	55-38-9	—	—	—	—	7.2E+01	1.4E+02	—	—	5.1E-03	5.1E-01
Fenuron	101-42-8	—	—	—	—	7.2E+04	1.4E+05	—	—	5.1E+00	5.1E+02
Fluoranthene	206-44-0	—	—	—	—	4.1E+04	6.3E+04	—	—	2.9E+00	2.9E+02
Fluorene	86-73-7	—	—	—	—	4.1E+04	6.3E+04	—	—	2.9E+00	2.9E+02
Fluorine (soluble fluoride)	7782-41-4	—	—	—	3.9E-02	6.1E+04	1.0E+06	—	—	4.4E+00	4.4E+02

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Individual RBELs Commercial/Industrial

Last Revised: March 1, 2022

Chemical of Concern	CAS	Soil						Groundwater			
		Carcinogenic			Noncarcinogenic			Carcinogenic		Noncarcinogenic	
		Air RBEL _{Inh} (mg/m ³)	Soil RBEL _{Ing} (mg/kg)	Soil RBEL _{Derm} (mg/kg)	Air RBEL _{Inh} (mg/m ³)	Soil RBEL _{Ing} (mg/kg)	Soil RBEL _{Derm} (mg/kg)	GW RBEL _{Ing} ¹ (mg/L)	GW RBEL _{Class 3} ² (mg/L)	GW RBEL _{Ing} ¹ (mg/L)	GW RBEL _{Class 3} ² (mg/L)
Fluorochloridone	61213-25-0	—	—	—	—	7.7E+03	1.5E+04	—	—	5.5E-01	5.5E+01
Fonofos	944-22-9	—	—	—	—	2.0E+03	4.1E+03	—	—	1.5E-01	1.5E+01
Formaldehyde	50-00-0	—	—	—	1.6E-02	2.0E+05	—	—	—	1.5E+01	1.5E+03
Formic acid	64-18-6	—	—	—	4.4E-03	9.2E+05	—	—	—	6.6E+01	6.6E+03
Furan	110-00-9	—	—	—	—	1.0E+03	—	—	—	7.3E-02	7.3E+00
Furfural	98-01-1	—	—	—	—	3.1E+03	—	—	—	2.2E-01	2.2E+01
Glycidylaldehyde	765-34-4	—	—	—	1.5E-03	4.1E+02	—	—	—	2.9E-02	2.9E+00
Glyphosate	1071-83-6	—	—	—	—	1.0E+06	1.0E+06	—	—	7.3E+01	7.3E+03
Heptachlor	76-44-8	3.1E-05	6.4E+00	1.3E+01	—	5.1E+02	1.0E+03	4.5E-04	4.5E-02	3.7E-02	3.7E+00
Heptachlor epoxide	1024-57-3	1.6E-05	3.1E+00	6.3E+00	—	1.3E+01	2.7E+01	2.2E-04	2.2E-02	9.5E-04	9.5E-02
Heptane, n-	142-82-5	—	—	—	1.3E+01	6.1E+04	—	—	—	4.4E+00	4.4E+02
Heptanoic acid, n-	111-14-8	—	—	—	1.5E-03	5.1E+05	1.0E+06	—	—	3.7E+01	3.7E+03
Hexachlorobenzene	118-74-1	8.9E-05	1.8E+01	3.6E+01	—	8.2E+02	1.6E+03	1.3E-03	1.3E-01	5.8E-02	5.8E+00
Hexachlorobutadiene	87-68-3	1.9E-03	3.7E+02	7.3E+02	—	1.0E+03	2.0E+03	2.6E-02	2.6E+00	7.3E-02	7.3E+00
Hexachlorocyclohexane, alpha (alpha-BHC)	319-84-6	2.3E-05	4.5E+00	2.3E+01	—	8.2E+03	4.1E+04	3.2E-04	3.2E-02	5.8E-01	5.8E+01
Hexachlorocyclohexane, beta (beta-BHC)	319-85-7	7.7E-05	1.6E+01	7.9E+01	—	—	—	1.1E-03	1.1E-01	—	—
Hexachlorocyclohexane, delta (delta-BHC)	319-86-8	8.0E-05	1.6E+01	7.9E+01	—	3.1E+02	1.5E+03	1.1E-03	1.1E-01	2.2E-02	2.2E+00
Hexachlorocyclohexane, gamma (lindane; gamma-BHC)	58-89-9	—	2.2E+01	1.1E+02	—	3.1E+02	1.5E+03	1.6E-03	1.6E-01	2.2E-02	2.2E+00
Hexachlorocyclohexane, techn (technical-BHC)	608-73-1	8.0E-05	1.6E+01	7.9E+01	—	—	—	1.1E-03	1.1E-01	—	—
Hexachlorocyclopentadiene	77-47-4	—	—	—	2.9E-04	6.1E+03	1.2E+04	—	—	4.4E-01	4.4E+01
Hexachloroethane	67-72-1	—	7.2E+02	1.4E+03	4.4E-02	7.2E+02	1.4E+03	5.1E-02	5.1E+00	5.1E-02	5.1E+00
Hexachlorophene	70-30-4	—	—	—	—	3.1E+02	6.1E+02	—	—	2.2E-02	2.2E+00
Hexachloropropylene	1888-71-7	—	7.2E+02	1.4E+03	4.4E-02	7.2E+02	1.4E+03	5.1E-02	5.1E+00	5.1E-02	5.1E+00
Hexanal, 2-ethyl-	123-05-7	—	—	—	—	1.5E+05	3.1E+05	—	—	1.1E+01	1.1E+03
Hexane, n-	110-54-3	—	—	—	9.8E-01	6.1E+04	—	—	—	4.4E+00	4.4E+02
Hexanediamine, 1,6-	124-09-4	—	—	—	—	5.1E+03	1.0E+04	—	—	3.7E-01	3.7E+01
Hexanedinitrile	111-69-3	—	—	—	8.8E-03	1.4E+03	2.9E+03	—	—	1.0E-01	1.0E+01
Hexanediol, 1,6-	629-11-8	—	—	—	2.7E+01	1.0E+06	1.0E+06	—	—	3.7E+02	3.7E+04
Hexanoic acid	142-62-1	—	—	—	1.5E-03	6.5E+04	1.3E+05	—	—	4.7E+00	4.7E+02
Hexanone, 2-	591-78-6	—	—	—	4.4E-02	5.1E+04	—	—	—	3.7E+00	3.7E+02
Hexazinone	51235-04-2	—	—	—	—	3.4E+04	6.7E+04	—	—	2.4E+00	2.4E+02
Hexene, 1-	592-41-6	—	—	—	1.6E-01	3.4E+05	—	—	—	2.4E+01	2.4E+03
Hexene, cis-2-	7688-21-3	—	—	—	1.6E-01	3.4E+05	—	—	—	2.4E+01	2.4E+03
Hexylene glycol (2-methyl-2,4-pentanediol)	107-41-5	—	—	—	—	3.1E+05	6.1E+05	—	—	2.2E+01	2.2E+03

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Last Revised: March 1, 2022

Chemical of Concern	CAS	Soil						Groundwater			
		Carcinogenic			Noncarcinogenic			Carcinogenic		Noncarcinogenic	
		Air RBEL _{Inh} (mg/m ³)	Soil RBEL _{Ing} (mg/kg)	Soil RBEL _{Derm} (mg/kg)	Air RBEL _{Inh} (mg/m ³)	Soil RBEL _{Ing} (mg/kg)	Soil RBEL _{Derm} (mg/kg)	GW RBEL _{Ing} ¹ (mg/L)	GW RBEL _{Class 3} ² (mg/L)	GW RBEL _{Ing} ¹ (mg/L)	GW RBEL _{Class 3} ² (mg/L)
Hydrazine	302-01-2	8.3E-06	9.5E+00	—	4.4E-05	—	—	6.8E-04	6.8E-02	—	—
Hydrocaproic acid, 6- (6-hydroxyhexanoic acid)	1191-25-9	—	—	—	1.5E-03	6.5E+04	1.3E+05	—	—	4.7E+00	4.7E+02
Hydrogen chloride (hydrochloric acid)*	7647-01-0	—	—	—	—	—	—	—	—	—	—
Hydroquinone	123-31-9	—	4.8E+02	9.5E+02	—	4.1E+04	8.2E+04	3.4E-02	3.4E+00	2.9E+00	2.9E+02
Indene	95-13-6	—	—	—	4.4E-03	2.0E+04	—	—	—	1.5E+00	1.5E+02
Indeno-1,2,3-cd-pyrene	193-39-5	6.8E-04	2.9E+02	4.4E+02	—	—	—	2.0E-02	2.0E+00	—	—
Iron*	7439-89-6	—	—	—	—	—	—	—	—	—	—
Isoamyl alcohol	123-51-3	—	—	—	—	5.1E+03	—	—	—	3.7E-01	3.7E+01
Isobutyl alcohol	78-83-1	—	—	—	—	3.1E+05	—	—	—	2.2E+01	2.2E+03
Isobutylene (2-methyl-1-propene)	115-11-7	—	—	—	1.6E+02	3.8E+03	—	—	—	2.7E-01	2.7E+01
Isobutyric acid (2-methylpropanoic acid)	79-31-2	—	—	—	—	5.1E+05	1.0E+06	—	—	3.7E+01	3.7E+03
Isodecanol	25339-17-7	—	—	—	—	1.6E+03	3.3E+03	—	—	1.2E-01	1.2E+01
Isodrin	465-73-6	8.3E-07	1.7E-01	3.4E-01	—	3.1E+00	6.1E+00	1.2E-05	1.2E-03	2.2E-04	2.2E-02
Isopentane	78-78-4	—	—	—	3.5E+01	6.1E+04	—	—	—	4.4E+00	4.4E+02
Isophorone	78-59-1	—	3.0E+04	6.0E+04	—	2.0E+05	4.1E+05	2.2E+00	2.2E+02	1.5E+01	1.5E+03
Isopropyl acetate	108-21-4	—	—	—	—	7.2E+04	—	—	—	5.1E+00	5.1E+02
Isopropyl alcohol	67-63-0	—	—	—	2.9E-01	1.0E+06	—	—	—	1.5E+02	1.5E+04
Isosafrole	120-58-1	6.5E-04	1.3E+02	2.6E+02	—	—	—	9.3E-03	9.3E-01	—	—
Kelthane (dicofol)	115-32-2	—	—	—	—	6.1E+03	1.2E+04	—	—	4.4E-01	4.4E+01
Kepone (chlordecone)	143-50-0	8.9E-06	2.9E+00	5.7E+00	—	3.1E+02	6.1E+02	2.0E-04	2.0E-02	2.2E-02	2.2E+00
Lead (inorganic)	7439-92-1	—	—	—	—	—	—	—	—	—	—
Leptophos	21609-90-5	—	—	—	2.6E-06	5.1E+00	1.0E+01	—	—	3.7E-04	3.7E-02
Limonene, d-*	5989-27-5	—	—	—	—	—	—	—	—	—	—
Lithium	7439-93-2	—	—	—	—	7.2E+03	1.4E+05	—	—	5.1E-01	5.1E+01
Magnesium*	7439-95-4	—	—	—	—	—	—	—	—	—	—
Malathion	121-75-5	—	—	—	2.9E-04	2.0E+04	4.1E+04	—	—	1.5E+00	1.5E+02
Maleic anhydride	108-31-6	—	—	—	—	1.0E+05	2.0E+05	—	—	7.3E+00	7.3E+02
Maleic hydrazide	123-33-1	—	—	—	—	5.1E+05	1.0E+06	—	—	3.7E+01	3.7E+03
Malononitrile	109-77-3	—	—	—	—	1.0E+02	2.0E+02	—	—	7.3E-03	7.3E-01
Mancozeb	8018-01-7	—	—	—	—	3.1E+04	6.1E+04	—	—	2.2E+00	2.2E+02
Manganese	7439-96-5	—	—	—	1.2E-03	1.4E+05	1.7E+05	—	—	1.0E+01	1.0E+03
MCPA (4-(chloro-2-methylphenoxy) acetic acid)	94-74-6	—	—	—	—	5.1E+02	1.0E+03	—	—	3.7E-02	3.7E+00
MCPP (2-(4-chloro-2-methylphenoxy) propanoic acid)	93-65-2	—	—	—	—	1.0E+03	2.0E+03	—	—	7.3E-02	7.3E+00
Mercury (pH = 4.9)	7439-97-6	—	—	—	4.4E-04	3.1E+02	4.3E+02	—	—	2.2E-02	2.2E+00

Table 10
Individual RBELs Commercial/Industrial

Last Revised: March 1, 2022

Chemical of Concern	CAS	Soil						Groundwater			
		Carcinogenic			Noncarcinogenic			Carcinogenic		Noncarcinogenic	
		Air RBEL _{Inh} (mg/m ³)	Soil RBEL _{Ing} (mg/kg)	Soil RBEL _{Derm} (mg/kg)	Air RBEL _{Inh} (mg/m ³)	Soil RBEL _{Ing} (mg/kg)	Soil RBEL _{Derm} (mg/kg)	GW RBEL _{Ing} ¹ (mg/L)	GW RBEL _{Class 3} ² (mg/L)	GW RBEL _{Ing} ¹ (mg/L)	GW RBEL _{Class 3} ² (mg/L)
Mercury (pH=6.8)	7439-97-6	—	—	—	4.4E-04	3.1E+02	4.3E+02	—	—	2.2E-02	2.2E+00
Merphos	150-50-5	—	—	—	—	3.1E+01	6.1E+01	—	—	2.2E-03	2.2E-01
Methacrylic acid (2-methyl-2-propenoic acid)	79-41-4	—	—	—	—	1.0E+04	—	—	—	7.3E-01	7.3E+01
Methacrylonitrile	126-98-7	—	—	—	4.4E-02	5.1E+04	—	—	—	3.7E+00	3.7E+02
Methanol	67-56-1	—	—	—	1.1E+01	1.0E+06	—	—	—	1.5E+02	1.5E+04
Methapyrilene	91-80-5	—	6.1E+00	1.2E+01	—	—	—	4.3E-04	4.3E-02	—	—
Methomyl	16752-77-5	—	—	—	—	2.6E+04	5.1E+04	—	—	1.8E+00	1.8E+02
Methoxychlor	72-43-5	—	—	—	—	5.1E+03	1.0E+04	—	—	3.7E-01	3.7E+01
Methoxyethanol, 2-	109-86-4	—	—	—	2.9E-02	2.8E+04	—	—	—	2.0E+00	2.0E+02
Methyl acetate (acetic acid, methyl ester)	79-20-9	—	—	—	—	1.0E+06	—	—	—	7.3E+01	7.3E+03
Methyl acrylate	96-33-3	—	—	—	2.9E-02	2.0E+03	—	—	—	1.5E-01	1.5E+01
Methyl amyl ketone (2-heptanone)	110-43-0	—	—	—	4.1E+00	5.1E+04	—	—	—	3.7E+00	3.7E+02
Methyl chrysene, 1-	3351-28-8	4.6E-02	3.9E+03	6.0E+03	—	—	—	2.8E-01	2.8E+01	—	—
Methyl chrysene, 2-	3351-32-4	4.6E-02	3.9E+03	6.0E+03	—	—	—	2.8E-01	2.8E+01	—	—
Methyl chrysene, 6-	1705-85-7	4.6E-03	3.9E+02	6.0E+02	—	—	—	2.8E-02	2.8E+00	—	—
Methyl cyclohexane	108-87-2	—	—	—	4.4E+00	1.0E+06	—	—	—	3.7E+02	3.7E+04
Methyl ethyl ketone (2-butanone)	78-93-3	—	—	—	1.3E+01	6.1E+05	—	—	—	4.4E+01	4.4E+03
Methyl iodide (iodomethane)	74-88-4	—	—	—	—	1.4E+03	—	—	—	1.0E-01	1.0E+01
Methyl isobutyl ketone (4-methyl-2-pentanone)	108-10-1	—	—	—	4.4E+00	8.2E+04	—	—	—	5.8E+00	5.8E+02
Methyl mercury	22967-92-6	—	—	—	—	1.0E+02	2.0E+03	—	—	7.3E-03	7.3E-01
Methyl methacrylate	80-62-6	—	—	—	1.0E+00	1.0E+06	—	—	—	1.0E+02	1.0E+04
Methyl methanesulfonate	66-27-3	1.5E-03	2.9E+02	5.8E+02	—	—	—	2.1E-02	2.1E+00	—	—
Methyl parathion	298-00-0	—	—	—	—	2.6E+02	5.1E+02	—	—	1.8E-02	1.8E+00
Methyl-1-butene, 2-	563-46-2	—	—	—	2.6E+01	6.1E+04	—	—	—	4.4E+00	4.4E+02
Methyl-1-propanal, 2- (isobutyraldehyde)	78-84-2	—	—	—	—	4.1E+04	—	—	—	2.9E+00	2.9E+02
Methyl-2-butene, 2-	513-35-9	—	—	—	2.6E+01	6.1E+04	—	—	—	4.4E+00	4.4E+02
Methyl-2-pentenal, 2-	623-36-9	—	1.5E+01	—	—	—	—	1.1E-03	1.1E-01	—	—
Methylcholanthrene, 3-	56-49-5	1.9E-05	1.3E+00	2.0E+00	—	—	—	9.3E-05	9.3E-03	—	—
Methylene bromide (dibromomethane)	74-95-3	—	3.8E+03	—	5.8E-03	6.1E+04	—	2.7E-01	2.7E+01	4.4E+00	4.4E+02
Methylene chloride (dichloromethane)	75-09-2	1.5E+00	2.9E+05	—	1.9E+00	2.1E+04	—	2.1E+01	2.1E+03	1.5E+00	1.5E+02
Methylene-bis (2-chloroaniline) 4,4'-	101-14-4	1.1E-03	2.9E+02	5.7E+02	—	2.0E+03	4.1E+03	2.0E-02	2.0E+00	1.5E-01	1.5E+01
Methylmercury hydroxide	1184-57-2	—	—	—	—	1.0E+02	2.0E+02	—	—	7.3E-03	7.3E-01
Methylnaphthalene, 1-	90-12-0	—	9.9E+02	1.5E+03	—	7.2E+04	1.1E+05	7.0E-02	7.0E+00	5.1E+00	5.1E+02
Methylnaphthalene, 2-	91-57-6	—	—	—	—	4.1E+03	6.3E+03	—	—	2.9E-01	2.9E+01

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Individual RBELs Commercial/Industrial

Last Revised: March 1, 2022

Chemical of Concern	CAS	Soil						Groundwater			
		Carcinogenic			Noncarcinogenic			Carcinogenic		Noncarcinogenic	
		Air RBEL _{Inh} (mg/m ³)	Soil RBEL _{Ing} (mg/kg)	Soil RBEL _{Derm} (mg/kg)	Air RBEL _{Inh} (mg/m ³)	Soil RBEL _{Ing} (mg/kg)	Soil RBEL _{Derm} (mg/kg)	GW RBEL _{Ing} ¹ (mg/L)	GW RBEL _{Class 3} ² (mg/L)	GW RBEL _{Ing} ¹ (mg/L)	GW RBEL _{Class 3} ² (mg/L)
Methylpyrrolidone, N-	872-50-4	—	—	—	—	2.0E+04	4.1E+04	—	—	1.5E+00	1.5E+02
Methylstyrene, alpha-	98-83-9	—	—	—	3.7E-02	8.5E+03	—	—	—	6.1E-01	6.1E+01
Methyltetrahydrofuran, 2-	96-47-9	2.2E-02	3.8E+03	—	—	2.0E+05	—	2.7E-01	2.7E+01	1.5E+01	1.5E+03
Methyltetrahydropyran, 2-	10141-72-7	2.2E-02	3.8E+03	—	—	2.0E+05	—	2.7E-01	2.7E+01	1.5E+01	1.5E+03
Metolachlor	51218-45-2	—	—	—	—	1.5E+05	3.1E+05	—	—	1.1E+01	1.1E+03
Metribuzin	21087-64-9	—	—	—	—	2.6E+04	5.1E+04	—	—	1.8E+00	1.8E+02
Mirex	2385-85-5	—	—	—	—	2.0E+02	4.1E+02	—	—	1.5E-02	1.5E+00
Molinate	2212-67-1	—	—	—	—	2.0E+03	4.1E+03	—	—	1.5E-01	1.5E+01
Molybdenum	7439-98-7	—	—	—	—	5.1E+03	3.9E+04	—	—	3.7E-01	3.7E+01
Monocrotophos	2157-98-4	—	—	—	—	6.1E+02	1.2E+03	—	—	4.4E-02	4.4E+00
Morpholine	110-91-8	—	—	—	—	1.0E+06	—	—	—	3.7E+04	3.7E+06
Morpholine, N-butyl-	1005-67-0	—	—	—	—	2.4E+03	4.7E+03	—	—	1.7E-01	1.7E+01
MTBE (methyl tert-butyl ether)	1634-04-4	1.6E-01	1.6E+04	—	4.4E+00	1.0E+04	—	1.1E+00	1.1E+02	7.3E-01	7.3E+01
Naled	300-76-5	—	—	—	—	2.0E+03	4.1E+03	—	—	1.5E-01	1.5E+01
Naphthalene	91-20-3	—	—	—	4.4E-03	2.0E+04	3.1E+04	—	—	1.5E+00	1.5E+02
Naphthoquinone, 1,4-	130-15-4	—	—	—	—	7.2E+03	1.4E+04	—	—	5.1E-01	5.1E+01
Naphthylamine, 1-	134-32-7	—	—	—	—	2.0E+04	4.1E+04	—	—	1.5E+00	1.5E+02
Naphthylamine, 2-	91-59-8	—	1.6E+01	3.2E+01	—	—	—	1.1E-03	1.1E-01	—	—
Napropamide	15299-99-7	—	—	—	—	1.0E+05	2.0E+05	—	—	7.3E+00	7.3E+02
Neopentyl glycol	126-30-7	—	—	—	—	3.1E+05	6.1E+05	—	—	2.2E+01	2.2E+03
Nickel and compounds	7440-02-0	2.4E-04	—	—	3.4E-04	2.0E+04	1.6E+04	—	—	1.5E+00	1.5E+02
Nitrate-N	14797-55-8	—	—	—	—	1.0E+06	1.0E+06	—	—	1.2E+02	1.2E+04
Nitrite-N	14797-65-0	—	—	—	—	1.0E+05	1.0E+06	—	—	7.3E+00	7.3E+02
Nitroaniline, 2-	88-74-4	—	—	—	2.9E-04	3.1E+02	6.1E+02	—	—	2.2E-02	2.2E+00
Nitroaniline, 3-	99-09-2	—	7.5E+02	1.5E+03	2.9E-04	3.1E+02	6.1E+02	5.4E-02	5.4E+00	2.2E-02	2.2E+00
Nitroaniline, 4-	100-01-6	—	1.4E+03	2.9E+03	8.8E-03	4.1E+03	8.2E+03	1.0E-01	1.0E+01	2.9E-01	2.9E+01
Nitrobenzene	98-95-3	1.0E-03	—	—	1.3E-02	2.0E+03	4.1E+03	—	—	1.5E-01	1.5E+01
Nitroglycerin	55-63-0	—	1.7E+03	3.4E+03	—	1.0E+02	2.0E+02	1.2E-01	1.2E+01	7.3E-03	7.3E-01
Nitrophenol, 2-	88-75-5	—	—	—	—	2.0E+03	4.1E+03	—	—	1.5E-01	1.5E+01
Nitrophenol, 3-	554-84-7	—	—	—	—	2.0E+03	4.1E+03	—	—	1.5E-01	1.5E+01
Nitrophenol, 4-	100-02-7	—	—	—	—	2.0E+03	4.1E+03	—	—	1.5E-01	1.5E+01
Nitropropane, 2-	79-46-9	7.0E-05	—	—	2.9E-02	1.4E+02	—	—	—	1.0E-02	1.0E+00
Nitroquinoline-N-oxide, 4-	56-57-5	1.5E-05	3.0E+00	6.1E+00	—	—	—	2.2E-04	2.2E-02	—	—
Nitrosodiethanolamine	1116-54-7	—	1.0E+01	2.0E+01	—	—	—	7.3E-04	7.3E-02	—	—

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Last Revised: March 1, 2022

Chemical of Concern	CAS	Soil						Groundwater			
		Carcinogenic			Noncarcinogenic			Carcinogenic		Noncarcinogenic	
		Air RBEL _{Inh} (mg/m ³)	Soil RBEL _{Ing} (mg/kg)	Soil RBEL _{Derm} (mg/kg)	Air RBEL _{Inh} (mg/m ³)	Soil RBEL _{Ing} (mg/kg)	Soil RBEL _{Derm} (mg/kg)	GW RBEL _{Ing} ¹ (mg/L)	GW RBEL _{Class 3} ² (mg/L)	GW RBEL _{Ing} ¹ (mg/L)	GW RBEL _{Class 3} ² (mg/L)
Nitrosodiethylamine, n-	55-18-5	9.5E-07	1.9E-01	—	—	—	—	1.4E-05	1.4E-03	—	—
Nitrosodimethylamine, n-	62-75-9	2.9E-06	5.6E-01	—	5.8E-05	8.2E+00	—	4.0E-05	4.0E-03	5.8E-04	5.8E-02
Nitrosodi-n-butylamine, n-	924-16-3	2.6E-05	5.3E+00	1.1E+01	—	—	—	3.8E-04	3.8E-02	—	—
Nitrosodi-n-propylamine, n-	621-64-7	—	4.1E+00	2.0E+00	—	—	—	2.9E-04	2.9E-02	—	—
Nitrosodiphenylamine	86-30-6	—	5.8E+03	2.9E+03	—	—	—	4.2E-01	4.2E+01	—	—
Nitroso-methyl-ethyl-amine, n-	10595-95-6	—	1.3E+00	—	—	—	—	9.3E-05	9.3E-03	—	—
Nitrosomorpholine, N-	59-89-2	2.2E-05	4.3E+00	8.5E+00	—	—	—	3.1E-04	3.1E-02	—	—
Nitroso-n-ethylurea, n-	759-73-9	—	2.0E-01	4.1E-01	—	—	—	1.5E-05	1.5E-03	—	—
Nitrosopiperidine, N-	100-75-4	1.5E-05	3.0E+00	6.1E+00	—	—	—	2.2E-04	2.2E-02	—	—
Nitrosopyrrolidine, n-	930-55-2	6.7E-05	1.4E+01	2.7E+01	—	—	—	9.7E-04	9.7E-02	—	—
Nitrotoluene, m-	99-08-1	—	—	—	—	1.0E+04	2.0E+04	—	—	7.3E-01	7.3E+01
Nitrotoluene, o-	88-72-2	—	1.3E+02	2.6E+02	—	9.2E+02	1.8E+03	9.3E-03	9.3E-01	6.6E-02	6.6E+00
Nitrotoluene, p-	99-99-0	—	1.8E+03	3.6E+03	—	4.1E+03	8.2E+03	1.3E-01	1.3E+01	2.9E-01	2.9E+01
Nonachlor, cis-	5103-73-1	4.1E-04	8.2E+01	1.6E+02	1.0E-03	5.1E+02	1.0E+03	5.8E-03	5.8E-01	3.7E-02	3.7E+00
Nonachlor, trans-	39765-80-5	4.1E-04	8.2E+01	1.6E+02	1.0E-03	5.1E+02	1.0E+03	5.8E-03	5.8E-01	3.7E-02	3.7E+00
Nonanal	124-19-6	—	—	—	—	2.0E+05	4.1E+05	—	—	1.5E+01	1.5E+03
Nonene, 1-n	124-11-8	—	—	—	—	1.0E+05	—	—	—	7.3E+00	7.3E+02
Nonylphenol, 4-n-	104-40-5	—	—	—	—	1.0E+05	2.0E+05	—	—	7.3E+00	7.3E+02
Nonylphenol ethoxylate	9016-45-9	—	—	—	—	1.0E+05	2.0E+05	—	—	7.3E+00	7.3E+02
Octamethylpyrophosphoramidate	152-16-9	—	—	—	—	2.0E+03	4.1E+03	—	—	1.5E-01	1.5E+01
Octanone	106-68-3	—	—	—	2.6E+01	6.1E+04	—	—	—	4.4E+00	4.4E+02
Oxamyl	23135-22-0	—	—	—	—	2.6E+04	5.1E+04	—	—	1.8E+00	1.8E+02
Oxychlorane	27304-13-8	4.1E-04	8.2E+01	1.6E+02	1.0E-03	5.1E+02	1.0E+03	5.8E-03	5.8E-01	3.7E-02	3.7E+00
Paraquat	1910-42-5	—	—	—	—	4.6E+03	9.2E+03	—	—	3.3E-01	3.3E+01
Parathion (ethyl parathion)	56-38-2	—	—	—	—	6.1E+03	1.2E+04	—	—	4.4E-01	4.4E+01
Pebulate	1114-71-2	—	—	—	—	5.1E+04	1.0E+05	—	—	3.7E+00	3.7E+02
Pendimethalin	40487-42-1	—	—	—	—	4.1E+04	8.2E+04	—	—	2.9E+00	2.9E+02
Pentachlorobenzene	608-93-5	—	—	—	—	8.2E+02	1.6E+03	—	—	5.8E-02	5.8E+00
Pentachloroethane	76-01-7	5.5E-03	3.2E+02	—	—	3.1E+04	—	2.3E-02	2.3E+00	2.2E+00	2.2E+02
Pentachloronitrobenzene	82-68-8	—	1.1E+02	2.2E+02	—	3.1E+03	6.1E+03	7.9E-03	7.9E-01	2.2E-01	2.2E+01
Pentachlorophenol	87-86-5	—	7.2E+01	5.7E+01	—	5.1E+03	4.1E+03	5.1E-03	5.1E-01	3.7E-01	3.7E+01
Pentadiene, 1,3-cis-	1574-41-0	—	—	—	2.6E+01	6.1E+04	—	—	—	4.4E+00	4.4E+02
Pentadiene, 1,3-trans-	2004-70-8	—	—	—	2.6E+01	6.1E+04	—	—	—	4.4E+00	4.4E+02
Pentaerythritol tetranitrate (PETN)	78-11-5	—	—	—	—	2.0E+03	4.1E+03	—	—	1.5E-01	1.5E+01

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Last Revised: March 1, 2022

Chemical of Concern	CAS	Soil						Groundwater			
		Carcinogenic			Noncarcinogenic			Carcinogenic		Noncarcinogenic	
		Air RBEL _{Inh} (mg/m ³)	Soil RBEL _{Ing} (mg/kg)	Soil RBEL _{Derm} (mg/kg)	Air RBEL _{Inh} (mg/m ³)	Soil RBEL _{Ing} (mg/kg)	Soil RBEL _{Derm} (mg/kg)	GW RBEL _{Ing} ¹ (mg/L)	GW RBEL _{Class 3} ² (mg/L)	GW RBEL _{Ing} ¹ (mg/L)	GW RBEL _{Class 3} ² (mg/L)
Pentane	109-66-0	—	—	—	3.5E+01	6.1E+04	—	—	—	4.4E+00	4.4E+02
Pentane, 2-methyl-	107-83-5	—	—	—	2.6E+01	6.1E+04	—	—	—	4.4E+00	4.4E+02
Pentane, 3-methyl-	96-14-0	—	—	—	2.6E+01	6.1E+04	—	—	—	4.4E+00	4.4E+02
Pentanediol, 1,5-	111-29-5	—	—	—	2.7E+01	1.0E+06	1.0E+06	—	—	3.7E+02	3.7E+04
Pentanol, 1-	71-41-0	—	—	—	—	3.4E+04	—	—	—	2.4E+00	2.4E+02
Pentanol, 4-methyl-2-	108-11-2	—	—	—	—	2.7E+04	—	—	—	1.9E+00	1.9E+02
Pentanone, 2-	107-87-9	—	—	—	—	4.1E+04	—	—	—	2.9E+00	2.9E+02
Pentene, 2-	109-68-2	—	—	—	2.6E+01	6.1E+04	—	—	—	4.4E+00	4.4E+02
Pentyne, 1-	627-19-0	—	—	—	2.6E+01	6.1E+04	—	—	—	4.4E+00	4.4E+02
Perchlorate	14797-73-0	—	—	—	—	7.2E+02	2.9E+03	—	—	5.1E-02	5.1E+00
Perfluorooctane sulfonic acid (1-Octanesulfonic acid, heptadecafluoro-1-) [PFOS]	1763-23-1	—	—	—	1.2E-04	2.4E+01	4.7E+01	—	—	1.7E-03	1.7E-01
Perfluoroundecanoic acid (Undecanoic acid, uncosafluoro-) [PFUnDa]	2058-94-8	—	—	—	—	1.2E+01	2.5E+01	—	—	8.8E-04	8.8E-02
Perfluoropentanoic acid (Pentanoic acid, nonafluoro-) [PFPeA]	2706-90-3	—	—	—	—	3.9E+00	7.8E+00	—	—	2.8E-04	2.8E-02
Perfluorohexanoic acid (Hexanoic acid, undecafluoro-) [PFHxA]	307-24-4	—	—	—	—	3.9E+00	7.8E+00	—	—	2.8E-04	2.8E-02
Perfluorododecanoic acid (Dodecanoic acid, tricosafuoro-) [PFDoA]	307-55-1	—	—	—	6.1E-05	1.2E+01	2.5E+01	—	—	8.8E-04	8.8E-02
Perfluorooctanoic acid (Octanoic acid, pentadecafluoro-) [PFOA]	335-67-1	—	—	—	6.0E-06	1.2E+01	2.5E+01	—	—	8.8E-04	8.8E-02
Perfluorodecanoic acid (Decanoic acid, nonadecafluoro-) [PFDA]	335-76-2	—	—	—	7.7E-05	1.5E+01	3.1E+01	—	—	1.1E-03	1.1E-01
Perfluorodecane sulfonic acid (1-Decanesulfonic acid, heneicosafluoro-) [PFDS]	335-77-3	—	—	—	—	1.2E+01	2.5E+01	—	—	8.8E-04	8.8E-02
Perfluorohexane sulfonic acid (1-Hexanesulfonic acid, tridecafluoro-) [PFHxS]	355-46-4	—	—	—	1.9E-05	3.9E+00	7.8E+00	—	—	2.8E-04	2.8E-02
Perfluorobutyric acid (Butanoic acid, heptafluoro-) [PFBA]	375-22-4	—	—	—	1.5E-02	3.0E+03	5.9E+03	—	—	2.1E-01	2.1E+01
Perfluorobutane sulfonic acid (1-Butanesulfonic acid, nonafluoro-) [PFBS]	375-73-5	—	—	—	7.2E-03	1.4E+03	2.9E+03	—	—	1.0E-01	1.0E+01
Perfluoroheptanoic acid (Heptanoic acid, tridecafluoro-) [PFHpA]	375-85-9	—	—	—	—	2.4E+01	4.7E+01	—	—	1.7E-03	1.7E-01
Perfluorononanoic acid (Nonanoic acid, heptadecafluoro-) [PFNA]	375-95-1	—	—	—	4.1E-05	1.2E+01	2.5E+01	—	—	8.8E-04	8.8E-02
Perfluorotetradecanoic acid (Tetradecanoic acid, heptacosafuoro-) [PFTeDA]	376-06-7	—	—	—	—	1.2E+01	2.5E+01	—	—	8.8E-04	8.8E-02
Perfluorotridecanoic acid (Tridecanoic acid, pentacosafuoro-) [PFTTrDA]	72629-94-8	—	—	—	—	1.2E+01	2.5E+01	—	—	8.8E-04	8.8E-02
Perfluorooctane sulfonamide (1-Octanesulfonamide, heptadecafluoro-) [PFOSA]	754-91-6	—	—	—	6.0E-06	1.2E+01	2.5E+01	—	—	8.8E-04	8.8E-02
Perylene	198-55-0	—	—	—	—	2.0E+04	4.1E+04	—	—	1.5E+00	1.5E+02
Phenacetin	62-44-2	6.5E-02	1.3E+04	2.6E+04	—	—	—	9.3E-01	9.3E+01	—	—
Phenanthrene	85-01-8	—	—	—	—	3.1E+04	4.7E+04	—	—	2.2E+00	2.2E+02

Table 10
Individual RBELs Commercial/Industrial

Last Revised: March 1, 2022

Chemical of Concern	CAS	Soil						Groundwater			
		Carcinogenic			Noncarcinogenic			Carcinogenic		Noncarcinogenic	
		Air RBEL _{Inh} (mg/m ³)	Soil RBEL _{Ing} (mg/kg)	Soil RBEL _{Derm} (mg/kg)	Air RBEL _{Inh} (mg/m ³)	Soil RBEL _{Ing} (mg/kg)	Soil RBEL _{Derm} (mg/kg)	GW RBEL _{Ing} ¹ (mg/L)	GW RBEL _{Class 3} ² (mg/L)	GW RBEL _{Ing} ¹ (mg/L)	GW RBEL _{Class 3} ² (mg/L)
Phenanthridine	229-87-8	—	—	—	—	3.1E+03	6.1E+03	—	—	2.2E-01	2.2E+01
Phenol	108-95-2	—	—	—	1.6E-02	3.1E+05	6.1E+05	—	—	2.2E+01	2.2E+03
Phenol, 4-tert-butyl-	98-54-4	—	—	—	—	1.2E+05	2.5E+05	—	—	8.8E+00	8.8E+02
Phenothiazine	92-84-2	—	—	—	—	1.1E+03	2.2E+03	—	—	8.0E-02	8.0E+00
Phenyl mercuric acetate	62-38-4	—	—	—	—	8.2E+01	1.6E+02	—	—	5.8E-03	5.8E-01
Phenylene diamine, m-	108-45-2	—	—	—	—	6.1E+03	1.2E+04	—	—	4.4E-01	4.4E+01
Phenylene diamine, p-	106-50-3	—	—	—	—	1.9E+05	3.9E+05	—	—	1.4E+01	1.4E+03
Phorate	298-02-2	—	—	—	—	2.0E+02	4.1E+02	—	—	1.5E-02	1.5E+00
Phosalone	2310-17-0	—	—	—	—	2.0E+03	4.1E+03	—	—	1.5E-01	1.5E+01
Phosdrin (mevinphos)	7786-34-7	—	—	—	—	2.6E+01	5.1E+01	—	—	1.8E-03	1.8E-01
Phosmet	732-11-6	—	—	—	—	2.0E+04	4.1E+04	—	—	1.5E+00	1.5E+02
Phosphine	7803-51-2	—	—	—	4.4E-04	3.1E+02	1.2E+03	—	—	2.2E-02	2.2E+00
Phosphorotrithioic acid, S,S,S-tributyl ester	78-48-8	—	3.4E+02	6.8E+02	—	5.1E+02	1.0E+03	2.4E-02	2.4E+00	3.7E-02	3.7E+00
Phosphorus, total*	7723-14-0	—	—	—	—	—	—	—	—	—	—
Phosphorus, white	7723-14-0	—	—	—	—	2.0E+01	8.2E+01	—	—	1.5E-03	1.5E-01
Phthalic anhydride	85-44-9	—	—	—	1.8E-01	1.0E+06	1.0E+06	—	—	1.5E+02	1.5E+04
Picloram	1918-02-1	—	—	—	—	7.2E+04	1.4E+05	—	—	5.1E+00	5.1E+02
Picoline, 2- (2-methylpyridine)	109-06-8	—	—	—	—	9.2E+03	—	—	—	6.6E-01	6.6E+01
Polybrominated biphenyls (PBBs)	67774-32-7	—	3.2E+00	6.4E+00	—	7.2E+00	1.4E+01	2.3E-04	2.3E-02	5.1E-04	5.1E-02
Polychlorinated biphenyls (PCBs)	1336-36-3	7.2E-05	1.4E+01	2.0E+01	—	2.0E+01	2.9E+01	1.0E-03	1.0E-01	1.5E-03	1.5E-01
Potassium*	7440-09-7	—	—	—	—	—	—	—	—	—	—
Primene	68955-53-3	—	—	—	—	6.1E+03	1.2E+04	—	—	4.4E-01	4.4E+01
Prometon (pramitol)	1610-18-0	—	—	—	—	1.5E+04	3.1E+04	—	—	1.1E+00	1.1E+02
Prometryn	7287-19-6	—	—	—	—	4.1E+04	8.2E+04	—	—	2.9E+00	2.9E+02
Pronamide	23950-58-5	—	—	—	—	7.7E+04	1.5E+05	—	—	5.5E+00	5.5E+02
Propanal (propionaldehyde)	123-38-6	—	—	—	1.2E-02	8.2E+03	—	—	—	5.8E-01	5.8E+01
Propane, 1-bromo-	106-94-5	—	—	—	—	3.7E+04	—	—	—	2.6E+00	2.6E+02
Propanil	709-98-8	—	—	—	—	5.1E+03	1.0E+04	—	—	3.7E-01	3.7E+01
Propanoic acid (propionic acid)	79-09-4	—	—	—	—	5.1E+05	—	—	—	3.7E+01	3.7E+03
Propanol, 1-	71-23-8	—	—	—	—	1.0E+06	—	—	—	1.5E+02	1.5E+04
Propargite	2312-35-8	—	—	—	—	2.0E+04	4.1E+04	—	—	1.5E+00	1.5E+02
Propargyl alcohol	107-19-7	—	—	—	—	2.0E+03	—	—	—	1.5E-01	1.5E+01
Propazine	139-40-2	—	6.4E+02	1.3E+03	—	2.0E+04	4.1E+04	4.6E-02	4.6E+00	1.5E+00	1.5E+02
Propham	122-42-9	—	—	—	—	2.0E+04	4.1E+04	—	—	1.5E+00	1.5E+02

Table 10
Individual RBELs Commercial/Industrial

Last Revised: March 1, 2022

Chemical of Concern	CAS	Soil						Groundwater			
		Carcinogenic			Noncarcinogenic			Carcinogenic		Noncarcinogenic	
		Air RBEL _{Inh} (mg/m ³)	Soil RBEL _{Ing} (mg/kg)	Soil RBEL _{Derm} (mg/kg)	Air RBEL _{Inh} (mg/m ³)	Soil RBEL _{Ing} (mg/kg)	Soil RBEL _{Derm} (mg/kg)	GW RBEL _{Ing} ¹ (mg/L)	GW RBEL _{Class 3} ² (mg/L)	GW RBEL _{Ing} ¹ (mg/L)	GW RBEL _{Class 3} ² (mg/L)
Propionitrile (propane nitrile)	107-12-0	—	—	—	—	4.1E+02	—	—	—	2.9E-02	2.9E+00
Propyl acetate, n-	109-60-4	—	—	—	—	9.2E+04	—	—	—	6.6E+00	6.6E+02
Propylbenzene, n-	103-65-1	—	—	—	5.8E-01	4.1E+04	—	—	—	2.9E+00	2.9E+02
Propylene glycol	57-55-6	—	—	—	4.4E-03	1.0E+06	1.0E+06	—	—	1.5E+03	1.5E+05
Propylene glycol monomethyl ether	107-98-2	—	—	—	2.9E+00	7.2E+05	—	—	—	5.1E+01	5.1E+03
Propylene oxide	75-56-9	1.1E-02	1.2E+02	—	4.4E-02	—	—	8.5E-03	8.5E-01	—	—
Propylene tetramer	6842-15-5	—	—	—	1.5E+00	1.0E+05	2.0E+05	—	—	7.3E+00	7.3E+02
Prothiofos (Tokuthion)	34643-46-4	—	—	—	—	1.0E+02	2.0E+02	—	—	7.3E-03	7.3E-01
Pyrene	129-00-0	—	—	—	—	3.1E+04	4.7E+04	—	—	2.2E+00	2.2E+02
Pyridine	110-86-1	—	—	—	—	1.0E+03	—	—	—	7.3E-02	7.3E+00
Quinoline	91-22-5	—	9.5E+00	1.9E+01	—	—	—	6.8E-04	6.8E-02	—	—
Ronnel	299-84-3	—	—	—	—	5.1E+04	1.0E+05	—	—	3.7E+00	3.7E+02
Safrole	94-59-7	6.5E-04	1.3E+02	2.6E+02	—	—	—	9.3E-03	9.3E-01	—	—
Selenium	7782-49-2	—	—	—	—	5.1E+03	1.0E+05	—	—	3.7E-01	3.7E+01
Selenourea	630-10-4	—	—	—	—	5.1E+03	—	—	—	3.7E-01	3.7E+01
Silver	7440-22-4	—	—	—	—	5.1E+03	4.1E+03	—	—	3.7E-01	3.7E+01
Simazine	122-34-9	—	2.4E+02	4.8E+02	—	5.1E+03	1.0E+04	1.7E-02	1.7E+00	3.7E-01	3.7E+01
Sodium*	7440-23-5	—	—	—	—	—	—	—	—	—	—
Sodium hypochlorite	7681-52-9	—	—	—	4.5E-04	2.1E+05	8.6E+05	—	—	1.5E+01	1.5E+03
Sodium polyacrylate	9003-04-7	—	—	—	1.5E-03	5.1E+05	—	—	—	3.7E+01	3.7E+03
Strontium	7440-24-6	—	—	—	—	6.1E+05	1.0E+06	—	—	4.4E+01	4.4E+03
Strychnine	57-24-9	—	—	—	—	3.1E+02	6.1E+02	—	—	2.2E-02	2.2E+00
Styrene	100-42-5	—	—	—	6.9E-01	2.0E+05	—	—	—	1.5E+01	1.5E+03
Sulfate*	14808-79-8	—	—	—	—	—	—	—	—	—	—
Sulfide*	18496-25-8	—	—	—	—	—	—	—	—	—	—
Sulfolane	126-33-0	—	—	—	9.3E-03	1.3E+04	2.7E+04	—	—	9.5E-01	9.5E+01
Sulfur*	7704-34-9	—	—	—	—	—	—	—	—	—	—
Sulprofos (Bolstar)	35400-43-2	—	—	—	—	3.1E+03	6.1E+03	—	—	2.2E-01	2.2E+01
Tebuconazole	107534-96-3	—	—	—	—	3.1E+04	6.1E+04	—	—	2.2E+00	2.2E+02
Tebuthiuron	34014-18-1	—	—	—	—	7.2E+04	1.4E+05	—	—	5.1E+00	5.1E+02
Terbufos	13071-79-9	—	—	—	—	2.6E+01	5.1E+01	—	—	1.8E-03	1.8E-01
Tert-amyl ethyl ether (TAEE)	919-94-8	—	—	—	—	4.1E+04	—	—	—	2.9E+00	2.9E+02
Tert-amyl-methyl ether (TAME)	994-05-8	—	—	—	—	4.1E+04	—	—	—	2.9E+00	2.9E+02
Tert-butyl alcohol (2-methyl-2-propanol)	75-65-0	—	—	—	—	9.2E+04	—	—	—	6.6E+00	6.6E+02

Table 10
Individual RBELs Commercial/Industrial

Last Revised: March 1, 2022

Chemical of Concern	CAS	Soil						Groundwater			
		Carcinogenic			Noncarcinogenic			Carcinogenic		Noncarcinogenic	
		Air RBEL _{Inh} (mg/m ³)	Soil RBEL _{Ing} (mg/kg)	Soil RBEL _{Derm} (mg/kg)	Air RBEL _{Inh} (mg/m ³)	Soil RBEL _{Ing} (mg/kg)	Soil RBEL _{Derm} (mg/kg)	GW RBEL _{Ing} ¹ (mg/L)	GW RBEL _{Class 3} ² (mg/L)	GW RBEL _{Ing} ¹ (mg/L)	GW RBEL _{Class 3} ² (mg/L)
Tetrachlorobenzene, 1,2,3,4-	634-66-2	—	—	—	—	3.1E+02	6.1E+02	—	—	2.2E-02	2.2E+00
Tetrachlorobenzene, 1,2,3,5-	634-90-2	—	—	—	—	3.1E+02	6.1E+02	—	—	2.2E-02	2.2E+00
Tetrachlorobenzene, 1,2,4,5-	95-94-3	—	—	—	—	3.1E+02	6.1E+02	—	—	2.2E-02	2.2E+00
Tetrachloroethane, 1,1,1,2-	630-20-6	5.5E-03	1.1E+03	—	—	3.1E+04	—	7.9E-02	7.9E+00	2.2E+00	2.2E+02
Tetrachloroethane, 1,1,2,2-	79-34-5	—	1.4E+02	—	—	2.0E+04	—	1.0E-02	1.0E+00	1.5E+00	1.5E+02
Tetrachloroethylene [PCE]	127-18-4	1.1E-01	1.4E+04	—	5.4E-01	2.1E+04	—	9.7E-01	9.7E+01	1.5E+00	1.5E+02
Tetrachlorophenol, 2,3,4,5-	4901-51-3	—	—	—	—	3.1E+04	6.1E+04	—	—	2.2E+00	2.2E+02
Tetrachlorophenol, 2,3,4,6-	58-90-2	—	—	—	—	3.1E+04	6.1E+04	—	—	2.2E+00	2.2E+02
Tetrachlorophenol, 2,3,5,6-	935-95-5	—	—	—	—	3.1E+04	6.1E+04	—	—	2.2E+00	2.2E+02
Tetrachlorvinphos (Stirophos)	22248-79-9	—	—	—	—	4.3E+04	8.6E+04	—	—	3.1E+00	3.1E+02
Tetradifon	116-29-0	—	—	—	—	2.0E+04	4.1E+04	—	—	1.5E+00	1.5E+02
Tetraethyl dithiopyrophosphate (sulfotep)	3689-24-5	—	—	—	—	5.1E+02	1.0E+03	—	—	3.7E-02	3.7E+00
Tetraethyl lead	78-00-2	—	—	—	—	1.0E-01	2.0E-01	—	—	7.3E-06	7.3E-04
Tetraethyl pyrophosphate (TEPP)	107-49-3	—	—	—	—	1.1E+01	2.2E+01	—	—	8.0E-04	8.0E-02
Tetraethylene glycol	112-60-7	—	—	—	—	3.4E+05	6.7E+05	—	—	2.4E+01	2.4E+03
Tetrahydrofuran	109-99-9	2.2E-02	3.8E+03	—	2.9E+00	9.2E+05	—	2.7E-01	2.7E+01	6.6E+01	6.6E+03
Tetrahydropyran	142-68-7	2.2E-02	3.8E+03	—	—	2.0E+05	—	2.7E-01	2.7E+01	1.5E+01	1.5E+03
Tetraoxadodecane, 2,5,8,11-	112-49-2	—	—	—	—	2.6E+04	5.1E+04	—	—	1.8E+00	1.8E+02
Thallium	7440-28-0	—	—	—	—	6.8E+01	1.4E+03	—	—	4.9E-03	4.9E-01
Thiofanox	39196-18-4	—	—	—	—	3.1E+02	6.1E+02	—	—	2.2E-02	2.2E+00
Thionazin	297-97-2	—	—	—	—	7.2E+01	1.4E+02	—	—	5.1E-03	5.1E-01
Thiophanate-methyl	23564-05-8	—	—	—	—	8.2E+04	1.6E+05	—	—	5.8E+00	5.8E+02
Thiram	137-26-8	—	—	—	—	5.1E+03	1.0E+04	—	—	3.7E-01	3.7E+01
Tin	7440-31-5	—	—	—	—	6.1E+05	1.0E+06	—	—	4.4E+01	4.4E+03
Titanium	7440-32-6	—	—	—	—	1.0E+06	1.0E+06	—	—	3.7E+02	3.7E+04
Toluene	108-88-3	—	—	—	6.0E+00	8.2E+04	—	—	—	5.8E+00	5.8E+02
Toluene diisocyanate, 2,4/2,6-	26471-62-5	—	—	—	1.0E-04	—	—	—	—	—	—
Toluenediamine, 2,4-	95-80-7	—	8.9E+00	1.8E+01	—	—	—	6.4E-04	6.4E-02	—	—
Toluenediamine, 2,6-	823-40-5	—	—	—	—	3.1E+04	6.1E+04	—	—	2.2E+00	2.2E+02
Toluidine, o-	95-53-4	8.0E-04	1.8E+03	2.4E+02	—	—	—	1.3E-01	1.3E+01	—	—
Toluidine, p-	106-49-0	—	9.5E+02	3.0E+02	—	—	—	6.8E-02	6.8E+00	—	—
Toxaphene	8001-35-2	1.3E-04	2.6E+01	5.2E+01	—	3.2E+02	6.3E+02	1.9E-03	1.9E-01	2.3E-02	2.3E+00
TPH, TX1005, C6-C12	TPH-1005-1	—	—	—	2.9E-01	4.1E+04	—	—	—	2.9E+00	2.9E+02
TPH, TX1005, >C12-C28	TPH-1005-2	—	—	—	2.9E-01	4.1E+04	8.2E+04	—	—	2.9E+00	2.9E+02

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Last Revised: March 1, 2022

Chemical of Concern	CAS	Soil						Groundwater			
		Carcinogenic			Noncarcinogenic			Carcinogenic		Noncarcinogenic	
		Air RBEL _{Inh} (mg/m ³)	Soil RBEL _{Ing} (mg/kg)	Soil RBEL _{Derm} (mg/kg)	Air RBEL _{Inh} (mg/m ³)	Soil RBEL _{Ing} (mg/kg)	Soil RBEL _{Derm} (mg/kg)	GW RBEL _{Ing} ¹ (mg/L)	GW RBEL _{Class 3} ² (mg/L)	GW RBEL _{Ing} ¹ (mg/L)	GW RBEL _{Class 3} ² (mg/L)
TPH, TX1005, >C12-C35	TPH-1005-3	—	—	—	2.9E-01	4.1E+04	8.2E+04	—	—	2.9E+00	2.9E+02
TPH, TX1005, >C28-C35	TPH-1005-4	—	—	—	2.9E-01	4.1E+04	8.2E+04	—	—	2.9E+00	2.9E+02
TP Silvex, 2,4,5-	93-72-1	—	—	—	—	8.2E+03	1.6E+04	—	—	5.8E-01	5.8E+01
Triademenol	55219-65-3	—	—	—	—	3.1E+04	6.1E+04	—	—	2.2E+00	2.2E+02
Triallate	2303-17-5	—	—	—	—	1.3E+04	2.7E+04	—	—	9.5E-01	9.5E+01
Triaminotrinitrobenzene (TATB)	3058-38-6	—	—	—	—	3.1E+03	6.1E+03	—	—	2.2E-01	2.2E+01
Tributyltin oxide	56-35-9	—	—	—	—	3.1E+02	6.1E+02	—	—	2.2E-02	2.2E+00
Trichloro-1,2,2-trifluoroethane, 1,1,2-	76-13-1	—	—	—	7.3E+00	1.0E+06	—	—	—	2.2E+03	2.2E+05
Trichlorobenzene, 1,2,3-	87-61-6	—	—	—	2.9E-03	3.1E+03	6.1E+03	—	—	2.2E-01	2.2E+01
Trichlorobenzene, 1,2,4-	120-82-1	—	9.9E+02	2.0E+03	2.9E-03	1.0E+04	2.0E+04	7.0E-02	7.0E+00	7.3E-01	7.3E+01
Trichlorobenzene, 1,3,5-	108-70-3	—	—	—	2.9E-03	3.1E+03	6.1E+03	—	—	2.2E-01	2.2E+01
Trichloroethane, 1,1,1-	71-55-6	—	—	—	7.4E+00	1.0E+06	—	—	—	1.5E+02	1.5E+04
Trichloroethane, 1,1,2-	79-00-5	2.6E-03	5.0E+02	—	—	4.1E+03	—	3.6E-02	3.6E+00	2.9E-01	2.9E+01
Trichloroethylene [TCE]	79-01-6	1.0E-02	6.2E+02	—	2.9E-03	5.1E+02	—	4.4E-02	4.4E+00	3.7E-02	3.7E+00
Trichlorofluoromethane	75-69-4	—	—	—	—	3.1E+05	—	—	—	2.2E+01	2.2E+03
Trichloronate	327-98-0	—	—	—	—	3.1E+03	6.1E+03	—	—	2.2E-01	2.2E+01
Trichlorophenol, 2,3,4-	15950-66-0	—	—	—	—	1.0E+05	2.0E+05	—	—	7.3E+00	7.3E+02
Trichlorophenol, 2,3,5-	933-78-8	—	—	—	—	1.0E+05	2.0E+05	—	—	7.3E+00	7.3E+02
Trichlorophenol, 2,3,6-	933-75-5	—	—	—	—	1.0E+05	2.0E+05	—	—	7.3E+00	7.3E+02
Trichlorophenol, 2,4,5-	95-95-4	—	—	—	—	1.0E+05	2.0E+05	—	—	7.3E+00	7.3E+02
Trichlorophenol, 2,4,6-	88-06-2	1.3E-02	2.6E+03	5.2E+03	—	1.0E+03	2.0E+03	1.9E-01	1.9E+01	7.3E-02	7.3E+00
Trichlorophenol, 3,4,5-	609-19-8	—	—	—	—	1.0E+05	2.0E+05	—	—	7.3E+00	7.3E+02
Trichlorophenoxyacetic acid, 2,4,5-	93-76-5	—	—	—	—	1.0E+04	2.0E+04	—	—	7.3E-01	7.3E+01
Trichloropropane, 1,1,2-	598-77-6	—	—	—	4.4E-04	5.1E+03	—	—	—	3.7E-01	3.7E+01
Trichloropropane, 1,2,3-	96-18-4	—	9.5E-01	—	4.4E-04	4.1E+03	—	6.8E-05	6.8E-03	2.9E-01	2.9E+01
Triethanolamine	102-71-6	—	—	—	3.7E-02	2.0E+05	4.1E+05	—	—	1.5E+01	1.5E+03
Triethylamine	121-44-8	—	—	—	1.0E-02	—	—	—	—	—	—
Triethylene glycol	112-27-6	—	—	—	—	1.0E+06	1.0E+06	—	—	1.5E+02	1.5E+04
Triethylphosphorothioate, O, O, O-	126-68-1	—	—	—	—	8.5E+00	1.7E+01	—	—	6.1E-04	6.1E-02
Trifluralin	1582-09-8	—	3.7E+03	7.4E+03	—	7.7E+03	1.5E+04	2.7E-01	2.7E+01	5.5E-01	5.5E+01
Trimethylamine	75-50-3	—	—	—	1.0E-02	—	—	—	—	—	—
Trimethylbenzene, 1,2,3-	526-73-8	—	—	—	2.6E-01	3.5E+04	—	—	—	2.5E+00	2.5E+02
Trimethylbenzene, 1,2,4-	95-63-6	—	—	—	2.6E-01	3.5E+04	—	—	—	2.5E+00	2.5E+02
Trimethylbenzene, 1,3,5-	108-67-8	—	—	—	2.6E-01	3.5E+04	—	—	—	2.5E+00	2.5E+02

Table 10
Individual RBELs Commercial/Industrial

Last Revised: March 1, 2022

Chemical of Concern	CAS	Soil						Groundwater			
		Carcinogenic			Noncarcinogenic			Carcinogenic		Noncarcinogenic	
		Air RBEL _{Inh} (mg/m ³)	Soil RBEL _{Ing} (mg/kg)	Soil RBEL _{Derm} (mg/kg)	Air RBEL _{Inh} (mg/m ³)	Soil RBEL _{Ing} (mg/kg)	Soil RBEL _{Derm} (mg/kg)	GW RBEL _{Ing} ¹ (mg/L)	GW RBEL _{Class 3} ² (mg/L)	GW RBEL _{Ing} ¹ (mg/L)	GW RBEL _{Class 3} ² (mg/L)
Trinitrobenzene, 1,3,5-	99-35-4	—	—	—	—	3.1E+04	6.1E+04	—	—	2.2E+00	2.2E+02
Trinitrophenylmethyl nitramine (tetryl; nitramine)	479-45-8	—	—	—	—	2.0E+03	8.2E+03	—	—	1.5E-01	1.5E+01
Trinitrotoluene, 2,4,6-	118-96-7	—	9.5E+02	1.9E+03	—	5.1E+02	1.0E+03	6.8E-02	6.8E+00	3.7E-02	3.7E+00
Tungsten (as sodium tungstate dihydride)	7440-33-7	—	—	—	7.7E-03	1.0E+03	4.1E+03	—	—	7.3E-02	7.3E+00
Uranium (soluble salts)	7440-61-1	—	—	—	5.8E-05	3.1E+03	6.1E+04	—	—	2.2E-01	2.2E+01
Valeric acid (pentanoic acid)	109-52-4	—	—	—	1.5E-03	5.1E+05	1.0E+06	—	—	3.7E+01	3.7E+03
Vanadium	7440-62-2	—	—	—	4.4E-05	1.8E+03	9.6E+02	—	—	1.3E-01	1.3E+01
Vernam	1929-77-7	—	—	—	—	1.0E+03	2.0E+03	—	—	7.3E-02	7.3E+00
Vinyl acetate	108-05-4	—	—	—	2.9E-01	1.0E+06	—	—	—	7.3E+01	7.3E+03
Vinyl chloride	75-01-4	4.9E-03	1.9E+01	—	8.8E-02	3.1E+03	—	1.4E-03	1.4E-01	2.2E-01	2.2E+01
Vinylcyclohexane	695-12-5	—	—	—	—	5.1E+05	—	—	—	3.7E+01	3.7E+03
Warfarin	81-81-2	—	—	—	—	3.1E+02	6.1E+02	—	—	2.2E-02	2.2E+00
Xylene, m-	108-38-3	—	—	—	8.9E-01	1.0E+06	—	—	—	1.5E+02	1.5E+04
Xylene, o-	95-47-6	—	—	—	8.9E-01	1.0E+06	—	—	—	1.5E+02	1.5E+04
Xylene, p-	106-42-3	—	—	—	8.9E-01	1.0E+06	—	—	—	1.5E+02	1.5E+04
Xylenes	1330-20-7	—	—	—	8.9E-01	2.0E+05	—	—	—	1.5E+01	1.5E+03
Zinc	7440-66-6	—	—	—	—	3.1E+05	1.0E+06	—	—	2.2E+01	2.2E+03
6 C aliphatics (TPH) (>53% n-hexane content)	NA	—	—	—	9.8E-01	6.1E+04	—	—	—	4.4E+00	4.4E+02
6 C aliphatics (TPH) (<53% n-hexane content)	NA	—	—	—	2.7E+01	6.1E+04	—	—	—	4.4E+00	4.4E+02
>6-8 C aliphatics (TPH) (>53% n-hexane content)	NA	—	—	—	9.8E-01	6.1E+04	—	—	—	4.4E+00	4.4E+02
>6-8 C aliphatics (TPH) (<53% n-hexane content)	NA	—	—	—	2.7E+01	6.1E+04	—	—	—	4.4E+00	4.4E+02
>8-10 C aliphatics (TPH)	NA	—	—	—	7.3E-01	1.0E+05	—	—	—	7.3E+00	7.3E+02
>10-12 C aliphatics (TPH)	NA	—	—	—	7.3E-01	1.0E+05	2.0E+05	—	—	7.3E+00	7.3E+02
>12-16 C aliphatics (TPH)	NA	—	—	—	7.3E-01	1.0E+05	2.0E+05	—	—	7.3E+00	7.3E+02
>16-21 C aliphatics (TPH)	NA	—	—	—	—	1.0E+06	1.0E+06	—	—	1.5E+02	1.5E+04
>16-21 C aliphatics (TPH) (for transformer mineral oil releases only)	NA	—	—	—	—	1.0E+06	1.0E+06	—	—	1.2E+02	1.2E+04
>21-35 C aliphatics (TPH)	NA	—	—	—	—	1.0E+06	1.0E+06	—	—	1.5E+02	1.5E+04
>21-35 C aliphatics (TPH) (for transformer mineral oil releases only)	NA	—	—	—	—	1.0E+06	1.0E+06	—	—	1.2E+02	1.2E+04

Table 10
Individual RBELs Commercial/Industrial

Last Revised: March 1, 2022

Chemical of Concern	CAS	Soil						Groundwater			
		Carcinogenic			Noncarcinogenic			Carcinogenic		Noncarcinogenic	
		Air RBEL _{Inh} (mg/m ³)	Soil RBEL _{Ing} (mg/kg)	Soil RBEL _{Derm} (mg/kg)	Air RBEL _{Inh} (mg/m ³)	Soil RBEL _{Ing} (mg/kg)	Soil RBEL _{Derm} (mg/kg)	GW RBEL _{Ing} ¹ (mg/L)	GW RBEL _{Class 3} ² (mg/L)	GW RBEL _{Ing} ¹ (mg/L)	GW RBEL _{Class 3} ² (mg/L)
>7-8 C aromatics (TPH)	NA	—	—	—	2.8E+00	1.0E+05	—	—	—	7.3E+00	7.3E+02
>8-10 C aromatics (TPH)	NA	—	—	—	2.9E-01	4.1E+04	—	—	—	2.9E+00	2.9E+02
>10-12 C aromatics (TPH)	NA	—	—	—	2.9E-01	4.1E+04	8.2E+04	—	—	2.9E+00	2.9E+02
>12-16 C aromatics (TPH)	NA	—	—	—	2.9E-01	4.1E+04	8.2E+04	—	—	2.9E+00	2.9E+02
>16-21 C aromatics (TPH)	NA	—	—	—	—	3.1E+04	6.1E+04	—	—	2.2E+00	2.2E+02
>21-35 C aromatics (TPH)	NA	—	—	—	—	3.1E+04	6.1E+04	—	—	2.2E+00	2.2E+02
Footnotes											
1 Based on primary MCLs when available											
2 100 x ^{GW} GW _{Ing}											
3 The total MCL for trihalomethanes (bromodichloromethane, bromoform, chloroform, and dibromochloromethane) is 0.08 mg/L.											
* These compounds are not necessarily of concern from a human health standpoint, therefore calculation of human health-based values is not required. However, aesthetics and ecological criteria would still apply. See table entitled "Compounds for which Calculation of a Human Health PCL is Not Required" available on the TCEQ website at http://www.tceq.state.tx.us/remediation/trrp/trrp.html .											
NA = not applicable											
All values capped at 1E+06											

This table shows the commercial and industrial risk-based exposure limits for soil and groundwater with carcinogenic and non-carcinogenic values depicted.

end of worksheet

Toxicity Factors¹

Last Revised: March 1, 2022

Chemical of Concern	CAS	Class ²	Ref ³	SFo (mg/kg-day) ⁻¹	Ref ³	RfDo (mg/kg-day)	Ref ³	URF (µg/m ³) ⁻¹	Ref ³	RfC (mg/m ³)	Ref ³
Acenaphthene	83-32-9	IIACP	PPRTV	—	—	6.0E-02	I	—	—	—	—
Acenaphthylene	208-96-8	D	I	—	—	6.0E-02	T	—	—	—	—
Acetaldehyde	75-07-0	B2	I	—	—	1.0E-01	T	2.2E-06	I	9.0E-03	I
Acetate, 2-ethoxyethanol	111-15-9	—	—	—	—	1.0E-01	PPRTV	—	—	6.0E-02	PPRTV
Acetate, isoamyl	123-92-2	—	—	—	—	7.2E-02	T	—	—	—	—
Acetate, isobutyl	110-19-0	—	—	—	—	4.8E-02	T	—	—	—	—
Acetate, sec-butyl	105-46-4	—	—	—	—	4.8E-02	T	—	—	—	—
Acetic acid*	64-19-7	—	—	—	—	—	—	—	—	—	—
Acetone (2-propanone)	67-64-1	D	I	—	—	9.0E-01	I	—	—	3.1E+01	A
Acetone cyanohydrin	75-86-5	IIACP	PPRTV	—	—	3.0E-03	PPRTV	—	—	6.0E-02	PPRTV
Acetonitrile	75-05-8	D	I	—	—	3.2E-02	T	—	—	6.0E-02	I
Acetophenone	98-86-2	D	I	—	—	1.0E-01	I	—	—	—	—
Acetylaminofluorene, 2-	53-96-3	—	—	3.8E+00	OEHHHA	—	—	1.3E-03	OEHHHA	—	—
Acifluorfen, sodium	62476-59-9	—	—	—	—	1.3E-02	I	—	—	—	—
Acridine	260-94-6	—	—	—	—	3.0E-03	T	—	—	—	—
Acrolein	107-02-8	D	I	—	—	5.0E-04	I	—	—	2.7E-03	T
Acrylamide	79-06-1	LC	I	5.0E-01	I	2.0E-03	I	1.0E-04	I	6.0E-03	I
Acrylic acid	79-10-7	—	—	—	—	5.0E-01	I	—	—	1.0E-03	I
Acrylonitrile	107-13-1	B1	I	5.4E-01	I	1.0E-03	H	6.8E-05	I	2.0E-03	I
Adipic acid (hexanedioic acid)	124-04-9	—	—	—	—	2.0E+00	PPRTV	—	—	—	—
Alachlor	15972-60-8	B2	H	8.0E-02	H	1.0E-02	I	—	—	—	—
Aldicarb	116-06-3	D	I	—	—	1.0E-03	I	—	—	—	—
Aldicarb sulfone	1646-88-4	—	—	—	—	1.0E-03	I	—	—	—	—
Aldrin	309-00-2	B2	I	1.7E+01	I	3.0E-05	I	4.9E-03	I	—	—
Allyl alcohol	107-18-6	—	—	—	—	5.0E-03	I	—	—	1.0E-04	PPRTV
Allyl chloride	107-05-1	C	I	—	—	1.0E-02	I	—	—	1.0E-03	I
Aluminum	7429-90-5	—	—	—	—	1.0E+00	PPRTV	—	—	5.0E-03	PPRTV
Ametryn	834-12-8	—	—	—	—	9.0E-03	I	—	—	—	—
Amino-2,6-dinitrotoluene, 4-	19406-51-0	—	—	3.0E-02	T	5.0E-04	T	—	—	—	—
Amino-4,6-dinitrotoluene, 2-	35572-78-2	—	—	3.0E-02	T	5.0E-04	T	—	—	—	—
Aminobiphenyl, 4- (1,1-biphenyl-4-amine)	92-67-1	A	T	6.1E+00	T	—	—	—	—	—	—
Aminopyridine, 4-	504-24-5	D	I	—	—	2.0E-05	H	—	—	—	—
Ammonia	7664-41-7	IIACP	T	—	—	—	—	—	—	3.2E-01	T
Ammonium polyphosphate*	6833-79-9	—	—	—	—	—	—	—	—	—	—
Ammonium salts*	NA	—	—	—	—	—	—	—	—	—	—
Aniline	62-53-3	B2	I	5.7E-03	I	7.0E-03	N	—	—	1.0E-03	I
Anthracene	120-12-7	D	I	—	—	3.0E-01	I	—	—	—	—
Anthraquinone, 9,10-	84-65-1	LC	PPRTV	3.9E-02	PPRTV	2.0E-02	T	—	—	—	—
Antimony	7440-36-0	—	—	—	—	4.0E-04	I	—	—	—	—
Aramite	140-57-8	B2	I	2.5E-02	I	5.0E-02	H	7.1E-06	I	—	—
Arsenic	7440-38-2	A	I	1.5E+00	I	3.0E-04	I	1.5E-04	T	—	—
Arsine	7784-42-1	—	—	—	—	—	—	—	—	5.0E-05	I
Atrazine	1912-24-9	C	H	2.2E-01	H	3.5E-02	I	—	—	—	—
Azinphos-methyl (guthion)	86-50-0	—	—	—	—	1.5E-03	EPA —99	—	—	—	—
Azobenzene	103-33-3	B2	I	1.1E-01	I	—	—	3.1E-05	I	—	—
Barium	7440-39-3	D	I	—	—	2.0E-01	I	—	—	—	—
Bayleton	43121-43-3	—	—	—	—	3.0E-02	I	—	—	—	—
Benefin (benfluralin)	1861-40-1	—	—	—	—	3.0E-01	I	—	—	—	—
Benomyl	17804-35-2	—	I	—	—	5.0E-02	I	—	—	—	—
Benz-a-anthracene	56-55-3	CH	I	1.0E-01	EPA —93	—	—	6.0E-05	EPA —93	—	—
Benzaldehyde	100-52-7	—	—	—	—	1.0E-01	I	—	—	—	—
Benzene	71-43-2	A	I	1.5E-02	T	4.0E-03	I	2.2E-06	T	2.8E-01	T
Benzenedicarbonitrile, 1,3-	626-17-5	—	—	—	—	6.0E-03	T	—	—	—	—
Benzenedicarboxylic acid, 1,2-disodecyl ester	26761-40-0	—	—	—	—	4.0E-02	—	—	—	5.0E-03	—
Benzenethiol	108-98-5	—	—	—	—	1.0E-03	PPRTV	—	—	—	—
Benzydine	92-87-5	A	I	2.3E+02	I	3.0E-03	I	6.7E-02	I	—	—

Toxicity Factors¹

Last Revised: March 1, 2022

Chemical of Concern	CAS	Class ²	Ref ³	SFo (mg/kg- day) ⁻¹	Ref ³	RfDo (mg/kg- day)	Ref ³	URF (µg/m ³) ⁻¹	Ref ³	RfC (mg/m ³)	Ref ³
Benzo-a-pyrene	50-32-8	CH	I	1.0E+00	I	3.0E-04	I	6.0E-04	I	2.0E-06	I
Benzo-b-fluoranthene	205-99-2	CH	I	1.0E-01	EPA –93	—	—	6.0E-05	EPA –93	—	—
Benzo-e-pyrene	192-97-2	—	—	—	—	3.0E-02	T	—	—	—	—
Benzo-g,h,i-perylene	191-24-2	D	I	—	—	3.0E-02	T	—	—	—	—
Benzoic acid	65-85-0	D	I	—	—	4.0E+00	I	—	—	—	—
Benzo-j-fluoranthene	205-82-3	—	—	1.0E-01	T	—	—	6.0E-05	T	—	—
Benzo-k-fluoranthene	207-08-9	CH	I	1.0E-02	EPA –93	—	—	6.0E-06	EPA –93	—	—
Benzophenone	119-61-9	—	—	—	—	6.7E-03	T	—	—	—	—
Benzotrichloride	98-07-7	B2	I	1.3E+01	I	—	—	—	—	—	—
Benzoyl peroxide	94-36-0	—	—	—	—	5.0E-02	T	—	—	—	—
Benzyl alcohol	100-51-6	—	—	—	—	1.0E-01	PPRTV	—	—	—	—
Benzyl chloride	100-44-7	B2	I	1.7E-01	I	2.0E-03	PPRTV	—	—	1.0E-03	PPRTV
Benzyl dichloride	98-87-3	B2	T	1.7E-01	T	2.0E-03	T	—	—	1.0E-03	T
Beryllium	7440-41-7	B1	I	—	—	2.0E-03	I	2.4E-03	I	2.0E-05	I
Biphenyl, 1,1-	92-52-4	SEC	PPRTV	—	—	5.0E-01	I	—	—	—	—
Biphenyl, 1,1'-, 2-phenoxy-	6738-04-1	—	—	—	—	5.0E-02	T	—	—	—	—
Biquinoline, 2,2'-	119-91-5	—	—	—	—	3.0E-03	T	—	—	—	—
Bis (2-chloroethoxy) methane	111-91-1	B2	T	1.1E+00	T	3.0E-03	PPRTV	3.3E-04	T	—	—
Bis (2-chloroethyl) ether	111-44-4	B2	I	1.1E+00	I	—	—	3.3E-04	I	—	—
Bis (2-chloro-1-methylethyl) ether	108-60-1	C	H	7.0E-02	H	4.0E-02	H	1.0E-05	H	—	—
Bis (2-chloromethyl) ether	542-88-1	A	I	2.2E+02	I	—	—	6.2E-02	I	—	—
Bis (2-ethyl-hexyl) phthalate	117-81-7	B2	I	1.4E-02	I	2.0E-02	I	—	—	—	—
Bismuth	7440-69-9	—	—	—	—	5.0E-01	T	—	—	—	—
Bisphenol A	80-05-7	—	—	—	—	5.0E-02	I	—	—	—	—
Boron	7440-42-8	D	I	—	—	2.0E-01	I	—	—	2.0E-02	H
Bromacil	314-40-9	—	—	—	—	1.0E-01	T	—	—	—	—
Bromo-2-chloroethane, 1-	107-04-0	—	—	—	—	4.0E-02	T	—	—	—	—
Bromobenzene	108-86-1	IIACP	I	—	—	8.0E-03	I	—	—	6.0E-02	I
Bromodichloromethane	75-27-4	B2	I	6.2E-02	I	8.0E-03	A	—	—	—	—
Bromoform	75-25-2	B2	I	7.9E-03	I	2.0E-02	I	1.1E-06	I	—	—
Bromomethane	74-83-9	D	I	—	—	1.4E-03	I	—	—	3.9E-03	A
Bromophenyl phenylether, 4-	101-55-3	—	—	1.5E+01	T	—	—	3.3E-03	T	—	—
Butadiene, 1,3-	106-99-0	A	I	—	—	—	—	5.0E-07	T	3.3E-02	T
Butadiene, 2-methyl-1,3- (isoprene)	78-79-5	—	—	—	—	6.0E-02	T	—	—	1.8E+01	T
Butanal (butyraldehyde)	123-72-8	—	—	—	—	6.0E-02	T	—	—	1.0E-01	T
Butane, 2,3-dimethyl-	79-29-8	—	—	—	—	6.0E-02	T	—	—	1.8E+01	T
Butanoic acid (butyric acid)	107-92-6	—	—	—	—	5.0E-01	T	—	—	1.0E-03	T
Butanol, 2-	78-92-2	—	—	—	—	2.0E+00	PPRTV	—	—	3.0E+01	PPRTV
Butanol, 2-methyl-1-	137-32-6	—	—	—	—	1.0E-02	T	—	—	—	—
Butanol, 2-methyl-2-	75-85-4	—	—	—	—	1.0E-02	T	—	—	—	—
Butanol, n-	71-36-3	D	I	—	—	1.0E-01	I	—	—	—	—
Butene, 1-	106-98-9	—	—	—	—	6.0E-02	T	—	—	5.3E+00	T
Butene, cis-2-	590-18-1	—	—	—	—	6.0E-02	T	—	—	1.6E+00	T
Butene, trans-2-	624-64-6	—	—	—	—	6.0E-02	T	—	—	1.6E+00	T
Butoxy ethanol, 2- (Ethylene glycol monobutyl ether; EGBE)	111-76-2	NLC	I	—	—	1.0E-01	I	—	—	1.6E+00	I
Butyl acetate	123-86-4	—	—	—	—	1.4E-01	T	—	—	4.7E+00	T
Butyl acrylate	141-32-2	—	—	—	—	9.0E-03	T	—	—	—	—
Butyl benzyl phthalate	85-68-7	LC	PPRTV	1.9E-03	PPRTV	2.0E-01	I	—	—	—	—
Butyl ether, n- (dibutyl ether)	142-96-1	D	N	—	—	1.0E-01	T	—	—	—	—
Butyl methacrylate	97-88-1	—	—	—	—	9.0E-02	T	—	—	—	—
Butylate	2008-41-5	—	—	—	—	5.0E-02	I	—	—	—	—
Butylbenzene, n-	104-51-8	D	N	—	—	5.0E-02	PPRTV	—	—	—	—
Butylbenzene, sec-	135-98-8	IIACP	PPRTV	—	—	4.0E-02	N	—	—	—	—
Butylbenzene, tert-	98-06-6	IIACP	PPRTV	—	—	4.0E-02	N	—	—	—	—
Cacodylic acid	75-60-5	D	I	—	—	3.0E-03	H	—	—	—	—

Toxicity Factors¹

Last Revised: March 1, 2022

Chemical of Concern	CAS	Class ²	Ref ³	SFo (mg/kg-day) ⁻¹	Ref ³	RfDo (mg/kg-day)	Ref ³	URF (µg/m ³) ⁻¹	Ref ³	RfC (mg/m ³)	Ref ³
Cadmium ⁴	7440-43-9	LC	T	—	—	1.0E-03/ 5.0E-04	I	4.9E-04	T	1.1E-05	T
Calcium*	7440-70-2	—	—	—	—	—	—	—	—	—	—
Caprolactam	105-60-2	—	—	—	—	5.0E-01	I	—	—	—	—
Captan	133-06-2	B2	H	3.5E-03	H	1.3E-01	I	—	—	—	—
Carbaryl	63-25-2	—	—	—	—	1.0E-01	I	—	—	—	—
Carbazole	86-74-8	B2	H	2.0E-02	H	—	—	—	—	—	—
Carbofuran	1563-66-2	—	—	—	—	5.0E-03	I	—	—	—	—
Carbon disulfide	75-15-0	—	—	—	—	1.0E-01	I	—	—	7.0E-01	I
Carbon tetrachloride	56-23-5	LC	I	7.0E-02	I	4.0E-03	I	6.0E-06	I	1.0E-01	I
Carbophenothion	786-19-6	—	—	—	—	1.3E-02	CU	—	—	—	—
Carbosulfan	55285-14-8	—	—	—	—	1.0E-02	I	—	—	—	—
Carboxin	5234-68-4	—	—	—	—	1.0E-01	I	—	—	—	—
Chloral	75-87-6	C	I	—	—	1.0E-01	I	—	—	—	—
Chloral hydrate (1,1-ethanediol, 2,2,2-trichloro-)	302-17-0	C	I	—	—	1.0E-01	I	—	—	—	—
Chloramben (amiben; 3-amino-2,5-dichlorobenzoic acid)	133-90-4	—	—	—	—	1.5E-02	I	—	—	—	—
Chlordane (technical)	12789-03-6	B2	I	3.5E-01	I	5.0E-04	I	1.0E-04	I	7.0E-04	I
Chlordane, cis- (alpha chlordane)	5103-71-9	B2	T	3.5E-01	T	5.0E-04	T	1.0E-04	T	7.0E-04	T
Chlordane, trans- (gamma chlordane)	57-74-9	B2	T	3.5E-01	T	5.0E-04	T	1.0E-04	T	7.0E-04	T
Chlorfenvinphos	470-90-6	—	—	—	—	7.0E-04	A	—	—	2.0E-03	T
Chloride*	16887-00-6	—	—	—	—	—	—	—	—	—	—
Chlorine	7782-50-5	—	—	—	—	1.0E-01	I	—	—	8.7E-03	T
Chloro-1,3-butadiene, 2-	126-99-8	LC	I	—	—	—	—	3.0E-04	I	2.0E-02	I
Chloro-2-propanol, 1-	127-00-4	—	—	—	—	2.0E-02	T	—	—	—	—
Chloro-3-methylphenol, 4-	59-50-7	—	—	—	—	5.0E-03	T	—	—	—	—
Chloroaniline, p-	106-47-8	LC	PPRTV	2.0E-01	PPRTV	4.0E-03	I	—	—	—	—
Chlorobenzene	108-90-7	D	I	—	—	2.0E-02	I	—	—	5.0E-02	PPRTV
Chlorobenzilate	510-15-6	B2	H	2.7E-01	H	2.0E-02	I	7.8E-05	H	—	—
Chlorobromomethane (bromochloromethane)	74-97-5	—	—	—	—	4.0E-02	T	—	—	—	—
Chlorodifluoromethane	75-45-6	—	—	—	—	—	—	—	—	5.0E+01	I
Chloroethane (ethyl chloride)	75-00-3	—	—	—	—	4.0E-01	N	—	—	1.0E+01	I
Chloroethanol, 2-	107-07-3	IIACP	PPRTV	—	—	2.0E-02	PPRTV	—	—	—	—
Chloroethoxy ethene, 2- (2-chloroethylvinylether)	110-75-8	—	—	1.1E+00	T	2.0E-03	T	—	—	3.0E-04	T
Chloroform	67-66-3	B2	I	—	—	1.0E-02	I	2.3E-05	I	9.7E-02	A
Chlorohexane, 1-	544-10-5	—	—	—	—	4.0E-02	T	—	—	1.0E+00	T
Chloromethane (methyl chloride)	74-87-3	IIACP	PPRTV	1.3E-02	H	3.6E-03	T	1.8E-06	H	9.0E-02	I
Chloronaphthalene, 1- (Chloronaphthalene, alpha-)	90-13-1	—	—	—	—	8.0E-02	I	—	—	—	—
Chloronaphthalene, 2- (chloronaphthalene, beta)	91-58-7	—	—	—	—	8.0E-02	I	—	—	—	—
Chloronitrobenzene, p- (1-chloro-4-nitrobenzene)	100-00-5	LC	PPRTV	6.3E-03	PPRTV	1.0E-03	PPRTV	—	—	6.0E-04	PPRTV
Chlorophenol, 2-	95-57-8	—	—	—	—	5.0E-03	I	—	—	—	—
Chlorophenol, 3-	108-43-0	—	—	—	—	5.0E-03	T	—	—	—	—
Chlorophenol, 4-	106-48-9	—	—	—	—	5.0E-03	T	—	—	—	—
Chlorophenyl phenylether, 4-	7005-72-3	—	—	1.5E+01	T	—	—	3.3E-03	T	—	—
Chloropropane, 2-	75-29-6	—	—	—	—	3.0E-02	T	—	—	1.0E-01	H
Chlorothalonil	1897-45-6	B2	H	1.1E-02	H	1.5E-02	I	—	—	—	—
Chlorotoluene, o- (2-chlorotoluene)	95-49-8	—	—	—	—	2.0E-02	I	—	—	8.0E-01	PPRTV
Chlorotoluene, p- (4-chlorotoluene)	106-43-4	—	—	—	—	2.0E-02	PPRTV	—	—	—	—
Chlorpyrifos	2921-88-2	—	—	—	—	3.0E-03	I	—	—	—	—
Chromium (III)	16065-83-1	—	—	—	—	1.5E+00	I	—	—	1.4E-04	T
Chromium (total)	7440-47-3	—	—	—	—	1.5E+00	I	—	—	1.4E-04	T
Chromium (VI)	18540-29-9	CH	T	—	—	3.1E-03	T	2.3E-03	T	2.2E-04	T
Chrysene	218-01-9	CH	I	1.0E-03	EPA —93	—	—	6.0E-07	EPA —93	—	—
Cobalt	7440-48-4	LC	T	—	—	1.0E-02	T	6.0E-03	T	6.3E-05	T
Copolymer acrylamide	69418-26-4	—	—	—	—	2.0E-04	T	—	—	—	—

Toxicity Factors¹

Last Revised: March 1, 2022

Chemical of Concern	CAS	Class ²	Ref ³	SFo (mg/kg-day) ⁻¹	Ref ³	RfDo (mg/kg-day)	Ref ³	URF (µg/m ³) ⁻¹	Ref ³	RfC (mg/m ³)	Ref ³
Copper	7440-50-8	D	I	—	—	9.7E-02	T	—	—	—	—
Coronene	191-07-1	—	—	—	—	2.0E-03	T	—	—	—	—
Coumaphos	56-72-4	—	—	—	—	7.0E-03	T	—	—	—	—
Cresol	1319-77-3	C	I	—	—	5.0E-02	I	—	—	—	—
Cresol, m- (3-methylphenol)	108-39-4	C	I	—	—	5.0E-02	I	—	—	—	—
Cresol, o- (2-methylphenol)	95-48-7	C	I	—	—	5.0E-02	I	—	—	—	—
Cresol, p- (4-methylphenol)	106-44-5	C	I	—	—	5.0E-03	H	—	—	—	—
Crotonaldehyde	123-73-9	C	I	1.9E+00	H	1.0E-03	PPRTV	—	—	—	—
Cumene (isopropylbenzene)	98-82-8	D	I	—	—	1.0E-01	I	—	—	4.0E-01	I
Cyanazine	21725-46-2	C	H	8.4E-01	H	2.0E-03	H	—	—	—	—
Cyanide	57-12-5	D	I	—	—	6.0E-04	I	—	—	8.0E-04	I
Cyanogen	460-19-5	—	—	—	—	1.0E-03	I	—	—	8.0E-04	I
Cycloate	1134-23-2	—	—	—	—	5.5E-02	CU	—	—	—	—
Cyclohexane	110-82-7	D	I	—	—	5.0E+00	T	—	—	6.0E+00	I
Cyclohexanol	108-93-0	—	—	—	—	5.0E+00	T	—	—	—	—
Cyclohexanone	108-94-1	—	—	—	—	5.0E+00	I	—	—	7.0E-01	PPRTV
Cyclohexene-1-methanol, 3-	1679-51-2	—	—	—	—	2.0E-02	T	—	—	—	—
Cyclohexene, 4-vinyl-1-	100-40-3	—	—	—	—	2.2E-02	T	—	—	3.3E-01	T
Cyclopentane	287-92-3	—	—	—	—	6.0E-02	T	—	—	2.4E+01	T
Cyclopentane, methyl-	96-37-7	—	—	—	—	1.0E-01	T	—	—	1.0E+00	T
Cyclopentene	142-29-0	—	—	—	—	5.0E+00	T	—	—	—	—
Cyclotetramethylenetetranitramine (HMX)	2691-41-0	D	I	—	—	5.0E-02	I	—	—	—	—
Cyclotrimethylenetrinitramine (RDX)	121-82-4	SEC	I	8.0E-02	I	4.0E-03	I	—	—	—	—
Cymene (isopropyltoluene)	99-87-6	—	—	—	—	1.0E-01	T	—	—	—	—
Cymoxanil	57966-95-7	—	—	—	—	1.3E-02	EPA —OP	—	—	—	—
Dacthal (DCPA)	1861-32-1	—	—	—	—	1.0E-02	I	—	—	—	—
Dalapon, sodium salt (2,2-dichloropropanoic acid)	75-99-0	—	—	—	—	3.0E-02	I	—	—	—	—
DDD	72-54-8	B2	I	2.4E-01	I	—	—	—	—	—	—
DDE	72-55-9	B2	I	3.4E-01	I	—	—	—	—	—	—
DDT	50-29-3	B2	I	3.4E-01	I	5.0E-04	I	9.7E-05	I	—	—
Demeton	8065-48-3	—	—	—	—	4.0E-05	I	—	—	—	—
Desethylatrazine	6190-65-4	—	—	—	—	3.5E-02	T	—	—	—	—
Diacetone alcohol (4-hydroxy-4-methyl-2-pentanone)	123-42-2	—	—	—	—	4.0E-02	T	—	—	—	—
Diallate	2303-16-4	B2	H	6.1E-02	H	—	—	—	—	—	—
Diazinon	333-41-5	—	—	—	—	9.0E-04	H	—	—	1.0E-04	T
Dibenz(a,h)acridine	226-36-8	C	OEHHA	1.2E+00	OEHHA	—	—	1.1E-04	OEHHA	—	—
Dibenz(a,j)acridine	224-42-0	—	—	7.3E-01	T	—	—	8.8E-05	T	—	—
Dibenz-a,h-anthracene	53-70-3	CH	I	1.0E+00	EPA —93	—	—	6.0E-04	EPA —93	—	—
Dibenzo(a,e)pyrene	192-65-4	—	—	7.3E+00	T	—	—	8.8E-04	T	—	—
Dibenzo(a,h)pyrene	189-64-0	—	—	7.3E+01	T	—	—	8.8E-03	T	—	—
Dibenzo(a,i)pyrene	189-55-9	—	—	7.3E+01	T	—	—	8.8E-03	T	—	—
Dibenzofuran	132-64-9	D	I	—	—	4.0E-03	N	—	—	—	—
Dibenzothiophene	132-65-0	IIACP	PPRTV	—	—	1.0E-02	PPRTV	—	—	—	—
Dibromo-3-chloropropane, 1,2-	96-12-8	LC	PPRTV	8.0E-01	PPRTV	2.0E-04	PPRTV	6.0E-03	PPRTV	2.0E-04	I
Dibromochloromethane (chlorodibromomethane)	124-48-1	C	I	8.4E-02	I	2.0E-02	I	—	—	—	—
Dibromofluoromethane	1868-53-7	—	—	—	—	2.0E-01	T	—	—	—	—
Dicamba	1918-00-9	—	—	—	—	3.0E-02	I	—	—	—	—
Dichlormid	37764-25-3	—	—	—	—	2.5E-02	T	—	—	—	—
Dichloro-2-butene, 1,4-	764-41-0	SEC	PPRTV	—	—	—	—	4.2E-03	PPRTV	—	—
Dichloro-2-butene, 1,4- trans	110-57-6	SEC	PPRTV	—	—	—	—	4.2E-03	PPRTV	—	—
Dichlorobenzene, 1,2-	95-50-1	D	I	—	—	9.0E-02	I	—	—	3.0E-02	N
Dichlorobenzene, 1,3-	541-73-1	D	I	—	—	3.0E-02	N	—	—	8.0E-03	N
Dichlorobenzene, 1,4-	106-46-7	C	H	2.4E-02	H	—	—	—	—	5.3E-01	T
Dichlorobenzidine, 3,3'-	91-94-1	B2	I	4.5E-01	I	—	—	—	—	—	—

Toxicity Factors¹

Last Revised: March 1, 2022

Chemical of Concern	CAS	Class ²	Ref ³	SFo (mg/kg- day) ⁻¹	Ref ³	RfDo (mg/kg- day)	Ref ³	URF (µg/m ³) ⁻¹	Ref ³	RfC (mg/m ³)	Ref ³
Dichlorobutane, 2,3-	7581-97-7	—	—	—	—	1.0E-02	T	—	—	7.0E-03	T
Dichlorodifluoromethane	75-71-8	—	—	—	—	2.0E-01	I	—	—	1.0E-01	PPRTV
Dichloroethane, 1,1-	75-34-3	C	I	—	—	2.0E-01	PPRTV	—	—	2.4E+00	T
Dichloroethane, 1,2-	107-06-2	B2	I	9.1E-02	I	7.8E-02	T	3.4E-06	T	4.4E-02	T
Dichloroethylene, 1,1-	75-35-4	C	I	—	—	5.0E-02	I	—	—	3.4E-01	T
Dichloroethylene, cis-1,2-	156-59-2	IIACP	I	—	—	2.0E-03	I	—	—	6.0E-02	T
Dichloroethylene, trans-1,2	156-60-5	IIACP	I	—	—	2.0E-02	I	—	—	6.0E-02	PPRTV
Dichlorofluoromethane	75-43-4	—	—	—	—	2.0E-01	T	—	—	—	—
Dichlorophenol, 2,3-	576-24-9	—	—	—	—	3.0E-03	T	—	—	—	—
Dichlorophenol, 2,4-	120-83-2	—	—	—	—	3.0E-03	I	—	—	—	—
Dichlorophenol, 2,5-	583-78-8	—	—	—	—	3.0E-03	T	—	—	—	—
Dichlorophenol, 2,6-	87-65-0	—	—	—	—	1.0E-03	T	—	—	—	—
Dichlorophenol, 3,4-	95-77-2	—	—	—	—	3.0E-03	T	—	—	—	—
Dichlorophenol, 3,5-	591-35-5	—	—	—	—	3.0E-03	T	—	—	—	—
Dichlorophenoxy, 2,4- butyric acid, 4- (2,4-DB)	94-82-6	—	—	—	—	8.0E-03	I	—	—	—	—
Dichlorophenoxyacetic acid, 2,4- (2,4-D)	94-75-7	—	—	—	—	2.0E-01	A	—	—	—	—
Dichloroprop (2-(2,4-dichlorophenoxy) propanoic acid)	120-36-5	—	—	—	—	1.0E-02	T	—	—	—	—
Dichloropropane, 1,2-	78-87-5	LC	PPRTV	3.7E-02	PPRTV	1.3E-01	T	9.2E-07	T	4.0E-03	I
Dichloropropane, 1,3-	142-28-9	—	—	1.0E-01	T	2.0E-02	PPRTV	4.0E-06	T	2.0E-02	T
Dichloropropane, 2,2-	594-20-7	—	—	6.8E-02	T	9.0E-02	T	—	—	4.0E-03	T
Dichloropropanol, 2,3-	616-23-9	—	—	—	—	3.0E-03	I	—	—	—	—
Dichloropropene, 1,1-	563-58-6	B2	T	1.0E-01	T	3.0E-02	T	4.0E-06	T	2.0E-02	T
Dichloropropene, 1,3- (mixed isomers)	542-75-6	B2	I	1.0E-01	I	3.0E-02	I	4.0E-06	I	2.0E-02	I
Dichloropropene, cis 1,3-	10061-01-5	—	—	5.4E-01	T	1.0E-04	T	—	—	2.0E-02	I
Dichloropropene, trans 1,3-	10061-02-6	—	—	1.0E-01	T	3.0E-02	T	4.0E-06	T	2.0E-02	I
Dichlorvos	62-73-7	B2	I	2.9E-01	I	5.0E-04	I	—	—	5.0E-04	I
Dicrotophos (bidrin)	141-66-2	—	—	—	—	1.0E-04	I	—	—	—	—
Dicyclopentadiene	77-73-6	IIACP	PPRTV	—	—	8.0E-02	PPRTV	—	—	—	—
Dieldrin	60-57-1	B2	I	1.6E+01	I	5.0E-05	I	4.6E-03	I	—	—
Diethanolamine	111-42-2	—	—	—	—	5.0E-04	T	—	—	2.5E-02	T
Diethyldithiocarbamate, sodium salt	148-18-5	C	H	2.7E-01	H	3.0E-02	I	—	—	—	—
Diethyl phthalate	84-66-2	D	I	—	—	8.0E-01	I	—	—	—	—
Diethylene glycol	111-46-6	—	—	—	—	2.0E+00	T	—	—	—	—
Diethylene glycol monobutyl ether	112-34-5	—	—	—	—	3.0E-02	PPRTV	—	—	1.0E-04	PPRTV
Diethylhexyl adipate	103-23-1	C	I	1.2E-03	I	6.0E-01	I	—	—	—	—
Diethylstilbestrol	56-53-1	A	H	4.7E+03	H	—	—	—	—	—	—
Diisobutylene (trimethyl-1-pentene, 2,4,4-)	107-39-1	—	—	—	—	6.0E-02	T	—	—	2.0E-01	T
Diisopropylbenzene, p-	100-18-5	—	—	—	—	1.0E-02	T	—	—	—	—
Diisopropyl ether (2,2'-oxybis-propane)	108-20-3	—	—	—	—	1.0E-01	T	—	—	7.0E-01	PPRTV
Dimethenamid	87674-68-8	—	—	—	—	1.5E-02	T	—	—	—	—
Dimethoate	60-51-5	—	—	—	—	2.0E-04	I	—	—	—	—
Dimethoxybenzidine, 3,3'-	119-90-4	B2	H	1.4E-02	H	—	—	—	—	—	—
Dimethyl-2-nitrobenzene, 1,3-	81-20-9	—	—	—	—	2.0E-03	T	—	—	9.0E-03	T
Dimethyl-3-nitrobenzene, 1,2-	83-41-0	—	—	—	—	2.0E-03	T	—	—	9.0E-03	T
Dimethyl-4-nitrobenzene, 1-2-	99-51-4	—	—	—	—	2.0E-03	T	—	—	9.0E-03	T
Dimethyl-5-nitrobenzene, 1,3-	99-12-7	—	—	—	—	2.0E-03	T	—	—	9.0E-03	T
Dimethylphenethylamine, alpha, alpha-	122-09-8	—	—	—	—	2.0E-03	T	—	—	—	—
Dimethyl phenol, 2,4-	105-67-9	—	—	—	—	2.0E-02	I	—	—	—	—
Dimethylaminoazobenzene, p-	60-11-7	—	—	—	—	1.0E-05	T	—	—	—	—
Dimethylbenz-a-anthracene, 7,12-	57-97-6	—	—	2.5E+02	T	—	—	2.4E-02	T	—	—
Dimethylbenzidine, 3,3'-	119-93-7	LC	PPRTV	1.1E+01	PPRTV	—	—	—	—	—	—
Dimethylformamide, N,N-	68-12-2	—	—	—	—	1.0E-01	PPRTV	—	—	3.0E-02	I
Dimethylnaphthalene, 1,3-	575-41-7	—	—	—	—	4.0E-02	T	—	—	—	—
Dimethylphthalate	131-11-3	D	I	—	—	8.0E-01	T	—	—	—	—
Di-n-butyl phthalate	84-74-2	D	I	—	—	1.0E-01	I	—	—	—	—

Toxicity Factors¹

Last Revised: March 1, 2022

Chemical of Concern	CAS	Class ²	Ref ³	SFo (mg/kg-day)-1	Ref ³	RfDo (mg/kg-day)	Ref ³	URF (µg/m ³)- ¹	Ref ³	RfC (mg/m ³)	Ref ³
Dinitro-2-methylphenol, 4,6- (dinitro-o-cresol, 4, 6-)	534-52-1	—	—	—	—	1.0E-04	PPRTV	—	—	—	—
Dinitrobenzene, 1,3- (dinitrobenzene, 2,4-)	99-65-0	D	I	—	—	1.0E-04	I	—	—	—	—
Dinitrobenzene, 1,4-	100-25-4	—	—	—	—	1.0E-04	PPRTV	—	—	—	—
Dinitrophenol, 2,4-	51-28-5	—	—	—	—	2.0E-03	I	—	—	—	—
Dinitrophenol, 2,5-	329-71-5	—	—	—	—	2.0E-03	T	—	—	—	—
Dinitrotoluene, 2,4-	121-14-2	B2	I	6.8E-01	mixed iso	2.0E-03	I	—	—	—	—
Dinitrotoluene, 2,6-	606-20-2	B2	I	6.8E-01	mixed iso	1.0E-03	T	—	—	—	—
Di-n-octyl phthalate	117-84-0	IIACP	PPRTV	—	—	1.0E-02	PPRTV	—	—	—	—
Dinoseb	88-85-7	D	I	—	—	1.0E-03	I	—	—	—	—
Dioxane 1,4-	123-91-1	LC	I	1.0E-01	I	3.0E-02	I	5.0E-06	I	1.1E-01	A
Dioxins/furans, polychlorinated; (reported as 2,3,7,8-TCDD TEQ)	1746-01-6	—	—	—	—	—	—	—	—	—	—
Diphenyl ether	101-84-8	—	—	—	—	6.2E-03	T	—	—	—	—
Diphenylamine	122-39-4	—	—	—	—	2.5E-02	I	—	—	—	—
Diphenylhydrazine, 1,2-	122-66-7	B2	I	8.0E-01	I	—	—	2.2E-04	I	—	—
Dipropylene glycol	110-98-5	—	—	—	—	1.2E-01	T	—	—	—	—
Diquat	85-00-7	—	—	—	—	2.2E-03	I	—	—	—	—
Disodium iminodiacetate (iminodiacetic acid, disodium salt)	142-73-4	—	—	—	—	1.0E-02	T	—	—	—	—
Disulfoton	298-04-4	—	—	—	—	4.0E-05	I	—	—	—	—
Diuron	330-54-1	—	—	—	—	2.0E-03	I	—	—	—	—
Dodecylphenol, 4-	104-43-8	—	—	—	—	5.0E-02	T	—	—	—	—
Endosulfan	115-29-7	—	—	—	—	6.0E-03	I	—	—	—	—
Endosulfan I	959-98-8	—	—	—	—	2.0E-03	T	—	—	—	—
Endosulfan II	33213-65-9	—	—	—	—	6.0E-03	T	—	—	—	—
Endosulfan sulfate	1031-07-8	—	—	—	—	6.0E-03	T	—	—	—	—
Endothall	145-73-3	—	—	—	—	2.0E-02	I	—	—	—	—
Endrin	72-20-8	D	I	—	—	3.0E-04	I	—	—	—	—
Endrin aldehyde	7421-93-4	D	T	—	—	3.0E-04	T	—	—	—	—
Endrin ketone	53494-70-5	D	T	—	—	3.0E-04	T	—	—	—	—
Epichlorohydrin	106-89-8	B2	I	9.9E-03	I	6.0E-03	PPRTV	1.2E-06	I	1.0E-03	I
EPN (o-ethyl o-(4-nitrophenyl)phenylphosphonothioate)	2104-64-5	—	—	—	—	1.0E-05	I	—	—	—	—
Esfenvalerate	66230-04-4	—	—	—	—	2.0E-03	T	—	—	—	—
Ethalfuralin (sonolan)	55283-68-6	—	—	8.9E-02	EPA —97	4.0E-02	EPA —97	—	—	—	—
Ethanol	64-17-5	—	—	—	—	3.3E+01	T	—	—	—	—
Ethanol, 2-amino-	141-43-5	—	—	—	—	1.7E-03	T	—	—	2.3E-02	T
Ethanol, 2-(2-aminoethoxy)-	929-06-6	—	—	—	—	5.0E-04	T	—	—	—	—
Ethanol, 2-(2-ethoxyethoxy)-	111-90-0	—	—	—	—	2.0E+00	H	—	—	—	—
Ethanol, 2-(methylamino)-	109-83-1	—	—	—	—	1.6E-02	T	—	—	4.6E-02	T
Ethion	563-12-2	—	—	—	—	5.0E-04	I	—	—	—	—
Ethoprop	13194-48-4	B2	EPA —OP	2.8E-02	EPA —OP	1.0E-04	EPA —OP	—	—	—	—
Ethoxy ethanol, 2-	110-80-5	—	—	—	—	9.0E-02	PPRTV	—	—	2.0E-01	I
Ethyl acetate	141-78-6	IIACP	PPRTV	—	—	9.0E-01	I	—	—	2.3E-01	T
Ethyl acrylate	140-88-5	B2	H	4.8E-02	H	5.0E-03	PPRTV	—	—	8.0E-03	PPRTV
Ethyl benzene	100-41-4	D	I	—	—	1.0E-01	I	—	—	1.9E+00	T
Ethyl dipropylthiocarbamate, S-	759-94-4	—	—	—	—	2.5E-02	I	—	—	—	—
Ethyl ether	60-29-7	—	—	—	—	2.0E-01	I	—	—	—	—
Ethyl methacrylate	97-63-2	—	—	—	—	9.0E-02	H	—	—	3.0E-01	PPRTV
Ethyl methanesulfonate	62-50-0	—	—	9.9E-02	T	—	—	2.8E-05	T	—	—
Ethyl tert-butyl ether (2-ethyl-2-ethoxypropane)	637-92-3	—	—	—	—	1.0E-03	T	—	—	3.0E-01	T
Ethyl-1-hexanol, 2-	104-76-7	—	—	—	—	1.5E-01	T	—	—	—	—
Ethyl-2-hexenal, 2-	645-62-5	—	—	—	—	1.5E-01	T	—	—	—	—
Ethyl-2-methyl benzene, 1-	611-14-3	D	T	—	—	5.0E-02	T	—	—	4.0E-01	T
Ethyl-4-methyl benzene, 1-	622-96-8	D	T	—	—	5.0E-02	T	—	—	4.0E-01	T
Ethylene*	74-85-1	—	—	—	—	—	—	—	—	—	—

Toxicity Factors¹

Last Revised: March 1, 2022

Chemical of Concern	CAS	Class ²	Ref ³	SFo (mg/kg- day) ⁻¹	Ref ³	RfDo (mg/kg- day)	Ref ³	URF (µg/m ³) ⁻¹	Ref ³	RfC (mg/m ³)	Ref ³
Ethylene dibromide (dibromoethane, 1,2-)	106-93-4	LC	T	2.0E+00	I	9.0E-03	I	4.4E-05	T	6.7E-02	T
Ethylene glycol	107-21-1	—	—	—	—	2.0E+00	I	—	—	—	—
Ethylene oxide	75-21-8	LC	T	1.0E+00	H	—	—	1.4E-06	T	—	—
Ethylene thiourea	96-45-7	B2	H	1.1E-01	H	8.0E-05	I	—	—	—	—
Ethylenediamine	107-15-3	D	I	—	—	9.0E-02	PPRTV	—	—	—	—
Ethylenimine	151-56-4	C	T	6.5E+01	OEHHA	—	—	1.9E-02	OEHHA	—	—
Ethylhexyl acrylate, 2-	103-11-7	B2	T	4.8E-02	T	—	—	—	—	—	—
Famphur	52-85-7	—	—	—	—	3.0E-05	T	—	—	—	—
Fensulfothion	115-90-2	—	—	—	—	1.0E-03	T	—	—	—	—
Fenthion	55-38-9	—	—	—	—	7.0E-05	EPA —OP	—	—	—	—
Fenuron	-	—	—	—	—	7.0E-02	T	—	—	—	—
Fluoranthene	206-44-0	IIACP	PPRTV	—	—	4.0E-02	I	—	—	—	—
Fluorene	86-73-7	D	I	—	—	4.0E-02	I	—	—	—	—
Fluorine (soluble fluoride)	7782-41-4	—	—	—	—	6.0E-02	I	—	—	2.7E-02	T
Fluorochloridone	61213-25-0	—	—	—	—	7.5E-03	T	—	—	—	—
Fonofos	944-22-9	—	—	—	—	2.0E-03	I	—	—	—	—
Formaldehyde ⁵	50-00-0	B1	I	—	—	2.0E-01	I	—	—	1.1E-02	T
Formic acid	64-18-6	—	—	—	—	9.0E-01	PPRTV	—	—	3.0E-03	PPRTV
Furan	110-00-9	—	—	—	—	1.0E-03	I	—	—	—	—
Furfural	98-01-1	—	—	—	—	3.0E-03	I	—	—	—	—
Glycidylaldehyde	765-34-4	B2	I	—	—	4.0E-04	I	—	—	1.0E-03	H
Glyphosate	1071-83-6	D	I	—	—	1.0E+00	A	—	—	—	—
Heptachlor	76-44-8	B2	I	4.5E+00	I	5.0E-04	I	1.3E-03	I	—	—
Heptachlor epoxide	1024-57-3	B2	I	9.1E+00	I	1.3E-05	I	2.6E-03	I	—	—
Heptane, n-	142-82-5	D	I	—	—	6.0E-02	T	—	—	9.0E+00	T
Heptanoic acid, n-	111-14-8	—	—	—	—	5.0E-01	T	—	—	1.0E-03	T
Hexachlorobenzene	118-74-1	B2	I	1.6E+00	I	8.0E-04	I	4.6E-04	I	—	—
Hexachlorobutadiene	87-68-3	C	I	7.8E-02	I	1.0E-03	PPRTV	2.2E-05	I	—	—
Hexachlorocyclohexane, alpha (alpha-BHC)	319-84-6	B2	I	6.3E+00	I	8.0E-03	A	1.8E-03	I	—	—
Hexachlorocyclohexane, beta (beta-BHC)	319-85-7	C	I	1.8E+00	I	—	—	5.3E-04	I	—	—
Hexachlorocyclohexane, delta (delta-BHC)	319-86-8	B2	T	1.8E+00	T	3.0E-04	T	5.1E-04	T	—	—
Hexachlorocyclohexane, gamma (lindane; gamma-BHC)	58-89-9	B2	H	1.3E+00	H	3.0E-04	I	—	—	—	—
Hexachlorocyclohexane, techn (technical-BHC)	608-73-1	B2	I	1.8E+00	I	—	—	5.1E-04	I	—	—
Hexachlorocyclopentadiene	77-47-4	E	I	—	—	6.0E-03	I	—	—	2.0E-04	I
Hexachloroethane	67-72-1	LC	I	4.0E-02	I	7.0E-04	I	—	—	3.0E-02	I
Hexachlorophene	70-30-4	—	—	—	—	3.0E-04	I	—	—	—	—
Hexachloropropylene	1888-71-7	—	—	4.0E-02	T	7.0E-04	T	—	—	3.0E-02	T
Hexanal, 2-ethyl-	123-05-7	—	—	—	—	1.5E-01	T	—	—	—	—
Hexane, n-	110-54-3	D	I	—	—	6.0E-02	H	—	—	6.7E-01	T
Hexanediamine, 1,6-	124-09-4	—	—	—	—	5.0E-03	T	—	—	—	—
Hexanedinitrile	111-69-3	—	—	—	—	1.4E-03	T	—	—	6.0E-03	PPRTV
Hexanediol, 1,6-	629-11-8	—	—	—	—	5.0E+00	T	—	—	1.8E+01	T
Hexanoic acid	142-62-1	—	—	—	—	6.4E-02	T	—	—	1.0E-03	T
Hexanone, 2-	591-78-6	IIACP	I	—	—	5.0E-02	A	—	—	3.0E-02	I
Hexazinone	51235-04-2	—	—	—	—	3.3E-02	I	—	—	—	—
Hexene, 1-	592-41-6	—	—	—	—	3.3E-01	T	—	—	1.1E-01	T
Hexene, cis-2-	7688-21-3	—	—	—	—	3.3E-01	T	—	—	1.1E-01	T
Hexylene glycol (2-methyl-2,4-pentanediol)	107-41-5	—	—	—	—	3.0E-01	T	—	—	—	—
Hydrazine	302-01-2	B2	I	3.0E+00	I	—	—	4.9E-03	I	3.0E-05	PPRTV
Hydrocaproic acid, 6- (6-hydroxyhexanoic acid)	1191-25-9	—	—	—	—	6.4E-02	T	—	—	1.0E-03	T
Hydrogen chloride (hydrochloric acid)*	7647-01-0	—	—	—	—	—	—	—	—	—	—
Hydroquinone	123-31-9	LC	PPRTV	6.0E-02	PPRTV	4.0E-02	PPRTV	—	—	—	—
Indene	95-13-6	—	—	—	—	2.0E-02	T	—	—	3.0E-03	T
Indeno-1,2,3-cd-pyrene	193-39-5	CH	I	1.0E-01	EPA —93	—	—	6.0E-05	EPA —93	—	—

Toxicity Factors¹

Last Revised: March 1, 2022

Chemical of Concern	CAS	Class ²	Ref ³	SFo (mg/kg-day) ⁻¹	Ref ³	RfDo (mg/kg-day)	Ref ³	URF (µg/m ³) ⁻¹	Ref ³	RfC (mg/m ³)	Ref ³
Iron*	7439-89-6	—	—	—	—	—	—	—	—	—	—
Isoamyl alcohol	123-51-3	—	—	—	—	5.0E-03	T	—	—	—	—
Isobutyl alcohol	78-83-1	—	—	—	—	3.0E-01	I	—	—	—	—
Isobutylene (2-methyl-1-propene)	115-11-7	—	—	—	—	3.7E-03	T	—	—	1.1E+02	T
Isobutyric acid (2-methylpropanoic acid)	79-31-2	—	—	—	—	5.0E-01	T	—	—	—	—
Isodecanol	25339-17-7	—	—	—	—	1.6E-03	T	—	—	—	—
Isodrin	465-73-6	—	—	1.7E+02	T	3.0E-06	T	4.9E-02	T	—	—
Isopentane	78-78-4	—	—	—	—	6.0E-02	T	—	—	2.4E+01	T
Isophorone	78-59-1	C	I	9.5E-04	I	2.0E-01	I	—	—	—	—
Isopropyl acetate	108-21-4	—	—	—	—	7.0E-02	T	—	—	—	—
Isopropyl alcohol	67-63-0	—	—	—	—	2.0E+00	PPRTV	—	—	2.0E-01	PPRTV
Isosafrole	120-58-1	B2	T	2.2E-01	T	—	—	6.3E-05	T	—	—
Kelthane (dicofol)	115-32-2	—	—	—	—	6.0E-03	T	—	—	—	—
Kepone (chlordecone)	143-50-0	LC	I	1.0E+01	I	3.0E-04	I	—	—	—	—
Lead (inorganic)	7439-92-1	—	—	—	—	—	—	—	—	—	—
Leptophos	21609-90-5	—	—	—	—	5.0E-06	T	—	—	1.8E-06	T
Limonene, d-*	5989-27-5	—	—	—	—	—	—	—	—	—	—
Lithium	7439-93-2	—	—	—	—	7.0E-03	T	—	—	—	—
Magnesium*	7439-95-4	—	—	—	—	—	—	—	—	—	—
Malathion	121-75-5	—	—	—	—	2.0E-02	I	—	—	2.0E-04	T
Maleic anhydride	108-31-6	—	—	—	—	1.0E-01	I	—	—	—	—
Maleic hydrazide	123-33-1	—	—	—	—	5.0E-01	I	—	—	—	—
Malononitrile	109-77-3	—	—	—	—	1.0E-04	PPRTV	—	—	—	—
Mancozeb	8018-01-7	—	—	—	—	3.0E-02	I	—	—	—	—
Manganese ⁶	7439-96-5	D	I	—	—	1.4E-01/ 4.7E-02	I	—	—	8.4E-04	T
MCPA (4-(chloro-2-methylphenoxy) acetic acid)	94-74-6	—	—	—	—	5.0E-04	I	—	—	—	—
MCPP (2-(4-chloro-2-methylphenoxy) propanoic acid)	93-65-2	—	—	—	—	1.0E-03	I	—	—	—	—
Mercury (pH = 4.9) ⁷	7439-97-6	D	I	—	—	3.0E-04	I	—	—	3.0E-04	I
Mercury (pH = 6.8) ⁷	7439-97-6	D	I	—	—	3.0E-04	I	—	—	3.0E-04	I
Merphos	150-50-5	—	—	—	—	3.0E-05	I	—	—	—	—
Methacrylic acid (2-methyl-2-propenoic acid)	79-41-4	—	—	—	—	1.0E-02	T	—	—	—	—
Methacrylonitrile	126-98-7	NLC	PPRTV	—	—	5.0E-02	T	—	—	3.0E-02	PPRTV
Methanol	67-56-1	—	—	—	—	2.0E+00	I	—	—	7.2E+00	T
Methapyrilene	91-80-5	—	—	4.7E+00	NTP —00	—	—	—	—	—	—
Methomyl	16752-77-5	—	—	—	—	2.5E-02	I	—	—	—	—
Methoxychlor	72-43-5	D	I	—	—	5.0E-03	I	—	—	—	—
Methoxyethanol, 2-	109-86-4	—	—	—	—	2.7E-02	T	—	—	2.0E-02	I
Methyl acetate (acetic acid, methyl ester)	79-20-9	—	—	—	—	1.0E+00	H	—	—	—	—
Methyl acrylate	96-33-3	IIACP	PPRTV	—	—	2.0E-03	T	—	—	2.0E-02	PPRTV
Methyl amyl ketone (2-heptanone)	110-43-0	—	—	—	—	5.0E-02	T	—	—	2.8E+00	T
Methyl chrysene, 1-	3351-28-8	—	—	7.3E-03	T	—	—	8.8E-07	T	—	—
Methyl chrysene, 2-	3351-32-4	—	—	7.3E-03	T	—	—	8.8E-07	T	—	—
Methyl chrysene, 6-	1705-85-7	—	—	7.3E-02	T	—	—	8.8E-06	T	—	—
Methyl cyclohexane	108-87-2	IIACP	PPRTV	—	—	5.0E+00	T	—	—	3.0E+00	H
Methyl ethyl ketone (2-butanone)	78-93-3	D	I	—	—	6.0E-01	I	—	—	8.8E+00	T
Methyl iodide (iodomethane)	74-88-4	—	—	—	—	1.4E-03	T	—	—	—	—
Methyl isobutyl ketone (4-methyl-2-pentanone)	108-10-1	D	I	—	—	8.0E-02	H	—	—	3.0E+00	I
Methyl mercury	22967-92-6	C	I	—	—	1.0E-04	I	—	—	—	—
Methyl methacrylate	80-62-6	E	I	—	—	1.4E+00	I	—	—	7.0E-01	I
Methyl methanesulfonate	66-27-3	C	OEHHA	9.9E-02	OEHHA	—	—	2.8E-05	OEHHA	—	—
Methyl parathion	298-00-0	—	—	—	—	2.5E-04	I	—	—	—	—
Methyl-1-butene, 2-	563-46-2	—	—	—	—	6.0E-02	T	—	—	1.8E+01	T
Methyl-1-propanal, 2- (isobutyraldehyde)	78-84-2	—	—	—	—	4.0E-02	T	—	—	—	—
Methyl-2-butene, 2-	513-35-9	—	—	—	—	6.0E-02	T	—	—	1.8E+01	T

Toxicity Factors¹

Last Revised: March 1, 2022

Chemical of Concern	CAS	Class ²	Ref ³	SFo (mg/kg-day) ⁻¹	Ref ³	RfDo (mg/kg-day)	Ref ³	URF (µg/m ³) ⁻¹	Ref ³	RfC (mg/m ³)	Ref ³
Methyl-2-pentenal, 2-	623-36-9	—	—	1.9E+00	T	—	—	—	—	—	—
Methylcholanthrene, 3-	56-49-5	—	—	2.2E+01	T	—	—	2.1E-03	T	—	—
Methylene bromide (dibromomethane)	74-95-3	—	—	7.5E-03	T	6.0E-02	T	—	—	4.0E-03	PPRTV
Methylene chloride (dichloromethane)	75-09-2	LC	T	9.8E-05	T	2.1E-02	T	2.8E-08	T	1.3E+00	T
Methylene-bis (2-chloroaniline) 4,4'-	101-14-4	LC	PPRTV	1.0E-01	PPRTV	2.0E-03	PPRTV	3.7E-05	H	—	—
Methylmercury hydroxide	1184-57-2	C	T	—	—	1.0E-04	T	—	—	—	—
Methylnaphthalene, 1-	90-12-0	SEC	PPRTV	2.9E-02	PPRTV	7.0E-02	A	—	—	—	—
Methylnaphthalene, 2-	91-57-6	D	I	—	—	4.0E-03	I	—	—	—	—
Methylpyrrolidone, N-	872-50-4	—	—	—	—	2.0E-02	T	—	—	—	—
Methylstyrene, alpha-	98-83-9	—	—	—	—	8.3E-03	T	—	—	2.5E-02	T
Methyltetrahydrofuran, 2-	96-47-9	—	—	7.6E-03	T	2.0E-01	T	1.9E-06	T	—	—
Methyltetrahydropyran, 2-	10141-72-7	—	—	7.6E-03	T	2.0E-01	T	1.9E-06	T	—	—
Metolachlor	51218-45-2	C	I	—	—	1.5E-01	I	—	—	—	—
Metribuzin	21087-64-9	D	I	—	—	2.5E-02	I	—	—	—	—
Mirex	2385-85-5	B2	H	—	—	2.0E-04	I	—	—	—	—
Molinate	2212-67-1	—	—	—	—	2.0E-03	I	—	—	—	—
Molybdenum	7439-98-7	—	—	—	—	5.0E-03	I	—	—	—	—
Monocrotophos	2157-98-4	—	—	—	—	6.0E-04	T	—	—	—	—
Morpholine	110-91-8	—	—	—	—	5.0E+02	T	—	—	—	—
Morpholine, N-butyl-	1005-67-0	—	—	—	—	2.3E-03	T	—	—	—	—
MTBE (methyl tert-butyl ether)	1634-04-4	—	—	1.8E-03	OEHHA	1.0E-02	OEHHA	2.6E-07	OEHHA	3.0E+00	I
Naled	300-76-5	—	—	—	—	2.0E-03	I	—	—	—	—
Naphthalene	91-20-3	D	I	—	—	2.0E-02	I	—	—	3.0E-03	I
Naphthoquinone, 1,4-	130-15-4	—	—	—	—	7.0E-03	T	—	—	—	—
Naphthylamine, 1-	134-32-7	—	—	—	—	2.0E-02	T	—	—	—	—
Naphthylamine, 2-	91-59-8	—	—	1.8E+00	OEHHA	—	—	—	—	—	—
Napropamide	15299-99-7	—	—	—	—	1.0E-01	I	—	—	—	—
Neopentyl glycol	126-30-7	—	—	—	—	3.0E-01	T	—	—	—	—
Nickel and compounds	7440-02-0	CH	T	—	—	2.0E-02	I	1.7E-04	T	2.3E-04	T
Nitrate-N	14797-55-8	—	—	—	—	1.6E+00	I	—	—	—	—
Nitrite-N	14797-65-0	—	—	—	—	1.0E-01	I	—	—	—	—
Nitroaniline, 2-	88-74-4	D	N	—	—	3.0E-04	N	—	—	2.0E-04	H
Nitroaniline, 3-	99-09-2	C	N	3.8E-02	N	3.0E-04	PPRTV	—	—	2.0E-04	T
Nitroaniline, 4-	100-01-6	SEC	PPRTV	2.0E-02	PPRTV	4.0E-03	PPRTV	—	—	6.0E-03	PPRTV
Nitrobenzene	98-95-3	LC	I	—	—	2.0E-03	I	4.0E-05	I	9.0E-03	I
Nitroglycerin	55-63-0	LC	PPRTV	1.7E-02	PPRTV	1.0E-04	PPRTV	—	—	—	—
Nitrophenol, 2-	88-75-5	—	—	—	—	2.0E-03	T	—	—	—	—
Nitrophenol, 3-	554-84-7	—	—	—	—	2.0E-03	T	—	—	—	—
Nitrophenol, 4-	100-02-7	—	—	—	—	2.0E-03	T	—	—	—	—

Toxicity Factors¹

Last Revised: March 1, 2022

Chemical of Concern	CAS	Class ²	Ref ³	SFo (mg/kg- day) ⁻¹	Ref ³	RfDo (mg/kg- day)	Ref ³	URF (µg/m ³) ⁻¹	Ref ³	RfC (mg/m ³)	Ref ³
Nitropropane, 2-	79-46-9	—	—	—	—	1.4E-04	T	5.8E-04	PPRTV	2.0E-02	I
Nitroquinoline-N-oxide, 4-	56-57-5	B2	T	9.4E+00	T	—	—	2.7E-03	T	—	—
Nitrosodiethanolamine	1116-54-7	B2	I	2.8E+00	I	—	—	—	—	—	—
Nitrosodiethylamine, n-	55-18-5	B2	I	1.5E+02	I	—	—	4.3E-02	I	—	—
Nitrosodimethylamine, n-	62-75-9	B2	I	5.1E+01	I	8.0E-06	PPRTV	1.4E-02	I	4.0E-05	PPRTV
Nitrosodi-n-butylamine, n-	924-16-3	B2	I	5.4E+00	I	—	—	1.6E-03	I	—	—
Nitrosodi-n-propylamine, n-	621-64-7	B2	I	7.0E+00	I	—	—	—	—	—	—
Nitrosodiphenylamine	86-30-6	B2	I	4.9E-03	I	—	—	—	—	—	—
Nitroso-methyl-ethyl-amine, n-	10595-95-6	B2	I	2.2E+01	I	—	—	—	—	—	—
Nitrosomorpholine, N-	59-89-2	C	OEHHA	6.7E+00	OEHHA	—	—	1.9E-03	OEHHA	—	—
Nitroso-n-ethylurea, n-	759-73-9	B2	H	1.4E+02	H	—	—	—	—	—	—
Nitrosopiperidine, N-	100-75-4	C	OEHHA	9.4E+00	OEHHA	—	—	2.7E-03	OEHHA	—	—
Nitrosopyrrolidine, n-	930-55-2	B2	I	2.1E+00	I	—	—	6.1E-04	I	—	—
Nitrotoluene, m-	99-08-1	—	—	—	—	1.0E-02	H	—	—	—	—
Nitrotoluene, o-	88-72-2	LC	PPRTV	2.2E-01	PPRTV	9.0E-04	PPRTV	—	—	—	—
Nitrotoluene, p-	99-99-0	LC	PPRTV	1.6E-02	PPRTV	4.0E-03	PPRTV	—	—	—	—
Nonachlor, cis-	5103-73-1	B2	T	3.5E-01	T	5.0E-04	T	1.0E-04	T	7.0E-04	T
Nonachlor, trans-	39765-80-5	B2	T	3.5E-01	T	5.0E-04	T	1.0E-04	T	7.0E-04	T
Nonanal	124-19-6	—	—	—	—	2.0E-01	T	—	—	—	—
Nonene, 1-n	124-11-8	—	—	—	—	1.0E-01	T	—	—	—	—
Nonylphenol, 4-n-	104-40-5	—	—	—	—	1.0E-01	T	—	—	—	—
Nonylphenol ethoxylate ⁸	9016-45-9	—	—	—	—	1.0E-01	T	—	—	—	—
Octamethylpyrophosphoramidate	152-16-9	—	—	—	—	2.0E-03	H	—	—	—	—
Octanone	106-68-3	—	—	—	—	6.0E-02	T	—	—	1.8E+01	T
Oxamyl	23135-22-0	—	—	—	—	2.5E-02	I	—	—	—	—
Oxychlorane	27304-13-8	B2	T	3.5E-01	T	5.0E-04	T	1.0E-04	T	7.0E-04	T
Paraquat	1910-42-5	C	I	—	—	4.5E-03	I	—	—	—	—
Parathion (ethyl parathion)	56-38-2	C	I	—	—	6.0E-03	H	—	—	—	—
Pebulate	1114-71-2	—	—	—	—	5.0E-02	H	—	—	—	—
Pendimethalin	40487-42-1	—	—	—	—	4.0E-02	I	—	—	—	—
Pentachlorobenzene	608-93-5	D	I	—	—	8.0E-04	I	—	—	—	—
Pentachloroethane	76-01-7	LC	PPRTV	9.0E-02	PPRTV	3.0E-02	T	7.4E-06	T	—	—
Pentachloronitrobenzene	82-68-8	C	H	2.6E-01	H	3.0E-03	I	—	—	—	—
Pentachlorophenol	87-86-5	LC	I	4.0E-01	I	5.0E-03	I	—	—	—	—
Pentadiene, 1,3-cis-	1574-41-0	—	—	—	—	6.0E-02	T	—	—	1.8E+01	T
Pentadiene, 1,3-trans-	2004-70-8	—	—	—	—	6.0E-02	T	—	—	1.8E+01	T

Toxicity Factors¹

Last Revised: March 1, 2022

Chemical of Concern	CAS	Class ²	Ref ³	SFo (mg/kg- day) ⁻¹	Ref ³	RfDo (mg/kg- day)	Ref ³	URF (µg/m ³) ⁻¹	Ref ³	RfC (mg/m ³)	Ref ³
Pentaerythritol tetranitrate (PETN)	78-11-5	—	—	—	—	2.0E-03	PPRTV	—	—	—	—
Pentane	109-66-0	—	—	—	—	6.0E-02	T	—	—	2.4E+01	T
Pentane, 2-methyl-	107-83-5	—	—	—	—	6.0E-02	T	—	—	1.8E+01	T
Pentane, 3-methyl-	96-14-0	—	—	—	—	6.0E-02	T	—	—	1.8E+01	T
Pentanediol, 1,5-	111-29-5	—	—	—	—	5.0E+00	T	—	—	1.8E+01	T
Pentanol, 1-	71-41-0	—	—	—	—	3.3E-02	T	—	—	—	—
Pentanol, 4-methyl-2-	108-11-2	—	—	—	—	2.6E-02	T	—	—	—	—
Pentanone, 2-	107-87-9	—	—	—	—	4.0E-02	T	—	—	—	—
Pentene, 2-	109-68-2	—	—	—	—	6.0E-02	T	—	—	1.8E+01	T
Pentyne, 1-	627-19-0	—	—	—	—	6.0E-02	T	—	—	1.8E+01	T
Perchlorate	14797-73-0	—	—	—	—	7.0E-04	I	—	—	—	—
Perfluorooctane sulfonic acid (1-Octanesulfonic acid, heptadecafluoro-1-) [PFOS]	1763-23-1	—	—	—	—	2.3E-05	T	—	—	8.1E-05	T
Perfluoroundecanoic acid (Undecanoic acid, uncosafluoro-) [PFUnDa]	2058-94-8	—	—	—	—	1.2E-05	T	—	—	—	—
Perfluoropentanoic acid (Pentanoic acid, nonafluoro-) [PFPeA]	2706-90-3	—	—	—	—	3.8E-06	T	—	—	—	—
Perfluorohexanoic acid (Hexanoic acid, undecafluoro-) [PFHxA]	307-24-4	—	—	—	—	3.8E-06	T	—	—	—	—
Perfluorododecanoic acid (Dodecanoic acid, tricosafafluoro-) [PFDoA]	307-55-1	—	—	—	—	1.2E-05	T	—	—	4.2E-05	T
Perfluorooctanoic acid (Octanoic acid, pentadecafluoro-) [PFOA]	335-67-1	—	—	—	—	1.2E-05	T	—	—	4.1E-06	T
Perfluorodecanoic acid (Decanoic acid, nonadecafluoro-) [PFDA]	335-76-2	—	—	—	—	1.5E-05	T	—	—	5.3E-05	T
Perfluorodecane sulfonic acid (1-Decanesulfonic acid, heneicosafluoro-) [PFDS]	335-77-3	—	—	—	—	1.2E-05	T	—	—	—	—
Perfluorohexane sulfonic acid (1-Hexanesulfonic acid, tridecafluoro-) [PFHxS]	355-46-4	—	—	—	—	3.8E-06	T	—	—	1.3E-05	T
Perfluorobutyric acid (Butanoic acid, heptafluoro-) [PFBA]	375-22-4	—	—	—	—	2.9E-03	T	—	—	1.0E-02	T
Perfluorobutane sulfonic acid (1-Butanesulfonic acid, nonafluoro-) [PFBS]	375-73-5	—	—	—	—	1.4E-03	T	—	—	4.9E-03	T
Perfluoroheptanoic acid (Heptanoic acid, tridecafluoro-) [PFHpA]	375-85-9	—	—	—	—	2.3E-05	T	—	—	—	—
Perfluorononanoic acid (Nonanoic acid, heptadecafluoro-) [PFNA]	375-95-1	—	—	—	—	1.2E-05	T	—	—	2.8E-05	T
Perfluorotetradecanoic acid (Tetradecanoic acid, heptacosafafluoro-) [PFTeDA]	376-06-7	—	—	—	—	1.2E-05	T	—	—	—	—
Perfluorotridecanoic acid (Tridecanoic acid, pentacosafafluoro-) [PFTrDA]	72629-94-8	—	—	—	—	1.2E-05	T	—	—	—	—
Perfluorooctane sulfonamide (1-Octanesulfonamide, heptadecafluoro-) [PFOSA]	754-91-6	—	—	—	—	1.2E-05	T	—	—	4.1E-06	T
Perylene	198-55-0	—	—	—	—	2.0E-02	T	—	—	—	—
Phenacetin	62-44-2	B1	OEHA	2.2E-03	OEHA	—	—	6.3E-07	OEHA	—	—

Toxicity Factors¹

Last Revised: March 1, 2022

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Phenanthrene	85-01-8	D	I	—	—	3.0E-02	T	—	—	—	—
Phenanthridine	229-87-8	—	—	—	—	3.0E-03	T	—	—	—	—
Phenol	108-95-2	IIACP	T	—	—	3.0E-01	I	—	—	1.1E-02	T
Phenol, 4-tert-butyl-	98-54-4	—	—	—	—	1.2E-01	T	—	—	—	—
Phenothiazine	92-84-2	—	—	—	—	1.1E-03	T	—	—	—	—
Phenyl mercuric acetate	62-38-4	—	—	—	—	8.0E-05	I	—	—	—	—
Phenylene diamine, m-	108-45-2	—	—	—	—	6.0E-03	I	—	—	—	—
Phenylene diamine, p-	106-50-3	—	—	—	—	1.9E-01	H	—	—	—	—
Phorate	298-02-2	—	—	—	—	2.0E-04	H	—	—	—	—
Phosalone	2310-17-0	—	—	—	—	2.0E-03	EPA —OP	—	—	—	—
Phosdrin (mevinphos)	7786-34-7	—	—	—	—	2.5E-05	EPA —OP	—	—	—	—
Phosmet	732-11-6	—	—	—	—	2.0E-02	I	—	—	—	—
Phosphine	7803-51-2	D	I	—	—	3.0E-04	I	—	—	3.0E-04	I
Phosphorotrithioic acid, S,S,S-tributyl ester	78-48-8	—	—	8.4E-02	EPA —OP	5.0E-04	A	—	—	—	—
Phosphorus, total*	7723-14-0	—	—	—	—	—	—	—	—	—	—
Phosphorus, white	7723-14-0	D	I	—	—	2.0E-05	I	—	—	—	—
Phthalic anhydride	85-44-9	—	—	—	—	2.0E+00	I	—	—	1.2E-01	H
Picloram	1918-02-1	—	—	—	—	7.0E-02	I	—	—	—	—
Picoline, 2- (2-methylpyridine)	109-06-8	—	—	—	—	9.0E-03	T	—	—	—	—
Polybrominated biphenyls (PBBs)	67774-32-7	B2	H	8.9E+00	H	7.0E-06	H	—	—	—	—
Polychlorinated biphenyls (PCBs)	1336-36-3	B2	I	2.0E+00	I	2.0E-05	I	5.7E-04	I	—	—
Potassium*	7440-09-7	—	—	—	—	—	—	—	—	—	—
Primene	68955-53-3	—	—	—	—	6.0E-03	T	—	—	—	—
Prometon (pramitol)	1610-18-0	—	—	—	—	1.5E-02	I	—	—	—	—
Prometryn	7287-19-6	—	—	—	—	4.0E-02	T	—	—	—	—
Pronamide	23950-58-5	—	—	—	—	7.5E-02	I	—	—	—	—
Propanal (propionaldehyde)	123-38-6	—	—	—	—	8.0E-03	T	—	—	8.0E-03	I
Propane, 1-bromo-	106-94-5	—	—	—	—	3.6E-02	T	—	—	—	—
Propanil	709-98-8	—	—	—	—	5.0E-03	I	—	—	—	—
Propanoic acid (propionic acid)	79-09-4	—	—	—	—	5.0E-01	T	—	—	—	—
Propanol, 1-	71-23-8	—	—	—	—	7.0E+00	T	—	—	—	—
Propargite	2312-35-8	—	—	—	—	2.0E-02	I	—	—	—	—
Propargyl alcohol	107-19-7	—	—	—	—	2.0E-03	I	—	—	—	—
Propazine	139-40-2	C	EPA —OP	4.5E-02	EPA —OP	2.0E-02	I	—	—	—	—
Propham	122-42-9	—	—	—	—	2.0E-02	I	—	—	—	—
Propionitrile (propane nitrile)	107-12-0	—	—	—	—	4.0E-04	T	—	—	—	—
Propyl acetate, n-	109-60-4	—	—	—	—	9.0E-02	T	—	—	—	—
Propylbenzene, n-	103-65-1	—	—	—	—	4.0E-02	N	—	—	4.0E-01	T
Propylene glycol	57-55-6	—	—	—	—	2.0E+01	PPRTV	—	—	3.0E-03	PPRTV
Propylene glycol monomethyl ether	107-98-2	—	—	—	—	7.0E-01	H	—	—	2.0E+00	I
Propylene oxide	75-56-9	B2	I	2.4E-01	I	—	—	3.7E-06	I	3.0E-02	I
Propylene tetramer	6842-15-5	—	—	—	—	1.0E-01	T	—	—	1.0E+00	T
Prothiofos (Tokuthion)	34643-46-4	—	—	—	—	1.0E-04	T	—	—	—	—
Pyrene	129-00-0	D	I	—	—	3.0E-02	I	—	—	—	—
Pyridine	110-86-1	—	—	—	—	1.0E-03	I	—	—	—	—
Quinoline	91-22-5	B2	I	3.0E+00	I	—	—	—	—	—	—
Ronnel	299-84-3	—	—	—	—	5.0E-02	H	—	—	—	—
Safrole	94-59-7	C	OEHHA	2.2E-01	OEHHA	—	—	6.3E-05	OEHHA	—	—
Selenium	7782-49-2	D	I	—	—	5.0E-03	I	—	—	—	—
Selenourea	630-10-4	—	—	—	—	5.0E-03	H	—	—	—	—
Silver	7440-22-4	D	I	—	—	5.0E-03	I	—	—	—	—
Simazine	122-34-9	C	H	1.2E-01	H	5.0E-03	I	—	—	—	—
Sodium*	7440-23-5	—	—	—	—	—	—	—	—	—	—
Sodium hypochlorite	7681-52-9	—	—	—	—	2.1E-01	T	—	—	3.1E-04	T
Sodium polyacrylate	9003-04-7	—	—	—	—	5.0E-01	T	—	—	1.0E-03	T
Strontium	7440-24-6	—	—	—	—	6.0E-01	I	—	—	—	—

Toxicity Factors¹

Last Revised: March 1, 2022

Chemical of Concern	CAS	Class ²	Ref ³	SFo (mg/kg- day) ⁻¹	Ref ³	RfDo (mg/kg- day)	Ref ³	URF (µg/m ³) ⁻¹	Ref ³	RfC (mg/m ³)	Ref ³
Strychnine	57-24-9	—	—	—	—	3.0E-04	I	—	—	—	—
Styrene	100-42-5	—	—	—	—	2.0E-01	I	—	—	4.7E-01	T
Sulfate*	14808-79-8	—	—	—	—	—	—	—	—	—	—
Sulfide*	18496-25-8	—	—	—	—	—	—	—	—	—	—
Sulfolane	126-33-0	—	—	—	—	1.3E-02	T	—	—	6.4E-03	T
Sulfur*	7704-34-9	—	—	—	—	—	—	—	—	—	—
Sulprofos (Bolstar)	35400-43-2	—	—	—	—	3.0E-03	EPA —OP	—	—	—	—
Tebuconazole	107534-96-3	C	EPA —OP	—	—	3.0E-02	EPA —OP	—	—	—	—
Tebuthiuron	34014-18-1	—	—	—	—	7.0E-02	I	—	—	—	—
Terbufos	13071-79-9	—	—	—	—	2.5E-05	H	—	—	—	—
Tert-amyl ethyl ether (TAEЕ)	919-94-8	—	—	—	—	4.0E-02	T	—	—	—	—
Tert-amyl-methyl ether (TAME)	994-05-8	—	—	—	—	4.0E-02	T	—	—	—	—
Tert-butyl alcohol (2-methyl-2-propanol)	75-65-0	—	—	—	—	9.0E-02	T	—	—	—	—
Tetrachlorobenzene, 1,2,3,4-	634-66-2	—	—	—	—	3.0E-04	T	—	—	—	—
Tetrachlorobenzene, 1,2,3,5-	634-90-2	—	—	—	—	3.0E-04	T	—	—	—	—
Tetrachlorobenzene, 1,2,4,5-	95-94-3	—	—	—	—	3.0E-04	I	—	—	—	—
Tetrachloroethane, 1,1,1,2-	630-20-6	C	I	2.6E-02	I	3.0E-02	I	7.4E-06	I	—	—
Tetrachloroethane, 1,1,2,2-	79-34-5	LC	I	2.0E-01	I	2.0E-02	I	—	—	—	—
Tetrachloroethylene (PCE)	127-18-4	LC	T	2.1E-03	I	2.1E-02	T	3.8E-07	T	3.7E-01	T
Tetrachlorophenol, 2,3,4,5-	4901-51-3	—	—	—	—	3.0E-02	T	—	—	—	—
Tetrachlorophenol, 2,3,4,6-	58-90-2	—	—	—	—	3.0E-02	I	—	—	—	—
Tetrachlorophenol, 2,3,5,6-	935-95-5	—	—	—	—	3.0E-02	T	—	—	—	—
Tetrachlorvinphos (Stiropfos)	22248-79-9	—	—	—	—	4.2E-02	EPA —OP	—	—	—	—
Tetradifon	116-29-0	—	—	—	—	2.0E-02	T	—	—	—	—
Tetraethyl dithiopyrophosphate (sulfotep)	3689-24-5	—	—	—	—	5.0E-04	I	—	—	—	—
Tetraethyl lead	78-00-2	—	—	—	—	1.0E-07	I	—	—	—	—
Tetraethyl pyrophosphate (TEPP)	107-49-3	—	—	—	—	1.1E-05	T	—	—	—	—
Tetraethylene glycol	112-60-7	—	—	—	—	3.3E-01	T	—	—	—	—
Tetrahydrofuran	109-99-9	SEC	I	7.6E-03	N	9.0E-01	I	1.9E-06	N	2.0E+00	I
Tetrahydropyran	142-68-7	—	—	7.6E-03	T	2.0E-01	T	1.9E-06	T	—	—
Tetraoxadodecane, 2,5,8,11-	112-49-2	—	—	—	—	2.5E-02	T	—	—	—	—
Thallium	7440-28-0	D	I	—	—	6.7E-05	T	—	—	—	—
Thiofanox	39196-18-4	—	—	—	—	3.0E-04	H	—	—	—	—
Thionazin	297-97-2	—	—	—	—	7.0E-05	T	—	—	—	—
Thiophanate-methyl	23564-05-8	—	—	—	—	8.0E-02	I	—	—	—	—
Thiram	137-26-8	—	—	—	—	5.0E-03	I	—	—	—	—
Tin	7440-31-5	—	—	—	—	6.0E-01	H	—	—	—	—
Titanium	7440-32-6	—	—	—	—	5.0E+00	T	—	—	—	—
Toluene	108-88-3	D	I	—	—	8.0E-02	I	—	—	4.1E+00	T
Toluene diisocyanate, 2,4/2,6-	26471-62-5	—	—	—	—	—	—	—	—	7.0E-05	I
Toluenediamine, 2,4-	95-80-7	B2	H	3.2E+00	H	—	—	—	—	—	—

Toxicity Factors¹

Last Revised: March 1, 2022

Chemical of Concern	CAS	Class ²	Ref ³	SFo (mg/kg-day) ⁻¹	Ref ³	RfDo (mg/kg-day)	Ref ³	URF (µg/m ³) ⁻¹	Ref ³	RfC (mg/m ³)	Ref ³
Toluenediamine, 2,6-	823-40-5	—	—	—	—	3.0E-02	PPRTV	—	—	—	—
Toluidine, o-	95-53-4	LC	PPRTV	1.6E-02	PPRTV	—	—	5.1E-05	OEHHA	—	—
Toluidine, p-	106-49-0	SEC	PPRTV	3.0E-02	PPRTV	—	—	—	—	—	—
Toxaphene	8001-35-2	B2	I	1.1E+00	I	3.1E-04	T	3.2E-04	I	—	—
TPH, TX1005, C6-C12	NA	—	—	—	—	4.0E-02	—	—	—	2.0E-01	—
TPH, TX1005, >C12-C28	NA	—	—	—	—	4.0E-02	—	—	—	2.0E-01	—
TPH, TX1005, >C12-C35	NA	—	—	—	—	4.0E-02	—	—	—	2.0E-01	—
TPH, TX1005, >C28-C35	NA	—	—	—	—	4.0E-02	—	—	—	2.0E-01	—
TP Silvex, 2,4,5-	93-72-1	D	I	—	—	8.0E-03	I	—	—	—	—
Triademenol	55219-65-3	—	—	—	—	3.0E-02	T	—	—	—	—
Triallate	2303-17-5	—	—	—	—	1.3E-02	I	—	—	—	—
Triaminotrinitrobenzene (TATB)	3058-38-6	—	—	—	—	3.0E-03	T	—	—	—	—
Tributyltin oxide	56-35-9	D	I	—	—	3.0E-04	I	—	—	—	—
Trichloro-1,2,2-trifluoroethane, 1,1,2-	76-13-1	—	—	—	—	3.0E+01	I	—	—	5.0E+00	PPRTV
Trichlorobenzene, 1,2,3-	87-61-6	—	—	—	—	3.0E-03	T	—	—	2.0E-03	T
Trichlorobenzene, 1,2,4-	120-82-1	LC	PPRTV	2.9E-02	PPRTV	1.0E-02	I	—	—	2.0E-03	PPRTV
Trichlorobenzene, 1,3,5-	108-70-3	—	—	—	—	3.0E-03	T	—	—	2.0E-03	T
Trichloroethane, 1,1,1-	71-55-6	IIACP	T	—	—	2.0E+00	I	—	—	5.1E+00	T
Trichloroethane, 1,1,2-	79-00-5	C	I	5.7E-02	I	4.0E-03	I	1.6E-05	I	—	—
Trichloroethylene (TCE)	79-01-6	CH	I	4.6E-02	I	5.0E-04	I	4.1E-06	I	2.0E-03	I
Trichlorofluoromethane	75-69-4	—	—	—	—	3.0E-01	I	—	—	—	—
Trichloronate	327-98-0	—	—	—	—	3.0E-03	T	—	—	—	—
Trichlorophenol, 2,3,4-	15950-66-0	—	—	—	—	1.0E-01	T	—	—	—	—
Trichlorophenol, 2,3,5-	933-78-8	—	—	—	—	1.0E-01	T	—	—	—	—
Trichlorophenol, 2,3,6-	933-75-5	—	—	—	—	1.0E-01	T	—	—	—	—
Trichlorophenol, 2,4,5-	95-95-4	—	—	—	—	1.0E-01	I	—	—	—	—
Trichlorophenol, 2,4,6-	88-06-2	B2	I	1.1E-02	I	1.0E-03	PPRTV	3.1E-06	I	—	—
Trichlorophenol, 3,4,5-	609-19-8	—	—	—	—	1.0E-01	T	—	—	—	—
Trichlorophenoxyacetic acid, 2,4,5-	93-76-5	—	—	—	—	1.0E-02	I	—	—	—	—

Toxicity Factors¹

Last Revised: March 1, 2022

Chemical of Concern	CAS	Class ²	Ref ³	SFo (mg/kg-day) ⁻¹	Ref ³	RfDo (mg/kg-day)	Ref ³	URF (µg/m ³) ⁻¹	Ref ³	RfC (mg/m ³)	Ref ³
Trichloropropane, 1,1,2-	598-77-6	—	—	—	—	5.0E-03	I	—	—	3.0E-04	T
Trichloropropane, 1,2,3-	96-18-4	LC	I	3.0E+01	I	4.0E-03	I	—	—	3.0E-04	I
Triethanolamine	102-71-6	—	—	—	—	2.0E-01	T	—	—	2.5E-02	T
Triethylamine	121-44-8	—	—	—	—	—	—	—	—	7.0E-03	I
Triethylene glycol	112-27-6	IIACP	PPRTV	—	—	2.0E+00	PPRTV	—	—	—	—
Triethylphosphorothioate, O, O, O-	126-68-1	—	—	—	—	8.3E-06	T	—	—	—	—
Trifluralin	1582-09-8	C	I	7.7E-03	I	7.5E-03	I	—	—	—	—
Trimethylamine	75-50-3	—	—	—	—	—	—	—	—	7.0E-03	T
Trimethylbenzene, 1,2,3-	526-73-8	—	—	—	—	3.4E-02	T	—	—	1.8E-01	T
Trimethylbenzene, 1,2,4-	95-63-6	—	—	—	—	3.4E-02	T	—	—	1.8E-01	T
Trimethylbenzene, 1,3,5-	108-67-8	—	—	—	—	3.4E-02	T	—	—	1.8E-01	T
Trinitrobenzene, 1,3,5-	99-35-4	—	—	—	—	3.0E-02	I	—	—	—	—
Trinitrophenylmethylnitramine (tetryl; nitramine)	479-45-8	—	—	—	—	2.0E-03	PPRTV	—	—	—	—
Trinitrotoluene, 2,4,6-	118-96-7	C	I	3.0E-02	I	5.0E-04	I	—	—	—	—
Tungsten (as sodium tungstate dihydride)	7440-33-7	—	—	—	—	1.0E-03	T	—	—	5.3E-03	T
Uranium (soluble salts)	7440-61-1	—	—	—	—	3.0E-03	I	—	—	4.0E-05	A
Valeric acid (pentanoic acid)	109-52-4	—	—	—	—	5.0E-01	T	—	—	1.0E-03	T
Vanadium	7440-62-2	—	—	—	—	1.8E-03	T	—	—	3.0E-05	T
Vernam	1929-77-7	—	—	—	—	1.0E-03	I	—	—	—	—
Vinyl acetate	108-05-4	—	—	—	—	1.0E+00	H	—	—	2.0E-01	I
Vinyl chloride	75-01-4	A	I	1.5E+00	I	3.0E-03	I	8.4E-06	T	6.0E-02	T
Vinylcyclohexane	695-12-5	—	—	—	—	5.0E-01	T	—	—	—	—
Warfarin	81-81-2	—	—	—	—	3.0E-04	I	—	—	—	—
Xylene, m-	108-38-3	—	—	—	—	2.0E+00	H	—	—	6.1E-01	T
Xylene, o-	95-47-6	—	—	—	—	2.0E+00	H	—	—	6.1E-01	T
Xylene, p-	106-42-3	—	—	—	—	2.0E+00	H	—	—	6.1E-01	T
Xylenes	1330-20-7	D	I	—	—	2.0E-01	I	—	—	6.1E-01	T
Zinc	7440-66-6	D	I	—	—	3.0E-01	I	—	—	—	—

Toxicity Factors¹

Last Revised: March 1, 2022

Chemical of Concern	CAS	Class ²	Ref ³	SFo (mg/kg-day) ⁻¹	Ref ³	RfDo (mg/kg-day)	Ref ³	URF (µg/m ³) ⁻¹	Ref ³	RfC (mg/m ³)	Ref ³
6 C aliphatics (TPH) (>53% n-hexane content)	NA	—	—	—	—	6.0E-02	—	—	—	6.7E-01	—
6 C aliphatics (TPH) (<53% n-hexane content)	NA	—	—	—	—	6.0E-02	—	—	—	1.8E+01	—
>6-8 C aliphatics (TPH) (>53% n-hexane content)	NA	—	—	—	—	6.0E-02	—	—	—	6.7E-01	—
>6-8 C aliphatics (TPH) (<53% n-hexane content)	NA	—	—	—	—	6.0E-02	—	—	—	1.8E+01	—
>8-10 C aliphatics (TPH)	NA	—	—	—	—	1.0E-01	—	—	—	5.0E-01	—
>10-12 C aliphatics (TPH)	NA	—	—	—	—	1.0E-01	—	—	—	5.0E-01	—
>12-16 C aliphatics (TPH)	NA	—	—	—	—	1.0E-01	—	—	—	5.0E-01	—
>16-21 C aliphatics (TPH)	NA	—	—	—	—	2.0E+00	—	—	—	—	—
>16-21 C aliphatics (TPH) (for transformer mineral oil releases only)	NA	—	—	—	—	1.6E+00	—	—	—	—	—
>21-35 C aliphatics (TPH)	NA	—	—	—	—	2.0E+00	—	—	—	—	—
>21-35 C aliphatics (TPH) (for transformer mineral oil releases only)	NA	—	—	—	—	1.6E+00	—	—	—	—	—
>7-8 C aromatics (TPH)	NA	—	—	—	—	1.0E-01	—	—	—	1.9E+00	—
>8-10 C aromatics (TPH)	NA	—	—	—	—	4.0E-02	—	—	—	2.0E-01	—
>10-12 C aromatics (TPH)	NA	—	—	—	—	4.0E-02	—	—	—	2.0E-01	—
>12-16 C aromatics (TPH)	NA	—	—	—	—	4.0E-02	—	—	—	2.0E-01	—
>16-21 C aromatics (TPH)	NA	—	—	—	—	3.0E-02	—	—	—	—	—
>21-35 C aromatics (TPH)	NA	—	—	—	—	3.0E-02	—	—	—	—	—

For questions on toxicity factors, contact the Toxicology Division at 877-992-8370.

Footnotes

1 The general hierarchy of the sources for the toxicity factors is: USEPA Integrated Risk Information System (IRIS); USEPA Provisional Peer Reviewed Toxicity Values (PPRTVs); USEPA Health Effects Assessment Summary Tables (HEAST); USEPA National Center for Environmental Assessment (NCEA); TCEQ Toxicology Division Chronic Remediation-Specific Effects Screening Levels (RS-ESLs); Agency for Toxic Substances Disease Registry Chronic Minimal Risk Levels (ATSDR MRLs); other scientifically valid sources as approved by the executive director on a chemical-specific basis.

2 U.S. EPA 2005 carcinogen guideline class descriptors: CH = carcinogenic to humans; LC = likely to be carcinogenic to humans; SEC = suggestive evidence of carcinogenic potential; NLC = not likely to be carcinogenic to humans; IIACP = inadequate information to assess carcinogenic potential. These descriptors may be specific to the exposure pathway for which a carcinogenic toxicity factor was developed. U.S. EPA 1986 carcinogenic classes: A = human carcinogen; B1 = probable human carcinogen with limited evidence of carcinogenicity; B2 = probable human carcinogen with inadequate evidence of carcinogenicity; C = possible human carcinogen; D = not classifiable as to human carcinogenicity; E = evidence of non-carcinogenicity in humans.

3 Reference (Ref): A = ATSDR chronic MRL; CU = Cornell University Pesticide Management Education Program; EPA-OP = EPA Office of Pesticide Programs; H = HEAST, July, 1997; I = IRIS; MA DEP = Massachusetts Department of Environmental Protection; N = NCEA; NYSDOH = New York State Department of Health; OEHA = Cal/EPA Office of Environmental; PPRTV = EPA Provisional Peer Reviewed Toxicity Value; T = TCEQ Toxicology Division.

4 The first value represents the toxicity value to be used for evaluating all residential and commercial/industrial soil pathways for cadmium; the second value represents the toxicity value to be used for evaluating the groundwater dermal pathway (if applicable) for cadmium; as an MCL is available, a risk-based calculation for the groundwater ingestion and groundwater protection pathways is not appropriate.

5 The RfC value is considered protective of the carcinogenic effects of formaldehyde due to inhalation based on the TCEQ Development Support Document for Formaldehyde posted August 7, 2008.

6 The first value represents the toxicity value to be used for evaluating all residential and commercial/industrial soil pathways and all commercial/industrial groundwater pathways for manganese; the second value represents the toxicity value to be used for evaluating all residential groundwater pathways for manganese.

7 Site-specific PCLs for mercury may vary based on the pH-dependent Kd value (see Figure:30 TAC §350.73(f)(1)(C)).

8 Compound with CAS# 104-35-8 nonylphenol ethoxylate in 2006 tox-trrp table has different CAS# 9016-45-9 nonylphenol ethoxylate beginning in the 2010 toxicity factors table.

* These compounds, acetic acid, ammonium polyphosphate, ammonium salts, calcium, chloride, ethylene, hydrogen chloride (hydrochloric acid), iron, limonene, d-, magnesium, phosphorus, total, potassium, sodium, sulfate, sulfide, and sulfure, are not necessarily of concern from a human health standpoint, therefore calculation of human health-based values is not required. However, aesthetics and ecological criteria would still apply. See table entitled "Compounds for which Calculation of a Human Health PCL is Not Required" available on the TCEQ website at <http://www.tceq.state.tx.us/remediation/trrp/trrp.htm>.

SFo - Oral Slope Factor

RfC - Inhalation Reference Concentration

RfDo - Oral Reference Dose

URF - Inhalation Unit Risk Factor

This table shows the toxicity factors used to calculate protective concentration levels.

end of worksheet

Chemical/Physical Properties

Last Revised: March 1, 2022

Chemical of Concern	CAS	Br _{abg} (µg/g DW)/ (µg/g soil)	Br _{bg} (µg/g DW)/ (µg/g soil)	Physical State	Type	MW (g/mole)	H _{unitless} (unitless)	LogK _{oc} (unitless)	LogK _d (unitless)	D _{air} (cm ² /s)	D _{wat} (cm ² /s)	Solubility (mg/l)	Vapor_P (mm Hg)	logK _{ow} (unitless)
Acenaphthene	83-32-9	—	—	s	O	1.54E+02	6.44E-03	3.60E+00	—	4.21E-02	7.69E-06	4.24E+00	3.75E-03	4.15E+00
Acenaphthylene	208-96-8	—	—	s	O	1.52E+02	4.74E-03	3.84E+00	—	4.39E-02	7.06E-06	3.93E+00	2.90E-02	3.94E+00
Acetaldehyde	75-07-0	—	—	g	O	4.41E+01	2.75E-03	4.19E-01	—	1.24E-01	1.23E-05	1.00E+06	9.00E+02	4.30E-01
Acetate, 2-ethoxyethanol	111-15-9	—	—	l	O	1.32E+02	1.37E-04	8.17E-01	—	6.13E-02	6.70E-06	1.02E+05	1.93E+00	9.33E-01
Acetate, isoamyl	123-92-2	—	—	l	O	1.30E+02	2.04E-02	1.87E+00	—	6.01E-02	6.40E-06	1.13E+03	3.25E+00	2.27E+00
Acetate, isobutyl	110-19-0	—	—	l	O	1.16E+02	1.98E-02	1.46E+00	—	6.62E-02	6.88E-06	3.81E+03	1.19E+01	1.75E+00
Acetate, sec-butyl	105-46-4	—	—	l	O	1.16E+02	3.02E-02	1.54E+00	—	6.69E-02	6.91E-06	3.34E+03	1.59E+01	1.85E+00
Acetic acid*	64-19-7	—	—	—	—	—	—	—	—	—	—	—	—	—
Acetone (2-propanone)	67-64-1	—	—	l	O	5.81E+01	1.61E-03	-2.44E-01	—	1.24E-01	1.14E-05	6.00E+05	2.27E+02	-2.35E-01
Acetone cyanohydrin	75-86-5	—	—	l	O	8.51E+01	1.34E-04	-2.16E-01	—	8.12E-02	9.09E-06	1.83E+06	8.00E-01	-3.45E-02
Acetonitrile	75-05-8	—	—	l	O	4.11E+01	1.21E-03	-3.30E-01	—	1.28E-01	1.44E-05	2.05E+05	9.00E+01	-3.40E-01
Acetophenone	98-86-2	—	—	l	O	1.20E+02	4.45E-04	1.56E+00	—	6.00E-02	8.73E-06	5.50E+03	3.95E-01	1.67E+00
Acetylaminofluorene, 2-	53-96-3	—	—	s	O	2.23E+02	7.00E-10	2.63E+00	—	4.25E-02	6.08E-06	1.66E+00	9.52E-11	2.80E+00
Acifluorfen, sodium	62476-59-9	—	—	s	O	3.84E+02	8.31E-13	2.05E+00	—	1.45E-02	4.40E-06	2.50E+05	9.75E-09	3.73E-01
Acridine	260-94-6	—	—	s	O	1.79E+02	3.93E-06	3.40E+00	—	5.11E-02	6.66E-06	2.24E+01	8.96E-06	3.46E+00
Acrolein	107-02-8	—	—	l	O	5.61E+01	1.83E-04	-2.80E-01	—	1.05E-01	1.12E-05	2.00E+05	2.65E+02	-1.00E-01
Acrylamide	79-06-1	—	—	s	O	7.11E+01	1.33E-08	-6.60E-01	—	9.70E-02	1.27E-05	2.20E+06	7.00E-03	-8.07E-01
Acrylic acid	79-10-7	—	—	l	O	7.21E+01	1.32E-05	5.43E-02	—	9.08E-02	1.06E-05	1.00E+06	3.72E+00	4.42E-01
Acrylonitrile	107-13-1	—	—	l	O	5.31E+01	4.57E-03	4.00E-02	—	1.22E-01	1.34E-05	7.50E+04	1.10E+02	2.09E-01
Adipic acid (hexanedioic acid)	124-04-9	—	—	s	O	1.46E+02	1.80E-11	-6.56E+00	—	6.13E-02	7.90E-06	7.72E+04	1.74E-07	1.25E-01
Alachlor	15972-60-8	—	—	s	O	2.70E+02	8.62E-07	2.28E+00	—	1.94E-02	5.83E-06	2.40E+02	2.20E-05	3.37E+00
Aldicarb	116-06-3	—	—	s	O	1.90E+02	5.82E-08	1.20E+00	—	3.05E-02	7.20E-06	6.00E+03	2.90E-05	1.36E+00
Aldicarb sulfone	1646-88-4	—	—	s	O	2.22E+02	1.10E-07	2.30E-01	—	5.55E-02	5.79E-06	8.00E+03	9.00E-05	-6.66E-01
Aldrin	309-00-2	—	—	s	O	3.65E+02	7.07E-03	4.68E+00	—	1.32E-02	4.86E-06	7.84E-02	1.67E-05	6.75E+00
Allyl alcohol	107-18-6	—	—	l	O	5.81E+01	2.08E-04	5.10E-01	—	1.14E-01	1.10E-05	3.20E+05	2.63E+01	1.70E-01
Allyl chloride	107-05-1	—	—	l	O	7.65E+01	4.57E-01	1.43E+00	—	9.80E-02	1.08E-05	3.40E+03	3.60E+02	1.93E+00
Aluminum	7429-90-5	1.50E-03	6.50E-04	s	M	2.70E+01	0.00E+00	—	2.55E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.29E-01
Ametryn	834-12-8	—	—	s	OB	2.27E+02	7.33E-08	2.89E+00	—	4.24E-02	5.70E-06	1.85E+02	1.81E-07	2.88E+00
Amino-2,6-dinitrotoluene, 4-	19406-51-0	—	—	s	O	1.97E+02	1.74E-07	2.56E+00	—	5.60E-02	7.31E-06	3.64E+01	5.86E-07	2.62E+00
Amino-4,6-dinitrotoluene, 2-	35572-78-2	—	—	s	O	1.97E+02	1.19E-07	2.75E+00	—	5.60E-02	7.30E-06	1.73E+01	1.91E-07	2.80E+00
Aminobiphenyl, 4- (1,1-biphenyl-4-amine)	92-67-1	—	—	s	O	1.69E+02	1.84E-06	3.24E+00	—	5.25E-02	6.82E-06	7.14E+01	1.42E-05	3.24E+00
Aminopyridine, 4-	504-24-5	—	—	s	O	9.41E+01	2.44E-07	-3.22E-01	—	8.02E-02	1.08E-05	7.66E+04	2.00E-03	-1.12E-01
Ammonia	7664-41-7	—	—	g	I	1.70E+01	1.36E-02	4.90E-01	—	2.59E-01	6.93E-05	5.31E+05	7.47E+03	2.29E-01
Ammonium polyphosphate*	6833-79-9	—	—	—	—	—	—	—	—	—	—	—	—	—
Ammonium salts*	Ammonium	—	—	—	—	—	—	—	—	—	—	—	—	—
Aniline	62-53-3	—	—	l	O	9.31E+01	5.82E-05	9.60E-01	—	7.00E-02	8.30E-06	3.60E+04	6.69E-01	1.08E+00
Anthracene	120-12-7	—	—	s	O	1.78E+02	4.61E-03	4.37E+00	—	3.24E-02	7.74E-06	4.34E-02	2.55E-05	4.34E+00
Anthraquinone, 9,10-	84-65-1	—	—	s	O	2.08E+02	3.58E-06	3.07E+00	—	4.81E-02	6.26E-06	1.22E-01	3.83E-08	3.12E+00

Chemical/Physical Properties

Last Revised: March 1, 2022

Chemical of Concern	CAS	Br _{abg} ((µg/g DW)/ (µg/g soil))	Br _{bg} ((µg/g DW)/ (µg/g soil))	Physical State	Type	MW (g/mole)	H _{unitless} (unitless)	LogK _{oc} (unitless)	LogK _d (unitless)	D _{air} (cm ² /s)	D _{wat} (cm ² /s)	Solubility (mg/l)	Vapor_P (mm Hg)	logK _{ow} (unitless)
Antimony	7440-36-0	7.00E-02	3.00E-02	s	M	1.22E+02	0.00E+00	—	1.65E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Aramite	140-57-8	—	—	l	O	3.35E+02	—	4.00E+00	—	4.23E-02	4.45E-06	—	1.23E-04	4.82E+00
Arsenic	7440-38-2	1.00E-02	8.00E-03	s	M	7.49E+01	0.00E+00	—	1.40E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.79E-01
Arsine	7784-42-1	—	—	g	I	7.79E+01	2.41E-01	—	—	—	—	2.00E+05	1.13E+04	—
Atrazine	1912-24-9	—	—	s	O	2.16E+02	1.09E-07	2.20E+00	—	5.64E-02	5.58E-06	3.00E+01	3.00E-07	2.82E+00
Azinphos-methyl (guthion)	86-50-0	—	—	s	O	3.17E+02	8.80E-11	2.40E+00	—	4.11E-02	5.34E-06	9.00E-02	4.70E-09	2.50E+00
Azobenzene	103-33-3	—	—	l	O	1.82E+02	1.89E-03	4.73E+00	—	4.96E-02	6.36E-06	1.60E+00	3.02E-04	4.77E+00
Barium	7440-39-3	4.90E-02	1.50E-02	s	M	1.37E+02	0.00E+00	-	1.04E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Bayleton	43121-43-3	—	—	s	O	2.94E+02	2.76E-08	2.31E+00	—	4.00E-02	5.25E-06	4.74E+01	8.13E-08	2.47E+00
Benefin (benfluralin)	1861-40-1	—	—	s	O	3.35E+02	7.77E-06	5.22E+00	—	3.60E-02	4.92E-06	5.09E+00	2.16E-06	5.25E+00
Benomyl	17804-35-2	—	—	s	O	2.90E+02	2.08E-07	1.16E+00	—	4.49E-02	4.46E-06	2.90E+00	7.50E-09	1.37E+00
Benz-a-anthracene	56-55-3	—	—	s	O	2.28E+02	1.39E-04	5.55E+00	—	5.10E-02	9.00E-06	1.00E-02	1.54E-07	5.52E+00
Benzaldehyde	100-52-7	—	—	l	O	1.06E+02	2.04E-03	1.77E+00	—	7.28E-02	8.67E-06	3.58E+03	1.26E+00	1.90E+00
Benzene	71-43-2	—	—	l	O	7.81E+01	2.27E-01	1.82E+00	—	8.80E-02	9.80E-06	1.77E+03	9.50E+01	1.99E+00
Benzenedicarbonitrile, 1,3-	626-17-5	—	—	s	O	1.28E+02	1.88E-06	8.79E-01	—	6.71E-02	7.62E-06	1.28E+04	3.43E-03	1.03E+00
Benzenedicarboxylic acid, 1,2-disodecyl ester	26761-40-0	—	—	l	O	4.47E+02	6.07E-05	1.04E+01	—	2.52E-02	3.24E-06	1.17E-03	3.76E-12	1.06E+01
Benzenethiol	108-98-5	—	—	l	O	1.10E+02	1.83E-02	1.32E+00	—	7.60E-02	8.68E-06	7.60E+02	2.40E+00	2.69E+00
Benzidine	92-87-5	—	—	s	O	1.84E+02	1.62E-09	1.32E+00	—	3.40E-02	1.50E-05	5.20E+02	8.36E-08	1.34E+00
Benzo-a-pyrene	50-32-8	—	—	s	O	2.52E+02	4.70E-05	5.98E+00	—	4.30E-02	9.00E-06	1.62E-03	4.89E-09	6.11E+00
Benzo-b-fluoranthene	205-99-2	—	—	s	O	2.52E+02	4.99E-04	6.08E+00	—	2.26E-02	5.56E-06	1.50E-03	8.06E-08	6.11E+00
Benzo-e-pyrene	192-97-2	—	—	s	O	2.52E+02	2.38E-05	6.59E+00	—	4.05E-02	5.49E-06	8.60E-04	7.26E-10	6.70E+00
Benzo-g,h,i-perylene	191-24-2	—	—	s	O	2.76E+02	5.82E-06	6.20E+00	—	4.90E-02	5.65E-05	2.60E-04	1.00E-10	6.70E+00
Benzoic acid	65-85-0	—	—	s	OA	1.22E+02	1.39E-05	-3.01E-01	—	5.36E-02	7.97E-06	3.50E+03	6.51E-03	1.87E+00
Benzo-j-fluoranthene	205-82-3	—	—	s	O	2.52E+02	4.63E-04	5.72E+00	—	4.15E-02	5.48E-06	2.50E-03	8.39E-08	6.11E+00
Benzo-k-fluoranthene	207-08-9	—	—	s	O	2.52E+02	4.45E-07	6.09E+00	—	2.26E-02	5.56E-06	5.50E-04	9.59E-11	6.11E+00
Benzophenone	119-61-9	—	—	s	O	1.82E+02	1.05E-04	3.40E+00	—	5.07E-02	6.03E-06	3.43E+01	3.61E-04	3.46E+00
Benzotrichloride	98-07-7	—	—	l	O	1.95E+02	2.03E-02	3.16E+00	—	5.91E-02	7.02E-06	1.00E+02	1.90E-01	3.90E+00
Benzoyl peroxide	94-36-0	—	—	s	O	2.42E+02	8.12E-06	3.02E+00	—	4.49E-02	5.48E-06	8.44E+00	5.17E-06	3.08E+00
Benzyl alcohol	100-51-6	—	—	l	O	1.08E+02	1.62E-05	1.08E+00	—	8.00E-02	8.00E-06	4.00E+04	1.06E-01	1.08E+00
Benzyl chloride	100-44-7	—	—	l	O	1.27E+02	1.66E-02	2.26E+00	—	7.50E-02	7.80E-06	4.93E+02	1.20E+00	2.79E+00
Benzyl dichloride	98-87-3	—	—	l	O	1.61E+02	8.28E-03	2.39E+00	—	6.14E-02	7.62E-06	2.09E+02	1.96E-01	2.92E+00
Beryllium	7440-41-7	3.60E-03	1.50E-03	s	M	9.01E+00	0.00E+00	—	1.36E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.71E-01
Biphenyl, 1,1-	92-52-4	—	—	s	O	1.54E+02	1.25E-02	3.71E+00	—	5.73E-02	6.71E-06	7.50E+00	2.94E-02	3.76E+00
Biphenyl, 1,1'-, 2-phenoxy-	6738-04-1	—	—	s	O	2.46E+02	2.82E-03	6.18E+00	—	4.08E-02	5.09E-06	1.92E-02	4.03E-06	6.29E+00
Biquinoline, 2,2'-	119-91-5	—	—	s	O	2.56E+02	2.85E-09	3.96E+00	—	4.18E-02	5.65E-06	1.70E+00	3.45E-10	4.02E+00
Bis (2-chloroethoxy) methane	111-91-1	—	—	l	O	1.73E+02	1.25E-03	2.49E+00	—	5.82E-02	7.11E-06	1.35E+03	1.78E-01	2.53E+00
Bis (2-chloroethyl) ether	111-44-4	—	—	l	O	1.43E+02	8.90E-04	1.19E+00	—	6.92E-02	7.53E-06	1.02E+04	1.34E+00	1.56E+00
Bis (2-chloro-1-methylethyl) ether	108-60-1	—	—	l	O	1.71E+02	4.16E-03	2.50E+00	—	6.00E-02	6.40E-06	1.70E+03	8.50E-01	2.58E+00

Chemical/Physical Properties

Last Revised: March 1, 2022

Chemical of Concern	CAS	Br _{abg} ((µg/g DW)/ (µg/g soil))	Br _{bg} ((µg/g DW)/ (µg/g soil))	Physical State	Type	MW (g/mole)	H _{unitless} (unitless)	LogK _{oc} (unitless)	LogK _d (unitless)	D _{air} (cm ² /s)	D _{wat} (cm ² /s)	Solubility (mg/l)	Vapor_P (mm Hg)	logK _{ow} (unitless)
Bis (2-chloromethyl) ether	542-88-1	—	—	l	O	1.15E+02	4.99E-03	8.00E-02	—	8.32E-02	9.59E-06	3.80E+04	3.00E+01	5.75E-01
Bis (2-ethyl-hexyl) phthalate	117-81-7	—	—	l	O	3.91E+02	4.57E-04	5.83E+00	—	3.51E-02	3.66E-06	3.00E-01	6.45E-06	8.39E+00
Bismuth	7440-69-9	—	—	s	M	2.09E+02	—	—	7.30E-01	—	—	—	—	—
Bisphenol A	80-05-7	—	—	—	O	2.28E+02	2.18E-10	2.74E+00	—	5.09E-02	5.89E-06	1.00E+03	7.25E-07	3.32E+00
Boron	7440-42-8	—	—	s	I	1.08E+01	0.00E+00	—	—	—	—	—	—	—
Bromacil	314-40-9	—	—	s	O	2.61E+02	9.94E-09	2.11E+00	—	4.58E-02	5.80E-06	7.64E+02	6.32E-07	2.25E+00
Bromo-2-chloroethane, 1-	107-04-0	—	—	l	O	1.43E+02	3.79E-02	1.58E+00	—	8.35E-02	9.83E-06	4.93E+03	2.38E+01	1.90E+00
Bromobenzene	108-86-1	—	—	l	O	1.57E+02	8.38E-02	2.38E+00	—	7.05E-02	8.54E-06	2.98E+02	2.91E+00	2.91E+00
Bromodichloromethane	75-27-4	—	—	l	O	1.64E+02	1.32E-01	1.74E+00	—	2.98E-02	1.06E-05	4.50E+03	5.84E+01	1.61E+00
Bromoform	75-25-2	—	—	l	O	2.53E+02	2.56E-02	1.94E+00	—	1.49E-02	1.03E-05	3.20E+03	5.60E+00	1.79E+00
Bromomethane	74-83-9	—	—	g	O	9.49E+01	5.90E-01	1.02E+00	—	7.28E-02	1.21E-05	1.52E+04	1.64E+03	1.18E+00
Bromophenyl phenylether, 4-	101-55-3	—	—	l	O	2.49E+02	9.66E-03	5.16E+00	—	4.75E-02	6.28E-06	8.25E-01	5.85E-04	5.25E+00
Butadiene, 1,3-	106-99-0	—	—	g	O	5.41E+01	2.61E+00	2.11E+00	—	1.79E-01	1.02E-05	7.35E-02	2.11E+03	2.03E+00
Butadiene, 2-methyl-1,3- (isoprene)	78-79-5	—	—	l	O	6.81E+01	1.20E+00	1.82E+00	—	8.78E-02	8.10E-06	1.11E+03	3.58E+02	2.20E+00
Butanal (butyraldehyde)	123-72-8	—	—	l	O	7.21E+01	5.40E-03	7.44E-01	—	8.90E-02	9.48E-06	4.67E+04	6.35E+01	8.40E-01
Butane, 2,3-dimethyl-	79-29-8	—	—	l	O	8.62E+01	5.45E+01	3.14E+00	—	7.40E-02	6.94E-06	1.82E+01	2.11E+02	3.86E+00
Butanoic acid (butyric acid)	107-92-6	—	—	l	O	8.81E+01	7.86E-06	-2.26E+00	—	7.80E-02	9.25E-06	8.96E+04	2.80E-01	1.02E+00
Butanol, 2-	78-92-2	—	—	l	O	7.41E+01	5.29E-04	7.35E-01	—	8.47E-02	8.60E-06	9.91E+04	1.29E+01	8.29E-01
Butanol, 2-methyl-1-	137-32-6	—	—	l	O	8.82E+01	5.70E-04	1.12E+00	—	7.40E-02	7.80E-06	3.25E+04	3.84E+00	1.31E+00
Butanol, 2-methyl-2-	75-85-4	—	—	l	O	8.81E+01	1.64E-03	1.09E+00	—	7.65E-02	7.72E-06	3.59E+04	1.22E+01	1.28E+00
Butanol, n-	71-36-3	—	—	l	O	7.41E+01	3.55E-04	7.70E-01	—	8.00E-02	9.30E-06	7.47E+04	6.54E+00	8.41E-01
Butene, 1-	106-98-9	—	—	g	O	5.61E+01	9.53E+00	2.02E+00	—	9.88E-02	8.42E-06	2.40E+02	1.61E+03	2.45E+00
Butene, cis-2-	590-18-1	—	—	g	O	5.61E+01	6.56E+00	1.95E+00	—	9.92E-02	8.50E-06	3.48E+02	1.46E+03	2.37E+00
Butene, trans-2-	624-64-6	—	—	g	O	5.61E+01	6.56E+00	1.95E+00	—	9.92E-02	8.50E-06	3.48E+02	1.46E+03	2.37E+00
Butoxy ethanol, 2- (Ethylene glycol monobutyl ether; EGBE)	111-76-2	—	—	l	O	1.18E+02	2.11E-05	1.09E+00	—	6.30E-02	7.46E-06	3.43E+04	1.12E-01	1.28E+00
Butyl acetate	123-86-4	—	—	l	O	1.16E+02	1.11E-02	1.42E+00	—	6.63E-02	7.45E-06	5.75E+03	1.00E+01	1.70E+00
Butyl acrylate	141-32-2	—	—	l	O	1.28E+02	1.16E-02	1.84E+00	—	6.00E-02	7.13E-06	1.43E+03	2.43E+00	2.22E+00
Butyl benzyl phthalate	85-68-7	—	—	l	O	3.12E+02	7.94E-05	4.14E+00	—	1.74E-02	4.83E-06	2.90E+00	1.20E-05	4.84E+00
Butyl ether, n- (dibutyl ether)	142-96-1	—	—	l	O	1.30E+02	4.84E-02	2.59E+00	—	5.65E-02	6.40E-06	4.90E+02	3.33E+00	3.18E+00
Butyl methacrylate	97-88-1	—	—	l	O	1.42E+02	1.98E-02	2.39E+00	—	5.69E-02	6.18E-06	3.68E+02	9.40E-01	2.92E+00
Butylate	2008-41-5	—	—	l	O	2.17E+02	3.50E-03	2.10E+00	—	4.89E-02	5.14E-06	4.60E+01	1.30E-02	3.85E+00
Butylbenzene, n-	104-51-8	—	—	l	O	1.34E+02	5.57E-01	3.48E+00	—	5.70E-02	6.74E-06	1.08E+01	8.14E-01	4.29E+00
Butylbenzene, sec-	135-98-8	—	—	l	O	1.34E+02	5.07E-01	3.32E+00	—	5.75E-02	6.75E-06	1.81E+01	1.25E+00	4.09E+00
Butylbenzene, tert-	98-06-6	—	—	l	O	1.34E+02	8.56E-01	3.39E+00	—	5.84E-02	6.76E-06	1.51E+01	1.76E+00	4.18E+00
Cacodylic acid	75-60-5	—	—	s	O	1.38E+02	0.00E+00	3.80E-01	—	—	—	2.00E+06	0.00E+00	0.00E+00
Cadmium	7440-43-9	1.40E-01	6.40E-02	s	M	1.12E+02	0.00E+00	—	1.18E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-7.10E-02
Calcium*	7440-70-2	—	—	—	—	—	—	—	—	—	—	—	—	—

Chemical/Physical Properties

Last Revised: March 1, 2022

Chemical of Concern	CAS	Br _{abg} ((μg/g DW)/ (μg/g soil))	Br _{bg} ((μg/g DW)/ (μg/g soil))	Physical State	Type	MW (g/mole)	H _{unitless} (unitless)	LogK _{oc} (unitless)	LogK _d (unitless)	D _{air} (cm ² /s)	D _{wat} (cm ² /s)	Solubility (mg/l)	Vapor_P (mm Hg)	logK _{ow} (unitless)
Caprolactam	105-60-2	—	—	s	O	1.13E+02	2.19E-08	1.68E+00	—	6.71E-02	8.45E-06	3.40E+04	1.20E-04	5.62E-01
Captan	133-06-2	—	—	s	O	3.01E+02	2.99E-04	3.81E+00	—	1.83E-02	4.90E-06	5.00E-01	7.50E-06	1.84E+00
Carbaryl	63-25-2	—	—	s	O	2.01E+02	5.32E-07	2.37E+00	—	2.78E-02	5.60E-06	3.00E+01	1.36E-06	2.35E+00
Carbazole	86-74-8	—	—	s	O	1.67E+02	3.38E-03	3.39E+00	—	3.90E-02	7.03E-06	7.21E-01	2.66E-04	3.23E+00
Carbofuran	1563-66-2	—	—	s	O	2.21E+02	1.62E-07	1.46E+00	—	5.35E-02	5.40E-06	7.00E+02	8.30E-06	2.30E+00
Carbon disulfide	75-15-0	—	—	l	O	7.61E+01	6.13E-01	1.72E+00	—	1.04E-01	1.00E-05	2.30E+03	3.40E+02	1.94E+00
Carbon tetrachloride	56-23-5	—	—	l	O	1.54E+02	1.20E+00	2.27E+00	—	7.80E-02	8.80E-06	8.05E+02	1.12E+02	2.44E+00
Carbophenothion	786-19-6	—	—	l	O	3.43E+02	1.66E-04	5.07E+00	—	3.77E-02	5.00E-06	3.90E+00	3.45E-05	5.10E+00
Carbosulfan	55285-14-8	—	—	l	O	3.81E+02	2.15E-05	4.41E+00	—	3.76E-02	3.88E-06	3.00E-01	3.10E-07	5.57E+00
Carboxin	5234-68-4	—	—	s	O	2.35E+02	2.77E-08	2.93E+00	—	4.48E-02	6.14E-06	2.24E+01	4.82E-08	3.02E+00
Chloral	75-87-6	—	—	l	O	1.47E+02	2.66E-05	8.02E-01	—	3.85E-02	9.70E-06	8.30E+06	3.50E+01	1.19E+00
Chloral hydrate (1,1-ethanediol, 2,2,2-trichloro-)	302-17-0	—	—	l	O	1.65E+02	4.91E-09	7.27E-01	—	7.43E-02	9.16E-06	1.80E+06	9.79E-04	3.30E-01
Chloramben (amiben; 3-amino-2,5-dichlorobenzoic acid)	133-90-4	—	—	s	O	2.06E+02	3.49E-08	2.32E+00	—	5.71E-02	7.46E-06	6.26E+03	1.94E-05	2.48E+00
Chlordane (technical)	12789-03-6	—	—	s	O	4.10E+02	2.02E-03	5.08E+00	—	1.18E-02	4.37E-06	5.60E-02	1.00E-05	6.60E+00
Chlordane, cis- (alpha chlordane)	5103-71-9	—	—	l	O	4.10E+02	4.11E-03	6.85E+00	—	3.32E-02	4.66E-06	4.64E-02	8.51E-06	6.97E+00
Chlordane, trans- (gamma chlordane)	5103-74-2	—	—	s	O	4.10E+02	4.11E-03	5.59E+00	—	3.32E-02	4.65E-06	2.28E-02	4.17E-06	6.97E+00
Chlorfenvinphos	470-90-6	—	—	l	O	3.60E+02	2.31E-08	3.11E+00	—	—	—	1.45E+02	1.70E-07	4.15E+00
Chloride*	16887-00-6	—	—	—	—	—	—	—	—	—	—	—	—	—
Chlorine	7782-50-5	—	—	g	I	7.09E+01	2.86E+00	—	—	1.20E-01	1.48E-05	7.00E+03	5.17E+03	8.49E-01
Chloro-1,3-butadiene, 2-	126-99-8	—	—	l	O	8.85E+01	1.33E+00	2.00E+00	—	1.00E-01	1.00E-05	6.30E+02	2.12E+02	2.53E+00
Chloro-2-propanol, 1-	127-00-4	—	—	s	O	9.55E+01	9.64E-05	8.29E-01	—	8.28E-02	9.65E-06	1.10E+05	2.05E+00	9.48E-01
Chloro-3-methylphenol, 4-	59-50-7	—	—	s	O	1.43E+02	1.40E-05	2.94E+00	—	6.46E-02	8.01E-06	5.43E+03	9.75E-03	2.99E+00
Chloroaniline, p-	106-47-8	—	—	s	O	1.28E+02	4.86E-05	1.82E+00	—	4.83E-02	1.01E-05	3.90E+03	2.35E-02	1.72E+00
Chlorobenzene	108-90-7	—	—	l	O	1.13E+02	1.82E-01	2.33E+00	—	7.30E-02	8.70E-06	5.02E+02	1.21E+01	2.64E+00
Chlorobenzilate	510-15-6	—	—	s	O	3.25E+02	3.78E-06	2.90E+00	—	8.00E-02	8.00E-06	1.30E+01	2.20E-06	3.99E+00
Chlorobromomethane (bromochloromethane)	74-97-5	—	—	l	O	1.29E+02	3.69E-02	1.44E+00	—	9.65E-02	1.12E-05	2.04E+04	1.06E+02	1.32E+00
Chlorodifluoromethane	75-45-6	—	—	g	O	8.65E+01	1.22E+00	7.87E-01	—	1.13E-01	1.32E-05	2.90E+03	7.83E+03	8.94E-01
Chloroethane (ethyl chloride)	75-00-3	—	—	l	O	6.45E+01	2.12E-01	1.25E+00	—	1.50E-01	1.18E-05	2.00E+04	1.20E+03	1.58E+00
Chloroethanol, 2-	107-07-3	—	—	l	O	8.05E+01	3.23E-05	2.42E-01	—	9.60E-02	1.11E-05	5.51E+05	2.29E+00	2.06E-01
Chloroethoxy ethene, 2- (2-chloroethylvinylether)	110-75-8	—	—	l	O	1.07E+02	3.02E-02	1.57E+00	—	7.60E-02	8.55E-06	5.02E+03	2.60E+01	1.88E+00
Chloroform	67-66-3	—	—	l	O	1.19E+02	1.53E-01	1.67E+00	—	1.04E-01	1.00E-05	7.92E+03	1.98E+02	1.52E+00
Chlorohexane, 1-	544-10-5	—	—	l	O	1.21E+02	9.98E-01	2.95E+00	—	6.40E-02	7.27E-06	5.38E+01	8.22E+00	3.63E+00
Chloromethane (methyl chloride)	74-87-3	—	—	g	O	5.05E+01	1.44E+00	7.78E-01	—	1.26E-01	6.50E-06	7.25E+03	3.77E+03	1.09E+00
Chloronaphthalene, 1- (Chloronaphthalene, alpha-)	90-13-1	—	—	l	O	1.63E+02	6.33E-03	3.98E+00	—	5.76E-02	7.31E-06	1.69E+01	1.21E-02	4.04E+00
Chloronaphthalene, 2- (chloronaphthalene, beta)	91-58-7	—	—	s	O	1.63E+02	2.54E-02	3.93E+00	—	6.18E-02	6.98E-06	6.74E+00	1.70E-02	3.81E+00
Chloronitrobenzene, p- (1-chloro-4-nitrobenzene)	100-00-5	—	—	s	O	1.58E+02	1.00E-03	2.03E+00	—	6.37E-02	8.04E-06	2.67E+02	3.92E-02	2.47E+00
Chlorophenol, 2-	95-57-8	—	—	l	OA	1.29E+02	7.40E-04	2.46E+00	—	5.01E-02	9.46E-06	2.80E+04	1.42E+00	2.16E+00
Chlorophenol, 3-	108-43-0	—	—	s	OA	1.29E+02	9.20E-06	2.05E+00	—	7.13E-02	8.74E-06	4.11E+04	5.38E-02	2.07E+00

Chemical/Physical Properties

Last Revised: March 1, 2022

Chemical of Concern	CAS	Br _{abg} ((µg/g DW)/ (µg/g soil))	Br _{bg} ((µg/g DW)/ (µg/g soil))	Physical State	Type	MW (g/mole)	H _{unitless} (unitless)	LogK _{oc} (unitless)	LogK _d (unitless)	D _{air} (cm ² /s)	D _{wat} (cm ² /s)	Solubility (mg/l)	Vapor_P (mm Hg)	logK _{ow} (unitless)
Chlorophenol, 4-	106-48-9	—	—	s	OA	1.29E+02	9.97E-06	2.09E+00	—	7.13E-02	8.75E-06	2.86E+04	4.06E-02	2.10E+00
Chlorophenyl phenylether, 4-	7005-72-3	—	—	l	O	2.05E+02	1.30E-02	4.12E+00	—	4.89E-02	6.19E-06	1.43E+00	1.66E-03	5.04E+00
Chloropropane, 2-	75-29-6	—	—	l	O	7.85E+01	1.11E+00	1.83E+00	—	9.12E-02	9.30E-06	1.56E+03	4.04E+02	2.21E+00
Chlorothalonil	1897-45-6	—	—	s	O	2.66E+02	1.53E-06	3.38E+00	—	4.90E-02	6.57E-06	2.30E+01	2.41E-06	3.46E+00
Chlorotoluene, o- (2-chlorotoluene)	95-49-8	—	—	l	O	1.27E+02	1.35E-01	2.61E+00	—	7.01E-02	8.01E-06	1.54E+02	3.90E-03	3.20E+00
Chlorotoluene, p- (4-chlorotoluene)	106-43-4	—	—	l	O	1.27E+02	1.33E-01	2.70E+00	—	6.76E-02	7.96E-06	1.18E+02	2.27E+00	3.31E+00
Chlorpyrifos	2921-88-2	—	—	s	O	3.51E+02	1.73E-04	3.70E+00	—	4.85E-02	5.11E-06	9.00E-01	1.87E-05	4.66E+00
Chromium (III)	16065-83-1	5.20E-03	4.50E-03	s	M	5.20E+01	0.00E+00	—	3.08E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chromium (total)	7440-47-3	5.20E-03	4.50E-03	s	M	5.20E+01	0.00E+00	—	3.08E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chromium (VI)	18540-29-9	5.20E-03	4.50E-03	s	M	5.20E+01	0.00E+00	—	1.15E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chrysene	218-01-9	—	—	s	O	2.28E+02	5.03E-05	5.49E+00	—	2.48E-02	6.21E-06	2.00E-03	7.80E-09	5.52E+00
Cobalt	7440-48-4	1.00E-02	7.00E-03	s	M	5.89E+01	0.00E+00	—	1.65E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Copolymer acrylamide	69418-26-4	—	—	s	O	7.11E+01	1.33E-08	-6.60E-01	—	9.70E-02	1.27E-05	2.20E+06	7.00E-03	-8.07E-01
Copper	7440-50-8	2.90E-01	2.50E-01	s	M	6.35E+01	0.00E+00	—	1.60E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-5.71E-01
Coronene	191-07-1	—	—	s	O	3.00E+02	6.60E-06	7.46E+00	—	3.70E-02	4.93E-06	9.03E-06	2.21E-13	7.59E+00
Coumaphos	56-72-4	—	—	s	O	3.63E+02	2.17E-07	4.20E+00	—	3.53E-02	4.81E-06	3.86E-01	4.22E-09	4.26E+00
Cresol	1319-77-3	—	—	l	O	1.08E+02	3.62E-05	1.94E+00	—	7.40E-02	1.00E-05	2.30E+04	1.40E-01	2.06E+00
Cresol, m- (3-methylphenol)	108-39-4	—	—	l	O	1.08E+02	3.62E-05	1.94E+00	—	7.40E-02	1.00E-05	2.30E+04	1.40E-01	2.06E+00
Cresol, o- (2-methylphenol)	95-48-7	—	—	s	O	1.08E+02	6.65E-05	1.99E+00	—	7.40E-02	8.30E-06	2.04E+04	3.20E-01	2.06E+00
Cresol, p- (4-methylphenol)	106-44-5	—	—	s	O	1.08E+02	3.99E-05	1.91E+00	—	7.40E-02	1.00E-05	2.30E+04	1.30E-01	2.06E+00
Crotonaldehyde	123-73-9	—	—	l	O	7.01E+01	8.15E-04	2.14E-01	—	9.37E-02	1.02E-05	1.60E+05	1.90E+01	6.01E-01
Cumene (isopropylbenzene)	98-82-8	—	—	l	O	1.20E+02	6.07E-01	3.54E+00	—	6.50E-02	7.10E-06	5.00E+01	4.60E+00	3.45E+00
Cyanazine	21725-46-2	—	—	s	O	2.41E+02	6.70E-10	1.69E+00	—	4.33E-02	5.83E-06	1.15E+02	7.28E-09	1.72E+00
Cyanide	57-12-5	—	—	-	I	2.60E+01	0.00E+00	-	9.96E-01	5.21E-01	2.28E-05	1.00E+05	1.38E+01	-6.93E-01
Cyanogen	460-19-5	—	—	g	O	5.20E+01	2.06E-01	1.34E-01	—	2.04E-01	1.37E-05	1.00E+04	3.88E+03	7.00E-02
Cycloate	1134-23-2	—	—	l	O	2.15E+02	8.55E-05	3.44E+00	—	4.28E-02	5.60E-06	8.32E+01	6.04E-04	3.80E+00
Cyclohexane	110-82-7	—	—	l	O	8.42E+01	6.68E+00	2.87E+00	—	7.84E-02	8.39E-06	4.25E+01	6.16E+01	3.52E+00
Cyclohexanol	108-93-0	—	—	s	O	1.00E+02	3.52E-05	1.09E+00	—	7.20E-02	8.63E-06	2.09E+00	2.84E-01	1.11E+00
Cyclohexanone	108-94-1	—	—	l	O	9.81E+01	4.99E-04	7.39E-01	—	7.72E-02	8.73E-06	2.30E+04	4.00E+00	1.13E+00
Cyclohexene-1-methanol, 3-	1679-51-2	—	—	s	O	1.12E+02	3.13E-05	2.16E+00	—	6.60E-02	7.45E-06	1.44E+04	7.40E-01	2.63E+00
Cyclohexene, 4-vinyl-1-	100-40-3	—	—	l	O	1.08E+02	2.31E+00	3.09E+00	—	6.56E-02	6.93E-06	2.95E+01	1.15E+01	3.80E+00
Cyclopentane	287-92-3	—	—	l	O	7.01E+01	3.77E+00	2.29E+00	—	8.87E-02	8.45E-06	2.25E+02	2.21E+02	2.79E+00
Cyclopentane, methyl-	96-37-7	—	—	l	O	8.42E+01	9.82E+00	2.87E+00	—	7.84E-02	7.59E-06	5.02E+01	1.07E+02	3.52E+00
Cyclopentene	142-29-0	—	—	l	O	6.81E+01	1.26E+00	1.96E+00	—	9.21E-02	8.81E-06	6.63E+02	2.24E+02	2.38E+00
Cyclotetramethylenetetranitramine (HMX)	2691-41-0	—	—	s	O	2.96E+02	2.50E-14	-1.40E+00	—	3.74E-02	6.34E-06	2.37E+03	4.75E-15	-1.30E+00
Cyclotrimethylenetrinitramine (RDX)	121-82-4	—	—	s	O	2.22E+02	4.99E-04	1.80E+00	—	6.65E-02	6.39E-06	3.87E+01	1.00E-09	8.70E-01
Cymene (isopropyltoluene)	99-87-6	—	—	l	O	1.34E+02	4.66E-01	3.36E+00	—	5.72E-02	6.73E-06	1.71E+01	1.08E+00	4.14E+00
Cymoxanil	57966-95-7	—	—	s	OA	1.98E+02	1.37E-08	-3.89E+00	—	4.91E-02	6.76E-06	4.47E+03	1.13E-06	6.00E-01

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Dacthal (DCPA)	1861-32-1	—	—	s	O	3.32E+02	9.35E-06	4.67E+00	—	4.20E-02	2.05E+00	2.20E-01	1.13E-07	4.71E+00
Dalapon, sodium salt (2,2-dichloropropanoic acid)	75-99-0	—	—	s	O	1.43E+02	1.46E-05	1.40E+00	—	6.98E-02	8.70E-06	6.98E+04	1.30E-01	1.60E+00
DDD	72-54-8	—	—	s	O	3.20E+02	1.66E-04	4.93E+00	—	1.69E-02	4.76E-06	9.00E-02	8.66E-07	5.87E+00
DDE	72-55-9	—	—	s	O	2.42E+02	8.73E-04	5.04E+00	—	1.44E-02	5.87E-06	6.50E-02	5.66E-06	6.00E+00
DDT	50-29-3	—	—	s	O	3.54E+02	2.23E-03	5.14E+00	—	1.37E-02	4.95E-06	3.10E-03	3.93E-07	6.79E+00
Demeton	8065-48-3	—	—	l	O	2.58E+02	6.65E-03	2.43E+00	—	4.56E-02	5.45E-06	7.20E+02	1.00E-04	2.97E+00
Desethylatrazine	6190-65-4	—	—	s	O	1.88E+02	2.19E-08	1.85E+00	—	5.14E-02	6.39E-06	1.80E+03	3.85E-06	1.97E+00
Diacetone alcohol (4-hydroxy-4-methyl-2-pentanone)	123-42-2	—	—	l	O	1.16E+02	1.68E-06	2.67E-01	—	6.39E-02	7.74E-06	6.81E+05	1.80E-01	2.71E-01
Diallate	2303-16-4	—	—	s	O	2.70E+02	1.58E-04	3.28E+00	—	8.00E-02	8.00E-06	1.40E+01	1.50E-04	4.08E+00
Diazinon	333-41-5	—	—	l	O	3.04E+02	4.70E-06	2.12E+00	—	1.80E-02	4.90E-06	4.00E+01	8.40E-05	3.86E+00
Dibenz(a,h)acridine	226-36-8	—	—	s	O	2.79E+02	8.44E-09	6.28E+00	—	3.78E-02	5.39E-06	6.84E-04	3.79E-13	6.39E+00
Dibenz(a,j)acridine	224-42-0	—	—	s	O	2.79E+02	7.08E-09	6.35E+00	—	3.79E-02	5.41E-06	8.14E-04	3.77E-13	6.36E+00
Dibenz-a,h-anthracene	53-70-3	—	—	s	O	2.78E+02	4.66E-07	6.28E+00	—	2.00E-02	5.18E-06	5.00E-04	2.10E-11	6.70E+00
Dibenzo(a,e)pyrene	192-65-4	—	—	s	O	3.02E+02	2.16E-06	7.42E+00	—	3.67E-02	5.06E-06	7.84E-05	5.32E-13	7.85E+00
Dibenzo(a,h)pyrene	189-64-0	—	—	s	O	3.02E+02	1.83E-06	7.38E+00	—	3.68E-02	5.07E-06	2.08E-05	1.30E-13	7.81E+00
Dibenzo(a,i)pyrene	189-55-9	—	—	s	O	3.02E+02	1.83E-06	7.38E+00	—	3.68E-02	5.07E-06	3.39E-05	2.11E-13	7.81E+00
Dibenzofuran	132-64-9	—	—	s	O	1.68E+02	5.28E-03	3.93E+00	—	5.51E-02	7.04E-06	2.86E+00	1.64E-03	4.00E+00
Dibenzothiophene	132-65-0	—	—	s	O	1.84E+02	9.79E-04	4.54E+00	—	5.22E-02	6.74E-06	2.11E-01	2.05E-05	4.61E+00
Dibromo-3-chloropropane, 1,2-	96-12-8	—	—	l	O	2.36E+02	8.31E-03	2.23E+00	—	8.00E-02	8.00E-06	1.00E+03	7.60E-01	2.68E+00
Dibromochloromethane (chlorodibromomethane)	124-48-1	—	—	l	O	2.08E+02	3.25E-02	1.80E+00	—	1.96E-02	1.05E-05	5.25E+03	1.50E+01	1.70E+00
Dibromofluoromethane	1868-53-7	—	—	l	O	1.92E+02	1.14E-01	1.40E+00	—	8.70E-02	1.01E-05	1.26E+04	1.37E+02	1.67E+00
Dicamba	1918-00-9	—	—	s	O	2.09E+02	3.28E-07	3.42E-01	—	6.02E-02	6.69E-06	5.60E+03	9.70E-05	2.14E+00
Dichlormid	37764-25-3	—	—	l	O	2.08E+02	2.75E-06	1.77E+00	—	4.66E-02	5.79E-06	4.26E+03	1.03E-03	1.89E+00
Dichloro-2-butene, 1,4-	764-41-0	—	—	l	O	1.25E+02	1.24E-02	2.26E+00	—	7.43E-02	8.62E-06	6.91E+03	1.26E+01	2.60E+00
Dichloro-2-butene, 1,4- trans	110-57-6	—	—	l	O	1.25E+02	1.35E-02	2.31E+00	—	7.14E-02	8.48E-06	1.27E+03	2.52E+00	2.35E+00
Dichlorobenzene, 1,2-	95-50-1	—	—	l	O	1.47E+02	8.73E-02	2.84E+00	—	6.90E-02	7.90E-06	1.50E+02	1.36E+00	3.28E+00
Dichlorobenzene, 1,3-	541-73-1	—	—	l	O	1.47E+02	1.95E-01	2.23E+00	—	6.80E-02	8.13E-06	1.10E+02	2.30E+00	3.28E+00
Dichlorobenzene, 1,4-	106-46-7	—	—	s	O	1.47E+02	1.17E-01	2.81E+00	—	6.90E-02	7.90E-06	7.38E+01	1.06E+00	3.28E+00
Dichlorobenzidine, 3,3-	91-94-1	—	—	s	O	2.53E+02	8.65E-07	2.86E+00	—	1.94E-02	6.74E-06	3.11E+00	2.20E-07	3.21E+00
Dichlorobutane, 2,3-	7581-97-7	—	—	l	O	1.27E+02	2.31E-01	2.30E+00	—	7.10E-02	8.07E-06	4.52E+02	1.50E+01	2.81E+00
Dichlorodifluoromethane	75-71-8	—	—	l	O	1.21E+02	1.67E+01	2.11E+00	—	5.20E-02	1.05E-05	2.80E+02	4.80E+03	1.82E+00
Dichloroethane, 1,1-	75-34-3	—	—	l	O	9.90E+01	2.39E-01	1.50E+00	—	7.42E-02	1.05E-05	5.50E+03	2.28E+02	1.76E+00
Dichloroethane, 1,2-	107-06-2	—	—	l	O	9.90E+01	5.32E-02	1.24E+00	—	1.04E-01	9.90E-06	8.70E+03	8.13E+01	1.83E+00
Dichloroethylene, 1,1-	75-35-4	—	—	l	O	9.69E+01	1.06E+00	1.81E+00	—	9.00E-02	1.04E-05	2.40E+03	5.91E+02	2.12E+00
Dichloroethylene, cis-1,2-	156-59-2	—	—	l	O	9.69E+01	1.87E-01	1.46E+00	—	7.35E-02	1.13E-05	4.93E+03	1.75E+02	1.86E+00
Dichloroethylene, trans-1,2	156-60-5	—	—	l	O	9.69E+01	3.90E-01	1.70E+00	—	7.07E-02	1.19E-05	6.30E+03	3.52E+02	2.07E+00
Dichlorofluoromethane	75-43-4	—	—	g	O	1.03E+02	1.98E-01	1.08E+00	—	1.00E-01	9.81E-06	1.99E+04	7.43E+02	1.26E+00
Dichlorophenol, 2,3-	576-24-9	—	—	s	OA	1.63E+02	9.40E-06	2.14E+00	—	6.63E-02	8.21E-06	6.94E+03	7.32E-03	2.77E+00

Chemical/Physical Properties

Last Revised: March 1, 2022

Chemical of Concern	CAS	Br _{abg} ((µg/g DW)/ (µg/g soil))	Br _{bg} ((µg/g DW)/ (µg/g soil))	Physical State	Type	MW (g/mole)	H _{unitless} (unitless)	LogK _{oc} (unitless)	LogK _d (unitless)	D _{air} (cm ² /s)	D _{wat} (cm ² /s)	Solubility (mg/l)	Vapor_P (mm Hg)	logK _{ow} (unitless)
Dichlorophenol, 2,4-	120-83-2	—	—	s	OA	1.63E+02	1.31E-04	1.86E+00	—	3.46E-02	8.77E-06	4.50E+03	7.15E-02	2.80E+00
Dichlorophenol, 2,5-	583-78-8	—	—	s	OA	1.63E+02	9.09E-06	2.09E+00	—	6.63E-02	8.19E-06	8.34E+03	8.50E-03	2.73E+00
Dichlorophenol, 2,6-	87-65-0	—	—	s	O	1.63E+02	1.20E-05	1.35E+00	—	6.57E-02	8.12E-06	1.03E+02	1.50E-01	2.83E+00
Dichlorophenol, 3,4-	95-77-2	—	—	s	OA	1.63E+02	2.75E-06	2.81E+00	—	6.50E-02	8.21E-06	6.80E+03	2.10E-03	2.89E+00
Dichlorophenol, 3,5-	591-35-5	—	—	s	OA	1.63E+02	3.68E-06	2.61E+00	—	6.51E-02	8.18E-06	1.06E+04	4.38E-03	2.75E+00
Dichlorophenoxy, 2,4- butyric acid, 4- (2,4-DB)	94-82-6	—	—	s	O	2.49E+02	3.19E-08	2.74E-01	—	4.41E-02	6.13E-06	7.76E+01	1.82E-07	3.79E+00
Dichlorophenoxyacetic acid, 2,4- (2,4-D)	94-75-7	—	—	s	O	2.21E+02	5.82E-09	2.95E+00	—	5.90E-02	6.50E-06	8.90E+02	2.40E-05	2.62E+00
Dichloroprop (2-(2,4-dichlorophenoxy) propanoic acid)	120-36-5	—	—	s	O	2.35E+02	9.00E-07	-1.54E+00	—	4.70E-02	6.43E-06	2.30E+02	1.60E-05	3.26E+00
Dichloropropane, 1,2-	78-87-5	—	—	l	O	1.13E+02	1.17E-01	1.77E+00	—	7.82E-02	8.73E-06	2.80E+03	5.00E+01	2.25E+00
Dichloropropane, 1,3-	142-28-9	—	—	l	O	1.13E+02	5.52E-02	2.10E+00	—	7.91E-02	9.07E-06	2.16E+03	1.93E+01	2.23E+00
Dichloropropane, 2,2-	594-20-7	—	—	l	O	1.13E+02	3.39E-01	2.19E+00	—	7.96E-02	8.71E-06	1.68E+03	9.24E+01	2.36E+00
Dichloropropanol, 2,3-	616-23-9	—	—	l	O	1.29E+02	3.97E-05	1.53E+00	—	4.84E-02	9.84E-06	2.95E+05	5.82E-01	7.84E-01
Dichloropropene, 1,1-	563-58-6	—	—	l	O	1.11E+02	1.82E+00	2.31E+00	—	8.21E-02	8.95E-06	5.44E+02	1.63E+02	2.82E+00
Dichloropropene, 1,3- (mixed isomers)	542-75-6	—	—	l	O	1.11E+02	1.23E-01	1.72E+00	—	6.26E-02	1.00E-05	1.55E+03	3.12E+01	1.75E+00
Dichloropropene, cis 1,3-	10061-01-5	—	—	l	O	1.11E+02	9.15E-02	1.65E+00	—	7.94E-02	8.00E-06	2.70E+03	3.70E+01	1.53E+00
Dichloropropene, trans 1,3-	10061-02-6	—	—	l	O	1.11E+02	9.15E-02	1.65E+00	—	7.94E-02	9.20E-06	2.80E+03	3.00E+01	1.53E+00
Dichlorvos	62-73-7	—	—	l	O	2.21E+02	3.98E-05	9.59E+00	—	2.32E-02	7.80E-06	1.60E+04	5.27E-02	1.40E+00
Dicrotophos (bidrin)	141-66-2	—	—	l	O	2.37E+02	1.49E-10	-9.68E-01	—	4.33E-02	5.70E-06	1.31E+07	1.68E-03	-7.65E-01
Dicyclopentadiene	77-73-6	—	—	—	O	1.32E+02	—	2.96E+00	—	7.32E-02	8.48E-06	—	1.40E+00	3.60E+00
Dieldrin	60-57-1	—	—	s	O	3.81E+02	1.11E-04	4.33E+00	—	1.25E-02	4.74E-06	1.95E-01	9.96E-07	5.45E+00
Diethanolamine	111-42-2	—	—	s	O	1.05E+02	1.90E-11	-2.10E+00	—	7.15E-02	9.10E-06	—	1.00E-04	-2.13E+00
Diethyldithiocarbamate, sodium salt	148-18-5	—	—	s	O	1.71E+02	—	—	—	—	—	—	—	2.69E-01
Diethyl phthalate	84-66-2	—	—	l	O	2.22E+02	1.87E-05	2.18E+00	—	2.56E-02	6.35E-06	1.08E+03	1.65E-03	2.65E+00
Diethylene glycol	111-46-6	—	—	l	O	1.06E+02	3.88E-09	-1.33E+00	—	7.31E-02	9.15E-06	1.00E+06	1.30E-03	-1.36E+00
Diethylene glycol monobutyl ether	112-34-5	—	—	l	O	1.62E+02	2.75E-07	7.50E-01	—	5.14E-02	6.35E-06	5.11E+04	1.58E-03	1.00E+00
Diethylhexyl adipate	103-23-1	—	—	l	O	3.71E+02	9.78E-01	5.58E+00	—	3.56E-02	3.72E-06	1.71E-03	8.25E-05	8.12E+00
Diethylstilbestrol	56-53-1	—	—	s	O	2.68E+02	2.62E-13	4.88E+00	—	4.43E-02	8.00E-06	1.30E+04	1.06E-09	5.64E+00
Diisobutylene (trimethyl-1-pentene, 2,4,4-)	107-39-1	—	—	l	O	1.12E+02	7.34E+01	3.75E+00	—	6.25E-02	6.70E-06	3.17E+00	3.80E+01	4.64E+00
Diisopropylbenzene, p-	100-18-5	—	—	L	O	1.62E+02	9.39E-01	3.98E+00	—	4.91E-02	5.55E-06	1.94E+00	2.10E-01	4.93E+00
Diisopropyl ether (2,2'-oxybis-propane)	108-20-3	—	—	l	O	1.02E+02	1.63E-01	1.81E+00	—	6.81E-02	7.15E-06	2.67E+03	7.76E+01	2.19E+00
Dimethenamid	87674-68-8	—	—	l	O	2.76E+02	2.18E-09	1.35E+00	—	3.80E-02	5.35E-06	3.75E+04	5.42E-06	1.49E+00
Dimethoate	60-51-5	—	—	s	O	2.29E+02	2.58E-09	6.30E-01	—	8.00E-02	8.00E-06	2.50E+04	5.09E-06	2.78E-01
Dimethoxybenzidine, 3,3'-	119-90-4	—	—	s	O	2.44E+02	1.66E-08	1.78E+00	—	2.42E-02	5.50E-06	2.40E+02	2.50E-07	2.08E+00
Dimethyl-2-nitrobenzene, 1,3-	81-20-9	—	—	l	O	1.51E+02	1.18E-03	3.04E+00	—	5.83E-02	6.87E-06	1.14E+02	1.62E-02	3.09E+00
Dimethyl-3-nitrobenzene, 1,2-	83-41-0	—	—	l	O	1.51E+02	9.35E-04	2.83E+00	—	5.85E-02	6.88E-06	2.13E+02	2.42E-02	2.88E+00
Dimethyl-4-nitrobenzene, 1-2-	99-51-4	—	—	s	O	1.51E+02	8.36E-04	2.82E+00	—	5.82E-02	6.85E-06	2.02E+02	2.05E-02	2.87E+00
Dimethyl-5-nitrobenzene, 1,3-	99-12-7	—	—	s	O	1.51E+02	1.36E-03	2.90E+00	—	5.81E-02	6.80E-06	1.22E+02	2.01E-02	2.95E+00
Dimethylphenethylamine, alpha, alpha-	122-09-8	—	—	l	O	1.49E+02	5.45E-05	2.16E+00	—	5.57E-02	6.64E-06	3.54E+03	1.30E-01	2.20E+00

Chemical/Physical Properties

Last Revised: March 1, 2022

Chemical of Concern	CAS	Br _{abg} ((µg/g DW)/ (µg/g soil))	Br _{bg} ((µg/g DW)/ (µg/g soil))	Physical State	Type	MW (g/mole)	H _{unitless} (unitless)	LogK _{oc} (unitless)	LogK _d (unitless)	D _{air} (cm ² /s)	D _{wat} (cm ² /s)	Solubility (mg/l)	Vapor_P (mm Hg)	logK _{ow} (unitless)
Dimethyl phenol, 2,4-	105-67-9	—	—	s	O	1.22E+02	8.31E-05	2.07E+00	—	5.84E-02	8.69E-06	6.20E+03	1.26E-01	2.61E+00
Dimethylaminoazobenzene, p-	60-11-7	—	—	s	OB	2.25E+02	3.25E-05	5.06E+00	—	4.25E-02	5.57E-06	4.04E-01	1.07E-06	5.00E+00
Dimethylbenz-a-anthracene, 7,12-	57-97-6	—	—	s	O	2.56E+02	6.49E-06	6.93E+00	—	3.90E-02	5.39E-06	1.27E-03	4.03E-10	7.14E+00
Dimethylbenzidine, 3,3'-	119-93-7	—	—	s	O	2.12E+02	5.40E-09	2.30E+00	—	5.10E-02	8.00E-06	2.40E+02	3.70E-07	3.02E+00
Dimethylformamide, N,N-	68-12-2	—	—	l	O	7.31E+01	3.21E-05	-3.10E-01	—	9.01E-02	9.28E-06	1.00E+06	1.07E+01	-4.90E-01
Dimethylnaphthalene, 1,3-	575-41-7	—	—	l	O	1.56E+02	7.23E-03	4.30E+00	—	5.39E-02	6.77E-06	8.85E+00	7.49E-03	4.38E+00
Dimethylphthalate	131-11-3	—	—	l	O	1.94E+02	2.40E-05	1.50E+00	—	5.68E-02	6.30E-06	4.19E+03	9.12E-03	1.66E+00
Di-n-butyl phthalate	84-74-2	—	—	l	O	2.78E+02	5.94E-05	4.53E+00	—	4.38E-02	7.86E-06	1.12E+01	4.25E-05	4.61E+00
Dinitro-2-methylphenol, 4,6- (dinitro-o-cresol, 4, 6-)	534-52-1	—	—	s	O	1.98E+02	1.07E-07	-1.50E+00	—	5.31E-02	7.27E-06	3.00E+03	2.87E-05	2.07E+00
Dinitrobenzene, 1,3- (dinitrobenzene, 2,4-)	99-65-0	—	—	s	O	1.68E+02	4.57E-06	1.48E+00	—	2.80E-01	7.60E-06	5.40E+02	2.49E-04	1.63E+00
Dinitrobenzene, 1,4-	100-25-4	—	—	s	O	1.68E+02	4.44E-06	1.42E+00	—	6.15E-02	7.18E-06	1.00E+02	4.83E-05	1.63E+00
Dinitrophenol, 2,4-	51-28-5	—	—	s	OA	1.84E+02	2.01E-07	-2.00E+00	—	2.73E-02	9.06E-06	5.80E+03	1.14E-04	1.73E+00
Dinitrophenol, 2,5-	329-71-5	—	—	s	OA	1.84E+02	1.47E-07	2.55E-03	—	5.98E-02	7.84E-06	1.79E+03	2.61E-05	2.62E+00
Dinitrotoluene, 2,4-	121-14-2	—	—	s	O	1.82E+02	3.60E-05	1.71E+00	—	2.03E-01	7.06E-06	2.85E+02	1.74E-04	2.18E+00
Dinitrotoluene, 2,6-	606-20-2	—	—	s	O	1.82E+02	3.11E-05	1.62E+00	—	3.27E-02	7.26E-06	1.82E+02	5.70E-04	2.18E+00
Di-n-octyl phthalate	117-84-0	—	—	l	O	3.91E+02	2.78E-03	7.92E+00	—	1.51E-02	3.90E-06	2.00E-02	4.47E-06	8.54E+00
Dinoseb	88-85-7	—	—	s	O	2.40E+02	2.08E-02	3.08E+00	—	2.25E-02	6.25E-06	5.20E+01	7.52E-02	3.67E+00
Dioxane 1,4-	123-91-1	—	—	l	O	8.81E+01	2.04E-04	-2.68E-01	—	2.30E-01	1.00E-05	9.00E+05	3.80E+01	-3.20E-01
Dioxins/furans, polychlorinated; (reported as 2,3,7,8-TCDD TEQ)	1746-01-6	—	—	s	O	3.22E+02	1.47E-03	7.15E+00	—	4.70E-02	8.00E-06	1.93E-05	7.40E-10	7.02E+00
Diphenyl ether	101-84-8	—	—	s	O	1.70E+02	1.75E-02	4.18E+00	—	5.30E-02	6.69E-06	7.78E+00	1.47E-02	4.25E+00
Diphenylamine	122-39-4	—	—	s	O	1.69E+02	1.83E-04	2.54E+00	—	6.80E-02	6.30E-06	3.00E+02	4.26E-03	3.29E+00
Diphenylhydrazine, 1,2-	122-66-7	—	—	s	O	1.84E+02	1.42E-07	2.82E+00	—	5.62E-02	5.70E-06	1.84E+03	2.60E-05	3.06E+00
Dipropylene glycol	110-98-5	—	—	l	O	1.34E+02	1.79E-08	-4.77E-01	—	5.97E-02	6.90E-06	9.83E+05	2.39E-03	-4.86E-01
Diquat	85-00-7	—	—	s	O	3.44E+02	2.69E-12	2.31E+00	—	5.52E-02	5.52E-06	7.00E+05	1.00E-07	-2.82E+00
Disodium iminodiacetate (iminodiacetic acid, disodium salt)	142-73-4	—	—	s	O	1.33E+02	3.82E-14	-1.31E+00	—	6.03E-02	8.38E-06	1.57E+05	8.21E-10	-1.33E+00
Disulfoton	298-04-4	—	—	s	O	2.74E+02	2.58E-04	3.95E+00	—	8.00E-02	8.00E-06	1.60E+01	2.30E-04	3.86E+00
Diuron	330-54-1	—	—	s	O	2.33E+02	3.04E-08	2.63E+00	—	5.40E-02	5.30E-06	4.20E+01	1.00E-07	2.67E+00
Dodecylphenol, 4-	104-43-8	—	—	l	OA	2.62E+02	4.00E-04	8.40E+00	—	3.46E-02	4.72E-06	3.80E-02	1.06E-06	8.40E+00
Endosulfan	115-29-7	—	—	s	O	4.07E+02	4.66E-04	2.87E+00	—	1.15E-02	4.55E-06	5.10E-01	9.96E-06	3.84E+00
Endosulfan I	959-98-8	—	—	s	O	4.07E+02	3.55E-05	4.20E+00	—	3.22E-02	4.67E-06	1.73E+00	2.75E-06	5.20E+00
Endosulfan II	33213-65-9	—	—	s	O	4.07E+02	3.55E-05	4.20E+00	—	3.22E-02	4.67E-06	1.16E+00	1.84E-06	5.20E+00
Endosulfan sulfate	1031-07-8	—	—	s	O	4.23E+02	3.65E-05	5.90E+00	—	3.00E-02	4.63E-06	1.02E-01	1.62E-07	6.01E+00
Endothall	145-73-3	—	—	s	O	2.30E+02	1.08E-08	1.93E+00	—	5.72E-02	7.50E-06	1.00E+05	1.80E-04	1.89E+00
Endrin	72-20-8	—	—	s	O	3.81E+02	4.95E-05	3.97E+00	—	1.25E-02	4.74E-06	2.50E-01	5.84E-07	5.45E+00
Endrin aldehyde	7421-93-4	—	—	l	O	3.81E+02	1.80E-02	6.33E+00	—	2.97E-02	3.83E-06	1.68E-02	1.46E-05	6.44E+00
Endrin ketone	53494-70-5	—	—	s	O	3.81E+02	3.66E-05	5.24E+00	—	3.10E-02	4.46E-06	8.60E-01	1.51E-06	5.33E+00
Epichlorohydrin	106-89-8	—	—	l	O	9.25E+01	1.37E-03	3.00E-01	—	8.60E-02	9.80E-06	6.60E+04	1.67E+01	6.26E-01

Chemical/Physical Properties

Last Revised: March 1, 2022

Chemical of Concern	CAS	Br _{abg} ((µg/g DW)/ (µg/g soil))	Br _{bg} ((µg/g DW)/ (µg/g soil))	Physical State	Type	MW (g/mole)	H _{unitless} (unitless)	LogK _{oc} (unitless)	LogK _d (unitless)	D _{air} (cm ² /s)	D _{wat} (cm ² /s)	Solubility (mg/l)	Vapor_P (mm Hg)	logK _{ow} (unitless)
EPN (o-ethyl o-(4-nitrophenyl)phenylphosphonothioate)	2104-64-5	—	—	s	O	3.23E+02	2.00E-08	3.75E+00	—	3.93E-02	5.16E-06	1.40E+00	1.91E-09	3.81E+00
Esfenvalerate	66230-04-4	—	—	s	O	4.20E+02	1.70E-08	4.80E+00	—	2.91E-02	4.18E-06	2.00E-04	1.80E-11	6.30E+00
Ethalfuralin (sonolan)	55283-68-6	—	—	l	O	3.33E+02	1.54E-05	4.78E+00	—	3.75E-02	4.96E-06	1.01E+01	8.54E-06	4.82E+00
Ethanol	64-17-5	—	—	l	O	4.61E+01	2.77E-04	7.68E-02	—	1.15E-01	1.22E-05	2.96E+05	3.26E+01	-2.00E-03
Ethanol, 2-amino-	141-43-5	—	—	l	O	6.11E+01	1.75E-07	-8.96E-01	—	1.02E-01	1.11E-05	1.00E+06	5.70E-01	-1.23E+00
Ethanol, 2-(2-aminoethoxy)-	929-06-6	—	—	l	O	1.05E+02	8.48E-09	-8.09E-01	—	7.15E-02	8.06E-06	1.00E+06	2.45E-02	-1.12E+00
Ethanol, 2-(2-ethoxyethoxy)-	111-90-0	—	—	l	O	1.34E+02	2.54E-07	1.56E+00	—	5.95E-02	6.73E-06	7.40E+05	2.56E-02	3.30E-01
Ethanol, 2-(methylamino)-	109-83-1	—	—	s	O	7.51E+01	2.20E-07	-7.69E-01	—	8.44E-02	9.23E-06	1.39E+06	1.10E-01	-1.07E+00
Ethion	563-12-2	—	—	l	O	3.84E+02	2.87E-05	4.19E+00	—	3.20E-02	4.60E-06	1.20E+00	1.50E-06	4.75E+00
Ethoprop	13194-48-4	—	—	l	O	2.42E+02	6.73E-06	3.09E+00	—	4.16E-02	5.56E-06	7.50E+02	3.80E-04	3.14E+00
Ethoxy ethanol, 2-	110-80-5	—	—	l	O	9.01E+01	1.04E-05	-9.69E-02	—	9.47E-02	9.75E-06	1.20E+01	4.56E+00	-4.16E-01
Ethyl acetate	141-78-6	—	—	l	O	8.81E+01	5.57E-03	7.20E-01	—	7.30E-02	9.70E-06	7.90E+04	9.41E+01	8.64E-01
Ethyl acrylate	140-88-5	—	—	l	O	1.00E+02	1.06E-02	2.03E+00	—	7.40E-02	8.68E-06	2.00E+04	2.95E+01	1.22E+00
Ethyl benzene	100-41-4	—	—	l	O	1.06E+02	3.28E-01	2.31E+00	—	7.50E-02	7.80E-06	1.69E+02	9.60E+00	3.03E+00
Ethyl dipropylthiocarbamate, S-	759-94-4	—	—	l	O	1.89E+02	4.57E-03	2.38E+00	—	5.35E-02	5.65E-06	3.70E+02	1.60E-01	3.02E+00
Ethyl ether	60-29-7	—	—	l	O	7.41E+01	2.70E-02	8.80E-01	—	7.40E-02	9.30E-06	6.10E+04	5.40E+02	1.05E+00
Ethyl methacrylate	97-63-2	—	—	l	O	1.14E+02	6.65E-03	1.57E+00	—	8.00E-02	8.00E-06	1.90E+04	1.75E+01	1.77E+00
Ethyl methanesulfonate	62-50-0	—	—	l	O	1.24E+02	2.49E-06	-6.04E-01	—	6.94E-02	8.72E-06	6.95E+04	2.54E-02	-6.14E-01
Ethyl tert-butyl ether (2-ethyl-2-ethoxypropane)	637-92-3	—	—	l	O	1.02E+02	9.99E-02	1.57E+00	—	6.95E-02	7.34E-06	5.03E+03	9.00E+01	1.88E+00
Ethyl-1-hexanol, 2-	104-76-7	—	—	l	O	1.30E+02	8.73E-04	2.67E+00	—	5.70E-02	6.73E-06	8.66E+02	1.10E-01	2.72E+00
Ethyl-2-hexenal, 2-	645-62-5	—	—	l	O	1.26E+02	1.79E-02	2.15E+00	—	6.00E-02	6.91E-06	5.85E+02	1.52E+00	2.62E+00
Ethyl-2-methyl benzene, 1-	611-14-3	—	—	l	O	1.20E+02	2.19E-01	3.03E+00	—	6.76E-02	7.29E-06	7.46E+01	2.48E+00	3.53E+00
Ethyl-4-methyl benzene, 1-	622-96-8	—	—	l	O	1.20E+02	3.27E-01	3.07E+00	—	6.70E-02	7.18E-06	9.48E+01	2.95E+00	3.58E+00
Ethylene*	74-85-1	—	—	—	—	—	—	—	—	—	—	—	—	—
Ethylene dibromide (dibromoethane, 1,2-)	106-93-4	—	—	l	O	1.88E+02	2.93E-02	1.73E+00	—	2.17E-02	1.90E-05	4.32E+03	1.10E+01	2.01E+00
Ethylene glycol	107-21-1	—	—	l	O	6.21E+01	2.49E-06	-9.00E-01	—	1.08E-01	1.22E-05	1.00E+06	7.00E-02	-1.20E+00
Ethylene oxide	75-21-8	—	—	g	O	4.41E+01	4.92E-03	3.42E-01	—	1.04E-01	1.45E-05	3.83E+05	1.32E+03	-4.54E-02
Ethylene thiourea	96-45-7	—	—	s	O	1.02E+02	4.99E-05	-6.60E-01	—	7.15E-02	1.02E-05	1.20E+04	8.36E-02	-4.91E-01
Ethylenediamine	107-15-3	—	—	l	O	6.01E+01	7.19E-08	6.73E-01	—	1.53E-01	1.12E-05	7.95E+06	1.10E+01	-1.62E+00
Ethylenimine	151-56-4	—	—	l	OB	4.31E+01	1.68E-05	2.68E-01	—	1.20E-01	1.30E-05	8.62E+05	2.31E+02	-6.04E-01
Ethylhexyl acrylate, 2-	103-11-7	—	—	l	O	1.84E+02	4.29E-02	4.00E+00	—	4.68E-02	5.74E-06	1.37E+01	5.85E-02	4.07E+00
Famphur	52-85-7	—	—	s	O	3.25E+02	6.70E-11	1.14E+00	—	4.02E-02	5.31E-06	7.06E+03	2.66E-08	1.29E+00
Fensulfothion	115-90-2	—	—	l	O	3.08E+02	1.42E-07	2.49E+00	—	4.04E-02	5.32E-06	4.10E+04	3.45E-04	2.05E+00
Fenthion	55-38-9	—	—	l	O	2.78E+02	2.13E-05	3.04E+00	—	4.35E-02	5.42E-06	2.17E+01	1.38E-04	3.06E+00
Fenuron	101-42-8	—	—	s	O	1.64E+02	7.03E-08	1.28E+00	—	5.36E-02	6.61E-06	2.30E+03	1.81E-05	1.37E+00
Fluoranthene	206-44-0	—	—	s	O	2.02E+02	3.88E-04	4.69E+00	—	3.02E-02	6.35E-06	2.60E-01	8.13E-06	4.93E+00
Fluorene	86-73-7	—	—	s	O	1.66E+02	2.64E-03	3.88E+00	—	3.63E-02	7.88E-06	1.98E+00	3.24E-03	4.02E+00
Fluorine (soluble fluoride)	7782-41-4	—	—	g	I	3.80E+01	—	—	2.18E+00	—	—	—	7.60E+02	2.23E-01

Chemical/Physical Properties

Last Revised: March 1, 2022

Chemical of Concern	CAS	Br _{abg} (µg/g DW)/ (µg/g soil)	Br _{bg} (µg/g DW)/ (µg/g soil)	Physical State	Type	MW (g/mole)	H _{unitless} (unitless)	LogK _{oc} (unitless)	LogK _d (unitless)	D _{air} (cm ² /s)	D _{wat} (cm ² /s)	Solubility (mg/l)	Vapor_P (mm Hg)	logK _{ow} (unitless)
Fluorochloridone	61213-25-0	—	—	s	O	3.12E+02	8.44E-08	2.69E+00	—	4.09E-02	5.47E-06	8.23E+01	4.07E-07	3.30E+00
Fonofos	944-22-9	—	—	s	O	2.46E+02	3.17E-01	3.55E+00	—	4.65E-02	5.52E-06	1.46E+01	3.43E-01	4.00E+00
Formaldehyde	50-00-0	—	—	g	O	3.00E+01	1.37E-05	3.40E-01	—	1.80E-01	2.00E-05	5.50E+05	3.88E+03	3.50E-01
Formic acid	64-18-6	—	—	l	O	4.60E+01	1.79E-04	-5.40E-01	—	7.90E-02	1.40E-06	1.00E+06	4.10E+01	-4.61E-01
Furan	110-00-9	—	—	l	O	6.81E+01	2.24E-01	1.32E+00	—	1.04E-01	1.20E-05	1.00E+04	6.00E+02	1.36E+00
Furfural	98-01-1	—	—	l	O	9.61E+01	1.25E-04	4.45E-01	—	8.72E-02	1.12E-05	8.60E+04	2.00E+00	8.32E-01
Glycidylaldehyde	765-34-4	—	—	l	O	7.21E+01	1.08E-05	9.64E-01	—	9.64E-02	1.16E-05	8.55E+07	2.70E+01	-1.17E-01
Glyphosate	1071-83-6	—	—	s	OA	1.69E+02	6.11E-12	3.00E+00	—	5.07E-02	7.64E-06	1.46E+04	2.43E-08	-3.33E+00
Heptachlor	76-44-8	—	—	s	O	3.73E+02	2.44E-02	4.07E+00	—	1.12E-02	5.69E-06	1.80E-01	3.26E-04	6.21E+00
Heptachlor epoxide	1024-57-3	—	—	s	O	3.89E+02	3.45E-04	3.86E+00	—	1.32E-02	4.23E-06	2.75E-01	4.34E-06	4.91E+00
Heptane, n-	142-82-5	—	—	l	O	1.00E+02	8.37E+01	3.84E+00	—	6.54E-02	7.00E-06	2.66E+00	4.07E+01	4.75E+00
Heptanoic acid, n-	111-14-8	—	—	l	OA	1.30E+02	3.72E-05	-3.00E-01	—	5.73E-02	7.13E-06	1.70E+03	8.84E-03	2.99E+00
Hexachlorobenzene	118-74-1	—	—	s	O	2.85E+02	2.22E-02	4.45E+00	—	5.42E-02	5.91E-06	6.00E-03	1.23E-05	5.86E+00
Hexachlorobutadiene	87-68-3	—	—	l	O	2.61E+02	9.94E-01	3.84E+00	—	5.61E-02	6.16E-06	2.55E+00	1.77E-01	4.72E+00
Hexachlorocyclohexane, alpha (alpha-BHC)	319-84-6	—	—	s	O	2.91E+02	2.82E-04	3.12E+00	—	1.42E-02	7.34E-06	2.00E+00	4.26E-05	4.26E+00
Hexachlorocyclohexane, beta (beta-BHC)	319-85-7	—	—	s	O	2.91E+02	1.44E-05	3.14E+00	—	1.42E-02	7.34E-06	5.42E-01	4.90E-07	4.26E+00
Hexachlorocyclohexane, delta (delta-BHC)	319-86-8	—	—	s	O	2.91E+02	1.77E-04	3.93E+00	—	4.50E-02	6.20E-06	2.59E+00	2.87E-05	4.00E+00
Hexachlorocyclohexane, gamma (lindane; gamma-BHC)	58-89-9	—	—	s	O	2.91E+02	1.41E-04	3.04E+00	—	1.42E-02	7.34E-06	5.75E+00	3.72E-05	4.26E+00
Hexachlorocyclohexane, techn (technical-BHC)	608-73-1	—	—	—	O	2.91E+02	5.99E-05	3.38E+00	—	1.42E-02	7.34E-06	4.35E+01	1.64E-04	4.26E+00
Hexachlorocyclopentadiene	77-47-4	—	—	l	O	2.74E+02	7.15E-01	3.98E+00	—	1.61E-02	7.21E-06	1.80E+00	7.32E-02	4.63E+00
Hexachloroethane	67-72-1	—	—	s	O	2.37E+02	1.62E-01	3.26E+00	—	2.50E-03	6.80E-06	5.00E+01	4.72E-01	4.03E+00
Hexachlorophene	70-30-4	—	—	s	O	4.07E+02	2.54E-09	7.30E+00	—	8.00E-02	8.00E-06	3.00E-03	2.74E-12	6.92E+00
Hexachloropropylene	1888-71-7	—	—	l	O	2.49E+02	3.94E-02	4.03E+00	—	5.64E-02	7.15E-06	4.11E+01	1.19E-01	4.10E+00
Hexanal, 2-ethyl-	123-05-7	—	—	l	O	1.28E+02	1.23E-02	2.12E+00	—	5.81E-02	6.26E-06	5.48E+02	9.59E-01	2.58E+00
Hexane, n-	110-54-3	—	—	l	O	8.62E+01	4.66E+01	2.68E+00	—	2.00E-01	7.77E-06	1.30E+01	1.52E+02	3.29E+00
Hexanediamine, 1,6-	124-09-4	—	—	s	O	1.16E+02	2.88E-08	3.56E-01	—	6.02E-02	6.79E-06	1.00E+06	4.22E-02	3.50E-01
Hexanedinitrile	111-69-3	—	—	l	O	1.08E+02	9.31E-08	2.62E-01	—	6.72E-02	7.66E-06	1.00E+06	6.23E-03	2.80E-01
Hexanediol, 1,6-	629-11-8	—	—	s	O	1.18E+02	3.14E-08	7.62E-01	—	6.58E-02	7.82E-06	2.34E+04	1.10E-04	7.75E-01
Hexanoic acid	142-62-1	—	—	l	O	1.16E+02	1.31E-05	-1.29E+00	—	6.20E-02	7.68E-06	1.19E+04	2.46E-02	2.06E+00
Hexanone, 2-	591-78-6	—	—	l	O	1.00E+02	3.38E-03	1.25E+00	—	6.96E-02	7.75E-06	1.79E+04	1.11E+01	1.48E+00
Hexazinone	51235-04-2	—	—	s	O	2.52E+02	8.62E-11	1.57E+00	—	5.08E-02	5.11E-06	3.30E+04	2.03E-07	2.15E+00
Hexene, 1-	592-41-6	—	—	l	O	8.42E+01	2.33E+01	2.90E+00	—	7.39E-02	7.12E-06	2.98E+01	1.52E+02	3.56E+00
Hexene, cis-2-	7688-21-3	—	—	l	O	8.42E+01	1.62E+01	2.93E+00	—	7.39E-02	7.15E-06	3.75E+01	1.33E+02	3.60E+00
Hexylene glycol (2-methyl-2,4-pentanediol)	107-41-5	—	—	l	O	1.18E+02	6.57E-07	3.93E-01	—	6.57E-02	7.70E-06	7.27E+05	7.40E-02	4.00E-01
Hydrazine	302-01-2	—	—	l	O	3.20E+01	7.20E-08	-1.00E+00	—	4.16E-01	1.90E-05	3.41E+08	1.40E+01	-1.47E+00
Hydrocaproic acid, 6- (6-hydroxyhexanoic acid)	1191-25-9	—	—	l	OA	1.32E+02	1.84E-09	-2.55E-01	—	5.77E-02	7.22E-06	9.86E+03	2.51E-06	-3.00E+00
Hydrogen chloride (hydrochloric acid)*	7647-01-0	—	—	—	—	—	—	—	—	—	—	—	—	—
Hydroquinone	123-31-9	—	—	s	O	1.10E+02	1.35E-09	4.98E-01	—	6.82E-02	8.56E-06	2.06E+04	4.62E-06	5.30E-01

Chemical/Physical Properties

Last Revised: March 1, 2022

Chemical of Concern	CAS	Br _{abg} (µg/g DW)/ (µg/g soil)	Br _{bg} (µg/g DW)/ (µg/g soil)	Physical State	Type	MW (g/mole)	H _{unitless} (unitless)	LogK _{oc} (unitless)	LogK _d (unitless)	D _{air} (cm ² /s)	D _{wat} (cm ² /s)	Solubility (mg/l)	Vapor_P (mm Hg)	logK _{ow} (unitless)
Indene	95-13-6	—	—	l	O	1.16E+02	2.08E-02	2.50E+00	—	6.82E-02	7.97E-06	3.90E+02	1.30E+00	2.80E+00
Indeno-1,2,3-cd-pyrene	193-39-5	—	—	s	O	2.76E+02	2.85E-06	6.54E+00	—	1.90E-02	5.66E-06	3.75E-03	1.40E-10	6.70E+00
Iron*	7439-89-6	—	—	—	—	—	—	—	—	—	—	—	—	—
Isoamyl alcohol	123-51-3	—	—	l	O	8.81E+01	5.64E-04	1.24E+00	—	7.40E-02	7.75E-06	1.75E+04	2.05E+00	1.47E+00
Isobutyl alcohol	78-83-1	—	—	l	O	7.41E+01	4.99E-04	7.50E-01	—	8.60E-02	8.00E-06	9.49E+04	1.00E+01	7.67E-01
Isobutylene (2-methyl-1-propene)	115-11-7	—	—	g	O	5.61E+01	9.56E+00	2.03E+00	—	9.90E-02	9.08E-06	2.39E+02	1.75E+03	2.47E+00
Isobutyric acid (2-methylpropanoic acid)	79-31-2	—	—	l	OA	8.81E+01	2.40E-05	-2.05E+00	—	7.76E-02	9.17E-06	4.96E+04	4.52E-01	1.15E+00
Isodecanol	25339-17-7	—	—	l	O	1.58E+02	1.67E-03	3.27E+00	—	4.84E-02	5.49E-06	3.43E+01	6.63E-03	4.02E+00
Isodrin	465-73-6	—	—	s	O	3.65E+02	9.13E-02	6.84E+00	—	3.40E-02	4.49E-06	1.70E-02	7.77E-05	6.82E+00
Isopentane	78-78-4	—	—	l	O	7.22E+01	6.28E+01	2.74E+00	—	8.21E-02	7.43E-06	4.24E+01	6.75E+02	3.36E+00
Isophorone	78-59-1	—	—	l	O	1.38E+02	2.57E-04	1.48E+00	—	6.23E-02	6.76E-06	1.20E+04	4.10E-01	2.62E+00
Isopropyl acetate	108-21-4	—	—	l	O	1.02E+02	1.16E-02	1.02E+00	—	7.35E-02	8.00E-06	2.14E+04	4.43E+01	1.19E+00
Isopropyl alcohol	67-63-0	—	—	l	O	6.01E+01	3.70E-04	5.30E-01	—	9.59E-02	1.03E-05	1.97E+05	2.22E+01	5.00E-01
Isosafrole	120-58-1	—	—	l	O	1.62E+02	1.28E-03	2.87E+00	—	5.59E-02	7.07E-06	1.43E+02	2.06E-02	2.92E+00
Kelthane (dicofol)	115-32-2	—	—	s	OA	3.70E+02	8.20E-07	4.10E+00	—	3.91E-02	5.20E-06	7.00E-01	3.90E-08	5.10E+00
Kepone (chlordecone)	143-50-0	—	—	s	O	4.91E+02	1.04E-06	4.43E+00	—	4.22E-02	4.30E-06	7.60E+00	2.25E-07	4.91E+00
Lead (inorganic)	7439-92-1	—	—	s	M	2.07E+02	0.00E+00	-	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.29E-01
Leptophos	21609-90-5	—	—	s	O	4.12E+02	1.31E-05	5.12E+00	—	3.39E-02	4.69E-06	1.96E-03	1.14E-09	6.88E+00
Limonene, d-*	5989-27-5	—	—	—	—	—	—	—	—	—	—	—	—	—
Lithium	7439-93-2	2.00E-02	4.00E-03	s	M	6.94E+00	0.00E+00	—	—	—	—	—	—	—
Magnesium*	7439-95-4	—	—	—	—	—	—	—	—	—	—	—	—	—
Malathion	121-75-5	—	—	l	O	3.30E+02	9.98E-07	2.46E+00	—	1.50E-02	4.40E-06	1.45E+02	7.90E-06	2.29E+00
Maleic anhydride	108-31-6	—	—	s	O	9.81E+01	8.31E-06	1.41E+00	—	9.50E-02	1.11E-05	8.65E+02	1.34E-03	1.62E+00
Maleic hydrazide	123-33-1	—	—	s	O	1.12E+02	1.03E-10	1.40E+00	—	8.75E-02	8.75E-06	6.00E+03	7.50E-08	-8.87E-01
Malononitrile	109-77-3	—	—	s	O	6.61E+01	1.97E-07	6.90E-01	—	9.97E-02	1.09E-05	6.96E+06	3.79E-01	-1.78E-01
Mancozeb	8018-01-7	—	—	s	O	2.65E+02	1.81E-05	1.13E+00	—	5.69E-02	6.02E-06	6.20E+00	7.50E-06	1.33E+00
Manganese	7439-96-5	1.00E-01	5.00E-02	s	M	5.49E+01	0.00E+00	—	1.70E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MCPA (4-(chloro-2-methylphenoxy) acetic acid)	94-74-6	—	—	s	O	2.01E+02	1.18E-07	-1.50E+00	—	5.12E-02	6.82E-06	6.50E+02	6.99E-06	3.39E+00
MCPP (2-(4-chloro-2-methylphenoxy) propanoic acid)	93-65-2	—	—	s	O	2.15E+02	1.00E-06	-1.76E+00	—	4.70E-02	6.36E-06	2.80E+02	2.50E-05	3.13E+00
Mercury (pH = 4.9)	7439-97-6	5.50E-03	1.40E-02	l	M	2.01E+02	4.74E-01	—	-1.40E+00	3.07E-02	6.30E-06	3.00E-02	1.30E-03	-4.71E-01
Mercury (pH=6.8)	7439-97-6	5.50E-03	1.40E-02	l	M	2.01E+02	4.74E-01	—	1.72E+00	3.07E-02	6.30E-06	3.00E-02	1.30E-03	-4.71E-01
Merphos	150-50-5	—	—	l	O	2.99E+02	1.26E+00	5.34E+00	—	3.65E-02	4.75E-06	4.97E-03	3.83E-04	7.29E+00
Methacrylic acid (2-methyl-2-propenoic acid)	79-41-4	—	—	l	O	8.61E+01	5.21E-04	-2.40E+00	—	8.50E-02	9.59E-06	9.59E+04	1.06E+01	1.67E+00
Methacrylonitrile	126-98-7	—	—	l	O	6.71E+01	3.03E-03	5.30E-01	—	8.00E-02	8.00E-06	2.50E+04	6.80E+01	7.57E-01
Methanol	67-56-1	—	—	l	O	3.20E+01	1.94E-04	-7.40E-01	—	1.50E-01	1.64E-05	1.00E+06	1.22E+02	-6.32E-01
Methapyrilene	91-80-5	—	—	l	O	2.61E+02	1.18E-07	1.30E+00	—	4.00E-02	5.29E-06	2.03E+03	1.68E-05	3.15E+00
Methomyl	16752-77-5	—	—	s	O	1.62E+02	7.48E-09	2.20E+00	—	4.07E-02	7.20E-06	5.80E+04	5.00E-05	6.09E-01
Methoxychlor	72-43-5	—	—	s	O	3.46E+02	6.57E-04	4.89E+00	—	1.56E-02	4.46E-06	4.50E-02	1.23E-06	5.67E+00

Chemical/Physical Properties

Last Revised: March 1, 2022

Chemical of Concern	CAS	Br _{abg} ((µg/g DW)/ (µg/g soil))	Br _{bg} ((µg/g DW)/ (µg/g soil))	Physical State	Type	MW (g/mole)	H _{unitless} (unitless)	LogK _{oc} (unitless)	LogK _d (unitless)	D _{air} (cm ² /s)	D _{wat} (cm ² /s)	Solubility (mg/l)	Vapor_P (mm Hg)	logK _{ow} (unitless)
Methoxyethanol, 2-	109-86-4	—	—	l	O	7.61E+01	1.28E+00	9.31E-01	—	9.15E-02	1.02E-05	2.01E+01	6.20E+00	-9.07E-01
Methyl acetate (acetic acid, methyl ester)	79-20-9	—	—	l	O	7.41E+01	4.46E-03	2.43E-01	—	9.50E-02	1.01E-05	1.44E+05	1.58E+02	2.46E-01
Methyl acrylate	96-33-3	—	—	l	O	8.61E+01	9.15E-03	6.56E-01	—	8.70E-02	9.35E-06	4.03E+04	7.93E+01	7.30E-01
Methyl amyl ketone (2-heptanone)	110-43-0	—	—	l	O	1.14E+02	3.64E-03	1.69E+00	—	6.32E-02	7.20E-06	6.06E+03	3.53E+00	2.03E+00
Methyl chrysene, 1-	3351-28-8	—	—	s	O	2.42E+02	1.16E-05	6.65E+00	—	4.09E-02	5.61E-06	2.53E-04	2.22E-10	6.76E+00
Methyl chrysene, 2-	3351-32-4	—	—	s	O	2.42E+02	1.18E-05	6.65E+00	—	4.09E-02	5.61E-06	3.54E-04	3.17E-10	6.76E+00
Methyl chrysene, 6-	1705-85-7	—	—	s	O	2.42E+02	1.17E-05	6.55E+00	—	4.09E-02	5.61E-06	1.07E-03	9.44E-10	6.76E+00
Methyl cyclohexane	108-87-2	—	—	l	O	9.82E+01	1.59E+01	3.33E+00	—	6.97E-02	7.59E-06	1.04E+01	3.08E+01	4.10E+00
Methyl ethyl ketone (2-butanone)	78-93-3	—	—	l	O	7.21E+01	1.94E-03	2.79E-01	—	8.08E-02	9.80E-06	2.40E+05	9.10E+01	2.56E-01
Methyl iodide (iodomethane)	74-88-4	—	—	l	O	1.42E+02	2.36E-01	1.31E+00	—	1.02E-01	1.17E-05	1.24E+04	3.79E+02	1.55E+00
Methyl isobutyl ketone (4-methyl-2-pentanone)	108-10-1	—	—	l	O	1.00E+02	5.82E-03	1.18E+00	—	7.50E-02	7.80E-06	1.90E+04	1.45E+01	1.16E+00
Methyl mercury	22967-92-6	—	—	—	I	2.16E+02	—	—	—	—	—	—	—	7.63E-02
Methyl methacrylate	80-62-6	—	—	l	O	1.00E+02	1.33E-02	1.36E+00	—	7.70E-02	8.60E-06	1.60E+04	3.80E+01	1.28E+00
Methyl methanesulfonate	66-27-3	—	—	l	O	1.10E+02	3.25E-06	-7.54E-01	—	7.52E-02	9.50E-06	4.95E+04	2.67E-02	-7.67E-01
Methyl parathion	298-00-0	—	—	s	O	2.63E+02	5.82E-06	2.81E+00	—	8.00E-02	8.00E-06	5.00E+01	1.52E-05	2.75E+00
Methyl-1-butene, 2-	563-46-2	—	—	l	O	7.01E+01	1.41E+01	2.23E+00	—	8.57E-02	8.93E-06	1.38E+02	5.06E+02	2.72E+00
Methyl-1-propanal, 2- (isobutyraldehyde)	78-84-2	—	—	l	O	7.21E+01	7.48E-03	7.04E-01	—	8.90E-02	9.36E-06	4.59E+04	8.89E+01	7.90E-01
Methyl-2-butene, 2-	513-35-9	—	—	l	O	7.01E+01	7.32E+00	2.19E+00	—	8.57E-02	8.93E-06	2.06E+02	3.93E+02	2.67E+00
Methyl-2-pentenal, 2-	623-36-9	—	—	l	O	9.81E+01	1.34E-02	1.44E+00	—	7.20E-02	8.05E-06	5.04E+03	1.26E+01	1.72E+00
Methylcholanthrene, 3-	56-49-5	—	—	s	O	2.68E+02	7.72E-07	6.96E+00	—	3.83E-02	5.40E-06	1.76E-04	6.64E-12	7.08E+00
Methylene bromide (dibromomethane)	74-95-3	—	—	l	O	1.74E+02	3.49E-02	2.26E+00	—	8.00E-02	8.00E-06	1.10E+04	4.56E+01	1.52E+00
Methylene chloride (dichloromethane)	75-09-2	—	—	l	O	8.49E+01	9.10E-02	1.07E+00	—	1.01E-01	1.17E-05	1.54E+04	4.55E+02	1.34E+00
Methylene-bis (2-chloroaniline) 4,4'-	101-14-4	—	—	s	O	2.67E+02	1.40E-05	3.90E+00	—	1.99E-02	5.80E-06	7.24E+01	6.94E-05	3.47E+00
Methylmercury hydroxide	1184-57-2	—	—	s	OM	2.33E+02	5.47E-09	1.92E-02	—	1.05E-01	1.43E-05	1.00E+06	7.50E-03	-1.33E+00
Methylnaphthalene, 1-	90-12-0	—	—	s	O	1.42E+02	1.64E-02	3.36E+00	—	6.31E-02	7.13E-06	2.80E+01	6.62E-02	3.72E+00
Methylnaphthalene, 2-	91-57-6	—	—	s	O	1.42E+02	1.85E-02	3.63E+00	—	6.29E-02	7.20E-06	2.54E+01	6.75E-02	3.72E+00
Methylpyrrolidone, N-	872-50-4	—	—	l	O	9.91E+01	1.83E-06	1.01E-02	—	7.16E-02	8.75E-06	—	4.90E-01	1.00E-02
Methylstyrene, alpha-	98-83-9	—	—	l	O	1.18E+02	1.95E-01	2.87E+00	—	6.31E-02	6.91E-06	6.11E+01	1.84E+00	3.53E+00
Methyltetrahydrofuran, 2-	96-47-9	—	—	l	O	8.61E+01	8.78E-03	9.43E-01	—	8.09E-02	8.72E-06	3.99E+04	7.44E+01	1.09E+00
Methyltetrahydropyran, 2-	10141-72-7	—	—	l	O	1.00E+02	8.30E-03	1.28E+00	—	7.19E-02	8.04E-06	1.23E+04	1.87E+01	1.52E+00
Metolachlor	51218-45-2	—	—	l	O	2.84E+02	3.13E-08	2.85E+00	—	3.61E-02	5.10E-06	8.64E+02	2.29E-06	2.90E+00
Metribuzin	21087-64-9	—	—	s	O	2.14E+02	4.99E-09	3.48E-01	—	4.51E-02	5.98E-06	1.21E+05	5.16E-05	3.72E-01
Mirex	2385-85-5	—	—	s	O	5.46E+02	3.20E-01	7.36E+00	—	3.50E-02	4.08E-06	3.41E-08	7.50E-07	1.10E+01
Molinate	2212-67-1	—	—	l	O	1.87E+02	5.25E-05	1.70E+00	—	5.65E-02	6.00E-06	9.00E+02	5.60E-03	2.91E+00
Molybdenum	7439-98-7	1.00E-01	6.00E-02	s	M	9.59E+01	0.00E+00	—	1.30E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Monocrotophos	2157-98-4	—	—	s	O	2.23E+02	1.24E-12	3.18E-01	—	4.48E-02	5.67E-06	8.02E+05	8.12E-08	4.84E-01
Morpholine	110-91-8	—	—	l	O	8.71E+01	2.28E-06	-2.63E-02	—	8.34E-02	9.44E-06	3.33E+07	1.59E+01	-8.80E-01
Morpholine, N-butyl-	1005-67-0	—	—	l	O	1.43E+02	7.19E-05	1.74E+00	—	5.36E-02	6.01E-06	7.36E+04	6.80E-01	1.77E+00

Chemical/Physical Properties

Last Revised: March 1, 2022

Chemical of Concern	CAS	Br _{abg} (µg/g DW)/ (µg/g soil)	Br _{bg} (µg/g DW)/ (µg/g soil)	Physical State	Type	MW (g/mole)	H _{unitless} (unitless)	LogK _{oc} (unitless)	LogK _d (unitless)	D _{air} (cm ² /s)	D _{wat} (cm ² /s)	Solubility (mg/l)	Vapor_P (mm Hg)	logK _{ow} (unitless)
MTBE (methyl tert-butyl ether)	1634-04-4	—	—	l	O	8.81E+01	2.44E-02	1.15E+00	—	7.92E-02	9.41E-05	4.80E+04	2.49E+02	1.43E+00
Naled	300-76-5	—	—	l	O	3.81E+02	2.71E-03	2.12E+00	—	4.40E-02	6.80E-06	1.50E+00	2.00E-04	1.60E+00
Naphthalene	91-20-3	—	—	s	O	1.28E+02	2.00E-02	3.19E+00	—	5.90E-02	7.50E-06	3.14E+01	8.89E-02	3.17E+00
Naphthoquinone, 1,4-	130-15-4	—	—	s	O	1.58E+02	4.00E-05	1.29E+00	—	5.55E-02	7.09E-06	2.20E+02	1.34E-03	1.50E+00
Naphthylamine, 1-	134-32-7	—	—	s	O	1.43E+02	8.64E-06	2.64E+00	—	5.89E-02	7.56E-06	5.84E+02	6.44E-04	2.64E+00
Naphthylamine, 2-	91-59-8	—	—	s	O	1.43E+02	1.00E-06	2.76E+00	—	5.86E-02	7.46E-06	1.25E+02	6.76E-05	2.76E+00
Napropamide	15299-99-7	—	—	s	OB	2.71E+02	2.17E-07	3.74E+00	—	3.78E-02	5.05E-06	2.57E+01	3.77E-07	3.81E+00
Neopentyl glycol	126-30-7	—	—	s	O	1.04E+02	5.11E-07	2.54E-01	—	7.23E-02	8.54E-06	2.81E+05	2.52E-02	2.22E-01
Nickel and compounds	7440-02-0	2.50E-02	8.00E-03	s	M	5.87E+01	0.00E+00	—	1.20E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-5.71E-01
Nitrate-N	14797-55-8	—	—	—	I	6.20E+01	—	—	—	—	—	—	—	2.09E-01
Nitrite-N	14797-65-0	—	—	—	I	4.60E+01	—	—	—	—	—	—	—	5.64E-02
Nitroaniline, 2-	88-74-4	—	—	s	O	1.38E+02	2.08E-05	1.43E+00	—	5.99E-02	7.18E-06	1.26E+03	4.75E-03	2.02E+00
Nitroaniline, 3-	99-09-2	—	—	s	O	1.38E+02	2.31E-07	1.60E+00	—	6.73E-02	8.59E-06	4.56E+02	1.39E-05	1.62E+00
Nitroaniline, 4-	100-01-6	—	—	s	O	1.38E+02	3.33E-08	1.05E+00	—	6.69E-02	8.59E-06	6.49E+02	2.86E-06	1.07E+00
Nitrobenzene	98-95-3	—	—	l	O	1.23E+02	8.56E-04	2.12E+00	—	7.60E-02	8.60E-06	1.90E+03	2.44E-01	1.81E+00
Nitroglycerin	55-63-0	—	—	l	O	2.27E+02	3.40E-06	1.97E+00	—	5.53E-02	7.34E-06	6.70E+04	1.00E-04	2.00E+00
Nitrophenol, 2-	88-75-5	—	—	s	O	1.39E+02	2.21E-05	1.32E+00	—	6.87E-02	8.47E-06	1.73E+04	5.03E-02	2.35E+00
Nitrophenol, 3-	554-84-7	—	—	s	O	1.39E+02	1.90E-11	1.84E+00	—	6.65E-02	8.61E-06	5.86E+03	7.81E-05	1.97E+00
Nitrophenol, 4-	100-02-7	—	—	s	O	1.39E+02	3.24E-08	5.00E-01	—	6.73E-02	8.66E-06	4.49E+03	1.91E-05	1.73E+00
Nitropropane, 2-	79-46-9	—	—	l	O	8.91E+01	5.15E-03	5.44E-01	—	9.23E-02	1.01E-05	1.70E+04	1.82E+01	8.72E-01
Nitroquinoline-N-oxide, 4-	56-57-5	—	—	s	O	1.90E+02	8.23E-13	1.07E+00	—	6.78E-02	7.44E-06	1.17E+07	9.23E-07	1.09E+00
Nitrosodiethanolamine	1116-54-7	—	—	l	O	1.34E+02	2.05E-09	4.76E-01	—	7.27E-02	7.70E-06	7.33E+07	5.00E-04	-1.28E+00
Nitrosodiethylamine, n-	55-18-5	—	—	l	O	1.02E+02	3.60E-05	4.77E-01	—	8.00E-02	8.00E-06	1.47E+05	1.42E+00	3.44E-01
Nitrosodimethylamine, n-	62-75-9	—	—	l	O	7.41E+01	2.16E-05	5.56E-01	—	1.34E-01	9.72E-06	1.00E+06	5.37E+00	-6.39E-01
Nitrosodi-n-butylamine, n-	924-16-3	—	—	—	O	1.58E+02	3.58E-03	2.36E+00	—	8.00E-02	8.00E-06	1.20E+03	2.89E-01	2.31E+00
Nitrosodi-n-propylamine, n-	621-64-7	—	—	s	O	1.30E+02	9.35E-05	1.29E+00	—	5.45E-02	8.17E-06	9.89E+03	4.00E-01	1.35E+00
Nitrosodiphenylamine	86-30-6	—	—	s	O	1.98E+02	2.08E-04	2.52E+00	—	3.12E-02	6.35E-06	3.51E+01	9.88E-02	3.16E+00
Nitroso-methyl-ethyl-amine, n-	10595-95-6	—	—	—	O	8.81E+01	3.70E-05	1.32E+00	—	8.00E-02	8.00E-06	3.00E+05	2.28E+00	-1.47E-01
Nitrosomorpholine, N-	59-89-2	—	—	s	O	1.16E+02	3.99E-08	-1.37E+00	—	7.41E-02	9.22E-06	4.71E+06	2.96E-02	-1.39E+00
Nitroso-n-ethylurea, n-	759-73-9	—	—	s	O	1.17E+02	1.05E-04	1.51E+00	—	8.08E-02	8.25E-06	4.85E+04	7.97E-01	-2.47E-02
Nitrosopiperidine, N-	100-75-4	—	—	l	O	1.14E+02	1.30E-05	7.28E-01	—	6.90E-02	8.57E-06	4.91E+04	1.00E-01	7.40E-01
Nitrosopyrrolidine, n-	930-55-2	—	—	l	O	1.00E+02	7.48E-07	-1.87E-01	—	8.00E-02	8.00E-06	7.80E+05	1.75E-01	2.31E-01
Nitrotoluene, m-	99-08-1	—	—	l	O	1.37E+02	2.24E-03	2.15E+00	—	6.42E-02	7.69E-06	4.98E+02	1.50E-01	2.36E+00
Nitrotoluene, o-	88-72-2	—	—	l	O	1.37E+02	1.87E-03	2.15E+00	—	6.47E-02	7.73E-06	6.00E+02	1.50E-01	2.36E+00
Nitrotoluene, p-	99-99-0	—	—	s	O	1.37E+02	2.29E-03	2.15E+00	—	6.40E-02	7.70E-06	4.00E+02	1.20E-01	2.36E+00

Chemical/Physical Properties

Last Revised: March 1, 2022

Chemical of Concern	CAS	B _{fabg} ((μg/g DW)/ (μg/g soil))	B _{r_{bg}} ((μg/g DW)/ (μg/g soil))	Physical State	Type	MW (g/mole)	H _{unitless} (unitless)	LogK _{oc} (unitless)	LogK _d (unitless)	D _{air} (cm ² /s)	D _{wat} (cm ² /s)	Solubility (mg/l)	Vapor_P (mm Hg)	logK _{ow} (unitless)
Nonachlor, cis-	5103-73-1	—	—	s	O	4.10E+02	2.02E-03	5.08E+00	—	1.18E-02	4.37E-06	5.60E-02	1.00E-05	6.60E+00
Nonachlor, trans-	39765-80-5	—	—	s	O	4.10E+02	2.02E-03	5.08E+00	—	1.18E-02	4.37E-06	5.60E-02	1.00E-05	6.60E+00
Nonanal	124-19-6	—	—	l	O	1.42E+02	2.34E-02	2.85E+00	—	5.29E-02	6.29E-06	1.24E+02	3.71E-01	3.50E+00
Nonene, 1-n	124-11-8	—	—	l	o	1.26E+02	8.81E+01	4.45E+00	—	5.56E-02	5.86E-06	3.00E-01	3.80E+00	5.52E+00
Nonylphenol, 4-n-	104-40-5	—	—	l	OA	2.20E+02	6.96E-05	6.48E+00	—	3.93E-02	5.27E-06	7.23E-01	4.14E-06	6.48E+00
Nonylphenol ethoxylate	9016-45-9	—	—	l	O	2.92E+02	8.19E-04	6.88E+00	—	3.29E-02	4.08E-06	2.79E-02	1.38E-06	7.00E+00
Octamethylpyrophosphoramide	152-16-9	—	—	l	O	2.86E+02	1.16E-08	-5.09E-01	—	8.00E-02	8.00E-06	1.00E+06	9.88E-04	-1.01E+00
Octanone	106-68-3	—	—	l	O	1.28E+02	6.35E-03	2.15E+00	—	5.78E-02	6.67E-06	1.65E+03	1.50E+00	2.61E+00
Oxamyl	23135-22-0	—	—	s	O	2.19E+02	1.60E-11	6.99E-01	—	5.57E-02	5.75E-06	2.80E+05	3.83E-07	-1.20E+00
Oxychlorthane	27304-13-8	—	—	s	O	4.10E+02	2.02E-03	5.08E+00	—	1.18E-02	4.37E-06	5.60E-02	1.00E-05	6.60E+00
Paraquat	1910-42-5	—	—	s	OB	2.57E+02	2.91E-11	-4.81E+00	—	3.74E-02	3.57E-06	7.00E+05	1.45E-06	-4.50E+00
Parathion (ethyl parathion)	56-38-2	—	—	s	O	2.91E+02	2.37E-05	3.75E+00	—	1.70E-02	5.80E-06	1.18E+01	1.73E-05	3.73E+00
Pebulate	1114-71-2	—	—	l	O	2.03E+02	9.85E-04	2.63E+00	—	5.10E-02	5.38E-06	9.20E+01	8.85E-03	3.51E+00
Pendimethalin	40487-42-1	—	—	s	O	2.81E+02	1.97E-05	5.28E+00	—	3.81E-02	5.26E-06	5.69E-01	7.31E-07	5.37E+00
Pentachlorobenzene	608-93-5	—	—	s	O	2.50E+02	3.16E-02	4.50E+00	—	6.70E-02	6.30E-06	6.50E-01	1.67E-03	5.22E+00
Pentachloroethane	76-01-7	—	—	l	O	2.02E+02	2.15E-02	2.28E+00	—	6.37E-02	7.88E-06	6.19E+02	1.20E+00	2.78E+00
Pentachloronitrobenzene	82-68-8	—	—	s	O	2.95E+02	2.57E-02	4.11E+00	—	1.59E-02	6.10E-06	7.11E-02	1.13E-04	5.03E+00
Pentachlorophenol	87-86-5	—	—	s	OA	2.66E+02	1.16E-05	2.61E+00	—	5.60E-02	6.10E-06	1.40E+01	1.70E-05	4.74E+00
Pentadiene, 1,3-cis-	1574-41-0	—	—	l	O	6.81E+01	2.42E+00	2.08E+00	—	8.73E-02	8.10E-06	5.62E+02	3.65E+02	2.53E+00
Pentadiene, 1,3-trans-	2004-70-8	—	—	l	O	6.81E+01	1.31E+00	1.95E+00	—	8.75E-02	8.74E-06	8.94E+02	3.15E+02	2.37E+00
Pentaerythritol tetranitrate (PETN)	78-11-5	—	—	s	O	3.16E+02	5.60E-05	3.80E+00	—	4.48E-02	6.20E-06	2.66E+01	8.63E-05	3.86E+00
Pentane	109-66-0	—	—	l	O	7.22E+01	4.50E+01	3.48E+00	—	8.26E-01	8.07E-06	4.05E+01	4.62E+02	3.54E+00
Pentane, 2-methyl-	107-83-5	—	—	l	O	8.62E+01	7.44E+01	3.26E+00	—	7.34E-02	6.89E-06	1.25E+01	1.97E+02	4.01E+00
Pentane, 3-methyl-	96-14-0	—	—	l	O	8.62E+01	5.78E+01	3.21E+00	—	7.38E-02	6.96E-06	1.48E+01	1.81E+02	3.96E+00
Pentenediol, 1,5-	111-29-5	—	—	l	O	1.04E+02	2.51E-08	1.47E-01	—	7.14E-02	8.57E-06	7.44E+04	3.27E-04	1.49E-01
Pentanol, 1-	71-41-0	—	—	l	O	8.81E+01	6.10E-04	1.35E+00	—	7.44E-02	7.77E-06	1.50E+04	1.90E+00	1.61E+00
Pentanol, 4-methyl-2-	108-11-2	—	—	l	O	1.02E+02	9.33E-04	1.33E+00	—	6.72E-02	7.08E-06	1.47E+04	2.46E+00	1.58E+00
Pentanone, 2-	107-87-9	—	—	l	O	8.61E+01	2.54E-03	9.31E-01	—	7.78E-02	8.46E-06	5.40E+04	2.91E+01	1.08E+00
Pentene, 2-	109-68-2	—	—	l	O	7.01E+01	7.90E+00	2.40E+00	—	8.48E-02	7.87E-06	1.86E+02	3.80E+02	2.93E+00
Pentyne, 1-	627-19-0	—	—	l	O	6.81E+01	1.35E+00	1.92E+00	—	8.92E-02	8.84E-06	8.34E+02	3.03E+02	2.32E+00
Perchlorate	14797-73-0	—	—	s	I	9.95E+01	0.00E+00	—	-5.00E-01	—	—	—	0.00E+00	0.00E+00

Chemical/Physical Properties

Last Revised: March 1, 2022

Chemical of Concern	CAS	Br _{abg} ((µg/g DW)/ (µg/g soil))	Br _{bg} ((µg/g DW)/ (µg/g soil))	Physical State	Type	MW (g/mole)	H _{unitless} (unitless)	LogK _{oc} (unitless)	LogK _d (unitless)	D _{air} (cm ² /s)	D _{wat} (cm ² /s)	Solubility (mg/l)	Vapor_P (mm Hg)	logK _{ow} (unitless)
Perfluorooctane sulfonic acid (1-Octanesulfonic acid, heptadecafluoro-1-) [PFOS]	1763-23-1	—	—	s	O	4.99E+02	3.25E-08	3.34E+00	—	3.92E-02	9.00E-06	5.70E+02	5.91E-09	2.45E+00
Perfluoroundecanoic acid (Undecanoic acid, uncosafluoro-) [PFUnDa]	2058-94-8	—	—	s	O	5.63E+02	1.27E-05	3.18E+00	—	3.57E-02	7.97E-06	5.33E-01	2.14E-07	3.59E+00
Perfluoropentanoic acid (Pentanoic acid, nonafluoro-) [PFPeA]	2706-90-3	—	—	s	O	2.63E+02	1.03E-10	1.58E+00	—	5.36E-02	1.17E-05	1.07E+05	7.15E-07	-7.00E-02
Perfluorohexanoic acid (Hexanoic acid, undecafluoro-) [PFHxA]	307-24-4	—	—	s	O	3.13E+02	7.07E-10	1.91E+00	—	4.88E-02	1.07E-05	1.15E+05	5.67E-07	5.40E-01
Perfluorododecanoic acid (Dodecanoic acid, tricosafafluoro-) [PFDaA]	307-55-1	—	—	s	O	6.13E+02	9.36E-05	3.45E+00	—	3.41E-02	7.63E-06	6.71E-02	1.83E-07	3.68E+00
Perfluorooctanoic acid (Octanoic acid, pentadecafluoro-) [PFOA]	335-67-1	—	—	s	O	4.13E+02	3.31E-08	2.31E+00	—	4.21E-02	9.30E-06	9.50E+03	3.57E-07	1.76E+00
Perfluorodecanoic acid (Decanoic acid, nonadecafluoro-) [PFDA]	335-76-2	—	—	s	O	5.13E+02	1.72E-06	3.17E+00	—	3.75E-02	8.34E-06	4.20E+00	2.50E-07	2.98E+00
Perfluorodecane sulfonic acid (1-Decanesulfonic acid, heneicosafluoro-) [PFDS]	335-77-3	—	—	s	O	5.99E+02	1.76E-06	3.53E+00	—	3.54E-02	8.21E-06	8.20E-02	4.29E-09	3.59E+00
Perfluorohexane sulfonic acid (1-Hexanesulfonic acid, tridecafluoro-) [PFHxS]	355-46-4	—	—	s	O	3.99E+02	6.02E-10	2.70E+00	—	4.45E-02	1.01E-05	3.07E+02	8.12E-09	1.15E+00
Perfluorobutyric acid (Butanoic acid, heptafluoro-) [PFBA]	375-22-4	—	—	s	O	2.13E+02	1.51E-11	1.32E+00	—	6.00E-02	1.29E-05	7.58E+05	9.01E-07	-6.80E-01
Perfluorobutane sulfonic acid (1-Butanesulfonic acid, nonafluoro-) [PFBS]	375-73-5	—	—	s	O	2.99E+02	1.12E-11	1.47E+00	—	5.25E-02	1.16E-05	1.74E+04	1.12E-08	-7.00E-02
Perfluoroheptanoic acid (Heptanoic acid, tridecafluoro-) [PFHpA]	375-85-9	—	—	s	O	3.63E+02	4.84E-09	2.19E+00	—	4.51E-02	9.92E-06	1.94E+03	4.50E-07	1.15E+00
Perfluorononanoic acid (Nonanoic acid, heptadecafluoro-) [PFNA]	375-95-1	—	—	s	O	4.63E+02	2.33E-07	2.33E+00	—	3.96E-02	8.78E-06	3.28E+01	2.92E-07	2.37E+00
Perfluorotetradecanoic acid (Tetradecanoic acid, heptacosafafluoro-) [PFTeDA]	376-06-7	—	—	s	O	7.13E+02	5.09E-03	3.98E+00	—	3.15E-02	7.08E-06	1.05E-03	1.34E-07	5.02E+00
Perfluorotridecanoic acid (Tridecanoic acid, pentacosafafluoro-) [PFTrDA]	72629-94-8	—	—	s	O	6.63E+02	6.88E-04	3.71E+00	—	3.27E-02	7.34E-06	8.39E-03	1.56E-07	4.35E+00
Perfluorooctane sulfonamide (1-Octanesulfonamide, heptadecafluoro-) [PFOSA]	754-91-6	—	—	s	O	4.99E+02	1.05E+03	4.10E+00	—	3.91E-02	9.00E-06	4.88E-02	3.13E-01	5.80E+00
Perylene	198-55-0	—	—	s	O	2.52E+02	3.50E-13	6.59E+00	—	4.06E-02	5.49E-06	1.31E-04	1.11E-10	6.70E+00
Phenacetin	62-44-2	—	—	s	O	1.79E+02	8.80E-09	1.43E+00	—	5.04E-02	6.65E-06	3.60E+02	3.30E-07	1.45E+00
Phenanthrene	85-01-8	—	—	s	O	1.78E+02	5.40E-03	4.15E+00	—	3.33E-02	7.47E-06	9.94E-01	6.80E-04	4.34E+00
Phenanthridine	229-87-8	—	—	s	O	1.79E+02	1.83E-06	3.24E+00	—	5.46E-02	7.19E-06	2.50E+01	4.30E-06	3.30E+00
Phenol	108-95-2	—	—	s	O	9.41E+01	2.47E-05	1.24E+00	—	8.20E-02	9.10E-06	8.70E+04	4.63E-01	1.51E+00
Phenol, 4-tert-butyl-	98-54-4	—	—	s	O	1.50E+02	7.03E-05	2.94E+00	—	5.57E-02	6.25E-06	1.83E+02	1.57E-03	3.62E+00
Phenothiazine	92-84-2	—	—	s	O	1.99E+02	1.46E-06	3.87E+00	—	5.09E-02	6.32E-06	1.39E-02	1.87E-09	4.19E+00
Phenyl mercuric acetate	62-38-4	—	—	s	O	3.37E+02	3.41E-09	2.20E+00	—	8.00E-02	8.00E-06	4.37E+03	3.04E-06	8.90E-01
Phenylene diamine, m-	108-45-2	—	—	s	O	1.08E+02	9.56E-07	4.14E-02	—	6.63E-02	9.90E-06	3.51E+05	2.28E-02	-3.91E-01
Phenylene diamine, p-	106-50-3	—	—	s	O	1.08E+02	5.24E-08	4.14E-02	—	7.15E-02	8.92E-06	3.80E+04	4.60E-03	-3.91E-01
Phorate	298-02-2	—	—	l	O	2.60E+02	4.99E-04	3.74E+00	—	8.00E-02	8.00E-06	4.40E+01	1.30E-03	3.37E+00
Phosalone	2310-17-0	—	—	s	O	3.68E+02	1.95E-05	3.06E+00	—	3.80E-02	4.97E-06	7.77E+01	7.53E-05	3.15E+00
Phosdrin (mevinphos)	7786-34-7	—	—	l	O	2.24E+02	3.28E-09	-9.00E-01	—	4.72E-02	6.06E-06	1.24E+07	1.81E-02	-7.00E-01
Phosmet	732-11-6	—	—	s	O	3.17E+02	8.02E-08	2.21E+00	—	4.07E-02	5.37E-06	3.70E+03	1.71E-05	1.53E+00
Phosphine	7803-51-2	—	—	g	I	3.40E+01	1.46E+02	-	—	3.81E-01	1.82E-05	4.00E+02	3.14E+04	-2.71E-01

Chemical/Physical Properties

Last Revised: March 1, 2022

Chemical of Concern	CAS	Br _{abg} ((µg/g DW)/ (µg/g soil))	Br _{bg} ((µg/g DW)/ (µg/g soil))	Physical State	Type	MW (g/mole)	H _{unitless} (unitless)	LogK _{oc} (unitless)	LogK _d (unitless)	D _{air} (cm ² /s)	D _{wat} (cm ² /s)	Solubility (mg/l)	Vapor_P (mm Hg)	logK _{ow} (unitless)
Phosphorotrithioic acid, S,S,S-tributyl ester	78-48-8	—	—	s	O	3.15E+02	1.98E-03	6.00E+00	—	3.34E-02	4.32E-06	1.23E-03	1.41E-07	6.10E+00
Phosphorus, total*	7723-14-0	—	—	—	—	—	—	—	—	—	—	—	—	—
Phosphorus, white	7723-14-0	—	—	s	I	1.24E+02	5.65E-02	3.05E+00	—	—	—	3.00E+00	2.50E-02	3.08E+00
Phthalic anhydride	85-44-9	—	—	s	O	1.48E+02	2.54E-07	1.90E+00	—	6.36E-02	7.90E-06	6.20E+03	2.00E-04	2.07E+00
Picloram	1918-02-1	—	—	s	O	2.41E+02	1.01E-07	-6.00E-02	—	5.50E-02	7.27E-06	2.82E+02	2.15E-06	2.94E+00
Picoline, 2- (2-methylpyridine)	109-06-8	—	—	l	O	9.31E+01	6.21E-04	1.20E+00	—	7.77E-02	8.86E-06	6.14E+04	7.48E+00	1.28E+00
Polybrominated biphenyls (PBBs)	67774-32-7	—	—	s	O	6.28E+02	1.62E-04	3.33E+00	—	—	4.63E-06	1.10E-02	5.20E-08	6.39E+00
Polychlorinated biphenyls (PCBs)	1336-36-3	—	—	l	O	2.90E+02	1.75E-02	5.72E+00	—	1.04E-01	1.00E-05	5.55E-02	7.60E-05	6.30E+00
Potassium*	7440-09-7	—	—	—	—	—	—	—	—	—	—	—	—	—
Primene	68955-53-3	—	—	l	O	1.71E+02	3.24E-03	3.96E+00	—	4.60E-02	1.08E-03	9.56E+01	3.30E-02	4.03E+00
Prometon (pramitol)	1610-18-0	—	—	s	O	2.25E+02	7.32E-07	2.78E+00	—	4.25E-02	5.54E-06	5.76E+01	3.43E-06	2.88E+00
Prometryn	7287-19-6	—	—	s	O	2.41E+02	4.99E-08	3.39E+00	—	3.89E-02	5.06E-06	2.09E+01	7.90E-08	3.62E+00
Pronamide	23950-58-5	—	—	s	O	2.56E+02	3.74E-04	2.30E+00	—	8.00E-02	8.00E-06	1.50E+01	4.00E-04	3.57E+00
Propanal (propionaldehyde)	123-38-6	—	—	l	O	5.81E+01	4.40E-03	3.40E-01	—	1.04E-01	1.07E-05	1.09E+05	1.51E+02	3.30E-01
Propane, 1-bromo-	106-94-5	—	—	l	O	1.23E+02	1.63E-01	1.59E+00	—	8.28E-02	8.63E-06	3.98E+03	9.67E+01	1.91E+00
Propanil	709-98-8	—	—	s	OA	2.18E+02	8.47E-08	2.96E+00	—	4.93E-02	6.59E-06	1.27E+02	8.99E-07	2.97E+00
Propanoic acid (propionic acid)	79-09-4	—	—	l	OA	7.41E+01	1.54E-05	-2.79E+00	—	9.01E-02	1.04E-05	1.92E+05	2.90E+00	4.95E-01
Propanol, 1-	71-23-8	—	—	l	O	6.01E+01	4.66E-04	5.70E-01	—	9.75E-02	1.05E-05	1.21E+05	1.71E+01	6.21E-01
Propargite	2312-35-8	—	—	l	O	3.50E+02	1.44E-06	3.75E+00	—	3.94E-02	4.20E-06	5.00E-01	4.48E-08	3.73E+00
Propargyl alcohol	107-19-7	—	—	l	O	5.61E+01	1.34E-05	7.31E-01	—	1.04E-01	1.24E-05	5.57E+06	1.20E+01	-4.22E-01
Propazine	139-40-2	—	—	s	O	2.30E+02	2.15E-06	3.04E+00	—	4.40E-02	5.69E-06	7.23E+00	1.23E-06	3.25E+00
Propham	122-42-9	—	—	s	O	1.79E+02	5.30E-06	1.71E+00	—	5.71E-02	6.28E-06	2.50E+02	1.35E-04	2.66E+00
Propionitrile (propane nitrile)	107-12-0	—	—	l	O	5.51E+01	1.02E-03	2.15E-01	—	1.02E-01	1.72E-05	9.73E+04	3.28E+01	1.73E-01
Propyl acetate, n-	109-60-4	—	—	l	O	1.02E+02	8.89E-03	1.07E+00	—	7.36E-02	8.09E-06	1.84E+04	2.93E+01	1.26E+00
Propylbenzene, n-	103-65-1	—	—	l	O	1.20E+02	4.24E-01	3.03E+00	—	6.22E-02	7.21E-06	4.20E+01	2.71E+00	3.73E+00
Propylene glycol	57-55-6	—	—	—	O	7.61E+01	2.06E-07	-5.67E-01	—	1.06E-01	1.23E-05	1.00E+05	2.05E-02	-9.21E-01
Propylene glycol monomethyl ether	107-98-2	—	—	—	O	9.01E+01	1.40E-05	-1.89E-01	—	9.45E-02	1.09E-05	1.00E+05	1.18E+01	-4.37E-01
Propylene oxide	75-56-9	—	—	l	O	5.81E+01	3.47E-03	1.02E-01	—	1.04E-01	1.16E-05	4.76E+05	5.32E+02	3.00E-02
Propylene tetramer	6842-15-5	—	—	l	O	1.60E+02	1.20E+02	5.40E+00	—	1.00E-01	1.00E-05	3.40E-02	4.79E-01	—
Prothiofos (Tokuthion)	34643-46-4	—	—	l	O	3.45E+02	5.72E-03	7.39E+00	—	3.56E-02	4.58E-06	6.23E-03	1.89E-06	7.36E+00
Pyrene	129-00-0	—	—	s	O	2.02E+02	4.57E-04	4.58E+00	—	2.72E-02	7.24E-06	1.35E-01	4.25E-06	4.93E+00
Pyridine	110-86-1	—	—	l	O	7.91E+01	2.91E-01	6.43E-01	—	9.10E-02	7.60E-06	3.00E+02	2.00E+01	8.04E-01
Quinoline	91-22-5	—	—	l	O	1.29E+02	1.15E-04	2.76E+00	—	5.46E-02	8.31E-06	6.78E+03	9.60E-02	2.14E+00
Ronnel	299-84-3	—	—	s	O	3.22E+02	1.32E-03	3.93E+00	—	4.62E-02	5.54E-06	2.28E+00	1.01E-04	4.86E+00
Safrole	94-59-7	—	—	l	O	1.62E+02	3.09E-03	2.97E+00	—	5.60E-02	7.01E-06	1.37E+02	4.77E-02	3.02E+00
Selenium	7782-49-2	1.50E-02	2.20E-02	s	M	7.90E+01	0.00E+00	—	3.42E-01	—	—	0.00E+00	0.00E+00	2.39E-01
Selenourea	630-10-4	—	—	—	O	1.19E+02	—	—	—	—	—	—	—	-2.63E+00
Silver	7440-22-4	1.70E-01	1.00E-01	s	M	1.08E+02	0.00E+00	—	-1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Chemical/Physical Properties

Last Revised: March 1, 2022

Chemical of Concern	CAS	B _r _{abg} (μg/g DW)/ (μg/g soil)	B _r _{bg} (μg/g DW)/ (μg/g soil)	Physical State	Type	MW (g/mole)	H _u _{unitless} (unitless)	LogK _{oc} (unitless)	LogK _d (unitless)	D _{air} (cm ² /s)	D _{wat} (cm ² /s)	Solubility (mg/l)	Vapor_P (mm Hg)	logK _{ow} (unitless)
Simazine	122-34-9	—	—	s	O	2.02E+02	2.48E-07	2.47E+00	—	4.90E-02	6.37E-06	4.06E+01	9.10E-07	2.64E+00
Sodium*	7440-23-5	—	—	—	—	—	—	—	—	—	—	—	—	—
Sodium hypochlorite	7681-52-9	—	—	l	I	7.44E+01	—	—	-2.08E-01	—	—	—	—	—
Sodium polyacrylate	9003-04-7	—	—	l	O	7.21E+01	1.32E-05	5.43E-02	—	9.08E-02	1.06E-05	1.00E+06	3.72E+00	4.42E-01
Strontium	7440-24-6	—	—	s	M	8.76E+01	0.00E+00	-	3.01E-01	0.00E+00	0.00E+00	-	0.00E+00	0.00E+00
Strychnine	57-24-9	—	—	s	O	3.34E+02	6.65E-12	1.90E+00	—	8.00E-02	8.00E-06	1.43E+02	1.67E-10	1.85E+00

Chemical/Physical Properties

Last Revised: March 1, 2022

Chemical of Concern	CAS	Br _{abg} (µg/g DW)/ (µg/g soil)	Br _{bg} (µg/g DW)/ (µg/g soil)	Physical State	Type	MW (g/mole)	H _{unitless} (unitless)	LogK _{oc} (unitless)	LogK _d (unitless)	D _{air} (cm ² /s)	D _{wat} (cm ² /s)	Solubility (mg/l)	Vapor_P (mm Hg)	logK _{ow} (unitless)
Styrene	100-42-5	—	—	l	O	1.04E+02	1.14E-01	2.88E+00	—	7.10E-02	8.00E-06	3.10E+02	6.24E+00	2.89E+00
Sulfate*	14808-79-8	—	—	—	—	—	—	—	—	—	—	—	—	—
Sulfide*	18496-25-8	—	—	—	—	—	—	—	—	—	—	—	—	—
Sulfolane	126-33-0	—	—	s	O	1.20E+02	4.82E-07	-7.89E-01	—	6.98E-01	9.30E-06	8.37E+03	6.15E-04	-8.03E-01
Sulfur*	7704-34-9	—	—	—	—	—	—	—	—	—	—	—	—	—
Sulprofos (Bolstar)	35400-43-2	—	—	l	O	3.22E+02	3.64E-05	6.41E+00	—	3.55E-02	4.52E-06	1.90E-02	3.99E-08	6.40E+00
Tebuconazole	107534-96-3	—	—	s	O	3.08E+02	5.94E-09	3.01E+00	—	4.25E-02	4.17E-06	3.60E+01	1.28E-08	3.70E+00
Tebuthiuron	34014-18-1	—	—	s	O	2.28E+02	4.99E-11	1.50E+00	—	5.62E-02	5.85E-06	2.50E+03	2.03E-05	1.79E+00
Terbufos	13071-79-9	—	—	l	O	2.88E+02	6.83E-02	4.14E+00	—	4.18E-02	5.08E-06	6.84E+00	2.96E-02	4.20E+00
Tert-amyl ethyl ether (TAEE)	919-94-8	—	—	l	O	1.66E+02	3.31E-01	2.24E+00	—	6.43E-02	6.38E-06	7.76E+02	4.04E+01	2.73E+00
Tert-amyl-methyl ether (TAME)	994-05-8	—	—	l	O	1.02E+02	1.30E-01	1.62E+00	—	6.99E-02	7.37E-06	4.29E+03	9.97E+01	1.95E+00
Tert-butyl alcohol (2-methyl-2-propanol)	75-65-0	—	—	s	O	7.41E+01	5.42E-04	6.25E-01	—	8.52E-02	9.11E-06	2.35E+05	3.14E+01	6.90E-01
Tetrachlorobenzene, 1,2,3,4-	634-66-2	—	—	s	O	2.16E+02	3.02E-02	4.61E+00	—	5.72E-02	7.31E-06	6.43E+00	1.64E-02	4.69E+00
Tetrachlorobenzene, 1,2,3,5-	634-90-2	—	—	s	O	2.16E+02	2.41E-02	3.80E+00	—	5.75E-02	7.31E-06	5.18E+00	1.06E-02	4.70E+00
Tetrachlorobenzene, 1,2,4,5-	95-94-3	—	—	s	O	2.16E+02	4.99E-02	3.20E+00	—	2.11E-02	8.80E-06	3.00E-01	5.40E-03	4.57E+00
Tetrachloroethane, 1,1,1,2-	630-20-6	—	—	s	O	1.68E+02	9.98E-02	2.98E+00	—	7.10E-02	7.90E-06	1.10E+03	1.22E+01	2.93E+00
Tetrachloroethane, 1,1,2,2-	79-34-5	—	—	l	O	1.68E+02	1.55E-02	1.89E+00	—	7.10E-02	7.90E-06	2.97E+03	5.17E+00	2.19E+00
Tetrachloroethylene (PCE)	127-18-4	—	—	l	O	1.66E+02	7.65E-01	2.19E+00	—	7.20E-02	8.20E-06	2.00E+02	1.84E+01	2.97E+00
Tetrachlorophenol, 2,3,4,5-	4901-51-3	—	—	s	OA	2.32E+02	1.98E-06	2.66E+00	—	5.65E-02	7.32E-06	2.96E+02	4.62E-05	4.41E+00
Tetrachlorophenol, 2,3,4,6-	58-90-2	—	—	s	OA	2.32E+02	2.54E-04	2.02E+00	—	2.17E-02	7.10E-06	1.00E+02	5.02E-03	4.09E+00
Tetrachlorophenol, 2,3,5,6-	935-95-5	—	—	s	O	2.32E+02	5.82E-03	1.40E+00	—	5.60E-02	7.29E-06	2.03E+00	9.20E-04	4.51E+00
Tetrachlorvinphos (Stirophos)	22248-79-9	—	—	s	O	3.66E+02	7.84E-08	4.76E+00	—	3.88E-02	4.82E-06	9.74E+01	3.82E-07	4.80E+00
Tetradifon	116-29-0	—	—	s	O	3.56E+02	7.32E-09	3.65E+00	—	4.14E-02	5.80E-06	7.02E-01	2.64E-10	4.17E+00
Tetraethyl dithiopyrophosphate (sulfotep)	3689-24-5	—	—	l	O	3.22E+02	1.75E-04	2.87E+00	—	1.50E-02	5.50E-06	2.50E+01	1.70E-04	3.98E+00
Tetraethyl lead	78-00-2	—	—	l	O	3.23E+02	3.31E+00	3.69E+00	—	1.32E-02	6.40E-06	8.00E-01	1.50E-01	4.88E+00
Tetraethyl pyrophosphate (TEPP)	107-49-3	—	—	l	O	2.90E+02	1.52E-08	2.91E+00	—	3.77E-02	4.76E-06	1.48E+04	1.41E-05	3.00E+00
Tetraethylene glycol	112-60-7	—	—	l	O	1.94E+02	5.69E-12	-5.54E-01	—	4.61E-02	5.81E-06	6.54E+05	2.54E-07	-5.90E-01
Tetrahydrofuran	109-99-9	—	—	l	O	7.21E+01	5.75E-03	5.73E-01	—	9.36E-02	9.88E-06	1.09E+05	1.59E+02	6.25E-01
Tetrahydropyran	142-68-7	—	—	l	O	8.61E+01	5.53E-03	9.19E-01	—	8.14E-02	8.95E-06	3.40E+04	3.99E+01	1.06E+00
Tetraoxadodecane, 2,5,8,11-	112-49-2	—	—	l	O	1.78E+02	6.73E-08	1.35E+00	—	4.88E-02	5.62E-06	1.00E+06	6.74E-02	-4.40E-02
Thallium	7440-28-0	1.00E-03	4.00E-04	s	M	2.40E+02	0.00E+00	—	1.64E+00	—	—	2.90E+03	0.00E+00	—

Chemical/Physical Properties

Last Revised: March 1, 2022

Chemical of Concern	CAS	Br _{abg} (μg/g DW)/ (μg/g soil)	Br _{bg} (μg/g DW)/ (μg/g soil)	Physical State	Type	MW (g/mole)	H _{unitless} (unitless)	LogK _{oc} (unitless)	LogK _d (unitless)	D _{air} (cm ² /s)	D _{wat} (cm ² /s)	Solubility (mg/l)	Vapor_P (mm Hg)	logK _{ow} (unitless)
Thiofanox	39196-18-4	—	—	s	O	2.18E+02	3.90E-07	1.77E+00	—	2.55E-02	6.62E-06	5.20E+03	3.10E-04	2.16E+00
Thionazin	297-97-2	—	—	l	O	2.48E+02	1.62E-05	2.06E+00	—	4.67E-02	5.81E-06	2.10E+02	2.51E-04	2.09E+00
Thiophanate-methyl	23564-05-8	—	—	s	O	3.42E+02	3.82E-07	9.54E-01	—	4.55E-02	4.68E-06	3.50E+00	7.50E-08	1.50E+00
Thiram	137-26-8	—	—	s	O	2.40E+02	3.28E-06	2.83E+00	—	2.25E-02	6.24E-06	3.00E+01	7.50E-06	1.70E+00
Tin	7440-31-5	1.00E-02	6.00E-03	s	M	1.19E+02	0.00E+00	—	2.10E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.29E+00
Titanium	7440-32-6	3.70E-03	3.00E-03	s	M	4.79E+01	0.00E+00	—	—	—	—	0.00E+00	—	—
Toluene	108-88-3	—	—	l	O	9.21E+01	2.76E-01	2.15E+00	—	8.70E-02	8.60E-06	5.30E+02	2.82E+01	2.54E+00
Toluene diisocyanate, 2,4/2,6-	26471-62-5	—	—	l	O	1.74E+02	6.86E-06	3.35E+00	—	6.09E-02	6.80E-06	1.11E+05	8.00E-02	3.74E+00
Toluenediamine, 2,4-	95-80-7	—	—	s	O	1.22E+02	7.48E-08	3.11E+00	—	8.00E-02	8.00E-06	7.47E+03	8.36E-05	1.56E-01
Toluenediamine, 2,6-	823-40-5	—	—	s	O	1.22E+02	5.15E-10	1.60E-01	—	6.87E-02	7.97E-06	4.80E+04	1.98E-05	1.56E-01
Toluidine, o-	95-53-4	—	—	l	OB	1.07E+02	1.57E-04	2.31E+00	—	7.01E-02	8.43E-06	1.06E+04	2.84E-01	1.61E+00
Toluidine, p-	106-49-0	—	—	s	O	1.07E+02	3.82E-04	1.40E+00	—	8.00E-02	8.00E-06	7.20E+03	3.30E-01	1.62E+00
Toxaphene	8001-35-2	—	—	s	O	4.14E+02	1.40E-04	4.98E+00	—	1.16E-02	4.34E-06	7.40E-01	4.19E-06	6.79E+00
TPH, TX1005, C6-C12	NA	—	—	l	O	1.20E+02	4.80E-01	3.20E+00	—	1.00E-01	1.00E-05	6.50E+01	4.79E+00	0.00E+00
TPH, TX1005, >C12-C28	NA	—	—	l	O	1.50E+02	5.30E-02	3.70E+00	—	1.00E-01	1.00E-05	5.80E+00	3.65E-02	0.00E+00
TPH, TX1005, >C12-C35	NA	—	—	l	O	1.50E+02	5.30E-02	3.70E+00	—	1.00E-01	1.00E-05	5.80E+00	3.65E-02	0.00E+00
TPH, TX1005, >C28-C35	NA	—	—	l	O	1.50E+02	5.30E-02	3.70E+00	—	1.00E-01	1.00E-05	5.80E+00	3.65E-02	0.00E+00
TP Silvex, 2,4,5-	93-72-1	—	—	s	O	2.70E+02	5.45E-07	3.41E+00	—	1.94E-02	5.80E-06	1.40E+02	5.20E-06	3.68E+00
Triademenol	55219-65-3	—	—	s	O	2.96E+02	5.32E-11	2.37E+00	—	4.55E-02	4.53E-06	9.50E+01	3.08E-10	2.90E+00
Triallate	2303-17-5	—	—	s	O	3.05E+02	4.53E-04	3.16E+00	—	4.58E-02	4.84E-06	4.00E+00	1.20E-04	4.57E+00
Triaminotrinitrobenzene (TATB)	3058-38-6	—	—	s	O	2.58E+02	5.80E-12	6.88E-01	—	5.02E-02	6.84E-06	3.20E+01	1.34E-11	7.00E-01
Tributyltin oxide	56-35-9	—	—	l	O	5.96E+02	2.08E-03	—	—	—	—	1.80E+01	6.91E-05	5.80E+00
Trichloro-1,2,2-trifluoroethane, 1,1,2-	76-13-1	—	—	l	O	1.87E+02	2.20E+01	3.11E+00	—	7.80E-02	8.20E-06	2.00E+02	3.60E+02	3.09E+00
Trichlorobenzene, 1,2,3-	87-61-6	—	—	l	O	1.81E+02	3.80E-02	3.95E+00	—	6.20E-02	7.71E-06	1.64E+01	6.30E-02	4.02E+00
Trichlorobenzene, 1,2,4-	120-82-1	—	—	l	O	1.81E+02	5.90E-02	3.22E+00	—	3.00E-02	8.23E-06	4.88E+01	3.36E-01	3.93E+00
Trichlorobenzene, 1,3,5-	108-70-3	—	—	s	O	1.81E+02	6.03E-02	3.40E+00	—	6.25E-02	7.66E-06	1.82E+01	1.11E-01	4.19E+00
Trichloroethane, 1,1,1-	71-55-6	—	—	l	O	1.33E+02	7.15E-01	2.04E+00	—	7.80E-02	8.80E-06	1.33E+03	1.24E+02	2.68E+00
Trichloroethane, 1,1,2-	79-00-5	—	—	l	O	1.33E+02	3.80E-02	1.70E+00	—	7.92E-02	8.80E-06	4.42E+03	2.52E+01	2.01E+00
Trichloroethylene (TCE)	79-01-6	—	—	l	O	1.31E+02	4.28E-01	1.97E+00	—	7.90E-02	9.10E-06	1.10E+03	7.20E+01	2.47E+00
Trichlorofluoromethane	75-69-4	—	—	l	O	1.37E+02	4.03E+00	2.13E+00	—	8.70E-02	9.70E-06	1.10E+03	6.87E+02	2.13E+00
Trichloronate	327-98-0	—	—	l	O	3.34E+02	4.82E-04	4.62E+00	—	4.27E-02	5.18E-06	8.13E-01	4.48E-05	5.74E+00
Trichlorophenol, 2,3,4-	15950-66-0	—	—	s	OA	1.97E+02	4.60E-06	2.75E+00	—	6.10E-02	7.73E-06	1.55E+03	6.60E-04	3.88E+00
Trichlorophenol, 2,3,5-	933-78-8	—	—	s	OA	1.97E+02	3.95E-06	2.37E+00	—	6.10E-02	7.71E-06	3.74E+03	1.37E-03	3.75E+00

Chemical/Physical Properties

Last Revised: March 1, 2022

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Trichlorophenol, 2,3,6-	933-75-5	—	—	s	OA	1.97E+02	8.78E-03	2.39E+00	—	6.08E-02	7.70E-06	2.78E+01	2.26E-02	4.66E+00
Trichlorophenol, 2,4,5-	95-95-4	—	—	s	OA	1.97E+02	1.78E-04	2.47E+00	—	2.91E-02	7.03E-06	1.20E+03	1.63E-02	3.45E+00
Trichlorophenol, 2,4,6-	88-06-2	—	—	s	OA	1.97E+02	3.19E-04	2.12E+00	—	3.18E-02	6.25E-06	9.82E+02	1.18E-02	3.45E+00
Trichlorophenol, 3,4,5-	609-19-8	—	—	s	OA	1.97E+02	1.15E-06	3.52E+00	—	6.00E-02	7.73E-06	1.52E+03	1.61E-04	3.91E+00
Trichlorophenoxyacetic acid, 2,4,5-	93-76-5	—	—	s	O	2.55E+02	3.62E-07	1.72E+00	—	8.00E-02	8.00E-06	2.78E+02	3.61E-06	3.26E+00
Trichloropropane, 1,1,2-	598-77-6	—	—	l	O	1.47E+02	1.21E+00	2.24E+00	—	3.96E-02	9.30E-06	4.44E+01	6.64E+00	2.43E+00
Trichloropropane, 1,2,3-	96-18-4	—	—	l	O	1.47E+02	1.58E-02	2.59E+00	—	7.10E-02	7.90E-06	1.90E+03	3.70E+00	2.50E+00
Triethanolamine	102-71-6	—	—	s	O	1.49E+02	3.50E-13	-2.93E+00	—	5.33E-02	7.54E-06	-	2.90E-06	-2.98E+00
Triethylamine	121-44-8	—	—	l	O	1.01E+02	1.99E-02	1.12E+00	—	7.54E-02	7.51E-06	1.50E+04	5.00E+01	1.51E+00
Triethylene glycol	112-27-6	—	—	l	O	1.50E+02	8.96E-11	-1.16E+00	—	5.65E-02	7.38E-06	2.11E+06	2.31E-05	-1.18E+00
Triethylphosphorothioate, O, O, O-	126-68-1	—	—	l	O	1.98E+02	2.08E-02	2.69E+00	—	5.26E-02	6.24E-06	8.45E+02	7.30E-01	2.64E+00
Trifluralin	1582-09-8	—	—	s	O	3.35E+02	2.01E-03	4.14E+00	—	1.49E-02	4.70E-06	6.00E-01	1.10E-04	5.31E+00
Trimethylamine	75-50-3	—	—	g	OB	5.91E+01	4.14E-03	1.24E+00	—	9.58E-02	9.13E-06	5.50E+05	9.36E+01	2.47E-01
Trimethylbenzene, 1,2,3-	526-73-8	—	—	l	O	1.20E+02	1.33E-01	2.77E+00	—	6.77E-02	7.41E-06	7.52E+01	1.49E+00	3.55E+00
Trimethylbenzene, 1,2,4-	95-63-6	—	—	l	O	1.20E+02	1.84E-01	2.97E+00	—	6.22E-02	7.28E-06	5.68E+01	1.59E+00	3.65E+00
Trimethylbenzene, 1,3,5-	108-67-8	—	—	l	O	1.20E+02	2.72E-01	3.01E+00	—	6.21E-02	7.23E-06	5.15E+01	2.13E+00	3.70E+00
Trinitrobenzene, 1,3,5-	99-35-4	—	—	s	O	2.13E+02	2.87E-06	1.15E+00	—	8.00E-02	8.00E-06	3.53E+02	9.90E-05	1.45E+00
Trinitrophenylmethyl nitramine (tetryl; nitramine)	479-45-8	—	—	s	O	2.87E+02	8.31E-11	2.37E+00	—	5.69E-02	6.40E-06	7.50E+01	4.00E-10	2.04E+00
Trinitrotoluene, 2,4,6-	118-96-7	—	—	s	O	2.27E+02	1.90E-05	2.48E+00	—	5.41E-02	6.57E-06	1.30E+02	1.24E-04	1.99E+00
Tungsten (as sodium tungstate dihydride)	7440-33-7	—	—	s	M	3.30E+02	0.00E+00	—	3.47E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Uranium (soluble salts)	7440-61-1	5.00E-03	4.00E-03	s	M	2.38E+02	0.00E+00	—	3.47E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Valeric acid (pentanoic acid)	109-52-4	—	—	l	O	1.02E+02	1.16E-05	-1.80E+00	—	6.92E-02	8.37E-06	2.20E+00	7.39E-02	1.53E+00
Vanadium	7440-62-2	3.60E-03	3.00E-03	s	M	5.09E+01	0.00E+00	—	3.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Vernam	1929-77-7	—	—	l	O	2.03E+02	7.36E-04	3.44E+00	—	5.10E-02	5.39E-06	9.85E+01	1.04E-02	3.51E+00
Vinyl acetate	108-05-4	—	—	l	O	8.61E+01	2.29E-02	7.20E-01	—	8.50E-02	9.20E-06	2.00E+04	1.09E+02	7.28E-01
Vinyl chloride	75-01-4	—	—	g	O	6.25E+01	3.49E+00	1.04E+00	—	1.06E-01	1.23E-05	2.76E+03	2.80E+03	1.62E+00
Vinylcyclohexane	695-12-5	—	—	l	O	1.10E+02	3.57E+00	3.42E+00	—	6.49E-02	7.33E-06	1.08E+01	6.40E+00	4.22E+00
Warfarin	81-81-2	—	—	s	O	3.08E+02	1.15E-07	2.96E+00	—	1.63E-02	4.40E-06	1.70E+01	1.16E-07	3.20E+00
Xylene, m-	108-38-3	—	—	l	O	1.06E+02	3.05E-01	2.29E+00	—	7.00E-02	7.80E-06	1.60E+02	8.00E+00	3.20E+00
Xylene, o-	95-47-6	—	—	l	O	1.06E+02	7.36E-04	2.11E+00	—	8.70E-02	1.00E-05	1.78E+02	6.75E+00	3.13E+00
Xylene, p-	106-42-3	—	—	l	O	1.06E+02	3.18E-01	2.49E+00	—	7.69E-02	8.44E-06	1.85E+02	8.76E+00	3.17E+00
Xylenes	1330-20-7	—	—	l	O	1.06E+02	2.93E-01	2.38E+00	—	7.40E-02	8.50E-06	1.98E+02	8.06E+00	3.09E+00
Zinc	7440-66-6	9.00E-02	4.40E-02	s	M	6.54E+01	0.00E+00	—	1.20E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-4.71E-01

Chemical/Physical Properties

Last Revised: March 1, 2022

Chemical of Concern	CAS	Br _{abg} ((µg/g DW)/ (µg/g soil))	Br _{bg} ((µg/g DW)/ (µg/g soil))	Physical State	Type	MW (g/mole)	H _{unitless} (unitless)	LogK _{oc} (unitless)	LogK _d (unitless)	D _{air} (cm ² /s)	D _{wat} (cm ² /s)	Solubility (mg/l)	Vapor_P (mm Hg)	logK _{ow} (unitless)
6 C aliphatics (TPH) (>53% n-hexane content)	NA	—	—	I	O	8.10E+01	3.30E+01	2.90E+00	—	1.00E-01	1.00E-05	3.60E+01	2.66E+02	—
6 C aliphatics (TPH) (<53% n-hexane content)	NA	—	—	I	O	8.10E+01	3.30E+01	2.90E+00	—	1.00E-01	1.00E-05	3.60E+01	2.66E+02	—
>6-8 C aliphatics (TPH) (>53% n-hexane content)	NA	—	—	I	O	1.00E+02	5.00E+01	3.60E+00	—	1.00E-01	1.00E-05	5.40E+00	4.79E+01	—
>6-8 C aliphatics (TPH) (<53% n-hexane content)	NA	—	—	I	O	1.00E+02	5.00E+01	3.60E+00	—	1.00E-01	1.00E-05	5.40E+00	4.79E+01	—
>8-10 C aliphatics (TPH)	NA	—	—	I	O	1.30E+02	8.00E+01	4.50E+00	—	1.00E-01	1.00E-05	4.30E-01	4.79E+00	—
>10-12 C aliphatics (TPH)	NA	—	—	I	O	1.60E+02	1.20E+02	5.40E+00	—	1.00E-01	1.00E-05	3.40E-02	4.79E-01	—
>12-16 C aliphatics (TPH)	NA	—	—	I	O	2.00E+02	5.20E+02	6.70E+00	—	1.00E-01	1.00E-05	7.60E-04	3.65E-02	—
>16-35 C aliphatics (TPH)	NA	—	—	I	O	2.70E+02	4.90E+03	8.80E+00	—	1.00E-01	1.00E-05	2.50E-06	8.40E-04	—
>16-35 C aliphatics (TPH) (for transformer mineral oil releases only)	NA	—	—	I	O	2.70E+02	4.90E+03	8.80E+00	—	1.00E-01	1.00E-05	2.50E-06	8.40E-04	—
>7-8 C aromatics (TPH)	NA	—	—	I	O	9.20E+01	2.76E-01	2.15E+00	—	8.70E-02	8.60E-06	5.30E+02	2.82E+01	—
>8-10 C aromatics (TPH)	NA	—	—	I	O	1.20E+02	4.80E-01	3.20E+00	—	1.00E-01	1.00E-05	6.50E+01	4.79E+00	—
>10-12 C aromatics (TPH)	NA	—	—	I	O	1.30E+02	1.40E-01	3.40E+00	—	1.00E-01	1.00E-05	2.50E+01	4.79E-01	—
>12-16 C aromatics (TPH)	NA	—	—	I	O	1.50E+02	5.30E-02	3.70E+00	—	1.00E-01	1.00E-05	5.80E+00	3.65E-02	—
>16-21 C aromatics (TPH)	NA	—	—	I	O	1.90E+02	1.30E-02	4.20E+00	—	1.00E-01	1.00E-05	6.50E-01	8.40E-04	—
>21-35 C aromatics (TPH)	NA	—	—	S	O	2.40E+02	6.70E-04	5.10E+00	—	1.00E-01	1.00E-05	6.60E-03	3.30E-07	—

Footnotes

* These compounds are not necessarily of concern from a human health standpoint, therefore calculation of human health-based values is not required. However, aesthetics and ecological criteria would still apply. See table entitled "Compounds for which Calculation of a Human Health PCL is Not Required" available on the TCEQ website at <http://www.tceq.texas.gov/remediation/trrp/trrppcls.html>.

s - compound solid at @ 20 oC

I - compound liquid at @ 20 oC

g - compound gaseous at @ 20 oC

H' - Dimensionless Henry's Law Constant H' = H x 41.57 @ 20 oC (cm³-H₂O/cm³-air)

H - Henry's Law Constant (atm-m³/mole)

MW - Molecular Weight (g/mole)

K_{oc} - Soil organic carbon-water partition coefficient (cm³-H₂O/g-Carbon)

K_d - soil-water partition coefficient (cm³-H₂O/g-Soil)

D_{air} - Diffusion coefficient in air (cm²/s)

D_{wat} - Diffusion coefficient in water (cm²/s)

K_{ow} - Octanol-water partition coefficient (cm³-H₂O/cm³-Octanol)

Br_{abg} - Soil-to-above ground plant biotransfer factor (g soil/g plant tissue dry weight)

Br_{bg} - Soil-to-below ground plant biotransfer factor (g soil/g plant tissue dry weight)

Type - O: Organic, I: Inorganic, M: Metal, OA: Organic Acids

CE - Not found, Can not estimate

NA/reacts - Not applicable because reacts with water

This table shows the chemical and physical properties used to calculate protective concentration levels.

end of worksheet

Koc Values for Ionizing Organic COCs as a Function of pH

Last Revised: March 1, 2022

pH	Adipic acid 124-04-9	Ametryn 834-12-8	Aminobiphenyl, 4- 92-67-1	Benz[c]acridine 225-51-4	Benzoic Acid* 65-85-0	Butanoic acid 107-92-6	Chlorophenol, 2-* 95-57-8	Chlorophenol, 3- 108-43-0	Chlorophenol, 4- 106-48-9
4.9	1.69E-01	8.57E+02	5.31E+03	1.48E+05	5.54E+00	4.19E+00	3.98E+02	1.17E+02	1.26E+02
5.0	1.22E-01	8.37E+02	4.68E+03	1.31E+05	4.64E+00	3.61E+00	3.98E+02	1.17E+02	1.26E+02
5.1	9.21E-02	8.24E+02	4.21E+03	1.17E+05	3.88E+00	3.11E+00	3.98E+02	1.17E+02	1.26E+02
5.2	6.27E-02	8.11E+02	3.73E+03	1.03E+05	3.25E+00	2.60E+00	3.98E+02	1.17E+02	1.26E+02
5.3	4.64E-02	8.03E+02	3.40E+03	9.35E+04	2.72E+00	2.20E+00	3.98E+02	1.17E+02	1.26E+02
5.4	3.01E-02	7.95E+02	3.06E+03	8.36E+04	2.29E+00	1.81E+00	3.98E+02	1.17E+02	1.26E+02
5.5	2.18E-02	7.90E+02	2.83E+03	7.67E+04	1.94E+00	1.51E+00	3.97E+02	1.17E+02	1.26E+02
5.6	1.36E-02	7.85E+02	2.61E+03	6.98E+04	1.65E+00	1.22E+00	3.97E+02	1.17E+02	1.26E+02
5.7	9.77E-03	7.82E+02	2.45E+03	6.51E+04	1.42E+00	1.01E+00	3.97E+02	1.17E+02	1.26E+02
5.8	5.91E-03	7.78E+02	2.30E+03	6.05E+04	1.24E+00	8.01E-01	3.97E+02	1.17E+02	1.26E+02
5.9	4.20E-03	7.76E+02	2.20E+03	5.74E+04	1.09E+00	6.61E-01	3.97E+02	1.17E+02	1.26E+02
6.0	2.49E-03	7.74E+02	2.10E+03	5.44E+04	9.69E-01	5.20E-01	3.96E+02	1.17E+02	1.26E+02
6.1	1.76E-03	7.73E+02	2.04E+03	5.24E+04	8.75E-01	4.27E-01	3.96E+02	1.17E+02	1.26E+02
6.2	1.03E-03	7.72E+02	1.97E+03	5.04E+04	7.99E-01	3.34E-01	3.96E+02	1.17E+02	1.26E+02
6.3	7.25E-04	7.71E+02	1.93E+03	4.92E+04	7.36E-01	2.74E-01	3.95E+02	1.17E+02	1.26E+02
6.4	4.20E-04	7.70E+02	1.89E+03	4.79E+04	6.89E-01	2.13E-01	3.94E+02	1.17E+02	1.26E+02
6.5	2.95E-04	7.70E+02	1.87E+03	4.71E+04	6.51E-01	1.74E-01	3.93E+02	1.17E+02	1.26E+02
6.6	1.70E-04	7.69E+02	1.84E+03	4.63E+04	6.20E-01	1.36E-01	3.92E+02	1.17E+02	1.26E+02
6.7	1.19E-04	7.69E+02	1.82E+03	4.58E+04	5.95E-01	1.11E-01	3.90E+02	1.17E+02	1.26E+02
6.8	6.83E-05	7.69E+02	1.81E+03	4.52E+04	5.76E-01	8.59E-02	3.88E+02	1.17E+02	1.26E+02
6.9	4.78E-05	7.68E+02	1.80E+03	4.49E+04	5.60E-01	7.02E-02	3.86E+02	1.17E+02	1.26E+02
7.0	2.74E-05	7.68E+02	1.79E+03	4.46E+04	5.47E-01	5.44E-02	3.83E+02	1.17E+02	1.26E+02
7.1	1.91E-05	7.68E+02	1.78E+03	4.44E+04	5.38E-01	4.44E-02	3.79E+02	1.17E+02	1.25E+02
7.2	1.09E-05	7.68E+02	1.77E+03	4.42E+04	5.32E-01	3.44E-02	3.75E+02	1.16E+02	1.25E+02
7.3	7.65E-06	7.68E+02	1.77E+03	4.41E+04	5.25E-01	2.81E-02	3.69E+02	1.16E+02	1.25E+02
7.4	4.36E-06	7.68E+02	1.77E+03	4.39E+04	5.19E-01	2.17E-02	3.62E+02	1.16E+02	1.25E+02
7.5	3.05E-06	7.68E+02	1.76E+03	4.38E+04	5.16E-01	1.77E-02	3.54E+02	1.15E+02	1.25E+02
7.6	1.74E-06	7.68E+02	1.76E+03	4.38E+04	5.13E-01	1.37E-02	3.44E+02	1.15E+02	1.24E+02
7.7	1.22E-06	7.68E+02	1.76E+03	4.37E+04	5.09E-01	1.12E-02	3.33E+02	1.14E+02	1.24E+02
7.8	6.93E-07	7.68E+02	1.76E+03	4.37E+04	5.06E-01	8.66E-03	3.19E+02	1.13E+02	1.23E+02
7.9	4.85E-07	7.68E+02	1.76E+03	4.36E+04	5.06E-01	7.06E-03	3.04E+02	1.12E+02	1.23E+02
8.0	2.76E-07	7.68E+02	1.75E+03	4.36E+04	5.06E-01	5.46E-03	2.86E+02	1.11E+02	1.22E+02

Koc Values for Ionizing Organic COCs as a Function of pH

Last Revised: January 6, 2021

pH	Cymoxanil 57966-95-7	Dibenz(a,j)acridine 224-42-0	Dichlorophenol, 2,3- 576-24-9	Dichlorophenol,2,4-* 120-83-2	Dichlorophenol, 2,5- 583-78-8	Dichlorophenol, 2,6- 87-65-0	Dichlorophenol, 3,4- 95-77-2
4.9	1.56E-01	7.18E+06	5.87E+02	1.59E+02	5.36E+02	6.58E+02	7.77E+02
5.0	1.22E-01	6.32E+06	5.87E+02	1.59E+02	5.35E+02	6.55E+02	7.77E+02
5.1	1.00E-01	5.68E+06	5.86E+02	1.59E+02	5.35E+02	6.49E+02	7.77E+02
5.2	7.83E-02	5.03E+06	5.86E+02	1.59E+02	5.34E+02	6.44E+02	7.77E+02
5.3	6.41E-02	4.56E+06	5.85E+02	1.59E+02	5.33E+02	6.36E+02	7.76E+02
5.4	4.99E-02	4.10E+06	5.84E+02	1.58E+02	5.33E+02	6.28E+02	7.76E+02
5.5	4.08E-02	3.78E+06	5.83E+02	1.58E+02	5.31E+02	6.16E+02	7.76E+02
5.6	3.17E-02	3.46E+06	5.81E+02	1.58E+02	5.30E+02	6.03E+02	7.76E+02
5.7	2.59E-02	3.24E+06	5.79E+02	1.58E+02	5.28E+02	5.86E+02	7.76E+02
5.8	2.01E-02	3.03E+06	5.77E+02	1.58E+02	5.26E+02	5.69E+02	7.76E+02
5.9	1.64E-02	2.89E+06	5.73E+02	1.57E+02	5.23E+02	5.45E+02	7.75E+02
6.0	1.27E-02	2.75E+06	5.70E+02	1.57E+02	5.20E+02	5.21E+02	7.75E+02
6.1	1.03E-02	2.66E+06	5.65E+02	1.57E+02	5.15E+02	4.90E+02	7.75E+02
6.2	8.02E-03	2.57E+06	5.59E+02	1.56E+02	5.10E+02	4.60E+02	7.74E+02
6.3	6.54E-03	2.51E+06	5.52E+02	1.55E+02	5.03E+02	4.24E+02	7.73E+02
6.4	5.06E-03	2.46E+06	5.44E+02	1.54E+02	4.95E+02	3.88E+02	7.73E+02
6.5	4.13E-03	2.42E+06	5.32E+02	1.53E+02	4.85E+02	3.49E+02	7.71E+02
6.6	3.20E-03	2.38E+06	5.20E+02	1.52E+02	4.74E+02	3.11E+02	7.70E+02
6.7	2.61E-03	2.36E+06	5.04E+02	1.50E+02	4.58E+02	2.73E+02	7.68E+02
6.8	2.02E-03	2.34E+06	4.87E+02	1.47E+02	4.43E+02	2.36E+02	7.67E+02
6.9	1.65E-03	2.32E+06	4.65E+02	1.45E+02	4.23E+02	2.04E+02	7.64E+02
7.0	1.27E-03	2.31E+06	4.42E+02	1.41E+02	4.02E+02	1.71E+02	7.61E+02
7.1	1.04E-03	2.30E+06	4.14E+02	1.38E+02	3.76E+02	1.45E+02	7.56E+02
7.2	8.03E-04	2.29E+06	3.86E+02	1.33E+02	3.51E+02	1.19E+02	7.51E+02
7.3	6.55E-04	2.28E+06	3.54E+02	1.28E+02	3.21E+02	9.97E+01	7.44E+02
7.4	5.07E-04	2.28E+06	3.22E+02	1.21E+02	2.91E+02	8.04E+01	7.37E+02
7.5	4.13E-04	2.27E+06	2.88E+02	1.14E+02	2.61E+02	6.67E+01	7.27E+02
7.6	3.20E-04	2.27E+06	2.54E+02	1.07E+02	2.30E+02	5.31E+01	7.16E+02
7.7	2.61E-04	2.27E+06	2.22E+02	9.84E+01	2.01E+02	4.38E+01	7.01E+02
7.8	2.02E-04	2.26E+06	1.91E+02	8.97E+01	1.72E+02	3.45E+01	6.85E+02
7.9	1.65E-04	2.26E+06	1.64E+02	8.07E+01	1.48E+02	2.83E+01	6.63E+02
8.0	1.27E-04	2.26E+06	1.37E+02	7.17E+01	1.23E+02	2.22E+01	6.41E+02

Koc Values for Ionizing Organic COCs as a Function of pH

Last Revised: January 6, 2021

pH	Dichlorophenol, 3,5- 591-35-5	DB, 2,4- (4-(2,4-Dichlorophenoxy) butyric acid) 94-82-6	Dichloroprop (2-(2,4-dichlorophenoxy) propanoic acid) 120-36-5	Dimethylamino- azobenzene, 4- 60-11-7	Dimethylhydrazine, 1,1- 57-14-7	Dinitro-2-methylphenol, 4,6- (dinitro-o-cresol, 4, 6-) 534-52-1
4.9	5.59E+02	1.72E+03	3.61E+01	1.13E+05	6.44E-01	2.91E+01
5.0	5.59E+02	1.44E+03	2.81E+01	1.10E+05	6.44E-01	2.43E+01
5.1	5.59E+02	1.22E+03	2.30E+01	1.09E+05	6.43E-01	2.05E+01
5.2	5.59E+02	9.93E+02	1.78E+01	1.07E+05	6.43E-01	1.67E+01
5.3	5.59E+02	8.30E+02	1.46E+01	1.06E+05	6.42E-01	1.40E+01
5.4	5.59E+02	6.66E+02	1.13E+01	1.04E+05	6.41E-01	1.12E+01
5.5	5.59E+02	5.52E+02	9.22E+00	1.04E+05	6.40E-01	9.27E+00
5.6	5.59E+02	4.38E+02	7.15E+00	1.03E+05	6.38E-01	7.35E+00
5.7	5.58E+02	3.61E+02	5.83E+00	1.03E+05	6.36E-01	6.05E+00
5.8	5.58E+02	2.84E+02	4.52E+00	1.02E+05	6.34E-01	4.75E+00
5.9	5.58E+02	2.33E+02	3.68E+00	1.02E+05	6.31E-01	3.90E+00
6.0	5.57E+02	1.82E+02	2.85E+00	1.02E+05	6.28E-01	3.05E+00
6.1	5.57E+02	1.49E+02	2.33E+00	1.01E+05	6.22E-01	2.50E+00
6.2	5.56E+02	1.16E+02	1.80E+00	1.01E+05	6.17E-01	1.94E+00
6.3	5.55E+02	9.51E+01	1.47E+00	1.01E+05	6.10E-01	1.59E+00
6.4	5.54E+02	7.39E+01	1.14E+00	1.01E+05	6.02E-01	1.24E+00
6.5	5.53E+02	6.03E+01	9.27E-01	1.01E+05	5.91E-01	1.01E+00
6.6	5.51E+02	4.68E+01	7.17E-01	1.01E+05	5.80E-01	7.83E-01
6.7	5.49E+02	3.82E+01	5.85E-01	1.01E+05	5.63E-01	6.39E-01
6.8	5.46E+02	2.96E+01	4.53E-01	1.01E+05	5.47E-01	4.95E-01
6.9	5.42E+02	2.42E+01	3.69E-01	1.01E+05	5.26E-01	4.04E-01
7.0	5.39E+02	1.87E+01	2.86E-01	1.01E+05	5.04E-01	3.13E-01
7.1	5.33E+02	1.53E+01	2.33E-01	1.01E+05	4.77E-01	2.55E-01
7.2	5.27E+02	1.18E+01	1.80E-01	1.01E+05	4.49E-01	1.98E-01
7.3	5.19E+02	9.65E+00	1.47E-01	1.01E+05	4.17E-01	1.61E-01
7.4	5.10E+02	7.47E+00	1.14E-01	1.01E+05	3.86E-01	1.25E-01
7.5	4.98E+02	6.09E+00	9.27E-02	1.01E+05	3.52E-01	1.02E-01
7.6	4.85E+02	4.71E+00	7.17E-02	1.01E+05	3.19E-01	7.88E-02
7.7	4.68E+02	3.84E+00	5.85E-02	1.01E+05	2.88E-01	6.43E-02
7.8	4.50E+02	2.98E+00	4.53E-02	1.01E+05	2.56E-01	4.97E-02
7.9	4.27E+02	2.43E+00	3.69E-02	1.01E+05	2.29E-01	4.06E-02
8.0	4.04E+02	1.88E+00	2.86E-02	1.01E+05	2.02E-01	3.14E-02

Koc Values for Ionizing Organic COCs as a Function of pH

Last Revised: January 6, 2021

pH	Dinitrophenol, 2,4-* 51-28-5	Dinitrophenol, 2,5- 329-71-5	Dodecylphenol, 4- 104-43-8	Endothall 145-73-3	Ethanol, 2-(methylamino)- 109-83-1	Ethyleneimine 151-56-4	Glyphosate ¹ 1071-83-6	Heptanoic Acid, n- 111-14-8
4.9	2.94E-02	3.15E+02	2.51E+08	3.70E+00	3.11E-06	2.49E+00	Under review.	3.85E+02
5.0	2.55E-02	2.97E+02	2.51E+08	2.49E+00	3.82E-06	2.49E+00	-	3.31E+02
5.1	2.23E-02	2.75E+02	2.51E+08	1.84E+00	4.93E-06	2.49E+00	-	2.85E+02
5.2	1.98E-02	2.54E+02	2.51E+08	1.19E+00	6.05E-06	2.49E+00	-	2.39E+02
5.3	1.78E-02	2.30E+02	2.51E+08	8.60E-01	7.82E-06	2.49E+00	-	2.02E+02
5.4	1.62E-02	2.06E+02	2.51E+08	5.35E-01	9.58E-06	2.49E+00	-	1.66E+02
5.5	1.50E-02	1.82E+02	2.51E+08	3.83E-01	1.24E-05	2.49E+00	-	1.39E+02
5.6	1.40E-02	1.58E+02	2.51E+08	2.32E-01	1.52E-05	2.49E+00	-	1.12E+02
5.7	1.32E-02	1.37E+02	2.51E+08	1.65E-01	1.96E-05	2.49E+00	-	9.26E+01
5.8	1.25E-02	1.16E+02	2.51E+08	9.76E-02	2.41E-05	2.49E+00	-	7.35E+01
5.9	1.20E-02	9.86E+01	2.51E+08	6.89E-02	3.11E-05	2.48E+00	-	6.06E+01
6.0	1.16E-02	8.14E+01	2.51E+08	4.03E-02	3.82E-05	2.48E+00	-	4.77E+01
6.1	1.13E-02	6.83E+01	2.51E+08	2.84E-02	4.93E-05	2.48E+00	-	3.92E+01
6.2	1.10E-02	5.53E+01	2.51E+08	1.64E-02	6.05E-05	2.48E+00	-	3.07E+01
6.3	1.08E-02	4.60E+01	2.51E+08	1.15E-02	7.82E-05	2.47E+00	-	2.51E+01
6.4	1.06E-02	3.67E+01	2.51E+08	6.64E-03	9.58E-05	2.47E+00	-	1.96E+01
6.5	1.05E-02	3.03E+01	2.51E+08	4.65E-03	1.24E-04	2.46E+00	-	1.60E+01
6.6	1.04E-02	2.39E+01	2.51E+08	2.67E-03	1.52E-04	2.46E+00	-	1.24E+01
6.7	1.03E-02	1.96E+01	2.51E+08	1.87E-03	1.96E-04	2.45E+00	-	1.02E+01
6.8	1.02E-02	1.54E+01	2.51E+08	1.07E-03	2.41E-04	2.44E+00	-	7.89E+00
6.9	1.02E-02	1.26E+01	2.51E+08	7.48E-04	3.11E-04	2.42E+00	-	6.44E+00
7.0	1.02E-02	9.85E+00	2.51E+08	4.27E-04	3.81E-04	2.41E+00	-	4.99E+00
7.1	1.02E-02	8.06E+00	2.51E+08	2.99E-04	4.93E-04	2.38E+00	-	4.07E+00
7.2	1.01E-02	6.27E+00	2.51E+08	1.71E-04	6.04E-04	2.36E+00	-	3.16E+00
7.3	1.01E-02	5.12E+00	2.51E+08	1.19E-04	7.81E-04	2.32E+00	-	2.57E+00
7.4	1.01E-02	3.98E+00	2.51E+08	6.80E-05	9.57E-04	2.29E+00	-	1.99E+00
7.5	1.01E-02	3.25E+00	2.51E+08	4.75E-05	1.24E-03	2.24E+00	-	1.63E+00
7.6	1.01E-02	2.52E+00	2.51E+08	2.71E-05	1.52E-03	2.19E+00	-	1.26E+00
7.7	1.00E-02	2.05E+00	2.51E+08	1.89E-05	1.96E-03	2.11E+00	-	1.03E+00
7.8	1.00E-02	1.59E+00	2.50E+08	1.08E-05	2.40E-03	2.04E+00	-	7.95E-01
7.9	1.00E-02	1.30E+00	2.50E+08	7.55E-06	3.10E-03	1.95E+00	-	6.48E-01
8.0	1.00E-02	1.01E+00	2.50E+08	4.30E-06	3.80E-03	1.86E+00	-	5.02E-01

Koc Values for Ionizing Organic COCs as a Function of pH

Last Revised: January 6, 2021

pH	Hexanoic acid 142-62-1	Kelthane 115-32-2	MCPA (4-(Chloro-2-methylphenoxy) acetic acid) 94-74-6	MCPP, acid (2-(4-chloro-2-methylphenoxy) propanoic acid) 93-65-2	Methacrylic acid (2-methyl-2-propenoic acid) 79-41-4	Methanethiol 74-93-1	Methapyrilene 91-80-5
4.9	4.00E+01	1.26E+05	4.01E+01	2.20E+01	4.60E+00	4.23E+00	1.43E+04
5.0	3.44E+01	1.26E+05	3.12E+01	1.71E+01	3.67E+00	4.23E+00	1.43E+04
5.1	2.95E+01	1.26E+05	2.55E+01	1.40E+01	3.03E+00	4.23E+00	1.43E+04
5.2	2.47E+01	1.26E+05	1.98E+01	1.09E+01	2.39E+00	4.23E+00	1.43E+04
5.3	2.09E+01	1.26E+05	1.61E+01	8.87E+00	1.96E+00	4.23E+00	1.43E+04
5.4	1.71E+01	1.26E+05	1.25E+01	6.87E+00	1.54E+00	4.23E+00	1.43E+04
5.5	1.42E+01	1.26E+05	1.02E+01	5.61E+00	1.26E+00	4.23E+00	1.43E+04
5.6	1.14E+01	1.26E+05	7.90E+00	4.34E+00	9.83E-01	4.23E+00	1.43E+04
5.7	9.49E+00	1.26E+05	6.45E+00	3.54E+00	8.04E-01	4.23E+00	1.43E+04
5.8	7.53E+00	1.26E+05	4.99E+00	2.74E+00	6.25E-01	4.23E+00	1.42E+04
5.9	6.20E+00	1.26E+05	4.07E+00	2.24E+00	5.11E-01	4.23E+00	1.42E+04
6.0	4.88E+00	1.26E+05	3.15E+00	1.73E+00	3.97E-01	4.23E+00	1.42E+04
6.1	4.00E+00	1.26E+05	2.57E+00	1.41E+00	3.24E-01	4.23E+00	1.42E+04
6.2	3.13E+00	1.26E+05	1.99E+00	1.09E+00	2.51E-01	4.23E+00	1.42E+04
6.3	2.56E+00	1.26E+05	1.62E+00	8.92E-01	2.05E-01	4.23E+00	1.42E+04
6.4	2.00E+00	1.26E+05	1.26E+00	6.90E-01	1.59E-01	4.23E+00	1.41E+04
6.5	1.63E+00	1.26E+05	1.02E+00	5.63E-01	1.30E-01	4.23E+00	1.41E+04
6.6	1.27E+00	1.26E+05	7.93E-01	4.36E-01	1.00E-01	4.23E+00	1.40E+04
6.7	1.04E+00	1.26E+05	6.46E-01	3.55E-01	8.18E-02	4.23E+00	1.39E+04
6.8	8.05E-01	1.26E+05	5.00E-01	2.75E-01	6.34E-02	4.23E+00	1.39E+04
6.9	6.57E-01	1.26E+05	4.08E-01	2.24E-01	5.17E-02	4.23E+00	1.38E+04
7.0	5.09E-01	1.26E+05	3.16E-01	1.73E-01	4.00E-02	4.23E+00	1.36E+04
7.1	4.15E-01	1.26E+05	2.57E-01	1.41E-01	3.26E-02	4.23E+00	1.35E+04
7.2	3.22E-01	1.26E+05	1.99E-01	1.09E-01	2.52E-02	4.23E+00	1.33E+04
7.3	2.63E-01	1.26E+05	1.62E-01	8.93E-02	2.06E-02	4.23E+00	1.30E+04
7.4	2.03E-01	1.26E+05	1.26E-01	6.91E-02	1.59E-02	4.22E+00	1.28E+04
7.5	1.66E-01	1.26E+05	1.02E-01	5.63E-02	1.30E-02	4.22E+00	1.24E+04
7.6	1.28E-01	1.26E+05	7.93E-02	4.36E-02	1.01E-02	4.22E+00	1.20E+04
7.7	1.05E-01	1.26E+05	6.47E-02	3.55E-02	8.20E-03	4.22E+00	1.16E+04
7.8	8.10E-02	1.26E+05	5.00E-02	2.75E-02	6.34E-03	4.21E+00	1.11E+04
7.9	6.61E-02	1.26E+05	4.08E-02	2.24E-02	5.17E-03	4.21E+00	1.05E+04
8.0	5.11E-02	1.26E+05	3.16E-02	1.73E-02	4.00E-03	4.20E+00	9.83E+03

Koc Values for Ionizing Organic COCs as a Function of pH

Last Revised: January 6, 2021

pH	Methylpyridine, 2- 109-06-8	Morpholine 110-91-8	Naphthylamine, 1- 134-32-7	Naphthylamine, 2- 91-59-8	Nitrophenol, 2- 88-75-5	Nitrophenol, 3- 554-84-7	Nitrophenol, 4- 100-02-7	Nonylphenol, 4- (branched) 84852-15-3
4.9	1.71E+02	1.32E+00	9.52E+02	1.44E+03	2.03E+02	9.33E+01	4.95E+01	3.01E+06
5.0	1.67E+02	1.32E+00	8.50E+02	1.27E+03	2.02E+02	9.33E+01	4.94E+01	3.01E+06
5.1	1.61E+02	1.32E+00	7.78E+02	1.16E+03	2.02E+02	9.33E+01	4.92E+01	3.01E+06
5.2	1.56E+02	1.32E+00	7.07E+02	1.04E+03	2.01E+02	9.33E+01	4.90E+01	3.01E+06
5.3	1.49E+02	1.32E+00	6.59E+02	9.61E+02	2.01E+02	9.33E+01	4.86E+01	3.01E+06
5.4	1.41E+02	1.32E+00	6.11E+02	8.81E+02	2.00E+02	9.32E+01	4.83E+01	3.01E+06
5.5	1.32E+02	1.32E+00	5.79E+02	8.27E+02	1.98E+02	9.32E+01	4.78E+01	3.01E+06
5.6	1.24E+02	1.32E+00	5.47E+02	7.74E+02	1.97E+02	9.32E+01	4.73E+01	3.01E+06
5.7	1.14E+02	1.32E+00	5.27E+02	7.39E+02	1.95E+02	9.32E+01	4.66E+01	3.01E+06
5.8	1.04E+02	1.32E+00	5.06E+02	7.04E+02	1.93E+02	9.31E+01	4.58E+01	3.01E+06
5.9	9.45E+01	1.32E+00	4.93E+02	6.82E+02	1.90E+02	9.31E+01	4.47E+01	3.01E+06
6.0	8.48E+01	1.31E+00	4.80E+02	6.59E+02	1.88E+02	9.30E+01	4.36E+01	3.01E+06
6.1	7.60E+01	1.31E+00	4.72E+02	6.45E+02	1.83E+02	9.29E+01	4.21E+01	3.01E+06
6.2	6.73E+01	1.31E+00	4.63E+02	6.30E+02	1.79E+02	9.28E+01	4.06E+01	3.01E+06
6.3	6.02E+01	1.31E+00	4.58E+02	6.21E+02	1.73E+02	9.27E+01	3.86E+01	3.01E+06
6.4	5.30E+01	1.31E+00	4.52E+02	6.12E+02	1.67E+02	9.25E+01	3.65E+01	3.01E+06
6.5	4.76E+01	1.30E+00	4.49E+02	6.06E+02	1.59E+02	9.23E+01	3.40E+01	3.01E+06
6.6	4.22E+01	1.30E+00	4.46E+02	6.00E+02	1.51E+02	9.20E+01	3.15E+01	3.01E+06
6.7	3.83E+01	1.29E+00	4.44E+02	5.97E+02	1.41E+02	9.17E+01	2.87E+01	3.01E+06
6.8	3.44E+01	1.29E+00	4.41E+02	5.93E+02	1.31E+02	9.13E+01	2.59E+01	3.01E+06
6.9	3.18E+01	1.28E+00	4.40E+02	5.91E+02	1.20E+02	9.07E+01	2.30E+01	3.01E+06
7.0	2.91E+01	1.27E+00	4.39E+02	5.88E+02	1.08E+02	9.02E+01	2.02E+01	3.01E+06
7.1	2.73E+01	1.25E+00	4.38E+02	5.87E+02	9.66E+01	8.93E+01	1.76E+01	3.00E+06
7.2	2.55E+01	1.24E+00	4.37E+02	5.85E+02	8.49E+01	8.84E+01	1.50E+01	3.00E+06
7.3	2.44E+01	1.22E+00	4.36E+02	5.85E+02	7.41E+01	8.71E+01	1.28E+01	3.00E+06
7.4	2.32E+01	1.19E+00	4.36E+02	5.84E+02	6.33E+01	8.58E+01	1.06E+01	3.00E+06
7.5	2.25E+01	1.16E+00	4.36E+02	5.83E+02	5.42E+01	8.38E+01	8.94E+00	3.00E+06
7.6	2.17E+01	1.13E+00	4.35E+02	5.82E+02	4.51E+01	8.19E+01	7.26E+00	3.00E+06
7.7	2.12E+01	1.09E+00	4.35E+02	5.82E+02	3.80E+01	7.91E+01	6.05E+00	3.00E+06
7.8	2.08E+01	1.05E+00	4.35E+02	5.82E+02	3.10E+01	7.64E+01	4.84E+00	3.00E+06
7.9	2.05E+01	9.95E-01	4.35E+02	5.81E+02	2.58E+01	7.27E+01	4.00E+00	3.00E+06
8.0	2.02E+01	9.41E-01	4.34E+02	5.81E+02	2.07E+01	6.91E+01	3.17E+00	2.99E+06

Koc Values for Ionizing Organic COCs as a Function of pH

Last Revised: January 6, 2021

pH	Pentachlorophenol* 87-86-5	Propanil 709-98-8	Tetrachlorophenol, 2,3,4,5-* 4901-51-3	Tetrachlorophenol, 2,3,4,6-* 58-90-2	Tetrachlorophenol, 2,3,5,6- 935-95-5	Toluenediamine, 2,6 823-40-5	Toluidine, o- 95-53-4
4.9	9.05E+03	9.33E+02	1.73E+04	4.45E+03	1.60E+04	9.01E+00	1.85E+02
5.0	7.96E+03	9.33E+02	1.72E+04	4.15E+03	1.42E+04	8.29E+00	1.65E+02
5.1	6.93E+03	9.33E+02	1.70E+04	3.83E+03	1.24E+04	7.55E+00	1.47E+02
5.2	5.97E+03	9.33E+02	1.67E+04	3.49E+03	1.07E+04	6.81E+00	1.30E+02
5.3	5.10E+03	9.33E+02	1.65E+04	3.14E+03	9.18E+03	6.13E+00	1.16E+02
5.4	4.32E+03	9.33E+02	1.61E+04	2.79E+03	7.68E+03	5.44E+00	1.03E+02
5.5	3.65E+03	9.33E+02	1.57E+04	2.45E+03	6.50E+03	4.87E+00	9.26E+01
5.6	3.07E+03	9.33E+02	1.52E+04	2.13E+03	5.32E+03	4.29E+00	8.25E+01
5.7	2.58E+03	9.33E+02	1.47E+04	1.83E+03	4.45E+03	3.84E+00	7.55E+01
5.8	2.18E+03	9.33E+02	1.40E+04	1.56E+03	3.58E+03	3.40E+00	6.84E+01
5.9	1.84E+03	9.33E+02	1.32E+04	1.32E+03	2.96E+03	3.07E+00	6.36E+01
6.0	1.56E+03	9.33E+02	1.24E+04	1.11E+03	2.35E+03	2.75E+00	5.88E+01
6.1	1.33E+03	9.33E+02	1.15E+04	9.27E+02	1.94E+03	2.52E+00	5.57E+01
6.2	1.15E+03	9.33E+02	1.05E+04	7.75E+02	1.53E+03	2.29E+00	5.25E+01
6.3	9.98E+02	9.33E+02	9.51E+03	6.47E+02	1.25E+03	2.14E+00	5.04E+01
6.4	8.77E+02	9.32E+02	8.48E+03	5.42E+02	9.80E+02	1.99E+00	4.84E+01
6.5	7.81E+02	9.32E+02	7.47E+03	4.55E+02	8.03E+02	1.89E+00	4.71E+01
6.6	7.03E+02	9.32E+02	6.49E+03	3.84E+02	6.25E+02	1.79E+00	4.57E+01
6.7	6.40E+02	9.32E+02	5.58E+03	3.27E+02	5.11E+02	1.72E+00	4.49E+01
6.8	5.92E+02	9.31E+02	4.74E+03	2.80E+02	3.97E+02	1.66E+00	4.41E+01
6.9	5.52E+02	9.31E+02	3.99E+03	2.42E+02	3.25E+02	1.62E+00	4.35E+01
7.0	5.21E+02	9.30E+02	3.33E+03	2.13E+02	2.52E+02	1.58E+00	4.30E+01
7.1	4.96E+02	9.29E+02	2.76E+03	1.88E+02	2.06E+02	1.55E+00	4.27E+01
7.2	4.76E+02	9.28E+02	2.28E+03	1.69E+02	1.59E+02	1.52E+00	4.23E+01
7.3	4.61E+02	9.27E+02	1.87E+03	1.53E+02	1.30E+02	1.51E+00	4.21E+01
7.4	4.47E+02	9.26E+02	1.53E+03	1.41E+02	1.01E+02	1.49E+00	4.19E+01
7.5	4.37E+02	9.23E+02	1.25E+03	1.31E+02	8.22E+01	1.48E+00	4.17E+01
7.6	4.29E+02	9.21E+02	1.02E+03	1.23E+02	6.37E+01	1.47E+00	4.16E+01
7.7	4.23E+02	9.18E+02	8.31E+02	1.17E+02	5.19E+01	1.46E+00	4.15E+01
7.8	4.18E+02	9.14E+02	6.79E+02	1.13E+02	4.02E+01	1.46E+00	4.14E+01
7.9	4.14E+02	9.09E+02	5.56E+02	1.08E+02	3.28E+01	1.45E+00	4.14E+01
8.0	4.10E+02	9.03E+02	4.58E+02	1.05E+02	2.54E+01	1.45E+00	4.13E+01

Koc Values for Ionizing Organic COCs as a Function of pH

Last revised: January 6, 2021

pH	Trichlorophenol, 2,3,4- 15950-66-0	Trichlorophenol, 2,3,5- 933-78-8	Trichlorophenol, 2,3,6- 933-75-5	Trichlorophenol, 2,4,5-* 95-95-4	Trichlorophenol, 2,4,6-* 88-06-2	Trichlorophenol, 3,4,5- 609-19-8	Valeric acid (pentanoic acid) 109-52-4
4.9	7.51E+03	5.47E+03	4.00E+04	2.37E+03	1.04E+03	8.13E+03	1.24E+01
5.0	7.49E+03	5.45E+03	3.88E+04	2.36E+03	1.03E+03	8.13E+03	1.06E+01
5.1	7.46E+03	5.41E+03	3.71E+04	2.36E+03	1.02E+03	8.12E+03	9.12E+00
5.2	7.44E+03	5.38E+03	3.55E+04	2.35E+03	1.01E+03	8.12E+03	7.63E+00
5.3	7.40E+03	5.32E+03	3.34E+04	2.34E+03	9.99E+02	8.12E+03	6.45E+00
5.4	7.35E+03	5.27E+03	3.13E+04	2.33E+03	9.82E+02	8.11E+03	5.27E+00
5.5	7.29E+03	5.19E+03	2.88E+04	2.32E+03	9.62E+02	8.10E+03	4.40E+00
5.6	7.22E+03	5.11E+03	2.64E+04	2.31E+03	9.38E+02	8.09E+03	3.54E+00
5.7	7.13E+03	4.99E+03	2.37E+04	2.29E+03	9.10E+02	8.08E+03	2.93E+00
5.8	7.03E+03	4.87E+03	2.11E+04	2.27E+03	8.77E+02	8.07E+03	2.33E+00
5.9	6.89E+03	4.71E+03	1.86E+04	2.24E+03	8.39E+02	8.04E+03	1.92E+00
6.0	6.74E+03	4.54E+03	1.60E+04	2.21E+03	7.96E+02	8.02E+03	1.51E+00
6.1	6.53E+03	4.32E+03	1.38E+04	2.17E+03	7.48E+02	7.99E+03	1.24E+00
6.2	6.33E+03	4.10E+03	1.16E+04	2.12E+03	6.97E+02	7.96E+03	9.68E-01
6.3	6.05E+03	3.82E+03	9.85E+03	2.06E+03	6.44E+02	7.90E+03	7.93E-01
6.4	5.77E+03	3.55E+03	8.08E+03	1.99E+03	5.89E+02	7.85E+03	6.17E-01
6.5	5.42E+03	3.24E+03	6.77E+03	1.91E+03	5.33E+02	7.77E+03	5.05E-01
6.6	5.06E+03	2.93E+03	5.45E+03	1.82E+03	4.80E+02	7.69E+03	3.92E-01
6.7	4.65E+03	2.61E+03	4.53E+03	1.71E+03	4.29E+02	7.57E+03	3.21E-01
6.8	4.24E+03	2.29E+03	3.60E+03	1.60E+03	3.81E+02	7.45E+03	2.49E-01
6.9	3.80E+03	2.00E+03	2.97E+03	1.47E+03	3.38E+02	7.28E+03	2.03E-01
7.0	3.37E+03	1.70E+03	2.34E+03	1.34E+03	3.00E+02	7.10E+03	1.57E-01
7.1	2.95E+03	1.46E+03	1.92E+03	1.21E+03	2.67E+02	6.86E+03	1.28E-01
7.2	2.54E+03	1.21E+03	1.50E+03	1.07E+03	2.39E+02	6.61E+03	9.83E-02
7.3	2.18E+03	1.02E+03	1.23E+03	9.43E+02	2.15E+02	6.29E+03	8.06E-02
7.4	1.83E+03	8.31E+02	9.60E+02	8.19E+02	1.95E+02	5.96E+03	6.28E-02
7.5	1.55E+03	6.93E+02	7.85E+02	7.03E+02	1.78E+02	5.55E+03	5.12E-02
7.6	1.27E+03	5.55E+02	6.10E+02	5.99E+02	1.64E+02	5.15E+03	3.97E-02
7.7	1.06E+03	4.59E+02	4.99E+02	5.07E+02	1.53E+02	4.70E+03	3.24E-02
7.8	8.52E+02	3.64E+02	3.87E+02	4.26E+02	1.44E+02	4.24E+03	2.50E-02
7.9	7.06E+02	2.99E+02	3.16E+02	3.57E+02	1.37E+02	3.78E+03	2.04E-02
8.0	5.61E+02	2.35E+02	2.45E+02	2.98E+02	1.31E+02	3.31E+03	1.58E-02

Footnotes

1 Glyphosate - Koc under review. Contact your TCEQ Project

* As listed in Figure: 30 TAC §350.73(e)(1)(B)

This table shows the carbon-water partitioning coefficient for end of worksheet

ABS_{GI} and ABS.d Values

Last Revised: March 1, 2022

Chemical of Concern	CAS	ABS _{GI} (unitless)	ABS.d (unitless)
Acenaphthene	83-32-9	8.90E-01	1.30E-01
Acenaphthylene	208-96-8	8.90E-01	1.30E-01
Acetaldehyde	75-07-0	8.00E-01	0.00E+00
Acetate, 2-ethoxyethanol	111-15-9	8.00E-01	0.00E+00
Acetate, isoamyl	123-92-2	8.00E-01	0.00E+00
Acetate, isobutyl	110-19-0	8.00E-01	0.00E+00
Acetate, sec-butyl	105-46-4	8.00E-01	0.00E+00
Acetic acid*	64-19-7	0.00E+00	0.00E+00
Acetone (2-propanone)	67-64-1	8.30E-01	0.00E+00
Acetone cyanohydrin	75-86-5	5.00E-01	1.00E-01
Acetonitrile	75-05-8	8.00E-01	0.00E+00
Acetophenone	98-86-2	5.00E-01	1.00E-01
Acetylaminofluorene, 2-	53-96-3	5.00E-01	1.00E-01
Acifluorfen, sodium	62476-59-9	5.00E-01	1.00E-01
Acridine	260-94-6	5.00E-01	1.00E-01
Acrolein	107-02-8	8.00E-01	0.00E+00
Acrylamide	79-06-1	5.00E-01	1.00E-01
Acrylic acid	79-10-7	8.00E-01	0.00E+00
Acrylonitrile	107-13-1	8.00E-01	0.00E+00
Adipic acid (hexanedioic acid)	124-04-9	5.00E-01	1.00E-01
Alachlor	15972-60-8	5.00E-01	1.00E-01
Aldicarb	116-06-3	5.00E-01	1.00E-01
Aldicarb sulfone	1646-88-4	5.00E-01	1.00E-01
Aldrin	309-00-2	5.00E-01	1.00E-01
Allyl alcohol	107-18-6	8.00E-01	0.00E+00
Allyl chloride	107-05-1	8.00E-01	0.00E+00
Aluminum	7429-90-5	1.00E-01	1.00E-02
Ametryn	834-12-8	5.00E-01	1.00E-01
Amino-2,6-dinitrotoluene, 4-	19406-51-0	5.00E-01	1.00E-01
Amino-4,6-dinitrotoluene, 2-	35572-78-2	5.00E-01	1.00E-01

ABS_{GI} and ABS.d Values

Last Revised: March 1, 2022

Chemical of Concern	CAS	ABS _{GI} (unitless)	ABS.d (unitless)
Aminobiphenyl, 4- (1,1-biphenyl-4-amine)	92-67-1	5.00E-01	1.00E-01
Aminopyridine, 4-	504-24-5	5.00E-01	1.00E-01
Ammonia	7664-41-7	2.00E-01	1.00E-02
Ammonium polyphosphate*	6833-79-9	0.00E+00	0.00E+00
Ammonium salts*	AMMONIUM	0.00E+00	0.00E+00
Aniline	62-53-3	5.00E-01	1.00E-01
Anthracene	120-12-7	8.90E-01	1.30E-01
Anthraquinone, 9,10-	84-65-1	5.00E-01	1.00E-01
Antimony	7440-36-0	1.50E-01	1.00E-02
Aramite	140-57-8	5.00E-01	1.00E-01
Arsenic	7440-38-2	9.50E-01	3.00E-02
Arsine	7784-42-1	2.00E-01	1.00E-02
Atrazine	1912-24-9	5.00E-01	1.00E-01
Azinphos-methyl (guthion)	86-50-0	5.00E-01	1.00E-01
Azobenzene	103-33-3	5.00E-01	1.00E-01
Barium	7440-39-3	7.00E-02	1.00E-02
Bayleton	43121-43-3	5.00E-01	1.00E-01
Benefin (benfluralin)	1861-40-1	5.00E-01	1.00E-01
Benomyl	17804-35-2	5.00E-01	1.00E-01
Benz-a-anthracene	56-55-3	8.90E-01	1.30E-01
Benzaldehyde	100-52-7	8.00E-01	0.00E+00
Benzene	71-43-2	9.70E-01	0.00E+00
Benzenedicarbonitrile, 1,3-	626-17-5	5.00E-01	1.00E-01
Benzenedicarboxylic acid, 1,2-disodecyl ester	26761-40-0	5.00E-01	1.00E-01
Benzenethiol	108-98-5	8.00E-01	0.00E+00
Benzidine	92-87-5	8.00E-01	1.00E-01
Benzo-a-pyrene	50-32-8	8.90E-01	1.30E-01
Benzo-b-fluoranthene	205-99-2	8.90E-01	1.30E-01
Benzo-e-pyrene	192-97-2	8.90E-01	1.30E-01
Benzo-g,h,i-perylene	191-24-2	8.90E-01	1.30E-01

ABS_{GI} and ABS.d Values

Last Revised: March 1, 2022

Chemical of Concern	CAS	ABS _{GI} (unitless)	ABS.d (unitless)
Benzoic acid	65-85-0	1.00E+00	1.00E-01
Benzo-j-fluoranthene	205-82-3	8.90E-01	1.30E-01
Benzo-k-fluoranthene	207-08-9	8.90E-01	1.30E-01
Benzophenone	119-61-9	5.00E-01	1.00E-01
Benzotrichloride	98-07-7	5.00E-01	1.00E-01
Benzoyl peroxide	94-36-0	5.00E-01	1.00E-01
Benzyl alcohol	100-51-6	6.60E-01	1.00E-01
Benzyl chloride	100-44-7	8.00E-01	0.00E+00
Benzyl dichloride	98-87-3	5.00E-01	1.00E-01
Beryllium	7440-41-7	7.00E-03	1.00E-02
Biphenyl, 1,1-	92-52-4	5.00E-01	1.00E-01
Biphenyl, 1,1'-, 2-phenoxy-	6738-04-1	5.00E-01	1.00E-01
Biquinoline, 2,2'-	119-91-5	5.00E-01	1.00E-01
Bis (2-chloroethoxy) methane	111-91-1	5.00E-01	1.00E-01
Bis (2-chloroethyl) ether	111-44-4	8.00E-01	0.00E+00
Bis (2-chloro-1-methylethyl) ether	108-60-1	5.00E-01	1.00E-01
Bis (2-chloromethyl) ether	542-88-1	8.00E-01	0.00E+00
Bis (2-ethyl-hexyl) phthalate	117-81-7	1.90E-01	1.00E-01
Bismuth	7440-69-9	2.00E-01	1.00E-02
Bisphenol A	80-05-7	5.00E-01	1.00E-01
Boron	7440-42-8	9.00E-01	1.00E-02
Bromacil	314-40-9	5.00E-01	1.00E-01
Bromo-2-chloroethane, 1-	107-04-0	8.00E-01	0.00E+00
Bromobenzene	108-86-1	8.00E-01	0.00E+00
Bromodichloromethane	75-27-4	9.80E-01	0.00E+00
Bromoform	75-25-2	6.00E-01	0.00E+00
Bromomethane	74-83-9	8.00E-01	0.00E+00
Bromophenyl phenylether, 4-	101-55-3	5.00E-01	1.00E-01
Butadiene, 1,3-	106-99-0	8.00E-01	0.00E+00
Butadiene, 2-methyl-1,3- (isoprene)	78-79-5	8.00E-01	0.00E+00

ABS_{GI} and ABS.d Values

Last Revised: March 1, 2022

Chemical of Concern	CAS	ABS _{GI} (unitless)	ABS.d (unitless)
Butanal (butyraldehyde)	123-72-8	8.00E-01	0.00E+00
Butane, 2,3-dimethyl-	79-29-8	8.00E-01	0.00E+00
Butanoic acid (butyric acid)	107-92-6	5.00E-01	1.00E-01
Butanol, 2-	78-92-2	8.00E-01	0.00E+00
Butanol, 2-methyl-1-	137-32-6	5.00E-01	1.00E-01
Butanol, 2-methyl-2-	75-85-4	8.00E-01	0.00E+00
Butanol, n-	71-36-3	8.00E-01	0.00E+00
Butene, 1-	106-98-9	8.00E-01	0.00E+00
Butene, cis-2-	590-18-1	8.00E-01	0.00E+00
Butene, trans-2-	624-64-6	8.00E-01	0.00E+00
Butoxy ethanol, 2- (Ethylene glycol monobutyl ether; EGBE)	111-76-2	5.00E-01	1.00E-01
Butyl acetate	123-86-4	8.00E-01	0.00E+00
Butyl acrylate	141-32-2	8.00E-01	0.00E+00
Butyl benzyl phthalate	85-68-7	6.10E-01	1.00E-01
Butyl ether, n- (dibutyl ether)	142-96-1	8.00E-01	0.00E+00
Butyl methacrylate	97-88-1	9.40E-01	5.00E-01
Butylate	2008-41-5	5.00E-01	1.00E-01
Butylbenzene, n-	104-51-8	5.00E-01	1.00E-01
Butylbenzene, sec-	135-98-8	8.00E-01	0.00E+00
Butylbenzene, tert-	98-06-6	8.00E-01	0.00E+00
Cacodylic acid	75-60-5	5.00E-01	1.00E-01
Cadmium	7440-43-9	2.50E-02	1.00E-03
Calcium*	7440-70-2	0.00E+00	0.00E+00
Caprolactam	105-60-2	5.00E-01	1.00E-01
Captan	133-06-2	5.00E-01	1.00E-01
Carbaryl	63-25-2	5.00E-01	1.00E-01
Carbazole	86-74-8	7.00E-01	1.00E-01
Carbofuran	1563-66-2	5.00E-01	1.00E-01
Carbon disulfide	75-15-0	6.30E-01	0.00E+00
Carbon tetrachloride	56-23-5	6.50E-01	0.00E+00

ABS_{GI} and ABS.d Values

Last Revised: March 1, 2022

Chemical of Concern	CAS	ABS _{GI} (unitless)	ABS.d (unitless)
Carbophenothion	786-19-6	5.00E-01	1.00E-01
Carbosulfan	55285-14-8	5.00E-01	1.00E-01
Carboxin	5234-68-4	5.00E-01	1.00E-01
Chloral	75-87-6	8.00E-01	0.00E+00
Chloral hydrate (1,1-ethanediol, 2,2,2-trichloro-)	302-17-0	5.00E-01	1.00E-01
Chloramben (amiben; 3-amino-2,5-dichlorobenzoic acid)	133-90-4	5.00E-01	1.00E-01
Chlordane (technical)	12789-03-6	8.00E-01	4.00E-02
Chlordane, cis- (alpha chlordane)	5103-71-9	5.00E-01	1.00E-01
Chlordane, trans- (gamma chlordane)	5103-74-2	5.00E-01	1.00E-01
Chlorfenvinphos	470-90-6	5.00E-01	1.00E-01
Chloride*	16887-00-6	0.00E+00	0.00E+00
Chlorine	7782-50-5	2.00E-01	1.00E-02
Chloro-1,3-butadiene, 2-	126-99-8	8.00E-01	0.00E+00
Chloro-2-propanol, 1-	127-00-4	8.00E-01	0.00E+00
Chloro-3-methylphenol, 4-	59-50-7	5.00E-01	1.00E-01
Chloroaniline, p-	106-47-8	5.00E-01	1.00E-01
Chlorobenzene	108-90-7	3.10E-01	0.00E+00
Chlorobenzilate	510-15-6	5.00E-01	1.00E-01
Chlorobromomethane (bromochloromethane)	74-97-5	8.00E-01	0.00E+00
Chlorodifluoromethane	75-45-6	8.00E-01	0.00E+00
Chloroethane (ethyl chloride)	75-00-3	8.00E-01	0.00E+00
Chloroethanol, 2-	107-07-3	8.00E-01	0.00E+00
Chloroethoxy ethene, 2- (2-chloroethylvinylether)	110-75-8	8.00E-01	0.00E+00
Chloroform	67-66-3	2.00E-01	0.00E+00
Chlorohexane, 1-	544-10-5	8.00E-01	0.00E+00
Chloromethane (methyl chloride)	74-87-3	8.00E-01	0.00E+00
Chloronaphthalene, 1- (Chloronaphthalene, alpha-)	90-13-1	8.90E-01	1.30E-01
Chloronaphthalene, 2- (chloronaphthalene, beta)	91-58-7	8.90E-01	1.30E-01
Chloronitrobenzene, p- (1-chloro-4-nitrobenzene)	100-00-5	5.00E-01	1.00E-01
Chlorophenol, 2-	95-57-8	8.00E-01	0.00E+00

ABS_{GI} and ABS.d Values

Last Revised: March 1, 2022

Chemical of Concern	CAS	ABS _{GI} (unitless)	ABS.d (unitless)
Chlorophenol, 3-	108-43-0	5.00E-01	1.00E-01
Chlorophenol, 4-	106-48-9	5.00E-01	1.00E-01
Chlorophenyl phenylether, 4-	7005-72-3	5.00E-01	1.00E-01
Chloropropane, 2-	75-29-6	8.00E-01	0.00E+00
Chlorothalonil	1897-45-6	5.00E-01	1.00E-01
Chlorotoluene, o- (2-chlorotoluene)	95-49-8	5.00E-01	1.00E-01
Chlorotoluene, p- (4-chlorotoluene)	106-43-4	8.00E-01	0.00E+00
Chlorpyrifos	2921-88-2	5.00E-01	1.00E-01
Chromium (III)	16065-83-1	1.30E-02	1.00E-02
Chromium (total)	7440-47-3	1.30E-02	1.00E-02
Chromium (VI)	18540-29-9	2.50E-02	1.00E-02
Chrysene	218-01-9	8.90E-01	1.30E-01
Cobalt	7440-48-4	8.00E-01	1.00E-02
Copolymer acrylamide	69418-26-4	5.00E-01	1.00E-01
Copper	7440-50-8	5.70E-01	1.00E-02
Coronene	191-07-1	5.00E-01	1.00E-01
Coumaphos	56-72-4	5.00E-01	1.00E-01
Cresol	1319-77-3	5.00E-01	1.00E-01
Cresol, m- (3-methylphenol)	108-39-4	5.00E-01	1.00E-01
Cresol, o- (2-methylphenol)	95-48-7	5.00E-01	1.00E-01
Cresol, p- (4-methylphenol)	106-44-5	6.50E-01	1.00E-01
Crotonaldehyde	123-73-9	8.00E-01	0.00E+00
Cumene (isopropylbenzene)	98-82-8	8.00E-01	0.00E+00
Cyanazine	21725-46-2	5.00E-01	1.00E-01
Cyanide	57-12-5	5.00E-01	1.00E-02
Cyanogen	460-19-5	8.00E-01	0.00E+00
Cycloate	1134-23-2	5.00E-01	1.00E-01
Cyclohexane	110-82-7	8.00E-01	0.00E+00
Cyclohexanol	108-93-0	5.00E-01	1.00E-01
Cyclohexanone	108-94-1	8.00E-01	0.00E+00

ABS_{GI} and ABS.d Values

Last Revised: March 1, 2022

Chemical of Concern	CAS	ABS _{GI} (unitless)	ABS.d (unitless)
Cyclohexene, 1-methanol-3-	1679-51-2	5.00E-01	1.00E-01
Cyclohexene, 4-vinyl-1-	100-40-3	8.00E-01	0.00E+00
Cyclopentane	287-92-3	8.00E-01	0.00E+00
Cyclopentane, methyl-	96-37-7	8.00E-01	0.00E+00
Cyclopentene	142-29-0	8.00E-01	0.00E+00
Cyclotetramethylenetetranitramine (HMX)	2691-41-0	1.50E-01	1.00E-01
Cyclotrimethylenetrinitramine (RDX)	121-82-4	1.00E+00	1.00E-01
Cymene (isopropyltoluene)	99-87-6	8.00E-01	0.00E+00
Cymoxanil	57966-95-7	5.00E-01	1.00E-01
Dacthal (DCPA)	1861-32-1	5.00E-01	1.00E-01
Dalapon, sodium salt (2,2-dichloropropanoic acid)	75-99-0	5.00E-01	1.00E-01
DDD	72-54-8	7.00E-01	3.00E-02
DDE	72-55-9	7.00E-01	3.00E-02
DDT	50-29-3	7.00E-01	3.00E-02
Demeton	8065-48-3	5.00E-01	1.00E-01
Desethylatrazine	6190-65-4	5.00E-01	1.00E-01
Diacetone alcohol (4-hydroxy-4-methyl-2-pentanone)	123-42-2	5.00E-01	1.00E-01
Diallate	2303-16-4	5.00E-01	1.00E-01
Diazinon	333-41-5	5.00E-01	1.00E-01
Dibenz(a,h)acridine	226-36-8	5.00E-01	1.00E-01
Dibenz(a,j)acridine	224-42-0	8.90E-01	1.30E-01
Dibenz-a,h-anthracene	53-70-3	8.90E-01	1.30E-01
Dibenzo(a,e)pyrene	192-65-4	5.00E-01	1.00E-01
Dibenzo(a,h)pyrene	189-64-0	5.00E-01	1.00E-01
Dibenzo(a,i)pyrene	189-55-9	5.00E-01	1.00E-01
Dibenzofuran	132-64-9	5.00E-01	1.00E-01
Dibenzothiophene	132-65-0	5.00E-01	1.00E-01
Dibromo-3-chloropropane, 1,2-	96-12-8	5.00E-01	1.00E-01
Dibromochloromethane (chlorodibromomethane)	124-48-1	6.00E-01	0.00E+00
Dibromofluoromethane	1868-53-7	8.00E-01	0.00E+00

ABS_{GI} and ABS.d Values

Last Revised: March 1, 2022

Chemical of Concern	CAS	ABS _{GI} (unitless)	ABS.d (unitless)
Dicamba	1918-00-9	5.00E-01	1.00E-01
Dichlormid	37764-25-3	5.00E-01	1.00E-01
Dichloro-2-butene, 1,4-	764-41-0	8.00E-01	0.00E+00
Dichloro-2-butene, 1,4- trans	110-57-6	8.00E-01	0.00E+00
Dichlorobenzene, 1,2-	95-50-1	8.00E-01	0.00E+00
Dichlorobenzene, 1,3-	541-73-1	8.00E-01	0.00E+00
Dichlorobenzene, 1,4-	106-46-7	9.00E-01	0.00E+00
Dichlorobenzidine, 3,3-	91-94-1	5.00E-01	1.00E-01
Dichlorobutane, 2,3-	7581-97-7	8.00E-01	0.00E+00
Dichlorodifluoromethane	75-71-8	2.30E-01	0.00E+00
Dichloroethane, 1,1-	75-34-3	1.00E+00	0.00E+00
Dichloroethane, 1,2-	107-06-2	1.00E+00	0.00E+00
Dichloroethylene, 1,1-	75-35-4	1.00E+00	0.00E+00
Dichloroethylene, cis-1,2-	156-59-2	1.00E+00	0.00E+00
Dichloroethylene, trans-1,2	156-60-5	1.00E+00	0.00E+00
Dichlorofluoromethane	75-43-4	8.00E-01	0.00E+00
Dichlorophenol, 2,3-	576-24-9	5.00E-01	1.00E-01
Dichlorophenol, 2,4-	120-83-2	8.20E-01	1.00E-01
Dichlorophenol, 2,5-	583-78-8	5.00E-01	1.00E-01
Dichlorophenol, 2,6-	87-65-0	5.00E-01	1.00E-01
Dichlorophenol, 3,4-	95-77-2	5.00E-01	1.00E-01
Dichlorophenol, 3,5-	591-35-5	5.00E-01	1.00E-01
Dichlorophenoxy, 2,4- butyric acid, 4- (2,4-DB)	94-82-6	5.00E-01	1.00E-01
Dichlorophenoxyacetic acid, 2,4- (2,4-D)	94-75-7	9.00E-01	5.00E-02
Dichloroprop (2-(2,4-dichlorophenoxy) propanoic acid)	120-36-5	5.00E-01	1.00E-01
Dichloropropane, 1,2-	78-87-5	7.40E-01	0.00E+00
Dichloropropane, 1,3-	142-28-9	8.00E-01	0.00E+00
Dichloropropane, 2,2-	594-20-7	8.00E-01	0.00E+00
Dichloropropanol, 2,3-	616-23-9	5.00E-01	1.00E-01
Dichloropropene, 1,1-	563-58-6	8.00E-01	0.00E+00

ABS_{GI} and ABS.d Values

Last Revised: March 1, 2022

Chemical of Concern	CAS	ABS _{GI} (unitless)	ABS.d (unitless)
Dichloropropene, 1,3- (mixed isomers)	542-75-6	5.50E-01	0.00E+00
Dichloropropene, cis 1,3-	10061-01-5	8.00E-01	0.00E+00
Dichloropropene, trans 1,3-	10061-02-6	8.00E-01	0.00E+00
Dichlorvos	62-73-7	5.00E-01	1.00E-01
Dicrotophos (bidrin)	141-66-2	5.00E-01	1.00E-01
Dicyclopentadiene	77-73-6	8.00E-01	0.00E+00
Dieldrin	60-57-1	5.00E-01	1.00E-01
Diethanolamine	111-42-2	5.00E-01	1.00E-01
Diethyldithiocarbamate, sodium salt	148-18-5	0.00E+00	0.00E+00
Diethyl phthalate	84-66-2	9.00E-01	1.00E-01
Diethylene glycol	111-46-6	5.00E-01	1.00E-01
Diethylene glycol monobutyl ether	112-34-5	5.00E-01	1.00E-01
Diethylhexyl adipate	103-23-1	5.00E-01	1.00E-01
Diethylstilbestrol	56-53-1	5.00E-01	1.00E-01
Diisobutylene (trimethyl-1-pentene, 2,4,4-)	107-39-1	8.00E-01	0.00E+00
Diisopropylbenzene, p-	100-18-5	5.00E-01	1.00E-01
Diisopropyl ether (2,2'-oxybis-propane)	108-20-3	8.00E-01	0.00E+00
Dimethenamid	87674-68-8	5.00E-01	1.00E-01
Dimethoate	60-51-5	5.00E-01	1.00E-01
Dimethoxybenzidine, 3,3'-	119-90-4	5.00E-01	1.00E-01
Dimethyl-2-nitrobenzene, 1,3-	81-20-9	5.00E-01	1.00E-01
Dimethyl-3-nitrobenzene, 1,2-	83-41-0	5.00E-01	1.00E-01
Dimethyl-4-nitrobenzene, 1-2-	99-51-4	5.00E-01	1.00E-01
Dimethyl-5-nitrobenzene, 1,3-	99-12-7	5.00E-01	1.00E-01
Dimethylphenethylamine, alpha, alpha-	122-09-8	5.00E-01	1.00E-01
Dimethyl phenol, 2,4-	105-67-9	5.00E-01	1.00E-01
Dimethylaminoazobenzene, p-	60-11-7	5.00E-01	1.00E-01
Dimethylbenz-a-anthracene, 7,12-	57-97-6	8.90E-01	1.30E-01
Dimethylbenzidine, 3,3'-	119-93-7	5.00E-01	1.00E-01
Dimethylformamide, N,N-	68-12-2	8.00E-01	0.00E+00

ABS_{GI} and ABS.d Values

Last Revised: March 1, 2022

Chemical of Concern	CAS	ABS _{GI} (unitless)	ABS.d (unitless)
Dimethylnaphthalene, 1,3-	575-41-7	8.90E-01	1.30E-01
Dimethylphthalate	131-11-3	9.00E-01	1.00E-01
Di-n-butyl phthalate	84-74-2	1.00E+00	1.00E-01
Dinitro-2-methylphenol, 4,6- (dinitro-o-cresol, 4, 6-)	534-52-1	1.00E+00	1.00E-01
Dinitrobenzene, 1,3- (dinitrobenzene, 2,4-)	99-65-0	6.50E-01	1.00E-01
Dinitrobenzene, 1,4-	100-25-4	5.00E-01	1.00E-01
Dinitrophenol, 2,4-	51-28-5	1.00E+00	1.00E-01
Dinitrophenol, 2,5-	329-71-5	5.00E-01	1.00E-01
Dinitrotoluene, 2,4-	121-14-2	8.50E-01	1.00E-01
Dinitrotoluene, 2,6-	606-20-2	8.50E-01	1.00E-01
Di-n-octyl phthalate	117-84-0	9.00E-01	1.00E-01
Dinoseb	88-85-7	5.00E-01	1.00E-01
Dioxane 1,4-	123-91-1	8.00E-01	0.00E+00
Dioxins/furans, polychlorinated; (reported as 2,3,7,8-TCDD TEQ)	1746-01-6	5.00E-01	3.00E-02
Diphenyl ether	101-84-8	5.00E-01	1.00E-01
Diphenylamine	122-39-4	5.00E-01	1.00E-01
Diphenylhydrazine, 1,2-	122-66-7	5.00E-01	1.00E-01
Dipropylene glycol	110-98-5	5.00E-01	1.00E-01
Diquat	85-00-7	5.00E-01	1.00E-01
Disodium iminodiacetate (iminodiacetic acid, disodium salt)	142-73-4	5.00E-01	1.00E-01
Disulfoton	298-04-4	5.00E-01	1.00E-01
Diuron	330-54-1	5.00E-01	1.00E-01
Dodecylphenol, 4-	104-43-8	5.00E-01	1.00E-01
Endosulfan	115-29-7	5.00E-01	1.00E-01
Endosulfan I	959-98-8	5.00E-01	1.00E-01
Endosulfan II	33213-65-9	5.00E-01	1.00E-01
Endosulfan sulfate	1031-07-8	5.00E-01	1.00E-01
Endothall	145-73-3	5.00E-01	1.00E-01
Endrin	72-20-8	5.00E-01	1.00E-01
Endrin aldehyde	7421-93-4	5.00E-01	1.00E-01

ABS_{GI} and ABS.d Values

Last Revised: March 1, 2022

Chemical of Concern	CAS	ABS _{GI} (unitless)	ABS.d (unitless)
Endrin ketone	53494-70-5	5.00E-01	1.00E-01
Epichlorohydrin	106-89-8	8.00E-01	0.00E+00
EPN (o-ethyl o-(4-nitrophenyl)phenylphosphonothioate)	2104-64-5	5.00E-01	1.00E-01
Esfenvalerate	66230-04-4	5.00E-01	1.00E-01
Ethalfuralin (sonolan)	55283-68-6	5.00E-01	1.00E-01
Ethanol	64-17-5	8.00E-01	0.00E+00
Ethanol, 2-amino-	141-43-5	5.00E-01	1.00E-01
Ethanol, 2-(2-aminoethoxy)-	929-06-6	5.00E-01	1.00E-01
Ethanol, 2-(2-ethoxyethoxy)-	111-90-0	5.00E-01	1.00E-01
Ethanol, 2-(methylamino)-	109-83-1	5.00E-01	1.00E-01
Ethion	563-12-2	5.00E-01	1.00E-01
Ethoprop	13194-48-4	5.00E-01	1.00E-01
Ethoxy ethanol, 2-	110-80-5	8.00E-01	0.00E+00
Ethyl acetate	141-78-6	8.00E-01	0.00E+00
Ethyl acrylate	140-88-5	8.00E-01	0.00E+00
Ethyl benzene	100-41-4	9.70E-01	0.00E+00
Ethyl dipropylthiocarbamate, S-	759-94-4	5.00E-01	1.00E-01
Ethyl ether	60-29-7	8.00E-01	0.00E+00
Ethyl methacrylate	97-63-2	8.00E-01	0.00E+00
Ethyl methanesulfonate	62-50-0	5.00E-01	1.00E-01
Ethyl tert-butyl ether (2-ethyl-2-ethoxypropane)	637-92-3	8.00E-01	0.00E+00
Ethyl-1-hexanol, 2-	104-76-7	5.00E-01	1.00E-01
Ethyl-2-hexenal, 2-	645-62-5	8.00E-01	0.00E+00
Ethyl-2-methyl benzene, 1-	611-14-3	9.70E-01	0.00E+00
Ethyl-4-methyl benzene, 1-	622-96-8	9.70E-01	0.00E+00
Ethylene*	74-85-1	0.00E+00	0.00E+00
Ethylene dibromide (dibromoethane, 1,2-)	106-93-4	8.00E-01	0.00E+00
Ethylene glycol	107-21-1	5.00E-01	1.00E-01
Ethylene oxide	75-21-8	8.00E-01	0.00E+00
Ethylene thiourea	96-45-7	5.00E-01	1.00E-01

ABS_{GI} and ABS.d Values

Last Revised: March 1, 2022

Chemical of Concern	CAS	ABS _{GI} (unitless)	ABS.d (unitless)
Ethylenediamine	107-15-3	8.00E-01	0.00E+00
Ethylenimine	151-56-4	8.00E-01	0.00E+00
Ethylhexyl acrylate, 2-	103-11-7	5.00E-01	1.00E-01
Famphur	52-85-7	5.00E-01	1.00E-01
Fensulfothion	115-90-2	5.00E-01	1.00E-01
Fenthion	55-38-9	5.00E-01	1.00E-01
Fenuron	101-42-8	5.00E-01	1.00E-01
Fluoranthene	206-44-0	8.90E-01	1.30E-01
Fluorene	86-73-7	8.90E-01	1.30E-01
Fluorine (soluble fluoride)	7782-41-4	9.70E-01	1.00E-02
Fluorochloridone	61213-25-0	5.00E-01	1.00E-01
Fonofos	944-22-9	5.00E-01	1.00E-01
Formaldehyde	50-00-0	8.00E-01	0.00E+00
Formic acid	64-18-6	8.00E-01	0.00E+00
Furan	110-00-9	8.00E-01	0.00E+00
Furfural	98-01-1	8.00E-01	0.00E+00
Glycidylaldehyde	765-34-4	8.00E-01	0.00E+00
Glyphosate	1071-83-6	5.00E-01	1.00E-01
Heptachlor	76-44-8	7.20E-01	1.00E-01
Heptachlor epoxide	1024-57-3	7.20E-01	1.00E-01
Heptane, n-	142-82-5	8.00E-01	0.00E+00
Heptanoic acid, n-	111-14-8	5.00E-01	1.00E-01
Hexachlorobenzene	118-74-1	5.00E-01	1.00E-01
Hexachlorobutadiene	87-68-3	5.00E-01	1.00E-01
Hexachlorocyclohexane, alpha (alpha-BHC)	319-84-6	9.70E-01	4.00E-02
Hexachlorocyclohexane, beta (beta-BHC)	319-85-7	9.10E-01	4.00E-02
Hexachlorocyclohexane, delta (delta-BHC)	319-86-8	5.00E-01	4.00E-02
Hexachlorocyclohexane, gamma (lindane; gamma-BHC)	58-89-9	9.70E-01	4.00E-02
Hexachlorocyclohexane, techn (technical-BHC)	608-73-1	9.70E-01	4.00E-02
Hexachlorocyclopentadiene	77-47-4	5.00E-01	1.00E-01

ABS_{GI} and ABS.d Values

Last Revised: March 1, 2022

Chemical of Concern	CAS	ABS _{GI} (unitless)	ABS.d (unitless)
Hexachloroethane	67-72-1	5.00E-01	1.00E-01
Hexachlorophene	70-30-4	5.00E-01	1.00E-01
Hexachloropropylene	1888-71-7	5.00E-01	1.00E-01
Hexanal, 2-ethyl-	123-05-7	5.00E-01	1.00E-01
Hexane, n-	110-54-3	8.00E-01	0.00E+00
Hexanediamine, 1,6-	124-09-4	5.00E-01	1.00E-01
Hexanedinitrile	111-69-3	5.00E-01	1.00E-01
Hexanediol, 1,6-	629-11-8	5.00E-01	1.00E-01
Hexanoic acid	142-62-1	5.00E-01	1.00E-01
Hexanone, 2-	591-78-6	6.60E-01	0.00E+00
Hexazinone	51235-04-2	5.00E-01	1.00E-01
Hexene, 1-	592-41-6	8.00E-01	0.00E+00
Hexene, cis-2-	7688-21-3	8.00E-01	0.00E+00
Hexylene glycol (2-methyl-2,4-pentanediol)	107-41-5	5.00E-01	1.00E-01
Hydrazine	302-01-2	8.00E-01	0.00E+00
Hydrocaproic acid, 6- (6-hydroxyhexanoic acid)	1191-25-9	5.00E-01	1.00E-01
Hydrogen chloride (hydrochloric acid)*	7647-01-0	0.00E+00	0.00E+00
Hydroquinone	123-31-9	5.00E-01	1.00E-01
Indene	95-13-6	8.00E-01	0.00E+00
Indeno-1,2,3-cd-pyrene	193-39-5	8.90E-01	1.30E-01
Iron*	7439-89-6	0.00E+00	0.00E+00
Isoamyl alcohol	123-51-3	8.00E-01	0.00E+00
Isobutyl alcohol	78-83-1	8.00E-01	0.00E+00
Isobutylene (2-methyl-1-propene)	115-11-7	8.00E-01	0.00E+00
Isobutyric acid (2-methylpropanoic acid)	79-31-2	5.00E-01	1.00E-01
Isodecanol	25339-17-7	5.00E-01	1.00E-01
Isodrin	465-73-6	5.00E-01	1.00E-01
Isopentane	78-78-4	8.00E-01	0.00E+00
Isophorone	78-59-1	5.00E-01	1.00E-01
Isopropyl acetate	108-21-4	8.00E-01	0.00E+00

ABS_{GI} and ABS.d Values

Last Revised: March 1, 2022

Chemical of Concern	CAS	ABS _{GI} (unitless)	ABS.d (unitless)
Isopropyl alcohol	67-63-0	8.00E-01	0.00E+00
Isosafrole	120-58-1	5.00E-01	1.00E-01
Kelthane (dicofol)	115-32-2	5.00E-01	1.00E-01
Kepone (chlordecone)	143-50-0	5.00E-01	1.00E-01
Lead (inorganic)	7439-92-1	1.50E-01	1.00E-02
Leptophos	21609-90-5	5.00E-01	1.00E-01
Limonene, d-*	5989-27-5	0.00E+00	0.00E+00
Lithium	7439-93-2	8.00E-01	1.00E-02
Magnesium*	7439-95-4	0.00E+00	0.00E+00
Malathion	121-75-5	5.00E-01	1.00E-01
Maleic anhydride	108-31-6	5.00E-01	1.00E-01
Maleic hydrazide	123-33-1	5.00E-01	1.00E-01
Malononitrile	109-77-3	5.00E-01	1.00E-01
Mancozeb	8018-01-7	5.00E-01	1.00E-01
Manganese	7439-96-5	6.00E-02	1.00E-02
MCPA (4-(chloro-2-methylphenoxy) acetic acid)	94-74-6	5.00E-01	1.00E-01
MCPP (2-(4-chloro-2-methylphenoxy) propanoic acid)	93-65-2	5.00E-01	1.00E-01
Mercury (pH = 4.9)	7439-97-6	7.00E-02	1.00E-02
Mercury (pH=6.8)	7439-97-6	7.00E-02	1.00E-02
Merphos	150-50-5	5.00E-01	1.00E-01
Methacrylic acid (2-methyl-2-propenoic acid)	79-41-4	8.00E-01	0.00E+00
Methacrylonitrile	126-98-7	8.00E-01	0.00E+00
Methanol	67-56-1	8.00E-01	0.00E+00
Methapyrilene	91-80-5	5.00E-01	1.00E-01
Methomyl	16752-77-5	5.00E-01	1.00E-01
Methoxychlor	72-43-5	5.00E-01	1.00E-01
Methoxyethanol, 2-	109-86-4	8.00E-01	0.00E+00
Methyl acetate (acetic acid, methyl ester)	79-20-9	8.00E-01	0.00E+00
Methyl acrylate	96-33-3	8.00E-01	0.00E+00
Methyl amyl ketone (2-heptanone)	110-43-0	8.00E-01	0.00E+00

ABS_{GI} and ABS.d Values

Last Revised: March 1, 2022

Chemical of Concern	CAS	ABS _{GI} (unitless)	ABS.d (unitless)
Methyl chrysene, 1-	3351-28-8	8.90E-01	1.30E-01
Methyl chrysene, 2-	3351-32-4	8.90E-01	1.30E-01
Methyl chrysene, 6-	1705-85-7	8.90E-01	1.30E-01
Methyl cyclohexane	108-87-2	8.00E-01	0.00E+00
Methyl ethyl ketone (2-butanone)	78-93-3	8.00E-01	0.00E+00
Methyl iodide (iodomethane)	74-88-4	8.00E-01	0.00E+00
Methyl isobutyl ketone (4-methyl-2-pentanone)	108-10-1	8.00E-01	0.00E+00
Methyl mercury	22967-92-6	9.00E-01	1.00E-02
Methyl methacrylate	80-62-6	8.00E-01	0.00E+00
Methyl methanesulfonate	66-27-3	5.00E-01	1.00E-01
Methyl parathion	298-00-0	5.00E-01	1.00E-01
Methyl-1-butene, 2-	563-46-2	8.00E-01	0.00E+00
Methyl-1-propanal, 2- (isobutyraldehyde)	78-84-2	8.00E-01	0.00E+00
Methyl-2-butene, 2-	513-35-9	8.00E-01	0.00E+00
Methyl-2-pentenal, 2-	623-36-9	8.00E-01	0.00E+00
Methylcholanthrene, 3-	56-49-5	8.90E-01	1.30E-01
Methylene bromide (dibromomethane)	74-95-3	8.00E-01	0.00E+00
Methylene chloride (dichloromethane)	75-09-2	9.50E-01	0.00E+00
Methylene-bis (2-chloroaniline) 4,4'-	101-14-4	5.00E-01	1.00E-01
Methylmercury hydroxide	1184-57-2	5.00E-01	1.00E-01
Methylnaphthalene, 1-	90-12-0	8.90E-01	1.30E-01
Methylnaphthalene, 2-	91-57-6	8.90E-01	1.30E-01
Methylpyrrolidone, N-	872-50-4	5.00E-01	1.00E-01
Methylstyrene, alpha-	98-83-9	8.00E-01	0.00E+00
Methyltetrahydrofuran, 2-	96-47-9	8.00E-01	0.00E+00
Methyltetrahydropyran, 2-	10141-72-7	8.00E-01	0.00E+00
Metolachlor	51218-45-2	5.00E-01	1.00E-01
Metribuzin	21087-64-9	5.00E-01	1.00E-01
Mirex	2385-85-5	5.00E-01	1.00E-01
Molinate	2212-67-1	5.00E-01	1.00E-01

ABS_{GI} and ABS.d Values

Last Revised: March 1, 2022

Chemical of Concern	CAS	ABS _{GI} (unitless)	ABS.d (unitless)
Molybdenum	7439-98-7	3.80E-01	1.00E-02
Monocrotophos	2157-98-4	5.00E-01	1.00E-01
Morpholine	110-91-8	8.00E-01	0.00E+00
Morpholine, N-butyl-	1005-67-0	5.00E-01	1.00E-01
MTBE (methyl tert-butyl ether)	1634-04-4	8.00E-01	0.00E+00
Naled	300-76-5	5.00E-01	1.00E-01
Naphthalene	91-20-3	8.90E-01	1.30E-01
Naphthoquinone, 1,4-	130-15-4	5.00E-01	1.00E-01
Naphthylamine, 1-	134-32-7	5.00E-01	1.00E-01
Naphthylamine, 2-	91-59-8	5.00E-01	1.00E-01
Napropamide	15299-99-7	5.00E-01	1.00E-01
Neopentyl glycol	126-30-7	5.00E-01	1.00E-01
Nickel and compounds	7440-02-0	4.00E-02	1.00E-02
Nitrate-N	14797-55-8	5.00E-01	1.00E-02
Nitrite-N	14797-65-0	5.00E-01	1.00E-02
Nitroaniline, 2-	88-74-4	5.00E-01	1.00E-01
Nitroaniline, 3-	99-09-2	5.00E-01	1.00E-01
Nitroaniline, 4-	100-01-6	5.00E-01	1.00E-01
Nitrobenzene	98-95-3	9.70E-01	1.00E-01
Nitroglycerin	55-63-0	5.00E-01	1.00E-01
Nitrophenol, 2-	88-75-5	5.00E-01	1.00E-01
Nitrophenol, 3-	554-84-7	5.00E-01	1.00E-01
Nitrophenol, 4-	100-02-7	1.00E+00	1.00E-01
Nitropropane, 2-	79-46-9	8.00E-01	0.00E+00
Nitroquinoline-N-oxide, 4-	56-57-5	5.00E-01	1.00E-01
Nitrosodiethanolamine	1116-54-7	5.00E-01	1.00E-01
Nitrosodiethylamine, n-	55-18-5	8.00E-01	0.00E+00
Nitrosodimethylamine, n-	62-75-9	8.00E-01	0.00E+00
Nitrosodi-n-butylamine, n-	924-16-3	5.00E-01	1.00E-01
Nitrosodi-n-propylamine, n-	621-64-7	2.50E-01	1.00E-01

ABS_{GI} and ABS.d Values

Last Revised: March 1, 2022

Chemical of Concern	CAS	ABS _{GI} (unitless)	ABS.d (unitless)
Nitrosodiphenylamine	86-30-6	2.50E-01	1.00E-01
Nitroso-methyl-ethyl-amine, n-	10595-95-6	8.00E-01	0.00E+00
Nitrosomorpholine, N-	59-89-2	5.00E-01	1.00E-01
Nitroso-n-ethylurea, n-	759-73-9	5.00E-01	1.00E-01
Nitrosopiperidine, N-	100-75-4	5.00E-01	1.00E-01
Nitrosopyrrolidine, n-	930-55-2	5.00E-01	1.00E-01
Nitrotoluene, m-	99-08-1	5.00E-01	1.00E-01
Nitrotoluene, o-	88-72-2	5.00E-01	1.00E-01
Nitrotoluene, p-	99-99-0	5.00E-01	1.00E-01
Nonachlor, cis-	5103-73-1	5.00E-01	1.00E-01
Nonachlor, trans-	39765-80-5	5.00E-01	1.00E-01
Nonanal	124-19-6	5.00E-01	1.00E-01
Nonene, 1-n	124-11-8	8.00E-01	0.00E+00
Nonylphenol, 4-n-	104-40-5	5.00E-01	1.00E-01
Nonylphenol ethoxylate	9016-45-9	5.00E-01	1.00E-01
Octamethylpyrophosphoramidate	152-16-9	5.00E-01	1.00E-01
Octanone	106-68-3	8.00E-01	0.00E+00
Oxamyl	23135-22-0	5.00E-01	1.00E-01
Oxychlorthane	27304-13-8	5.00E-01	1.00E-01
Paraquat	1910-42-5	5.00E-01	1.00E-01
Parathion (ethyl parathion)	56-38-2	5.00E-01	1.00E-01
Pebulate	1114-71-2	5.00E-01	1.00E-01
Pendimethalin	40487-42-1	5.00E-01	1.00E-01
Pentachlorobenzene	608-93-5	5.00E-01	1.00E-01
Pentachloroethane	76-01-7	8.00E-01	0.00E+00
Pentachloronitrobenzene	82-68-8	5.00E-01	1.00E-01
Pentachlorophenol	87-86-5	7.60E-01	2.50E-01
Pentadiene, 1,3-cis-	1574-41-0	8.00E-01	0.00E+00
Pentadiene, 1,3-trans-	2004-70-8	8.00E-01	0.00E+00
Pentaerythritol tetranitrate (PETN)	78-11-5	5.00E-01	1.00E-01

ABS_{GI} and ABS.d Values

Last Revised: March 1, 2022

Chemical of Concern	CAS	ABS _{GI} (unitless)	ABS.d (unitless)
Pentane	109-66-0	8.00E-01	0.00E+00
Pentane, 2-methyl-	107-83-5	8.00E-01	0.00E+00
Pentane, 3-methyl-	96-14-0	8.00E-01	0.00E+00
Pentanediol, 1,5-	111-29-5	5.00E-01	1.00E-01
Pentanol, 1-	71-41-0	5.00E-01	0.00E+00
Pentanol, 4-methyl-2-	108-11-2	8.00E-01	0.00E+00
Pentanone, 2-	107-87-9	8.00E-01	0.00E+00
Pentene, 2-	109-68-2	8.00E-01	0.00E+00
Pentyne, 1-	627-19-0	8.00E-01	0.00E+00
Perchlorate	14797-73-0	2.00E-01	1.00E-02
Perfluorooctane sulfonic acid (1-Octanesulfonic acid, heptadecafluoro-1-) [PFOS]	1763-23-1	5.00E-01	1.00E-01
Perfluoroundecanoic acid (Undecanoic acid, uncosafluoro-) [PFUnDa]	2058-94-8	5.00E-01	1.00E-01
Perfluoropentanoic acid (Pentanoic acid, nonafluoro-) [PFPeA]	2706-90-3	5.00E-01	1.00E-01
Perfluorohexanoic acid (Hexanoic acid, undecafluoro-) [PFHxA]	307-24-4	5.00E-01	1.00E-01
Perfluorododecanoic acid (Dodecanoic acid, tricoxafluoro-) [PFDoA]	307-55-1	5.00E-01	1.00E-01
Perfluorooctanoic acid (Octanoic acid, pentadecafluoro-) [PFOA]	335-67-1	5.00E-01	1.00E-01
Perfluorodecanoic acid (Decanoic acid, nonadecafluoro-) [PFDA]	335-76-2	5.00E-01	1.00E-01
Perfluorodecane sulfonic acid (1-Decanesulfonic acid, heneicosafluoro-) [PFDS]	335-77-3	5.00E-01	1.00E-01
Perfluorohexane sulfonic acid (1-Hexanesulfonic acid, tridecafluoro-) [PFHxS]	355-46-4	5.00E-01	1.00E-01
Perfluorobutyric acid (Butanoic acid, heptafluoro-) [PFBA]	375-22-4	5.00E-01	1.00E-01
Perfluorobutane sulfonic acid (1-Butanesulfonic acid, nonafluoro-) [PFBS]	375-73-5	5.00E-01	1.00E-01
Perfluoroheptanoic acid (Heptanoic acid, tridecafluoro-) [PFHpA]	375-85-9	5.00E-01	1.00E-01
Perfluorononanoic acid (Nonanoic acid, heptadecafluoro-) [PFNA]	375-95-1	5.00E-01	1.00E-01
Perfluorotetradecanoic acid (Tetradecanoic acid, heptacosafuoro-) [PFTeDA]	376-06-7	5.00E-01	1.00E-01

ABS_{GI} and ABS.d Values

Last Revised: March 1, 2022

Chemical of Concern	CAS	ABS _{GI} (unitless)	ABS.d (unitless)
Perfluorotridecanoic acid (Tridecanoic acid, pentacosafuoro-) [PFTrDA]	72629-94-8	5.00E-01	1.00E-01
Perfluorooctane sulfonamide (1-Octanesulfonamide, heptadecafluoro-) [PFOSA]	754-91-6	5.00E-01	1.00E-01
Perylene	198-55-0	5.00E-01	1.00E-01
Phenacetin	62-44-2	5.00E-01	1.00E-01
Phenanthrene	85-01-8	8.90E-01	1.30E-01
Phenanthridine	229-87-8	5.00E-01	1.00E-01
Phenol	108-95-2	9.00E-01	1.00E-01
Phenol, 4-tert-butyl-	98-54-4	5.00E-01	1.00E-01
Phenothiazine	92-84-2	5.00E-01	1.00E-01
Phenyl mercuric acetate	62-38-4	5.00E-01	1.00E-01
Phenylene diamine, m-	108-45-2	5.00E-01	1.00E-01
Phenylene diamine, p-	106-50-3	5.00E-01	1.00E-01
Phorate	298-02-2	5.00E-01	1.00E-01
Phosalone	2310-17-0	5.00E-01	1.00E-01
Phosdrin (mevinphos)	7786-34-7	5.00E-01	1.00E-01
Phosmet	732-11-6	5.00E-01	1.00E-01
Phosphine	7803-51-2	2.00E-01	1.00E-02
Phosphorotrithioic acid, S,S,S-tributyl ester	78-48-8	5.00E-01	1.00E-01
Phosphorus, total*	7723-14-0	0.00E+00	0.00E+00
Phosphorus, white	7723-14-0	2.00E-01	1.00E-02
Phthalic anhydride	85-44-9	5.00E-01	1.00E-01
Picloram	1918-02-1	5.00E-01	1.00E-01
Picoline, 2- (2-methylpyridine)	109-06-8	8.00E-01	0.00E+00
Polybrominated biphenyls (PBBs)	67774-32-7	9.30E-01	1.00E-01
Polychlorinated biphenyls (PCBs)	1336-36-3	8.10E-01	1.40E-01
Potassium*	7440-09-7	0.00E+00	0.00E+00
Primene	68955-53-3	5.00E-01	1.00E-01
Prometon (pramitol)	1610-18-0	5.00E-01	1.00E-01
Prometryn	7287-19-6	5.00E-01	1.00E-01

ABS_{GI} and ABS.d Values

Last Revised: March 1, 2022

Chemical of Concern	CAS	ABS _{GI} (unitless)	ABS.d (unitless)
Pronamide	23950-58-5	5.00E-01	1.00E-01
Propanal (propionaldehyde)	123-38-6	8.00E-01	0.00E+00
Propane, 1-bromo-	106-94-5	8.00E-01	0.00E+00
Propanil	709-98-8	5.00E-01	1.00E-01
Propanoic acid (propionic acid)	79-09-4	8.00E-01	0.00E+00
Propanol, 1-	71-23-8	8.00E-01	0.00E+00
Propargite	2312-35-8	5.00E-01	1.00E-01
Propargyl alcohol	107-19-7	8.00E-01	0.00E+00
Propazine	139-40-2	5.00E-01	1.00E-01
Propham	122-42-9	5.00E-01	1.00E-01
Propionitrile (propane nitrile)	107-12-0	8.00E-01	0.00E+00
Propyl acetate, n-	109-60-4	8.00E-01	0.00E+00
Propylbenzene, n-	103-65-1	8.00E-01	0.00E+00
Propylene glycol	57-55-6	5.00E-01	1.00E-01
Propylene glycol monomethyl ether	107-98-2	8.00E-01	0.00E+00
Propylene oxide	75-56-9	8.00E-01	0.00E+00
Propylene tetramer	6842-15-5	5.00E-01	1.00E-01
Prothiofos (Tokuthion)	34643-46-4	5.00E-01	1.00E-01
Pyrene	129-00-0	8.90E-01	1.30E-01
Pyridine	110-86-1	8.00E-01	0.00E+00
Quinoline	91-22-5	5.00E-01	1.00E-01
Ronnel	299-84-3	5.00E-01	1.00E-01
Safrole	94-59-7	5.00E-01	1.00E-01
Selenium	7782-49-2	5.00E-01	1.00E-02
Selenourea	630-10-4	0.00E+00	0.00E+00
Silver	7440-22-4	4.00E-02	1.00E-02
Simazine	122-34-9	5.00E-01	1.00E-01
Sodium*	7440-23-5	0.00E+00	0.00E+00
Sodium hypochlorite	7681-52-9	2.00E-01	1.00E-02
Sodium polyacrylate	9003-04-7	8.00E-01	0.00E+00

ABS_{GI} and ABS.d Values

Last Revised: March 1, 2022

Chemical of Concern	CAS	ABS _{GI} (unitless)	ABS.d (unitless)
Strontium	7440-24-6	2.00E-01	1.00E-02
Strychnine	57-24-9	5.00E-01	1.00E-01
Styrene	100-42-5	8.00E-01	0.00E+00
Sulfate*	14808-79-8	0.00E+00	0.00E+00
Sulfide*	18496-25-8	0.00E+00	0.00E+00
Sulfolane	126-33-0	5.00E-01	1.00E-01
Sulfur*	7704-34-9	0.00E+00	0.00E+00
Sulprofos (Bolstar)	35400-43-2	5.00E-01	1.00E-01
Tebuconazole	107534-96-3	5.00E-01	1.00E-01
Tebuthiuron	34014-18-1	5.00E-01	1.00E-01
Terbufos	13071-79-9	5.00E-01	1.00E-01
Tert-amyl ethyl ether (TAEE)	919-94-8	8.00E-01	0.00E+00
Tert-amyl-methyl ether (TAME)	994-05-8	8.00E-01	0.00E+00
Tert-butyl alcohol (2-methyl-2-propanol)	75-65-0	8.00E-01	0.00E+00
Tetrachlorobenzene, 1,2,3,4-	634-66-2	5.00E-01	1.00E-01
Tetrachlorobenzene, 1,2,3,5-	634-90-2	5.00E-01	1.00E-01
Tetrachlorobenzene, 1,2,4,5-	95-94-3	5.00E-01	1.00E-01
Tetrachloroethane, 1,1,1,2-	630-20-6	8.00E-01	0.00E+00
Tetrachloroethane, 1,1,2,2-	79-34-5	7.00E-01	0.00E+00
Tetrachloroethylene (PCE)	127-18-4	1.00E+00	0.00E+00
Tetrachlorophenol, 2,3,4,5-	4901-51-3	5.00E-01	1.00E-01
Tetrachlorophenol, 2,3,4,6-	58-90-2	5.00E-01	1.00E-01
Tetrachlorophenol, 2,3,5,6-	935-95-5	5.00E-01	1.00E-01
Tetrachlorvinphos (Stiropfos)	22248-79-9	5.00E-01	1.00E-01
Tetradifon	116-29-0	5.00E-01	1.00E-01
Tetraethyl dithiopyrophosphate (sulfotep)	3689-24-5	5.00E-01	1.00E-01
Tetraethyl lead	78-00-2	5.00E-01	1.00E-01
Tetraethyl pyrophosphate (TEPP)	107-49-3	5.00E-01	1.00E-01
Tetraethylene glycol	112-60-7	5.00E-01	1.00E-01
Tetrahydrofuran	109-99-9	8.00E-01	0.00E+00

ABS_{GI} and ABS.d Values

Last Revised: March 1, 2022

Chemical of Concern	CAS	ABS _{GI} (unitless)	ABS.d (unitless)
Tetrahydropyran	142-68-7	8.00E-01	0.00E+00
Tetraoxadodecane, 2,5,8,11-	112-49-2	5.00E-01	1.00E-01
Thallium	7440-28-0	1.00E+00	1.00E-02
Thiofanox	39196-18-4	5.00E-01	1.00E-01
Thionazin	297-97-2	5.00E-01	1.00E-01
Thiophanate-methyl	23564-05-8	5.00E-01	1.00E-01
Thiram	137-26-8	5.00E-01	1.00E-01
Tin	7440-31-5	1.00E-01	1.00E-02
Titanium	7440-32-6	3.00E-02	1.00E-02
Toluene	108-88-3	8.00E-01	0.00E+00
Toluene diisocyanate, 2,4/2,6-	26471-62-5	5.00E-01	1.00E-01
Toluenediamine, 2,4-	95-80-7	5.00E-01	1.00E-01
Toluenediamine, 2,6-	823-40-5	5.00E-01	1.00E-01
Toluidine, o-	95-53-4	5.00E-01	1.00E-01
Toluidine, p-	106-49-0	5.00E-01	1.00E-01
Toxaphene	8001-35-2	5.00E-01	1.00E-01
TPH, TX1005, C6-C12	NA	8.00E-01	0.00E+00
TPH, TX1005, >C12-C28	NA	5.00E-01	1.00E-01
TPH, TX1005, >C12-C35	NA	5.00E-01	1.00E-01
TPH, TX1005, >C28-C35	NA	5.00E-01	1.00E-01
TP Silvex, 2,4,5-	93-72-1	5.00E-01	1.00E-01
Triademenol	55219-65-3	5.00E-01	1.00E-01
Triallate	2303-17-5	5.00E-01	1.00E-01

ABS_{GI} and ABS.d Values

Last Revised: March 1, 2022

Chemical of Concern	CAS	ABS _{GI} (unitless)	ABS.d (unitless)
Triaminotrinitrobenzene (TATB)	3058-38-6	5.00E-01	1.00E-01
Tributyltin oxide	56-35-9	5.00E-01	1.00E-01
Trichloro-1,2,2-trifluoroethane, 1,1,2-	76-13-1	8.00E-01	0.00E+00
Trichlorobenzene, 1,2,3-	87-61-6	5.00E-01	1.00E-01
Trichlorobenzene, 1,2,4-	120-82-1	9.70E-01	1.00E-01
Trichlorobenzene, 1,3,5-	108-70-3	5.00E-01	1.00E-01
Trichloroethane, 1,1,1-	71-55-6	9.00E-01	0.00E+00
Trichloroethane, 1,1,2-	79-00-5	8.10E-01	0.00E+00
Trichloroethylene (TCE)	79-01-6	1.00E+00	0.00E+00
Trichlorofluoromethane	75-69-4	2.30E-01	0.00E+00
Trichloronate	327-98-0	5.00E-01	1.00E-01
Trichlorophenol, 2,3,4-	15950-66-0	5.00E-01	1.00E-01
Trichlorophenol, 2,3,5-	933-78-8	5.00E-01	1.00E-01
Trichlorophenol, 2,3,6-	933-75-5	5.00E-01	1.00E-01
Trichlorophenol, 2,4,5-	95-95-4	5.00E-01	1.00E-01
Trichlorophenol, 2,4,6-	88-06-2	5.00E-01	1.00E-01
Trichlorophenol, 3,4,5-	609-19-8	5.00E-01	1.00E-01
Trichlorophenoxyacetic acid, 2,4,5-	93-76-5	5.00E-01	1.00E-01
Trichloropropane, 1,1,2-	598-77-6	8.00E-01	0.00E+00
Trichloropropane, 1,2,3-	96-18-4	8.00E-01	0.00E+00
Triethanolamine	102-71-6	5.00E-01	1.00E-01
Triethylamine	121-44-8	8.00E-01	0.00E+00

ABS_{GI} and ABS.d Values

Last Revised: March 1, 2022

Chemical of Concern	CAS	ABS _{GI} (unitless)	ABS.d (unitless)
Triethylene glycol	112-27-6	5.00E-01	1.00E-01
Triethylphosphorothioate, O, O, O-	126-68-1	5.00E-01	1.00E-01
Trifluralin	1582-09-8	5.00E-01	1.00E-01
Trimethylamine	75-50-3	8.00E-01	0.00E+00
Trimethylbenzene, 1,2,3-	526-73-8	9.70E-01	0.00E+00
Trimethylbenzene, 1,2,4-	95-63-6	8.00E-01	0.00E+00
Trimethylbenzene, 1,3,5-	108-67-8	8.00E-01	0.00E+00
Trinitrobenzene, 1,3,5-	99-35-4	6.50E-01	1.00E-01
Trinitrophenylmethylnitramine (tetryl; nitramine)	479-45-8	5.00E-01	1.00E-01
Trinitrotoluene, 2,4,6-	118-96-7	6.00E-01	1.00E-01
Tungsten (as sodium tungstate dihydride)	7440-33-7	2.00E-01	1.00E-01
Uranium (soluble salts)	7440-61-1	8.50E-01	1.00E-02
Valeric acid (pentanoic acid)	109-52-4	5.00E-01	1.00E-01
Vanadium	7440-62-2	2.60E-02	1.00E-02
Vernam	1929-77-7	5.00E-01	1.00E-01
Vinyl acetate	108-05-4	6.50E-01	0.00E+00
Vinyl chloride	75-01-4	1.00E+00	0.00E+00
Vinylcyclohexane	695-12-5	8.00E-01	0.00E+00
Warfarin	81-81-2	5.00E-01	1.00E-01
Xylene, m-	108-38-3	8.00E-01	0.00E+00
Xylene, o-	95-47-6	8.00E-01	0.00E+00
Xylene, p-	106-42-3	8.00E-01	0.00E+00
Xylenes	1330-20-7	9.20E-01	0.00E+00
Zinc	7440-66-6	2.00E-01	1.00E-02

ABS_{GI} and ABS.d Values

Last Revised: March 1, 2022

Chemical of Concern	CAS	ABS _{GI} (unitless)	ABS.d (unitless)
6 C aliphatics (TPH) (>53% n-hexane content)	NA	8.00E-01	0.00E+00
6 C aliphatics (TPH) (<53% n-hexane content)	NA	8.00E-01	0.00E+00
>6-8 C aliphatics (TPH) (>53% n-hexane content)	NA	8.00E-01	0.00E+00
>6-8 C aliphatics (TPH) (<53% n-hexane content)	NA	8.00E-01	0.00E+00
>8-10 C aliphatics (TPH)	NA	8.00E-01	0.00E+00
>10-12 C aliphatics (TPH)	NA	5.00E-01	1.00E-01
>12-16 C aliphatics (TPH)	NA	5.00E-01	1.00E-01
>16-21 C aliphatics (TPH)	NA	5.00E-01	1.00E-01
>16-21 C aliphatics (TPH) (for transformer mineral oil releases only)	NA	5.00E-01	1.00E-01
>21-35 C aliphatics (TPH)	NA	5.00E-01	1.00E-01
>21-35 C aliphatics (TPH) (for transformer mineral oil releases only)	NA	5.00E-01	1.00E-01
>7-8 C aromatics (TPH)	NA	8.00E-01	0.00E+00
>8-10 C aromatics (TPH)	NA	8.00E-01	0.00E+00
>10-12 C aromatics (TPH)	NA	5.00E-01	1.00E-01
>12-16 C aromatics (TPH)	NA	5.00E-01	1.00E-01
>16-21 C aromatics (TPH)	NA	5.00E-01	1.00E-01
>21-35 C aromatics (TPH)	NA	5.00E-01	1.00E-01

Footnotes

*Acetic acid; Ammonium polyphosphate; Ammonium salts; Calcium; Chloride; Ethylene; Hydrogen chloride (hydrochloric acid); Iron; Limonene, d-; Magnesium; Phosphorus, total; Potassium; Sodium; Sulfate; Sulfide; Sulfur. These compounds are not necessarily of concern from a human health standpoint, therefore calculation of human health-based values is not required. However, aesthetics and ecological criteria would still apply. See table entitled "Compounds for which Calculation of a Human Health PCL is Not Required" available on the TCEQ website at <http://www.tceq.texas.gov/remediation/trrp/trrppcls.html>.

This table show gastrointestinal and dermal absorption values used in calculating protective concentration levels.

end of worksheet

Toxicity Factor changes for 2011 PCL table update

Chemical of Concern	CAS	Class ¹	Ref ²	SFo (mg/kg- day) ⁻¹	Ref ²	RfD (mg/k g-day)	Ref ²	URF (ug/m3) ⁻¹	Ref ²	RfC ³ (mg/m ³)	Ref ²
Acetate, 2-ethoxyethanol	111-15-9	—	—	—	—	0.1	PPRTV	—	—	0.06	PPRTV
Acetate, isoamyl	123-92-2	—	—	—	—	—	—	—	—	delete value	—
Acetate, isobutyl	110-19-0	—	—	—	—	—	—	—	—	delete value	—
Acetate, sec-butyl	105-46-4	—	—	—	—	—	—	—	—	delete value	—
Acetone (2-propanone)	67-64-1	—	—	—	—	—	—	—	—	31	A
Acetophenone	98-86-2	—	—	—	—	—	—	—	—	delete value	—
Acifluorfen, sodium	62476-59-9	—	—	—	—	—	—	—	—	delete value	—
Acrolein	107-02-8	—	—	—	—	—	—	—	—	0.0005	T
Acrylamide	79-06-1	LC	—	—	—	—	—	—	—	—	—
Adipic acid (hexanedioic acid)	124-04-9	—	—	—	—	—	—	—	—	delete value	—
Allyl alcohol	107-18-6	—	—	—	—	—	—	—	—	0.0001	—
Aluminum	7429-90-5	—	—	—	—	—	—	—	—	0.005	PPRTV
Amino-2,6-dinitrotoluene, 4-	19406-51-0	—	—	—	—	—	—	—	—	delete value	—
Amino-4,6-dinitrotoluene, 2-	35572-78-2	—	—	—	—	—	—	—	—	delete value	—
Aminopyridine, 4-	504-24-5	—	—	—	—	—	—	—	—	delete value	—
Anthraquinone, 9,10-	84-65-1	LC	PPRTV	0.039	PPRTV	—	—	—	—	—	—
Antimony	7440-36-0	—	—	—	—	—	—	—	—	delete value	—
Asbestos	1332-21-4	—	—	—	—	—	—	URF removed	—	—	—
Atrazine	1912-24-9	—	—	—	—	—	—	—	—	delete value	—
Barium	7440-39-3	—	—	—	—	—	—	—	—	delete value	—
Benzaldehyde	100-52-7	—	—	—	—	—	—	—	—	delete value	—
Benzene	71-43-2	—	—	0.015	T	—	—	—	—	-	—
Benzenethiol	108-98-5	—	—	—	—	—	—	—	—	delete value	—
Benzoic acid	65-85-0	—	—	—	—	—	—	—	—	delete value	—
Benzotrichloride	98-07-7	—	—	—	—	—	—	—	—	delete value	—
Benzoyl peroxide	94-36-0	—	—	—	—	—	—	—	—	delete value	—
Benzyl alcohol	100-51-6	—	—	—	—	—	—	—	—	delete value	—
Benzyl dichloride	98-87-3	—	—	—	—	0.002	T	—	—	0.001	T

Toxicity Factor changes for 2011 PCL table update

Chemical of Concern	CAS	Class ¹	Ref ²	SFo (mg/kg- day) ⁻¹	Ref ²	RfD (mg/k g-day)	Ref ²	URF (ug/m3) ⁻¹	Ref ²	RfC ³ (mg/m ³)	Ref ²
Chlorobromomethane	74-97-5	—	—	—	—	—	—	—	—	delete value	—
Chloroethanol, 2-	107-07-3	—	—	—	—	—	—	—	—	delete value	—
Chloronitrobenzene, p- (1-chloro-4-nitrobenzene)	100-00-5	LC	PPRTV	—	—	—	—	—	—	—	—
Chlorophenol, 2-	95-57-8	—	—	—	—	—	—	—	—	delete value	—
Chlorophenol, 3-	108-43-0	—	—	—	—	—	—	—	—	delete value	—
Chlorophenol, 4-	106-48-9	—	—	—	—	—	—	—	—	delete value	—
Chlorotoluene, o- (2-chlorotoluene)	95-49-8	—	—	—	—	—	—	—	—	0.8	PPRTV
Chlorotoluene, p- (4-chlorotoluene)	106-43-4	—	—	—	—	0.02	PPRTV	—	—	delete value	—
Chlorpyrifos	2921-88-2	—	—	—	—	—	—	—	—	delete value	—
Cobalt	7440-48-4	LC	PPRTV	—	—	—	—	—	—	—	—
Copolymer acrylamide	69418-26-4	—	—	—	—	—	—	—	—	delete value	—
Copper	7440-50-8	—	—	—	—	—	—	—	—	delete value	—
Cresol	1319-77-3	—	—	—	—	—	—	—	—	delete value	—
Cresol, m- (3-methylphenol)	108-39-4	—	—	—	—	—	—	—	—	delete value	—
Cresol, o- (2-methylphenol)	95-48-7	—	—	—	—	—	—	—	—	delete value	—
Cresol, p- (4-methylphenol)	106-44-5	—	—	—	—	—	—	—	—	delete value	—
Crotonaldehyde	123-73-9	—	—	—	—	0.001	PPRTV	—	—	delete value	—
Cyanide	57-12-5	—	—	—	—	0.0006	—	—	—	0.0008	I
Cyanogen	460-19-5	—	—	—	—	0.001	—	—	—	0.0008	I
Cyclohexanol	108-93-0	—	—	—	—	—	—	—	—	delete value	—
Cyclohexanone	108-94-1	—	—	—	—	—	—	—	—	0.7	PPRTV
Cyclotetramethylenetetranitramine (HMX)	2691-41-0	—	—	—	—	—	—	—	—	delete value	—
Cyclotrimethylenetrinitramine (RDX)	121-82-4	—	—	—	—	—	—	—	—	delete value	—
Cymene (isopropyltoluene)	99-87-6	—	—	—	—	—	—	—	—	delete value	—
Diazinon	333-41-5	—	—	—	—	—	—	—	—	0.0001	T
Dibromo-3-chloropropane, 1,2-	96-12-8	LC	PPRTV	—	—	—	—	—	—	—	—
Dibromofluoromethane	1868-53-7	—	—	—	—	—	—	—	—	delete value	—
Dicamba	1918-00-9	—	—	—	—	—	—	—	—	delete value	—
Dichloro-2-butene, 1,4-	764-41-0	SEC	PPRTV	—	—	—	—	—	—	—	—

Toxicity Factor changes for 2011 PCL table update	

[illegible]

Toxicity Factor changes for 2011 PCL table update	

[illegible]

Toxicity Factor changes for 2011 PCL table update	

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Toxicity Factor changes for 2011 PCL table update	

[illegible]

Toxicity Factor changes for 2011 PCL table update	

[illegible]

Toxicity Factor changes for 2011 PCL table update	

[illegible]

Toxicity Factor changes for 2011 PCL table update	

[illegible]

Toxicity Factor changes for 2011 PCL table update

Chemical of Concern	CAS	Class ¹	Ref ²	SFo (mg/kg- day) ⁻¹	Ref ²	RfD (mg/k g-day)	Ref ²	URF (ug/m3) ⁻¹	Ref ²	RfC ³ (mg/m ³)	Ref ²
Vinylcyclohexane	695-12-5	—	—	—	—	—	—	—	—	delete value	—
Warfarin	81-81-2	—	—	—	—	—	—	—	—	delete value	—
6 C aliphatics (TPH)	NA	—	—	—	—	—	—	—	—	0.67	—
>6-8 C aliphatics (TPH)	NA	—	—	—	—	—	—	—	—	0.67	—
>8-10 C aliphatics (TPH)	NA	—	—	—	—	—	MA DEP	—	—	0.5	T
>10-12 C aliphatics (TPH)	NA	—	—	—	—	—	MA DEP	—	—	0.5	T
>12-16 C aliphatics (TPH)	NA	—	—	—	—	—	MA DEP	—	—	0.5	T
>16-21 C aliphatics (TPH)	NA	—	—	—	—	—	MA DEP	—	—	—	—
>7-8 C aromatics (TPH)	NA	—	—	—	—	—	—	—	—	1.9	—

For questions on toxicity factors, contact the Toxicology Section at 877-992-8370.

Footnotes

1 2005 carcinogen guideline class descriptors: LC = likely to be carcinogenic to humans; SEC = suggestive evidence of carcinogenic potential; NLC = not likely to be carcinogenic to humans; IIACP = inadequate information to assess carcinogenic potential. These descriptors may be specific to the exposure pathway for which a carcinogenic toxicity factor was developed.

2 Reference (Ref): A = ATSDR chronic MRL; CU = Cornell University Pesticide Management Education Program; EPA-OP = EPA Office of Pesticide Programs; H = HEAST, July, 1997; I = IRIS; MA DEP = Massachusetts Department of Environmental Protection; N = NCEA; NYSDOH = New York State Department of Health; OEHHHA = Cal/EPA Office of Environmental; PPRTV = EPA Provisional Peer Reviewed Toxicity Value; T = TCEQ Toxicology Division.

3 RS-ESL values have been rescinded by the Toxicology Division as more scientifically rigorous methods are available for the derivation of inhalation toxicity factors which impact the setting of regulatory standards (i.e., TRRP PCLs). Consequently, there are no RS-ESLs to serve as a source of inhalation toxicity factors for TRRP, and RS-ESLs have been removed from the Toxicity Factors table. Any newly developed inhalation values by the Toxicology Division will not be differentially termed as "RS-ESLs," but will be referred to as an RfC or URF (with "T" noted as the source for the Toxicology Division) and undergo a more scientifically rigorous derivation process. If inhalation may be the driving exposure pathway for a chemical in a particular instance (e.g., groundwater-to-air or subsurface-soil-to-air for class 3 groundwater) but no inhalation toxicity factors are listed in the TRRP Toxicity Factors table, then contact the TCEQ to request that an inhalation toxicity factor and PCLs be derived. See the general process for requesting a PCL at <http://www.tceq.texas.gov/remediation/trrp/pclrequests.html>.

This table shows the 2011 changes to the protective concentration level tables
end of worksheet

ATTACHMENT 2

PACE QUALITY MANUAL AND CERTIFICATIONS

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 1 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

QUALITY ASSURANCE MANUAL

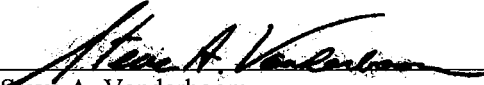
Quality Assurance/Quality Control Policies and Procedures

Pace Analytical Services – Kansas

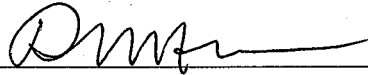
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06-05-2012
 Date

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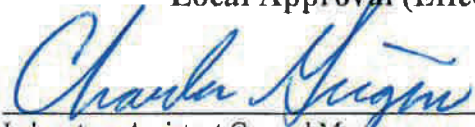
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Pace Analytical Services – Kansas

Local Approval (Effective upon final signature.)


Laboratory Assistant General Manager

Charles Girgin, 913-599-5665

6/7/12

Date



Laboratory Quality Manager
Jim Brownfield, 913-599-5665

6/7/12

Date



Laboratory Technical Director, Frontenac
Tim Harrell, 620-235-0003

6/5/12

Date

The Technical Director(s) and the Quality Manager, however named, nominate the following personnel to act as deputies in case of absence.



Organics Manager
Harry Borg, 913-599-5665

6/7/12

Date



Inorganics Manager
Tim Gramling, 913-599-5665

6/7/12

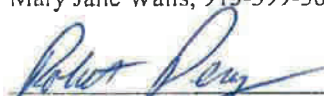
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Client Services Manager
Mary Jane Walls, 913-599-5665

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Date



Quality Assurance Analyst
Robert Perez, 913-599-5665

6/7/12

Date

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	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 3 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

Table of Contents

1.0. INTRODUCTION AND ORGANIZATIONAL STRUCTURE	5
1.1. INTRODUCTION TO PASI	5
1.2. STATEMENT OF PURPOSE	5
1.3. QUALITY POLICY STATEMENT AND GOALS OF THE QUALITY SYSTEM	5
1.4. CORE VALUES	5
1.5. CODE OF ETHICS	6
1.6. STANDARDS OF CONDUCT	7
1.7. LABORATORY ORGANIZATION	7
1.8. LABORATORY JOB DESCRIPTIONS	9
1.9. TRAINING AND ORIENTATION	15
1.10. DATA INTEGRITY SYSTEM	16
1.11. LABORATORY SAFETY	16
1.12. SECURITY AND CONFIDENTIALITY	16
1.13. COMMUNICATIONS	17
2.0. SAMPLE CUSTODY	18
2.1. SAMPLING SUPPORT	18
2.2. FIELD SERVICES	18
2.3. PROJECT INITIATION	19
2.4. CHAIN OF CUSTODY	19
2.5. SAMPLE ACCEPTANCE POLICY	20
2.6. SAMPLE LOG-IN	21
2.7. SAMPLE STORAGE	22
2.8. SAMPLE PROTECTION	24
2.9. SUBCONTRACTING ANALYTICAL SERVICES	24
2.10. SAMPLE RETENTION AND DISPOSAL	25
3.0. ANALYTICAL CAPABILITIES	26
3.1. ANALYTICAL METHOD SOURCES	26
3.2. ANALYTICAL METHOD DOCUMENTATION	26
3.3. ANALYTICAL METHOD VALIDATION	26
3.4. DEMONSTRATION OF CAPABILITY (DOC)	26
3.5. REGULATORY AND METHOD COMPLIANCE	27
4.0. QUALITY CONTROL PROCEDURES	29
4.1. METHOD BLANK	28
4.2. LABORATORY CONTROL SAMPLE	28
4.3. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)	30
4.4. SAMPLE DUPLICATE	30
4.5. SURROGATES	31
4.6. INTERNAL STANDARDS	31
4.7. FIELD BLANKS	31
4.8. TRIP BLANKS	31
4.9. LIMIT OF DETECTION (LOD)	32
4.10. LIMIT OF QUANTITATION (LOQ)	33
4.11. ESTIMATE OF ANALYTICAL UNCERTAINTY	33
4.12. PROFICIENCY TESTING (PT) STUDIES	33
4.13. ROUNDING AND SIGNIFICANT FIGURES	34
4.14. RETENTION TIME WINDOWS	35

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	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 4 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

5.0. DOCUMENT MANAGEMENT AND CHANGE CONTROL	36
5.1. DOCUMENT MANAGEMENT	36
5.2. DOCUMENT CHANGE CONTROL	37
5.3. MANAGEMENT OF CHANGE	38
6.0. EQUIPMENT AND MEASUREMENT TRACEABILITY	39
6.1. STANDARDS AND TRACEABILITY	39
6.2. GENERAL ANALYTICAL INSTRUMENT CALIBRATION PROCEDURES	39
6.3. SUPPORT EQUIPMENT CALIBRATION PROCEDURES	43
6.4. INSTRUMENT/EQUIPMENT MAINTENANCE	44
7.0. CONTROL OF DATA	46
7.1. ANALYTICAL RESULTS PROCESSING	46
7.2. DATA VERIFICATION	46
7.3. DATA REPORTING	47
7.4. DATA SECURITY	49
7.5. DATA ARCHIVING	50
7.6. DATA DISPOSAL	50
8.0. QUALITY SYSTEM AUDITS AND REVIEWS	51
8.1. INTERNAL AUDITS	51
8.2. EXTERNAL AUDITS	53
8.3. QUARTERLY QUALITY REPORTS	53
8.4. ANNUAL MANAGERIAL REVIEW	54
8.5. CUSTOMER SERVICE REVIEWS	54
9.0. CORRECTIVE ACTIONS	58
9.1. CORRECTIVE ACTION DOCUMENTATION	56
9.2. CORRECTIVE ACTION COMPLETION	57
9.3. PREVENTIVE ACTION DOCUMENTATION	58
10.0. GLOSSARY	60
11.0. REFERENCES	76
12.0. REVISIONS	77
ATTACHMENT I- QUALITY CONTROL CALCULATIONS	79
ATTACHMENT IIA- LABORATORY ORGANIZATIONAL CHART	81
ATTACHMENT IIB- CORPORATE ORGANIZATIONAL CHART	82
ATTACHMENT III- EQUIPMENT LIST	83
ATTACHMENT IV- LABORATORY FLOOR PLAN	86
ATTACHMENT V- LABORATORY SOP LIST	88
ATTACHMENT VI- LABORATORY CERTIFICATION LIST	91
ATTACHMENT VII- PACE CHAIN-OF-CUSTODY	92
ATTACHMENT VIII- METHOD HOLD TIME, CONTAINER AND PRESERVATION GUIDE	93

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	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 5 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

1.0. INTRODUCTION AND ORGANIZATIONAL STRUCTURE

“Working together to protect our environment and improve our health”

Pace Analytical Services Inc. - Mission Statement

1.1. Introduction to PASI

1.1.1. Pace Analytical Services, Inc. (PASI) is a privately held, full-service analytical testing firm operating a nationwide system of laboratories. PASI offers extensive services beyond standard analytical testing, including: bioassay for aquatic toxicity, air toxics, industrial hygiene testing, explosives, dioxins and coplanar PCB's by high resolution mass spectroscopy , radiochemical analyses, product testing, pharmaceutical testing, field services and mobile laboratory capabilities. PASI has implemented a consistent Quality System in each of its laboratories and service centers. In addition, the company utilizes an advanced data management system that is highly efficient and allows for flexible data reporting. Together, these systems ensure data reliability and superior on-time performance. This document defines the Quality System and QA/QC protocols.

1.1.2. Our goal is to combine our expertise in laboratory operations with customized solutions to meet the specific needs of our customers.

1.2. Statement of Purpose

1.2.1. To meet the business needs of our customers for high quality, cost-effective analytical measurements and services.

1.3. Quality Policy Statement and Goals of the Quality System

1.3.1. PASI management is committed to maintaining the highest possible standard of service for our customers by following a documented quality system. The overall objective of this quality system is to provide reliable data of known quality through adherence to rigorous quality assurance policies and quality control procedures as documented in this Quality Assurance Manual.

1.3.2. All personnel within the PASI network are required to be familiar with all facets of the quality system relevant to their position and implement these policies and procedures in their daily work. This daily focus on quality is applied with initial project planning, continued through all field and laboratory activities, and is ultimately included in the final report generation.

1.3.3. PASI management demonstrates its commitment to quality by providing the resources, including facilities, equipment, and personnel to ensure the adherence to these documented policies and procedures and to promote the continuous improvement of the quality system. All PASI personnel must comply with all current applicable state, federal, and industry standards, and are required to perform all tests in accordance with stated methods and customer requirements.

1.4. Core Values

1.4.1. **Integrity-** Pace personnel are required to abide by the PASI Code of Ethics and all Pace employees must go through Data Integrity/Ethics training upon initial orientation and as an annual refresher.

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 6 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

1.4.2. **Value Employees-** Pace management views employees as our most important asset and communicates to them the relevance and importance of their activities within their job functions and how they contribute to the achievement of the objectives of the quality management system.

1.4.3. **Know Our Customers-** Pace makes every effort to know our customers and address their sampling and analytical needs. More information on this item can be found in section 2.0.

1.4.4. **Honor Commitments-** Pace labs focus on making solid commitments with regards to quality, capacity, and agreed upon turnaround time to our customers.

1.4.5. **Flexible Response To Demand-** Pace labs are equipped with both the material and personnel resources to enable them to be responsive to the demands of customers when situations or projects need change.

1.4.6. **Pursue Opportunities-** Pace is committed to pursuing opportunities for the growth of the company by constantly exploring markets and areas where we can expand.

1.4.7. **Continuously Improve-** Pace has committed much time and effort into establishing a continuous improvement program where company personnel meet on a regular basis to share ideas in cost reduction, production improvement and standardization in order to develop best practices. This information, as well as company financial and production metrics, are tracked, evaluated, and shared with each Pace facility.

1.5. Code of Ethics

1.5.1. PASI's fundamental ethical principles are as follows:

1.5.1.1. Each PASI employee is responsible for the propriety and consequences of his or her actions;

1.5.1.2. Each PASI employee must conduct all aspects of Company business in an ethical and strictly legal manner, and must obey the laws of the United States and of all localities, states and nations where PASI does business or seeks to do business;

1.5.1.3. Each PASI employee must reflect the highest standards of honesty, integrity and fairness on behalf of the Company with customers, suppliers, the public, and one another.

1.5.1.4. Each PASI employee must recognize and understand that our daily activities in environmental laboratories affect public health as well as the environment and that environmental laboratory analysts are a critical part of the system society depends upon to improve and guard our natural resources:

1.5.2. Strict adherence by each PASI employee to this Code of Ethics and to the Standards of Conduct is essential to the continued vitality of PASI and to continue the pursuit of our common mission to protect our environment and improve our health.

1.5.3. Failure to comply with the Code of Ethics and Standards of Conduct will result in disciplinary action up to and including termination and referral for civil or criminal prosecution where appropriate. An employee will be notified of an infraction and given an opportunity to explain, as prescribed under current disciplinary procedures.

1.5.4. Any Pace employee can contact corporate management to report an ethical concern by calling the anonymous hotline at 612-607-6431.

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 7 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

1.6. Standards of Conduct

1.6.1. Data Integrity

1.6.1.1. The accuracy and integrity of the analytical results and its supporting documentation produced at PASI are the cornerstones of the company. Lack of data integrity is an assault on our most basic values putting PASI and its employees at grave financial and legal risk and will not be tolerated. Therefore, employees are to accurately prepare and maintain all technical records, scientific notebooks, calculations, and databases. Employees are prohibited from making false entries or misrepresentations of data for any reason.

1.6.1.2. Managerial staff must make every effort to ensure that personnel are free from any undue pressures that may affect the quality or integrity of their work including commercial, financial, over-scheduling, and working condition pressures.

1.6.2. Confidentiality

1.6.2.1. PASI employees must not use or disclose confidential or proprietary information except when in connection with their duties at PASI. This is effective over the course of employment and for an additional period of two years thereafter.

1.6.2.2. Confidential or proprietary information, belonging to either PASI and/or its customers, includes but is not limited to test results, trade secrets, research and development matters, procedures, methods, processes and standards, company-specific techniques and equipment, marketing and customer information, inventions, materials composition, etc.

1.6.3. Conflict of Interest

1.6.3.1. PASI employees must avoid situations that might involve a conflict of interest or could appear questionable to others. The employee must be careful in two general areas:

1.6.3.1.1. Participation in activities that conflict or appear to conflict with the employees' PASI responsibilities.

1.6.3.1.2. Offering or accepting anything that might influence the recipient or cause another person to believe that the recipient may be influenced to behave or in a different manner than he would normally. This includes bribes, gifts, kickbacks, or illegal payments.

1.6.3.2. Employees are not to engage in outside business or economic activity relating to a sale or purchase by the Company. Other problematic activities include service on the Board of Directors of a competing or supplier company, significant ownership in a competing or supplier company, employment for a competing or supplier company, or participation in any outside business during the employee's work hours.

1.6.4. Compliance

1.6.4.1. All employees are required to read, understand, and comply with the various components of the standards listed in this document. As confirmation that they understand their responsibility, each employee is required to sign an acknowledgment form annually that then becomes part of the employee's permanent record. Employees will be held accountable for complying with the Quality Systems as summarized in the Quality Assurance Manual.

1.7. Laboratory Organization

1.7.1. The PASI Corporate Office centralizes company-wide accounting, business development, financial management, human resources development, information systems, marketing, quality,

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 8 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

safety, and training activities. PASI's Director of Quality is responsible for assisting the development, implementation and monitoring of quality programs for the company. See Attachment IIB for the Corporate Organizational structure.

1.7.2. Each laboratory within the system operates with local management, but all labs share common systems and receive support from the Corporate Office.

1.7.3. A Senior General Manager (SGM) oversees all laboratories and service centers in their assigned region. Each laboratory or facility in the company is then directly managed by an SGM, a General Manager (GM), an Assistant General Manager (AGM), or an Operations Manager (OM). Quality Managers (QM) or Senior Quality Managers (SQM) at each laboratory report directly to the highest level of local laboratory management, however named, that routinely makes day-to-day decisions regarding that facility's operations. The QMs and SQMs will also receive guidance and direction from the corporate Director of Quality.

1.7.4. The SGM, GM, AGM or OM, or equivalent functionality in each facility, bears the responsibility for the laboratory operations and serves as the final, local authority in all matters. In the absence of these managers, the SQM/QM serves as the next in command. He or she assumes the responsibilities of the manager, however named, until the manager is available to resume the duties of their position. In the absence of both the manager and the SQM/QM, management responsibility of the laboratory is passed to the Technical Director, provided such a position is identified, and then to the most senior department manager until the return of the lab manager or SQM/QM. The most senior department manager in charge may include the Client Services Manager or the Administrative Business Manager at the discretion of the SGM/GM/AGM/OM.

1.7.5. A Technical Director who is absent for a period of time exceeding 15 consecutive calendar days shall designate another full-time staff member meeting the qualifications of the technical director to temporarily perform this function. The laboratory SGM/GM/AGM/OM or SQM/QM has the authority to make this designation in the event the existing Technical Director is unable to do so. If this absence exceeds 35 consecutive calendar days, the primary accrediting authority shall be notified in writing.

1.7.6. The SQM/QM has the responsibility and authority to ensure the Quality System is implemented and followed at all times. In circumstances where a laboratory is not meeting the established level of quality or following the policies set forth in this Quality Assurance Manual, the SQM/QM has the authority to halt laboratory operations should he or she deem such an action necessary. The SQM/QM will immediately communicate the halting of operations to the SGM/GM/AGM/OM and keep them posted on the progress of corrective actions. In the event the SGM/GM/AGM/OM and the SQM/QM are not in agreement as to the need for the suspension, the Chief Operating Officer and Director of Quality will be called in to mediate the situation.

1.7.7. The technical staff of the laboratory is generally organized into the following functional groups:

- Organic Sample Preparation
- Wet Chemistry Analysis
- Metals Analysis
- Volatiles Analysis
- Semi-volatiles Analysis
- Radiochemical Analysis
- Microbiology

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 9 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

1.7.8. Appropriate support groups are present in each laboratory. The actual organizational structure for PASI – Kansas is listed in Attachment IIA. In the event of a change in SGM/GM/AGM/OM, SQM/QM, or any Technical Director, the laboratory will notify its accrediting authorities and revise the organizational chart in the Quality Assurance Manual (QAM) within 30 days. For changes in Department Managers or Supervisors or other laboratory personnel, no notifications will be sent to the laboratory's accrediting agencies; changes to the organizational chart will be updated during or prior to the annual review process. Changes or additions in these key personnel will also be noted by additional signatures on the QAM, as applicable. In any case, the QAM will remain in effect until the next scheduled revision.

1.8. Laboratory Job Descriptions

1.8.1. Senior General Manager

- Oversees all functions of all the operations within their designated region;
- Oversees the development of local GMs/AGMs/OMs within their designated region;
- Oversees and authorizes personnel development including staffing, recruiting, training, workload scheduling, employee retention and motivation;
- Oversees the preparation of budgets and staffing plans for all operations within their designated region;
- Ensures compliance with all applicable state, federal and industry standards;
- Works closely with Regional Sales Management.

1.8.2. General Manager

- Oversees all functions of their assigned operations;
- Authorizes personnel development including staffing, recruiting, training, workload scheduling, employee retention and motivation;
- Prepares budgets and staffing plans;
- Monitors the Quality Systems of the laboratory and advises the SQM/QM accordingly;
- Ensures compliance with all applicable state, federal and industry standards.

1.8.3. Assistant General Manager / Operations Manager

- In the absence of the SGM/GM, performs all duties as listed above for the SGM or GM;
- Oversees the daily production and quality activities of all departments;
- Manages all departments and works with staff to ensure department objectives are met;
- Works with all departments to ensure capacity and customer expectations are accurately understood and met;
- Works with SGM/GM to prepare appropriate budget and staffing plans for all departments;
- Responsible for prioritizing personnel and production activities within all departments;
- Performs formal and informal performance reviews of departmental staff.

1.8.4. Senior Quality Manager

- Provides quality oversight for multiple laboratories where there is not a local quality manager or for labs where there are multiple and separately distinct quality systems in the same facility;

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 10 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

- Responsible for implementing, maintaining and improving the quality system while functioning independently from laboratory operations. Reports directly to the highest level of local laboratory facility management, however named, that routinely makes day-to-day decisions regarding laboratory operations, but receives direction and assistance from the Corporate Director of Quality;
- Ensures that communication takes place at all levels within the lab regarding the effectiveness of the quality system and that all personnel understand their contributions to the quality system;
- Monitors Quality Assurance/Quality Control activities to ensure that the laboratory achieves established standards of quality (as set forth by the Corporate Quality office). The Quality Manager is responsible for reporting the lab's level of compliance to these standards to the Corporate Director of Quality on a quarterly basis;
- Maintains records of quality control data and evaluates data quality;
- Conducts periodic internal audits and coordinates external audits performed by regulatory agencies or customer representatives;
- Reviews and maintains records of proficiency testing results;
- Maintains the document control system;
- Assists in development and implementation of appropriate training programs;
- Provides technical support to laboratory operations regarding methodology and project QA/QC requirements;
- Maintains certifications from federal and state programs;
- Ensures compliance with all applicable state, federal and industry standards;
- Maintains the laboratory training records, including those in the Learning Management System (LMS), and evaluates the effectiveness of training;
- Monitors correctives actions;
- Maintains the currency of the Quality Manual.

1.8.5. Quality Manager

- Responsible for implementing, maintaining and improving the quality system while functioning independently from laboratory operations. Reports directly to the highest level of local laboratory facility management, however named, that routinely makes day-to-day decisions regarding laboratory operations, but receives direction and assistance from the Corporate Director of Quality. They may also report to a Senior Quality Manager within the same facility;
- Ensures that communication takes place at all levels within the lab regarding the effectiveness of the quality system and that all personnel understand their contributions to the quality system;
- Monitors Quality Assurance/Quality Control activities to ensure that the laboratory achieves established standards of quality (as set forth by the Corporate Quality office). The Quality Manager is responsible for reporting the lab's level of compliance to these standards to the Corporate Director of Quality on a quarterly basis;
- Maintains records of quality control data and evaluates data quality;
- Conducts periodic internal audits and coordinates external audits performed by regulatory agencies or customer representatives;
- Reviews and maintains records of proficiency testing results;
- Maintains the document control system;
- Assists in development and implementation of appropriate training programs;

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 11 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

- Provides technical support to laboratory operations regarding methodology and project QA/QC requirements;
- Maintains certifications from federal and state programs;
- Ensures compliance with all applicable state, federal and industry standards;
- Maintains the laboratory training records, including those in the Learning Management System (LMS), and evaluates the effectiveness of training;
- Monitors correctives actions;
- Maintains the currency of the Quality Manual.

1.8.6. Quality Analyst

- Assists the SQM/QM in the performance of quality department responsibilities as delegated by the SQM/QM;
- Assists in monitoring QA/QC data;
- Assists in internal audits;
- Assists in maintaining training records;
- Assists in maintaining the document control system;

1.8.7. Technical Director

- Monitors the standards of performance in quality assurance and quality control data;
- Monitors the validity of analyses performed and data generated;
- Reviews tenders, contracts and QAPPs to ensure the laboratory can meet the data quality objectives for any given project;
- Serves as the manager of the laboratory in the absence of the SGM/GM/AGM/OM and SQM/QM;
- Provides technical guidance in the review, development, and validation of new methodologies.

1.8.8. Administrative Business Manager

- Responsible for financial and administrative management for the entire facility;
- Provides input relative to tactical and strategic planning activities;
- Organizes financial information so that the facility is run as a fiscally responsible business;
- Works with staff to confirm that appropriate processes are put in place to track revenues and expenses;
- Provide ongoing financial information to the SGM/GM/AGM/OM and the management team so they can better manage their business;
- Utilizes historical information and trends to accurately forecast future financial positions;
- Works with management to ensure that key measurements are put in place to be utilized for trend analysis—this will include personnel and supply expenses, and key revenue and expense ratios;
- Works with SGM/GM/AGM/OM to develop accurate budget and track on an ongoing basis;
- Works with entire management team to submit complete and justified capital budget requests and to balance requests across departments;
- Works with project management team and administrative support staff to ensure timely and accurate invoicing.

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 12 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

1.8.9. Client Services Manager

- Oversees all the day to day activities of the Client Services Department which includes Project Management and, possibly, Sample Control;
- Responsible for staffing and all personnel management related issues for Client Services;
- Serves as the primary senior consultant to customers on all project related issues such as set up, initiation, execution and closure;
- Performs or is capable of performing all duties listed for that of Project Manager.

1.8.10. Project Manager

- Coordinates daily activities including taking orders, reporting data and analytical results;
- Serves as the primary technical and administrative liaison between customers and PASI;
- Communicates with operations staff to update and set project priorities;
- Provides results to customers in the requested format (verbal, hardcopy, electronic, etc.);
- Works with customers, laboratory staff, and other appropriate PASI staff to develop project statements of work or resolve problems of data quality;
- Responsible for solicitation of work requests, assisting with proposal preparation and project initiation with customers and maintain customer records;
- Mediation of project schedules and scope of work through communication with internal resources and management;
- Responsible for preparing routine and non-routine quotations, reports and technical papers;
- Interfaces between customers and management personnel to achieve customer satisfaction;
- Manages large-scale complex projects;
- Supervises less experienced project managers and provide guidance on management of complex projects;
- Arranges bottle orders and shipment of sample kits to customers;
- Verifies login information relative to project requirements and field sample Chains-of-Custody.

1.8.11. Project Coordinator

- Responsible for preparation of project specifications and provides technical/project support;
- Coordinates project needs with other department sections and assists with proposal preparation;
- Prepares routine proposals and invoicing;
- Responsible for scanning, copying, assembling and binding final reports;
- Other duties include filing, maintaining forms, process outgoing mail, maintaining training database and data entry.

1.8.12. Department Manager/Supervisor

- Oversees the day-to-day production and quality activities of their assigned department;
- Ensures that quality assurance and quality control criteria of analytical methods and projects are satisfied;
- Assesses data quality and takes corrective action when necessary;

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 13 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

- Approves and releases technical and data management reports;
- Ensures compliance with all applicable state, federal and industry standards.

1.8.13. Group Supervisor/Leader

- Trains analysts in laboratory operations and analytical procedures;
- Organizes and schedules analyses with consideration for sample holding times;
- Implements data verification procedures by assigning data verification duties to appropriate personnel;
- Evaluates instrument performance and supervises instrument calibration and preventive maintenance programs;
- Reports non-compliance situations to laboratory management including the SQM/QM.

1.8.14. Laboratory Analyst

- Performs detailed preparation and analysis of samples according to published methods and laboratory procedures;
- Processes and evaluates raw data obtained from preparation and analysis steps;
- Generates final results from raw data, performing primary review against method criteria;
- Monitors quality control data associated with analysis and preparation. This includes examination of raw data such as chromatograms as well as an inspection of reduced data, calibration curves, and laboratory notebooks;
- Reports data in LIMS, authorizing for release pending secondary approval;
- Conducts routine and non-routine maintenance of equipment as required;
- Performs or is capable of performing all duties associated with that of Laboratory Technician.

1.8.15. Laboratory Technician

- Prepares standards and reagents according to published methods or in house procedures;
- Performs preparation and analytical steps for basic laboratory methods;
- Works under the direction of a Laboratory Analyst on complex methodologies;
- Assists Laboratory Analysts on preparation, analytical or data reduction steps for complex methodologies;
- Monitors quality control data as required or directed. This includes examination of raw data such as chromatograms as well as an inspection of reduced data, calibration curves, and laboratory notebooks.

1.8.16. Field Technician

- Prepares and samples according to published methods, PASI Quality Assurance Manual and/or customer directed sampling objectives;
- Capable of the collection of representative environmental or process related air samples;
- Use computer software to compile, organize, create tables, create graphics and write test reports;
- Reviews project documentation for completeness, method compliance and contract fulfillment;

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 14 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

- Train less experienced environmental technicians and provide guidance on sampling and analysis;
- Responsible for project initiation and contact follow-up;
- Develop sampling plans and prepare test plan documents.

1.8.17. Field Analyst

- Analyzes field samples according to published methods, PASI Quality Assurance Manual and/or customer directed sampling objectives,
- Capable of the collection and analysis of representative environmental or process related air samples,
- Proficient in a variety of analytical tests; specifically on-site gas-phase organic and inorganic compounds by extractive fourier transform infrared spectroscopy (FTIR),
- Train less experienced staff and provide guidance on FTIR sampling and analysis,
- Assist in reporting tasks and project management responsibilities, and
- Perform back-up support for manager tasks such as reporting needs and customer concerns.

1.8.18. Sample Management Personnel

- Signs for incoming samples and verifies the data entered on the Chain of custody forms;
- Enters the sample information into the Laboratory Information Management System (LIMS) for tracking and reporting;
- Stages samples according to EPA requirements;
- Assists Project Managers and Coordinators in filling bottle orders and sample shipments.

1.8.19. Systems Administrator or Systems Manager

- Assists with the creation and maintenance of electronic data deliverables (EDDs);
- Coordinates the installation and use of all hardware, software and operating systems;
- Performs troubleshooting on all aforementioned systems;
- Trains new and existing users on systems and system upgrades;
- Maintains all system security passwords;
- Maintains the electronic backups of all computer systems.

1.8.20. Safety/Chemical Hygiene Officer

- Maintains the laboratory Chemical Hygiene Plan;
- Plans and implements safety policies and procedures;
- Maintains safety records;
- Organizes and/or performs safety training;
- Performs safety inspections and provides corrective/preventative actions;
- Assists personnel with safety issues.

1.8.21. Program Director/Hazardous Waste Coordinator (or otherwise named)

- Evaluates waste streams and helps to select appropriate waste transportation and disposal companies;

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 15 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

- Maintains complete records of waste disposal including waste manifests and state reports;
- Assists in training personnel on waste-related issues such as waste handling and storage, waste container labeling, proper satellite accumulation, secondary containment, etc.;
- Conducts a weekly inspection of the waste storage areas of the laboratory.

1.9. Training and Orientation

1.9.1. Training for Pace employees is managed through a web-based Learning Management System. After a new employee has been instructed in matters of human resources, they are given instructional materials for the LMS and a password for access.

1.9.2. A new hire training checklist is provided to the new employee that lists training items for the employee to work through either independently on LMS or with their supervisor or trainer. The training items that can be completed independently include:

- Reading through applicable Standard Operating Procedures;
- Reviewing the Quality Manual and Chemical Hygiene Plan;
- Core training modules such as quality control indicators, basic laboratory skills, etc.;
- Quality Systems training including traceability of measurements, method calibration, calibration verification, accuracy, precision and uncertainty of measurements, corrective actions, documentation, and root cause analysis;
- Data Integrity/Ethics training.

1.9.3. The new employee's Department Supervisor provides the employee with a basic understanding of the role of the laboratory within the structure of PASI and the basic elements of that individual's position. Supervised training uses the following techniques:

- Hands-on training
- Training checklists/worksheets
- Lectures and training sessions
- Method-specific training
- Conferences and seminars
- Short courses
- Specialized training by instrument manufacturers
- Proficiency testing programs.
- On-line courses

1.9.4. Group Supervisors/Leaders are responsible for providing documentation of training and proficiency for each employee under their supervision. The employee's training file indicates what procedures an analyst or a technician is capable of performing, either independently or with supervision. The files also include documentation of continuing capability, which are fully detailed in Section 3.4. Training documentation files for each person are maintained by the Quality Office either in hardcopy format or within the LMS.

1.9.5. All procedures and training records are maintained and available for review during laboratory audits. These procedures are reviewed/updated periodically by laboratory management. Additional information can be found in SOP S-ALL-Q-020 **Training and Employee Orientation** or its equivalent revision or replacement.

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 16 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

1.10. Data Integrity System

1.10.1. The data integrity system at PASI provides assurances to management that a highly ethical approach is being applied to all planning, training and implementation of methods. Data integrity is crucial to the success of our company and Pace Analytical is committed to creating and maintaining a culture of quality throughout the organization. To accomplish this goal, PASI has implemented a data integrity system that encompasses the following four requirements:

1.10.1.1. A data integrity training program: standardized training is given to each new employee and a yearly refresher is presented to all employees. Key topics addressed by this training include:

- 1.10.1.1.1. Need for honesty and transparency in analytical reporting
- 1.10.1.1.2. Process for reporting data integrity issues
- 1.10.1.1.3. Specific examples of unethical behavior and improper practices
- 1.10.1.1.4. Documentation of non-conforming data that is still useful to the data user
- 1.10.1.1.5. Consequences and punishments for unethical behavior
- 1.10.1.1.6. Examples of monitoring devices used by management to review data and systems

1.10.1.2. Signed data integrity documentation for all employees: this includes a written quiz following the Ethics training session and written agreement to abide by the Code of Ethics and Standards of Conduct explained in the employee manual.

1.10.1.3. In-depth, periodic monitoring of data integrity including peer data review and validation, internal raw data audits, proficiency testing studies, etc.

1.10.1.4. Documentation of any review or investigation into possible data integrity infractions. This documentation, including any disciplinary actions involved, corrective actions taken, and notifications to customers must be retained for a minimum of five years.

1.10.2. PASI management makes every effort to ensure that personnel are free from any undue pressures that affect the quality of their work including commercial, financial, over scheduling, and working condition pressures.

1.10.3. Corporate management also provides all PASI facilities a mechanism for confidential reporting of data integrity issues that ensures confidentiality and a receptive environment in which all employees are comfortable discussing items of ethical concern. The anonymous message line is monitored by the Corporate Director of Quality who will ensure that all concerns are evaluated and, where necessary, brought to the attention of executive management and investigated. Any Pace employee can contact corporate management to report an ethical concern by calling the anonymous hotline at 612-607-6431.

1.11. Laboratory Safety

1.11.1. It is the policy of PASI to make safety and health an integral part of daily operations and to ensure that all employees are provided with safe working conditions, personal protective equipment, and requisite training to do their work without injury. Each employee is responsible for his/her own safety as well as those working in the immediate area by complying with established company rules and procedures. These rules and procedures as well as a more detailed description of the employees' responsibilities are contained in the corporate Safety Manual and Chemical Hygiene Plan.

1.12. Security and Confidentiality

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 17 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

1.12.1. Security is maintained by controlled access to laboratory buildings. Exterior doors to laboratory buildings remain either locked or continuously monitored by PASI staff. Posted signs direct visitors to the reception office and mark all other areas as off limits to unauthorized personnel. All visitors, including PASI staff from other facilities, must sign the Visitor's Logbook maintained by the receptionist. A staff member will accompany them during the duration of their stay on the premises unless the SGM/GM/AGM/OM, SQM/QM, or Technical Director specify otherwise. In this instance, the staff member will escort the visitor back to the reception area at the end of his/her visit where he/she signs out. The last staff member to leave their department for the day should ensure that all outside access points to that area are secure.

1.12.2. Additional security is provided where necessary, (e.g., specific secure areas for sample, data, and customer report storage), as requested by customers, or cases where national security is of concern. These areas are lockable within the facilities, or are securely offsite. Access is limited to specific individuals or their designees. Security of sample storage areas is the responsibility of the Sample Custodian. Security of samples and data during analysis and data reduction is the responsibility of Group Supervisors. Security of customer report archives is the responsibility of the Client Services Manager. These secure areas are locked whenever these individuals or their designees are not present in the facility.

1.12.3. Access to designated laboratory sample storage locations is limited to authorized personnel only. Provisions for lock and key access are provided. No samples are to be removed without proper authorization. If requested by customer or contract, samples are not to be removed from secure storage areas without filling out an associated internal chain of custody.

1.12.4. Standard business practices of confidentiality are applied to all documents and information regarding customer analyses. Specific protocols for handling confidential documents are described in PASI SOPs. Additional protocols for sample identification by internal laboratory identification numbers only are implemented as required under contract specific Quality Assurance Project Plans (QAPPs).

1.12.5. All information pertaining to a particular customer, including national security concerns will remain confidential. Data will be released to outside agencies only with written authorization from the customer or where federal or state law requires the company to do so. Additional information can be found in SOP S-KS-Q-007 **Laboratory Security Procedures** or its equivalent revision or replacement.

1.13. Communications

1.13.1. Management within each lab bears the responsibility of ensuring that appropriate communication processes are established and that communication takes place regarding the effectiveness of the management/quality system. These communication processes may include email, regular staff meetings, senior management meetings, etc.

1.13.2. Corporate management bears the responsibility of ensuring that appropriate communication processes are established within the network of facilities and that communication takes place at a company-wide level regarding the effectiveness of the management/quality systems of all Pace facilities. These communication processes may include email, quarterly continuous improvement conference calls for all lab departments, and annual continuous improvement meetings for all department supervisors, quality managers, client services managers, and other support positions.

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 18 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

2.0. SAMPLE CUSTODY

2.1. Sampling Support

2.1.1. Each individual PASI laboratory provides shipping containers, properly preserved sample containers, custody documents, and field quality control samples to support field-sampling events. Guidelines for sample container types, preservatives, and holding times for a variety of methods are listed in Attachment VIII. Note that all analyses listed are not necessarily performed at all PASI laboratories and there may be additional laboratory analyses performed that are not included in these tables. PASI - Kansas may provide pick-up and delivery services to their customers when needed.

2.2. Field Services

2.2.1. Pace Analytical has a large Field Services Division which is based in their Minneapolis facility as well as limited field service capabilities in some of our other facilities. Field Services provides comprehensive nationwide service offerings including:

- Stack Testing
- Ambient Air
- CEM Certification Testing
- Air Quality Monitoring
- Onsite Analytical Services- FTIR and GC
- Real-time Process Diagnostic/Optimization Testing
- Wastewater, Groundwater and Drinking Water Monitoring
- Storm Water and Surface Water Monitoring
- Soil and Waste Sampling
- Mobile Laboratory Services

2.2.2. Field Services operates under the PASI Corporate Quality System, with applicable and necessary provisions to address the activities, methods, and goals specific to Field Services. All procedures and methods used by Field Services are documented in Standard Operating Procedures and Procedure Manuals.

2.2.3. All sampling activities conducted by the laboratory's field personnel are conducted with the expectation that they will be made for routine monitoring purposes, unless specifically stated to the contrary prior to the field investigation. Therefore, the use of proper sampling procedures cannot be overemphasized. The collection of representative samples depends upon:

- Ensuring that the samples taken are representative of the material or medium being sampled.
- Using proper sampling, sample handling, preservation, and quality control techniques.
- Properly identifying the collected samples and documenting their collection in field records.
- Maintaining sample chain-of-custody.
- Protecting the collected samples by properly packing and transporting them to the laboratory for analysis.

Additional information can be found in the **Field Procedures Manual S-KS-F-001** or its equivalent revision or replacement.

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 19 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

2.3. Project Initiation

2.3.1. Prior to accepting new work, the laboratory reviews its performance capability. The laboratory confirms that sufficient personnel, equipment capacity, analytical method capability, etc., are available to complete the required work. Customer needs, certification requirements, and data quality objectives are defined and the appropriate sampling and analysis plan is developed to meet the project requirements by project managers or sales representatives. Members of the management staff review current instrument capacity, personnel availability and training, analytical procedures capability, and projected sample load. Management then informs the sales and client services personnel whether or not the laboratory can accept the new project via written correspondence, email, and/or daily operations meetings.

2.3.2. The laboratory maintains records of all such reviews, including discussions with customers. Routine analytical project documentation of quotes, notes, dates, initials, and/or recordings is maintained in a project folder by project management. Conditions for new and more complex contracts are determined by the SGM/GM/AGM/OM and sales representatives. Quality Management is consulted on technical requirements and operations staff provides input on volume capacities. Evidence of these reviews is maintained in the form of awarded Request for Proposals (RFPs), signed quotes or contracts, and a Customer Relationship Management (CRM) database. If a review identifies a potential mismatch between customer requirements and laboratory capabilities and/or capacities, Pace will specify its level of commitment by listing these exceptions to the requirements within the RFP, quote or contract.

2.3.3. Additional information regarding specific procedures for reviewing new work requests can be found in SOP S-KS-Q-033 **Review of Analytical Requests** or its equivalent revision or replacement.

2.4. Chain of Custody

2.4.1. A chain of custody (COC) provides the legal documentation of samples from time of collection to completion of analysis. PASI has implemented Standard Operating Procedures to ensure that sample custody traceability and responsibility objectives are achieved for every project.

2.4.2. Field personnel or client representatives must complete a chain of custody for all samples that are received by the laboratory. The importance of completeness of COCs is stressed to the samplers and is critical to efficient sample receipt and to insure the requested methods are used to analyze the correct samples.

2.4.3. If sample shipments are not accompanied by the correct documentation, the Sample Receiving department notifies a Project Manager. The Project Manager then obtains the correct documentation/information from the customer in order for analysis of samples to proceed.

2.4.4. The sampler is responsible for providing the following information on the chain of custody form:

- Customer project name
- Project location or number
- Field sample number/identification
- Date and time sampled
- Sample matrix

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 20 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

- Preservative
- Requested analyses
- Sampler signature
- Relinquishing signature
- Date and time relinquished
- Sampler remarks as needed
- Custody Seal Number if present
- Regulatory Program Designation
- The state where the samples were collected to ensure all applicable state requirements are met
- Turnaround time requested
- Purchase order number

2.4.5. The COC is filled out completely and legibly with indelible ink. Errors are corrected by drawing a single line through the initial entry and initialing and dating the change. All transfers of samples are recorded on the chain of custody in the “relinquished” and “received by” sections. All information except signatures is printed.

2.4.6. Additional information can be found in SOP S-KS-C-001 **Sample Management** and SOP S-KS-C-002 **Assembly of Sample Container Kits** or their equivalent revisions or replacements.

2.5. Sample Acceptance Policy

2.5.1. In accordance with regulatory guidelines, PASI complies with the following sample acceptance policy for all samples received.

2.5.2. If the samples do not meet the sample receipt acceptance criteria outlined below, the laboratory is required to document all non-compliances, contact the customer, and either reject the samples or fully document any decisions to proceed with analyses of samples which do not meet the criteria. Any results reported from samples not meeting these criteria are appropriately qualified on the final report.

2.5.3. All samples must:

- Have unique customer identification that is clearly marked on durable waterproof labels affixed to the sample containers that match the chain of custody.
- Have clear documentation on the chain of custody related to the location of the sampling site with the time and date of sample collection.
- Have the sampler’s name and signature.
- Have all requested analyses clearly designated on the COC.
- Have clear documentation of any special analytical or data reporting requirements.
- Be in appropriate sample containers with clear documentation of the preservatives used.
- Be correctly preserved unless the method allows for laboratory preservation.
- Be received within holding time. Any samples with hold times that are exceeded will not be processed without prior customer approval.
- Have sufficient sample volume to proceed with the analytical testing. If insufficient sample volume is received, analysis will not proceed without customer approval.
- Be received within appropriate temperature ranges - not frozen but $\leq 6^{\circ}\text{C}$ ^(See Note 1), unless program requirements or customer contractual obligations mandate otherwise ^(see Note 2). The

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 21 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

cooler temperature is recorded directly on the COC and the SCUR. Samples that are delivered to the laboratory immediately after collection are considered acceptable if there is evidence that the chilling process has been started. For example, by the arrival of the samples on ice. If samples arrive that are not compliant with these temperature requirements, the customer will be notified. The analysis will NOT proceed unless otherwise directed by the customer. If less than 72 hours remain in the hold time for the analysis, the analysis may be started while the customer is contacted to avoid missing the hold time. Data associated with any deviations from the above sample acceptance policy requirements will be appropriately qualified.

Note 1: Temperature will be read and recorded based on the precision of the measuring device. For example, temperatures obtained from a thermometer graduated to 0.1°C will be read and recorded to ±0.1°C. Measurements obtained from a thermometer graduate to 0.5°C will be read to ±0.5°C. Measurements read at the specified precision are not to be rounded down to meet the ≤6°C limit

Note 2: Some microbiology methods allow sample receipt temperatures of up to 10°C. Consult the specific method for microbiology samples received above 6°C prior to initiating corrective action for out of temperature preservation conditions.

Note 3: Biological Tissue Samples must be received frozen at ≤0°C.

2.5.4. Upon sample receipt, the following items are also checked and recorded:

- Presence of custody seals or tapes on the shipping containers;
- Sample condition: Intact, broken/leaking, bubbles in VOA samples;
- Sample holding time;
- Sample pH and residual chlorine when required;
- Appropriate containers.

2.5.5. Samples for drinking water analysis that are improperly preserved, or are received past holding time, are rejected at the time of receipt, with the exception of VOA samples that are tested for pH at the time of analysis.

2.5.6. Additional information can be found in SOP S-KS-C-001 **Sample Management** or its equivalent revision or replacement.

2.6. Sample Log-in

2.6.1. After sample inspection, all sample information on the chain of custody is entered into the Laboratory Information Management System. This permanent record documents receipt of all sample containers including:

- Customer name and contact
- Customer number
- Pace Analytical project number
- Pace Analytical Project Manager
- Sample descriptions
- Due dates
- List of analyses requested

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 22 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

- Date and time of laboratory receipt
- Field ID code
- Date and time of collection
- Any comments resulting from inspection for sample rejection

2.6.2. All samples received are logged into the LIMS within one working day of receipt. Sample login may be delayed due to customer clarification of analysis needed, corrective actions for sample receipt non-conformance, or other unusual circumstances. If the time collected for any sample is unspecified and Pace is unable to obtain this information from the customer, the laboratory will use 08:00 as the time sampled. All hold times will be based on this sampling time and qualified accordingly if exceeded.

2.6.3. The Laboratory Information Management System (LIMS) automatically generates a unique identification number for each sample created in the system. The LIMS sample number follows the general convention of BB-XXXXXX-YYY. The BB prefix represents the laboratory identification within Pace's laboratory network. The prefix 60 designates the PASI-Kansas laboratory region number. XXXXXX designates the project number, and is assigned in numerical order from 000001 to 999999 as a new project is created. The suffix YYY designates the sample number within a project, and is assigned in numerical order. In addition to the unique sample identification number, each sample container is also uniquely identified. Sample container identification consists of the LIMS sample number; the container type; and a container number such as 1 of Z, where Z is the total number of containers of a particular type. Together, the LIMS sample number and the sample container identification number are used to create a unique barcode encryption that can be linked to the sample analysis requested by the customer. These unique identifications are placed on the sample container as a durable label and becomes the link between the laboratory's sample management system and the customer's field identification; it will be a permanent reference number for all future interactions.

2.6.4. Current division codes are noted below. These division codes are used primarily for accounting purposes and LIMS sample identifications. More division codes may be added without updating this document.

10 = Minnesota; Montana; Virginia, MN	35 = Florida
92 = Asheville and Charlotte	20 = Gulf Coast
60 = Kansas	30 = Pittsburgh
50 = Indianapolis	40 = Green Bay
25 = Seattle	17 = Pace Life Sciences
51 = Columbus	65 = Schenectady, NY
75 = Dallas	36 = South Florida

2.6.5. Sample labels are printed from the LIMS and affixed to each sample container.

2.6.6. Samples with hold times that are near expiration date/time may be sent directly to the laboratory for analysis at the discretion of the Project Manager and/or SGM/GM/AGM/OM.

2.6.7. Additional information can be found in SOP S-KS-C-001 **Sample Management** or its equivalent revision or replacement.

2.7. Sample Storage

2.7.1. Storage Conditions

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 23 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

2.7.1.1. Samples are stored away from all standards, reagents, or other potential sources of contamination. Samples are stored in a manner that prevents cross contamination. Volatile samples are stored separately from other samples. All sample fractions, extracts, leachates, and other sample preparation products are stored in the same manner as actual samples or as specified by the analytical method.

2.7.1.2. Storage blanks, consisting of two 40mL aliquots of reagent water, are stored with volatile samples and are used to measure cross-contamination acquired during storage. If applicable, laboratories must have documented procedures and criteria for evaluating storage blanks, appropriate to the types of samples being stored.

2.7.1.3. Additional information can be found in SOP S-ALL-Q-018 **Monitoring Storage Units** or its equivalent revision or replacement.

2.7.2. Temperature Monitoring

2.7.2.1. Samples are taken to the appropriate storage location immediately after sample receipt and check-in procedures are completed. All sample storage areas are located in limited access areas and are monitored to ensure sample integrity.

2.7.2.2. The temperature of each refrigerated storage area is maintained at $\leq 6^{\circ}\text{C}$ unless state or program requirements differ. The temperature of each freezer storage area is maintained at $< -10^{\circ}\text{C}$ unless state or program requirements differ. The temperature of each storage area is checked and documented each day of use (each calendar day). If the temperature falls outside the acceptable limits, the following corrective actions are taken and appropriately documented:

- The temperature is rechecked after two hours to verify temperature exceedance. Corrective action is initiated and documented if necessary.
- The SQM/QM and/or laboratory management are notified if the problem persists.
- The samples are relocated to a proper environment if the temperature cannot be maintained after corrective actions are implemented.
- The affected customers are notified.
- Documentation is provided on analytical report.

Additional information can be found in SOP S-ALL-Q-018 **Monitoring Storage Units** or its equivalent revision or replacement.

2.7.3. Hazardous Materials

2.7.3.1. Pure product or potentially heavily contaminated samples must be tagged as "hazardous" or "lab pack" and stored separately from other samples.

2.7.3.2. Additional information can be found in SOP S-KS-S-002 **Waste Handling** or its equivalent revision or replacement.

2.7.4. Foreign/Quarantined Soils

2.7.4.1. Depending on the soil disposal practices of the laboratory, foreign soils and soils from USDA regulated areas are adequately segregated to enable proper sample disposal. The USDA requires these samples to be incinerated or sterilized by an approved treatment procedure. Additional information regarding USDA regulations and sample handling can be found in applicable local laboratory SOPs.

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 24 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

2.7.4.2. Additional information on sample storage can be found in SOPs S-KS-Q-020 **USDA Regulated Soil**, S-KS-C-001 **Sample Management**, and S-KS-S-002 **Waste Handling** or their equivalent revisions or replacements.

2.8. Sample Protection

2.8.1. PASI laboratory facilities are operated under controlled access protocols to ensure sample and data integrity. Visitors must register at the front desk and be properly escorted at all times.

2.8.2. Samples are removed from storage areas by designated personnel and returned to the storage areas, if necessary, immediately after the required sample quantity has been taken.

2.8.3. Upon customer request, additional and more rigorous chain of custody protocols for samples and data can be implemented. For example, some projects may require internal chain-of-custody protocols.

2.8.4. Additional information can be found in SOPs S-KS-C-001 **Sample Management** and S-KS-Q-007 **Laboratory Security Procedures** or their equivalent revisions or replacements.

2.9. Subcontracting Analytical Services

2.9.1. Every effort is made to perform all analyses for PASI customers within the laboratory that receives the samples. When subcontracting to a laboratory other than the receiving laboratory, whether inside or outside the PASI network, becomes necessary, a preliminary verbal communication with that laboratory is undertaken. Customers are notified in writing of the laboratory's intention to subcontract any portion of the testing to another laboratory. Work performed under specific protocols may involve special considerations.

2.9.2. Prior to subcontracting samples to a laboratory outside Pace Analytical, the potential subcontract laboratory will be pre-qualified by verifying that the subcontractor meets the following criteria:

- All certifications required for the proposed subcontract are in effect,
- Sufficient professional liability and other required insurance coverage is in effect, and
- Is not involved in legal action by any federal, state, or local government agency for data integrity issues and has not been convicted in such investigation at any time during the past 5 years.

2.9.3. The contact and preliminary arrangements are made between the PASI Project Manager and the appropriate subcontract laboratory personnel. The specific terms of the subcontract laboratory agreement include:

- Method of analysis
- Number and type of samples expected
- Project specific QA/QC requirements
- Deliverables required
- Laboratory certification requirement
- Price per analysis
- Turn-around time requirements

2.9.4. Chain of custody forms are generated for samples requiring subcontracting to other laboratories. Sample receiving personnel re-package the samples for shipment, create a transfer chain of custody form and record the following information:

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 25 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

- Pace Analytical Laboratory Number
- Matrix
- Requested analysis
- Special instructions regarding turnaround, required detection or reporting limits, or any unusual information known about the samples or analytical procedure.
- Signature in "Relinquished By"

2.9.5. All subcontracted sample data reports are sent to the PASI Project Manager. Pace will provide a copy of the subcontractor's report to the client when requested.

2.9.6. Any Pace Analytical work sent to other labs within the PASI network is handled as subcontracted work and all final reports are labeled clearly with the name of the laboratory performing the work. Any non-TNI work is clearly identified. PASI will not be responsible for analytical data if the subcontract laboratory was designated by the customer.

2.9.7. Additional information can be found in SOPs S-KS-Q-040 **Vendor Qualification** and SOP S-KS-C-003 **Subcontracting Samples** or their equivalent revisions or replacements.

2.10. Sample Retention and Disposal

2.10.1. Samples, extracts, digestates, and leachates must be retained by the laboratory for the period of time necessary to protect the interests of the laboratory and the customer.

2.10.2. Unused portions of samples are retained by each laboratory based on program or customer requirements for sample retention and storage. The minimum sample retention time is 45 days from receipt of the samples. Samples requiring thermal preservation may be stored at ambient temperature when the hold time is expired, the report has been delivered, and/or allowed by the customer, program, or contract. Samples requiring storage beyond the minimum sample retention time due to special requests or contractual obligations may be stored at ambient temperature unless the laboratory has sufficient capacity and their presence does not compromise the integrity of other samples.

2.10.3. After this period expires, non-hazardous samples are properly disposed of as non-hazardous waste. The preferred method for disposition of hazardous samples is to return the excess sample to the customer. If it is not feasible to return samples, or the customer requires PASI to dispose of excess samples, proper arrangements will be made for disposal by an approved contractor.

2.10.4. Additional information can be found in SOPs S-KS-S-002 **Waste Handling** and S-KS-C-001 **Sample Management** or their equivalent revisions or replacements.

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 26 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

3.0. ANALYTICAL CAPABILITIES

3.1. Analytical Method Sources

3.1.1. PASI laboratories are capable of analyzing a full range of environmental samples from a variety of matrices, including air, surface water, wastewater, groundwater, soil, sediment, biota, and other waste products. The latest valid editions of methodologies are applied from regulatory and professional sources including EPA, ASTM, USGS, NIOSH, Standard Methods, and State Agencies. Section 11 is a representative listing of general analytical protocol references. PASI discloses in writing to its customers and regulatory agencies any instances in which modified methods are being used in the analysis of samples.

3.1.2. In the event of a customer-specific need, instrumentation constraint or regulatory requirement, PASI laboratories reserve the right to use valid versions of methods that may not be the most recent edition available.

3.2. Analytical Method Documentation

3.2.1. The primary form of PASI laboratory documentation of analytical methods is the Standard Operating Procedure (SOP). SOPs contain pertinent information as to what steps are required by an analyst to successfully perform a procedure. The required contents for the SOPs are specified in the company-wide SOP for Preparation of SOPs (S-ALL-Q-001).

3.2.2. The SOPs may be supplemented by other training materials that further detail how methods are specifically performed. This training material will undergo periodic, documented review along with the other Quality System documentation.

3.3. Analytical Method Validation

3.3.1. In some situations, PASI develops and validates methodologies that may be more applicable to a specific problem or objective. When non-standard methods are required for specific projects or analytes of interest, or when the laboratory develops or modifies a method, the laboratory validates the method prior to applying it to customer samples. Method validity is established by meeting criteria for precision and accuracy as established by the data quality objectives specified by the end user of the data. The laboratory records the validation procedure, the results obtained and a statement as to the usability of the method. The minimum requirements for method validation include evaluation of sensitivity, quantitation, precision, bias, and selectivity of each analyte of interest.

3.3.2. Additional information can be found in SOP S-KS-Q-040 **Determination of Limit of Detection and Limit of Quantitation** or its equivalent revision or replacement.

3.4. Demonstration of Capability (DOC)

3.4.1. Analysts complete an initial demonstration of capability (IDOC) study prior to performing a method or when there is a change in instrument type, personnel, or test method, or at any time that a method has not been performed by the laboratory or analyst in a 12-month period. The mean recovery and standard deviation of each analyte, taken from 4 replicates of a quality control standard is calculated and compared to method criteria (if available) or established laboratory criteria for

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 27 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

evaluation of acceptance. Each laboratory maintains copies of all demonstrations of capability, including those that fail acceptance criteria and corresponding raw data for future reference and must document the acceptance criteria prior to the analysis of the DOC. Demonstrations of capability are verified on an annual basis.

3.4.2. For Continuing Demonstrations of Capability, the laboratories may use Performance Testing (PT) samples in lieu of the 4-replicate approach listed above. For methods or procedures that do not lend themselves to the “4-replicate” approach, the demonstration of capability requirements will be specified in Section 13 – Method Performance of the applicable SOP. Drinking Water DOCs must be done at or below the MCL.

3.4.3. Additional information can be found in SOP S-ALL-Q-020 **Training and Employee Orientation** or its equivalent revision or replacement.

3.5. Regulatory and Method Compliance

3.5.1. PASI understands that expectations of our customers commonly include the assumption that laboratory data will satisfy specific regulatory requirements. Therefore PASI attempts to ascertain, prior to beginning a project, what applicable regulatory jurisdiction, agency, or protocols apply to that project. This information is also required on the chain of custody submitted with samples.

3.5.2. PASI makes every effort to detect regulatory or project plan inconsistencies, based upon information from the customer, and communicate them immediately to the customer in order to aid in the decision making process. PASI will not be liable if the customer chooses not to follow PASI recommendations.

3.5.3. It is PASI policy to disclose in a forthright manner any detected noncompliance affecting the usability of data produced by our laboratories. The laboratory will notify customers within 30 days of fully characterizing the nature of the nonconformance, the scope of the nonconformance and the impact it may have on data usability.

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 28 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

4.0. QUALITY CONTROL PROCEDURES

Quality control data is analyzed and where they are found to be outside pre-defined criteria, planned action is taken to correct the problem in order to prevent incorrect results from being reported. Quality control samples are to be processed in the same manner as client samples.

4.1. Method Blank

4.1.1. A method blank is used to evaluate contamination in the preparation/analysis system and is processed through all preparation and analytical steps with its associated samples.

4.1.2. A method blank is processed at a minimum frequency of one per preparation batch. In the case of a method that has no separate preparation step, a method blank is processed with no more than 20 samples of a specific matrix performed by the same analyst, using the same method, standards, and reagents.

4.1.3. The method blank consists of a matrix similar to the associated samples that is known to be free of analytes of interest. Laboratories will characterize a representative matrix as “clean” if the matrix contains contaminants at less than ½ the laboratory’s reporting limit.

4.1.4. Method blanks are not applicable for certain analyses, such as pH, conductivity, flash point and temperature.

4.1.5. Each method blank is evaluated for contamination. The source of any contamination is investigated and documented corrective action is taken when the concentration of any target analyte is detected above the reporting limit and is greater than 1/10 of the amount of that analyte found in any associated sample. Corrective actions include the re-preparation and re-analysis of all the samples (where possible) along with the full set of required quality control samples. Data qualifiers must be applied to any result reported that is associated with a contaminated method blank.

4.1.6. Deviations made from this policy must be approved by the SQM/QM prior to release of the data.

4.2. Laboratory Control Sample

4.2.1. The Laboratory Control Sample (LCS) is used to evaluate the performance of the entire analytical system including preparation and analysis.

4.2.2. An LCS is processed at a minimum frequency of one per preparation batch. In the case of a method that has no separate preparation step, an LCS will be processed with no more than 20 samples of a specific matrix performed by the same analyst, using the same method, standards, and reagents.

4.2.3. The LCS consists of a matrix similar to the associated samples that is known to be free of the analytes of interest that is then spiked with known concentrations of target analytes.

4.2.4. The LCS contains **all** analytes specified by a specific method or by the customer or regulatory agency, which may include full list of target compounds, with certain exceptions. These exceptions may include analyzing only specific Aroclors when PCB analysis is requested or not spiking with all EPA Appendix IX compounds when a full Appendix IX list of compounds is requested. However, the lab must ensure that all target components in its scope of accreditation are included in the spike

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 29 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

mixture for the LCS over a two (2) year period. In the absence of specified components, the laboratory will spike the LCS with the following compounds:

- For multi-peak analytes (e.g. PCBs, technical chlordane, toxaphene), a representative standard will be processed.
- For methods with long lists of analytes, a representative number of target analytes may be chosen. The following criteria is used to determine the number of LCS compounds used:
 - For methods with 1-10 target compounds, the laboratory will spike with all compounds
 - For methods with 11-20 target compounds, the laboratory will spike with at least 10 compounds or 80%, whichever is greater
 - For methods with greater than 20 compounds, the laboratory will spike with at least 16 compounds.

4.2.5. The LCS is evaluated against the method default or laboratory-derived acceptance criteria. For those methods that require laboratory-derived limits, method default control limits may be used until the laboratory has a minimum of 20, but preferably greater than 30, data points from which to derive internal acceptance criteria. Any compound that is outside of these limits is considered to be 'out of control' and must be qualified appropriately. Any associated sample containing an 'out-of-control' compound must either be re-analyzed with a successful LCS or reported with the appropriate data qualifier. When the acceptance criteria for the LCS are exceeded high, and there are associated samples that are non-detects, then those non-detects can be reported with data qualifiers, or when the acceptance criteria are exceeded low, those associated sample results may be reported if they exceed the maximum regulatory limit/decision level with data qualifiers.

4.2.6. For LCSs containing a large number of analytes, it is statistically likely that a few recoveries will be outside of control limits. This does not necessarily mean that the system is out of control, and therefore no corrective action would be necessary (except for proper documentation). TNI has allowed for a minimum number of marginal exceedances, defined as recoveries that are beyond the LCS control limits (3X the standard deviation) but less than the marginal exceedance limits (4X the standard deviation). The number of allowable exceedances depends on the number of compounds in the LCS. If more analyte recoveries exceed the LCS control limits than is allowed (see below) or if any one analyte exceeds the marginal exceedance limits, then the LCS is considered non-compliant and corrective actions are necessary. The number of allowable exceedances is as follows:

- >90 analytes in the LCS- 5 analytes
- 71-90 analytes in the LCS- 4 analytes
- 51-70 analytes in the LCS- 3 analytes
- 31-50 analytes in the LCS- 2 analytes
- 11-30 analytes in the LCS- 1 analyte
- <11 analytes in the LCS- no analytes allowed out)

4.2.7. A matrix spike (MS) can be used in place of a non-compliant LCS in a batch as long as the MS passes the LCS acceptance criteria (this is a TNI allowance). When this happens, full documentation must be made available to the data user. If this is not allowed by a customer or regulatory body, the associated samples must be rerun with a compliant LCS (if possible) or reported with appropriate data qualifiers.

4.2.8. Deviations made from this policy must be approved by the SQM/QM prior to release of the data.

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 30 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

4.2.9. Additional information about the generation of control charts and control limits can be found in SOP S-ALL-Q-032 **Control Chart Generation and Trend Analysis** or its equivalent revision or replacement.

4.3. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

4.3.1. A matrix spike (MS) is used to determine the effect of the sample matrix on compound recovery for a particular method. The information from these spikes is sample or matrix specific and is not used to determine the acceptance of an entire batch unless the MS is actually used as the LCS.

4.3.2. A **Matrix Spike/Matrix Spike Duplicate** (MS/MSD) set is processed at a frequency specified in a particular method or as determined by a specific customer request. This frequency will be specified in the applicable method SOP or customer QAPP. In the absence of such requirements, an MS/MSD set is routinely analyzed once per every 20 samples per matrix per method.

4.3.3. The MS and MSD consist of the sample matrix that is then spiked with known concentrations of target analytes. Laboratory personnel spike customer samples that are specifically designated as MS/MSD samples or, when no designated samples are present in a batch, randomly select samples to spike that have adequate sample volume or weight. Spiked samples are prepared and analyzed in the same manner as the original samples and are selected from different customers if possible.

4.3.4. The MS and MSD contain all analytes specified by a specific method or by the customer or regulatory agency. In the absence of specified components, the laboratory will spike the MS/MSD with the same number of compounds as previously discussed in the LCS section. However, the lab must ensure that all targeted components in its scope of accreditation are included in the spike mixture for the MS/MSD over a two (2) year period.

4.3.5. The MS and MSD are evaluated against the method or laboratory derived criteria. Any compound that is outside of these limits is considered to be 'out of control' and must be qualified appropriately. Batch acceptance, however, is based on method blank and LCS performance, not on MS/MSD recoveries. The spike recoveries give the data user a better understanding of the final results based on their site specific information.

4.3.6. A matrix spike and sample duplicate will be performed instead of a matrix spike and matrix spike duplicate when specified by the customer or method.

4.3.7. Deviations made from this policy must be approved by the SQM/QM prior to release of the data.

4.3.8. Additional information about the generation of control charts and control limits can be found in SOP S-ALL-Q-032 **Control Chart Generation and Trend Analysis** or its equivalent revision or replacement.

4.4. Sample Duplicate

4.4.1. A sample duplicate is a second portion of sample that is prepared and analyzed in the laboratory along with the first portion. It is used to measure the precision associated with preparation and analysis. A sample duplicate is processed at a frequency specified by the particular method or as determined by a specific customer.

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 31 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

4.4.2. The sample and duplicate are evaluated against the method or laboratory derived criteria for relative percent difference (RPD). Any duplicate that is outside of these limits is considered to be 'out of control' and must be qualified appropriately.

4.4.3. Deviations made from this policy must be approved by the SQM/QM prior to release of the data.

4.5. Surrogates

4.5.1. Surrogates are compounds that reflect the chemistry of target analytes and are typically added to samples for organic analyses to monitor the effect of the sample matrix on compound recovery.

4.5.2. Surrogates are added to each customer sample (for organics), method blank, LCS, and MS prior to extraction or analysis. The surrogates are evaluated against the method or laboratory derived acceptance criteria or against project-specific acceptance criteria specified by the client, if applicable. Any surrogate compound that is outside of these limits is considered to be 'out of control' and must be qualified appropriately. Samples with surrogate failures are typically re-extracted and/or re-analyzed to confirm that the out-of-control value was caused by the matrix of the sample and not by some other systematic error. An exception to this would be samples that have high surrogate values but no reportable hits for target compounds. These samples would be reported, with a qualifier, because the implied high bias would not affect the final results. For methods with multiple surrogates, documentation regarding acceptance and associated compounds will be found in the individual method SOPs.

4.5.3. Deviations made from this policy must be approved by the SQM/QM prior to release of the data.

4.6. Internal Standards

4.6.1. Internal Standards are method-specific analytes added to every standard, method blank, laboratory control sample, matrix spike, matrix spike duplicate, and sample at a known concentration, prior to analysis for the purpose of adjusting the response factor used in quantifying target analytes. At a minimum, the laboratory will follow method specific guidelines for the treatment of internal standard recoveries as they are related to the reporting of data.

4.6.2. Deviations made from this policy must be approved by the SQM/QM prior to release of the data.

4.7. Field Blanks

4.7.1. Field blanks are blanks prepared at the sampling site in order to monitor for contamination that may be present in the environment where samples are collected. These field quality control samples are often referenced as field blanks, rinsate blanks, or equipment blanks. The laboratory analyzes these field blanks as normal samples and informs the customer if there are any target compounds detected above the reporting limits.

4.8. Trip Blanks

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 32 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

4.8.1. Trip blanks are blanks that originate from the laboratory as part of the sampling event and are used to monitor for contamination of samples during transport. These blanks accompany the empty sample containers to the field and then accompany the collected samples back to the laboratory. These blanks are routinely analyzed for volatile methods where ambient background contamination is likely to occur.

4.9. Limit of Detection (LOD)

4.9.1. PASI laboratories are required to use a documented procedure to determine a limit of detection for each analyte of concern in each matrix reported. All sample processing steps of the preparation and analytical methods are included in this determination including any clean ups. For any test that does not have a valid LOD, sample results below the limit of quantitation (LOQ) cannot be reported.

4.9.2. The LOD is initially established for the compounds of interest for each method in a clean matrix with no target analytes present and no interferences at a concentration that would impact the results. The LOD is then determined every time there is a change in the test method that affects how the test is performed or when there has been a change in the instrument that affects the sensitivity. If required by customer, method or accreditation body, the LOD will be re-established annually for all applicable methods.

4.9.3. Unless otherwise noted, the method used by PASI laboratories to determine LODs is based on the Method Detection Limit (MDL) procedure outlined in 40 CFR Part 136, Appendix B. Where required by regulatory program or customer, the above referenced procedure will be followed.

4.9.4. Where specifically stated in the published method, LODs or MDLs will be performed at the listed frequency.

4.9.5. The validity of the LOD must be shown by detection (a value above zero) of the analytes in a QC sample in each quality system matrix. The QC sample must contain the analyte at no more than 3X the LOD for a single analyte test and 4X the LOD for multiple analyte tests. This verification must be performed on each instrument used for sample analysis and reporting of data. The validity of the LOD must be verified as part of the LOD determination process. This verification must be done prior to the use of the LOD for sample analysis.

4.9.6. An LOD study is not required for any analyte for which spiking solutions or quality control samples are not available such as temperature.

4.9.7. The LOD, if required, shall be verified annually for each quality system matrix, technology and analyte. In lieu of performing full LOD (MDL) studies annually, the laboratory can verify the LOD (MDL) on an annual basis, providing this verification is fully documented and does not contradict other customer or program requirements that the laboratory must follow. The requirements of this verification are:

- The spike concentration of the verification must be no more than 3X times the LOD for single analyte tests and 4X the LOD for multiple analyte tests.
- The laboratory must verify the LOD on each instrument used for the reporting of sample data.
- The laboratory must be able to identify all target analytes in the verification standard (distinguishable from noise).

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 33 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

4.9.8. Additional information can be found in SOP S-KS-Q-040 **Determination of Limit of Detection and Limit of Quantitation** or its equivalent revision or replacement.

4.10. Limit of Quantitation (LOQ)

4.10.1. A limit of quantitation (LOQ) for every analyte of concern must be determined. For PASI laboratories, this LOQ is referred to as the RL, or Reporting Limit. This RL is based on the lowest calibration standard concentration that is used in each initial calibration. Results below this level are not allowed to be reported without qualification since the results would not be substantiated by a calibration standard. For methods with a determined LOD, results can be reported out below the LOQ but above the LOD if they are properly qualified (e.g., J flag).

4.10.2. The LOQ must be higher than the LOD.

4.10.3. To verify the LOQ, the laboratory will prepare a sample in the same matrix used for the LCS. The sample will be spiked with target analytes at the concentration(s) equivalent to or less than the RL(s). This sample must undergo the routine sample preparation procedure including any routine sample cleanup steps. The sample is then analyzed and the recovery of each target analyte determined. The recovery for each target analyte must meet the laboratories current control limits for an LCS. The annual LOQ verification is not required if the LOD was determined or verified annually on that instrument.

4.10.4. Additional information can be found in SOP S-KS-Q-040 **Determination of Limit of Detection and Limit of Quantitation** or its equivalent revision or replacement.

4.11. Estimate of Analytical Uncertainty

4.11.1. PASI laboratories can provide an estimation of uncertainty for results generated by the laboratory. The estimate quantifies the error associated with any given result at a 95% confidence interval. This estimate does not include bias that may be associated with sampling. The laboratory has a procedure in place for making this estimation. In the absence of a regulatory or customer-specific procedure, PASI laboratories base this estimation on the recovery data obtained from the Laboratory Control Spikes. The uncertainty is a function of the standard deviation of the recoveries multiplied by the appropriate Student's t Factor at 95% confidence. Additional information pertaining to the estimation of uncertainty and the exact manner in which it is derived are contained in the SOP S-KS-Q-022 **Estimation of Measurement Uncertainty** or its equivalent revision or replacement.

4.11.2. The measurement of uncertainty is provided only on request by the customer, as required by specification or regulation and when the result is used to determine conformance within a specification limit.

4.12. Proficiency Testing (PT) Studies

4.12.1. PASI laboratories participate in the TNI defined proficiency testing program. PT samples are obtained from NIST and/or A2LA accredited approved providers and analyzed and reported at a minimum of two times per year for the relevant fields of testing per matrix.

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 34 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

4.12.2. The PT studies are reported directly to the required accreditation agencies. A PT plan is required for A2LA and is maintained on file.

4.12.3. The laboratory initiates an investigation whenever PT results are deemed ‘unacceptable’ by the PT provider. All findings and corrective actions taken are reported to the SQM/QM or their designee. A corrective action plan is initiated and this report is sent to the appropriate state accreditation agencies for their review. Additional PTs will be analyzed and reported as needed for certification purposes.

4.12.4. PT samples are treated as typical customer samples, utilizing the same staff, methods, equipment, facilities, and frequency of analysis. PT samples are included in the laboratory’s normal analytical processes and do not receive extraordinary attention due to their nature.

4.12.5. Comparison of analytical results with anyone participating in the same PT study is prohibited prior to the close of the study.

4.12.6. Additional information can be found in SOP S-KS-Q-035 **Proficiency Testing Program** or its equivalent revision or replacement.

4.13. Rounding and Significant Figures

4.13.1. In general, the PASI laboratories report data to no more than three significant digits. Therefore, all measurements made in the analytical process must reflect this level of precision. In the event that a parameter that contributes to the final result has less than three significant figures of precision, the final result must be reported with no more significant figures than that of the parameter in question. The rounding rules listed below are descriptive of the LIMS and not necessarily of any supporting program such as Excel.

4.13.2. Data is compared to the reporting limits and MDLs to determine if qualifiers are needed before the rounding step occurs.

4.13.3. **Rounding:** PASI-Kansas follows the odd / even guidelines for rounding numbers:

- If the figure following the one to be retained is less than five, that figure is dropped and the retained ones are not changed (with three significant figures, 2.544 is rounded to 2.54).
- If the figure following the ones to be retained is greater than five, that figure is dropped and the last retained one is rounded up (with three significant figures, 2.546 is rounded to 2.55).
- If the figure following the ones to be retained is five and if there are no figures other than zeros beyond that five, then the five is dropped and the last figure retained is unchanged if it is even and rounded up if it is odd (with three significant figures, 2.525 is rounded to 2.52 and 2.535 is rounded to 2.54).

4.13.4. Significant Digits

4.13.4.1. PASI-Kansas follows the following convention for reporting to a specified number of significant figures. Unless specified by federal, state, or local requirements or on specific request by a customer, the laboratory reports:

Values > 10 – Reported to 3 significant digits
Values ≤ 10 – Reported to 2 significant digits

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 35 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

4.14. Retention Time Windows

4.14.1. When chromatographic conditions are changed, retention times and analytical separations are often affected. As a result, two critical aspects of any chromatographic method are the determination and verification of retention times and analyte separation. Retention time windows must be established for the identification of target analytes. The retention times of all target analytes in all calibration verification standards must fall within the retention time windows. If an analyte falls outside the retention time window in an ICV or CCV, new absolute retention time windows must be calculated, unless instrument maintenance fixes the problem. When a new column is installed, a new retention time window study must be performed.

4.14.2. One process for the production of retention time windows: Make 3 injections of all single component or multi-component analytes over a 72-hour period. Record the retention time in minutes for each analyte and surrogate to 3 decimal places. Calculate the mean and standard deviation of the three absolute retention times for each target analyte and surrogate. For multi-component analytes, choose 3-5 major peaks and calculate the mean and standard deviation for each of the peaks. If the standard deviation of the retention times of a target analyte is 0.000, the lab may use a default standard deviation of 0.01. The width of the retention time window for each analyte and surrogate and major peak in a multi-component analyte is defined as ± 3 times the standard deviation of the mean absolute retention time established during that 72-hour period or 0.03 minutes, whichever is greater.

4.14.3. The center of the retention time window is established for each analyte and surrogate by using the absolute retention times from the CCV at the beginning of the analytical shift. For samples run with an initial calibration, use the retention time of the mid-point standard of the initial calibration curve.

4.14.4. For more information, please reference the local facility's analytical SOPs.

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 36 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

5.0. DOCUMENT MANAGEMENT AND CHANGE CONTROL

5.1. Document Management

5.1.1. Additional information can be found in SOP S-ALL-Q-002 **Document Control and Management** or its equivalent revision or replacement. Information on Pace's policy for electronic signatures can also be found in this SOP.

5.1.2. Pace Analytical Services, Inc. has an established procedure for managing documents that are part of the quality system. The list of managed documents includes, but is not limited to, Standard Operating Procedures (both technical and non-technical), Quality Assurance Manuals, quality policy statements, training documents, work-processing documents, charts, posters, memoranda, notices, forms, software, and any other procedures, tables, plans, etc. that have a direct bearing on the quality system (including applicable data records and non-technical documents).

5.1.3. A master list of all managed documents is maintained at each facility identifying the current revision status and distribution of the controlled documents. This establishes that there are no invalid or obsolete documents in use in the facility. All documents are reviewed periodically and revised if necessary. Obsolete documents are systematically discarded or archived for audit or knowledge preservation purposes.

5.1.4. Each managed document is uniquely identified to include the date of issue, the revision identification, page numbers, the total number of pages and the issuing authorities. For complete information on document numbering, refer to SOP S-ALL-Q-003 **Document Numbering**.

5.1.5. SOPs, specifically, are available to all laboratory staff via the Learning Management System (LMS) which is a secure repository that is accessed through an internet portal. As a local alternative to the hard copy system of controlled documents, secured electronic copies of controlled documents may be maintained on the laboratory's local server. These document files must be read-only for all personnel except the Quality Department and system administrator. Other requirements for this system are as follows:

- Electronic documents must be readily accessible to all facility employees.
- Electronic documents must be locked from printing. All hardcopy SOPs must be obtained from the Quality Department.

5.1.6. **Quality Assurance Manual (QAM):** The Quality Assurance Manual is the company-wide document that describes all aspects of the quality system for PASI. The base QAM template is distributed by the Corporate Quality Department to each of the SQMs/QMs. The local management personnel modify the necessary and permissible sections of the base template and submit those modifications to the Corporate Director of Quality for review. Once approved and signed by both the CEO and the Director of Quality; the SGM/GM/AGM/OM, the SQM/QM, and any Technical Directors sign the Quality Assurance Manual. Each SQM/QM is then in charge of distribution to employees, external customers or regulatory agencies and maintaining a distribution list of controlled document copies. The Quality Assurance Manual template is reviewed on an annual basis by all of the PASI SQMs/QMs and revised accordingly by the Director of Quality.

5.1.7. **Standard Operating Procedures (SOPs)**

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 37 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

5.1.7.1. SOPs fall into two categories: company-wide documents and facility specific documents. Company-wide SOPs start with the prefix S-ALL- and local SOPs start with the individual facility prefix.

5.1.7.2. The purpose of the company-wide SOPs is to establish policies and procedure that are common and applicable to all PASI facilities. Company-wide SOPs are document-controlled by the corporate quality office and signed copies are distributed to all of the SQMs/QMs. The local management personnel sign the company-wide SOPs. The SQM/QM is then in charge of distribution to employees, external customers, or regulatory agencies and maintaining a distribution list of controlled document copies.

5.1.7.3. Local PASI facilities are responsible for developing facility-specific SOPs applicable to their respective facility. The local facility develops these facility-specific SOPs based on the corporate-wide SOP template. This template is written to incorporate a set of minimum method requirements and PASI best practice requirements. The local facilities may add to or modify the corporate-wide SOP template provided there are no contradictions to the minimum method or best practice requirements. Facility-specific SOPs are controlled by the applicable SQM/QM according to the corporate document management policies.

5.1.7.4. SOPs are reviewed every two years at a minimum although a more frequent review may be required by some state or federal agencies or customers. If no revisions are made based on this review, documentation of the review itself is made by the addition of new signatures on the cover page. If revisions are made, documentation of the revisions is made in the revisions section of each SOP and a new revision number is applied to the SOP. This provides a historical record of all revisions.

5.1.7.5. All copies of superseded SOPs are removed from general use and the original copy of each SOP is archived for audit or knowledge preservation purposes. This ensures that all PASI employees use the most current version of each SOP and provides the SQM/QM with a historical record of each SOP.

5.1.7.6. Additional information can be found in SOP S-ALL-Q-001 **Preparation of SOPs** or its equivalent revision or replacement.

5.1.8. **Field Services Procedures Manual (FSM)**

5.1.8.1. The Field Services Procedures Manual is a document that describes all aspects of the field testing and sampling procedures performed by PASI-Kansas. This document is distributed to all field personnel and maintained by the Quality Assurance department.

5.2. **Document Change Control**

5.2.1. Changes to managed documents are reviewed and approved in the same manner as the original review. Any revision to a document requires the approval of the applicable signatories. After revisions are approved, a revision number is assigned and the previous version of the document is officially retired. Copies may be kept for audit or knowledge preservation purposes.

5.2.2. All controlled copies of the previous document are replaced with controlled copies of the revised document and the superseded copies are destroyed or archived. All affected personnel are advised that there has been a revision and any necessary training is scheduled.

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 38 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

5.3. Management of Change

5.3.1. The process for documenting necessary changes within the laboratory network are not typically handled using the corrective or preventive action system as outlined in section 9.0. Management of Change is a proactive approach to dealing with change to minimize the potential negative impact of systematic change in the laboratory and to ensure that each change has a positive desired outcome. This process will primarily be used for the implementation of large scale projects and information system changes as a means to apply consistent systems or procedures within the laboratory network. The request for change is submitted by the initiator and subsequently assigned to an individual or team for development and planning. The final completion of the process culminates in final approval and verification that the procedure was effectively implemented. Additional information can be found in SOP S-KS-Q-034 **Management of Change** or its equivalent revision or replacement.

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 39 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

6.0. EQUIPMENT AND MEASUREMENT TRACEABILITY

Each PASI facility is equipped with sufficient instrumentation and support equipment to perform the relevant analytical testing or field procedures performed by each facility. Support equipment includes chemical standards, thermometers, balances, disposable and mechanical pipettes, etc. This section details some of the procedures necessary to maintain traceability and to perform proper calibration of instrumentation and support equipment. See Attachment III for a list of equipment currently used at the PASI-Kansas facility.

6.1. Standards and Traceability

6.1.1. Each PASI facility retains all pertinent information for standards, reagents, and chemicals to assure traceability to a national standard. This includes documentation of purchase, receipt, preparation, and use.

6.1.2. Upon receipt, all purchased standard reference materials are recorded into a standard logbook or database and assigned a unique identification number. The entries include the facility's unique identification number, the chemical name, manufacturer name, manufacturer's identification numbers, receipt date, and expiration date. Vendor's certificates of analysis for all standards, reagents, or chemicals are retained for future reference.

6.1.3. Subsequent preparations of intermediate or working solutions are also documented in a standard logbook or database. These entries include the stock standard name and lot number, the manufacturer name, the solvents used for preparation, the solvent lot number and manufacturer, the preparation steps, preparation date, expiration dates, preparer's initials, and a unique PASI identification number. This number is used in any applicable sample preparation or analysis logbook so the standard can be traced back to the standard preparation record. This process ensures traceability back to the national standard.

6.1.4. All prepared standard or reagent containers include the PASI identification number, the standard or chemical name, the date of preparation, the date of expiration, the concentration with units, and the preparer's initials. This ensures traceability back to the standard preparation logbook.

6.1.5. For containers that are too small to accommodate labels that list all of the above information associated with a standard, the minimum required information will be PASI standard ID, concentration, and expiration date. This assures that no standard will be used past its assigned expiration date.

6.1.6. If a second source standard is required to verify an existing calibration or spiking standard, this standard should be obtained from a different manufacturer or from a different lot unless client specific QAPP requirements state otherwise.

6.1.7. Additional information concerning standards and reagent traceability can be found in the **A2LA Policy on Measurement Traceability (P102)** and in the SOPs S-ALL-Q-025 **Standard and Reagent Management and Traceability**, S-KS-Q-026 **Purchasing of Lab Supplies**, and S-KS-Q-003 **Receipt and Storage of Lab Supplies** or their equivalent revisions or replacements.

6.2. General Analytical Instrument Calibration Procedures

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 40 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

6.2.1. All support equipment and instrumentation are calibrated or checked before use to ensure proper functioning and verify that the laboratory's requirements are met. All calibrations are performed by, or under the supervision of, an experienced analyst at scheduled intervals against either certified standards traceable to recognized national standards or reference standards whose values have been statistically validated.

6.2.2. Calibration standards for each parameter are chosen to establish the linear range of the instrument and must bracket the concentrations of those parameters measured in the samples. The lowest calibration standard is the lowest concentration for which quantitative data may be reported. Data reported below this level is considered to have less certainty and must be reported using appropriate data qualifiers or explained in a narrative. The highest calibration standard is the highest concentration for which quantitative data may be reported. Data reported above this level is considered to have less certainty and must be reported using appropriate data qualifiers or explained in the narrative. Any specific method requirement for number and type of calibration standards supersedes the general requirement. Instrument and method specific calibration criteria are explained within the specific analytical standard operating procedures for each facility.

6.2.3. Instrumentation or support equipment that cannot be calibrated to specification or is otherwise defective is clearly labeled as out-of-service until it has been repaired and tested to demonstrate it meets the laboratory's specifications. All repair and maintenance activities including service calls are documented in the maintenance log. Equipment sent off-site for calibration testing is packed and transported to prevent breakage and is in accordance with the calibration laboratory's recommendations.

6.2.4. In the event that recalibration of a piece of test equipment indicates the equipment may have been malfunctioning during the course of sample analysis, an investigation is performed. The results of the investigation along with a summary of the information reviewed are documented and maintained by the quality manager. If the investigation indicates sample results have been impacted, the customer is notified within 30 days. This allows for sufficient investigation and review of documentation to determine the impact on the analytical results. Instrumentation found to be consistently out of calibration is either repaired and positively verified or taken out of service and replaced.

6.2.5. Raw data records are retained to document equipment performance. Sufficient raw data is retained to reconstruct the instrument calibration and explicitly connect the continuing calibration verification to the initial calibration.

6.2.6. General Organic Calibration Procedures

6.2.6.1. Calibration standards are prepared at a minimum of five concentrations for organic analyses. Results from all calibration standards analyzed must be included in constructing the calibration curve with the following exceptions:

6.2.6.1.1. The lowest level calibration standard may be removed from the calibration as long as the remaining number of concentration levels meets the minimum established by the method and standard operating procedure. For multi-parameter methods, this may be done on an individual analyte basis. The reporting limit must be adjusted to the lowest concentration included in the calibration curve.

6.2.6.1.2. The highest level calibration standard may be removed from the calibration as long as the remaining number of concentration levels meets the minimum established by the method and standard operating procedure. For multi-parameter methods, this may be done on an individual analyte basis. The upper limit of quantitation must be adjusted to the highest concentration included in the calibration curve.

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 41 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

6.2.6.1.3. Multiple points from either the high end or the low end of the calibration curve may be excluded as long as the remaining points are contiguous in nature and the minimum number of levels remains as established by method or standard operating procedure. The reporting limit or quantitation range, whichever is appropriate, must be adjusted accordingly.

6.2.6.1.4. Results from a concentration level between the lowest and highest calibration levels can only be excluded from an initial calibration curve for a documentable and acceptable cause with approval from the responsible department supervisor and the local SQM/QM or their designee. An acceptable cause is defined as an obvious sample introduction issue that resulted in no response, documentation of an incorrectly prepared standard, or a documented response of a single standard that is greater than 2X difference from the expected value of that standard. The results for all analytes are to be excluded and the point must be replaced by re-analysis. Re-analysis of this interior standard must occur within the same 12-hour tune time period for GC/MS methodologies and within 8 hours of the initial analysis of that standard for non-GC/MS methodologies. All samples analyzed prior to the re-analyzed calibration curve point must be re-analyzed after the calibration curve is completed and re-processed against the final calibration curve.

6.2.6.2. Initial calibration curves are evaluated against appropriate statistical models as required by the analytical methods. Curves that do not meet the appropriate criteria require corrective action that may include re-running the initial calibration curve. Rounding to meet initial calibration criteria is not allowed, that is, 15.3 cannot be rounded down to meet a $\leq 15\%$ RSD requirement. This also applies to linear and non-linear fit requirements. All initial calibrations are verified with an initial calibration verification standard (ICV) obtained from a second manufacturer or second lot from the same manufacturer if that lot can be demonstrated as prepared independently from other lots prior to the analysis of samples. Sample results are quantitated from the initial calibration unless otherwise required by regulation, method, or program.

6.2.6.3. The calibration curve is periodically verified by the analysis of a mid-level continuing calibration verification (CCV) standard during the course of sample analysis. Rounding to meet continuing calibration criteria is not allowed, that is, 15.3 cannot be rounded down to meet a $\leq 15\%$ D requirement. Continuing calibration verification is performed at the beginning and end of each analytical batch except if an internal standard is used, then only one verification at the beginning of the batch is needed, whenever it is expected that the analytical system may be out of calibration, if the time period for calibration has expired, or for analytical systems that have specific calibration verification requirements. This verification standard must meet acceptance criteria in order for sample analysis to proceed.

6.2.6.4. In the event that the CCV does not meet the acceptance criteria, a second CCV may be injected as part of the diagnostic evaluation and corrective action investigation. If the second CCV is acceptable, the analytical sequence may be continued. If both CCVs fail, the analytical sequence is terminated and corrective action is initiated. Sample analysis cannot begin until after documented corrective action has been completed and two consecutive passing CCVs have been analyzed. If required by specific state, program, or customer specification, the instrument is re-calibrated after two consecutive CCV failures. All samples analyzed since the last compliant CCV are re-analyzed for methodologies utilizing external calibration.

6.2.6.5. When instruments are operating unattended, autosamplers may be programmed to inject consecutive CCVs as a preventative measure against CCV failure with no corrective action. In this case, both CCVs must be evaluated to determine potential impact to the results. A summary of the decision tree and necessary documentation are listed below:

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 42 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

- If both CCVs meet the acceptance criteria, the analytical sequence is allowed to continue without corrective action. The 12 hour clock begins with the injection of the second CCV.
- If the first CCV does not meet the acceptance criteria and the second CCV is acceptable, the analytical sequence is continued and the results are reported.
- If the first CCV meets the acceptance criteria and the second CCV is out of control, the samples after the out of control CCV must be re-analyzed in a compliant analytical sequence.
- If both CCVs are out of control, all samples since the last acceptable CCV must be re-analyzed in a compliant analytical sequence.

6.2.6.6. Some analytical methods require that samples be bracketed by passing CCVs analyzed both before and after the samples. This is specific to each method but, as a general rule, all external calibration methods require bracketing CCVs. Most internal standard calibrations do not require bracketing CCVs.

6.2.6.7. Some analytical methods require verification based on a time interval; some methods require a frequency based on an injection interval. The type and frequency of the calibration verifications is dependent on both the analytical method and possibly on the quality program associated with the samples. The type and frequency of calibration verification will be documented in the method specific SOP employed by each laboratory.

6.2.7. General Inorganic Calibration Procedures

6.2.7.1. The instrument is initially calibrated with standards at multiple concentrations to establish the linearity of the instrument's response. A calibration blank is also included. Initial calibration curves are evaluated against appropriate statistical models as required by the analytical methods. Rounding to meet initial calibration criteria is not allowed, that is, 15.3 cannot be rounded down to meet a $\leq 15\%$ RSD requirement. This also applies to linear and non-linear fit requirements. The number of calibration standards used depends on the specific method criteria or customer project requirements, although normally a minimum of three standards is used.

6.2.7.2. The ICP and ICP/MS can be standardized with a zero point and a single point calibration if:

- Prior to analysis, the zero point and the single point calibration are analyzed and a linear range has been established,
- Zero point and single point calibration standards are analyzed with each batch
- A standard corresponding to the LOQ is analyzed with the batch and meets the established acceptance criteria
- The linearity is verified at the frequency established by the method or manufacturer.

6.2.7.3. All initial calibrations are verified with an initial calibration verification standard (ICV) obtained from a second manufacturer or second lot from the same manufacturer if the lot can be demonstrated as prepared independently from other lots prior to the analysis of samples. Sample results are quantitated from the initial calibration unless otherwise required by regulation, method, or program.

6.2.7.4. During the course of analysis, the calibration curve is periodically verified by the analysis of calibration verification standards (CCV). A calibration verification standard is analyzed within each analytical batch at method/program specific intervals to verify that the initial calibration is still valid. The CCV is also analyzed at the end of the analytical batch.

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 43 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

6.2.7.5. A calibration blank is also run with each calibration verification standard to verify the cleanliness of the system. All reported results must be bracketed by acceptable CCVs. Instrument and method specific calibration acceptance criteria are explained within the specific analytical standard operating procedures for each facility.

6.2.7.6. Interference check standards are also analyzed per method requirements and must meet acceptance criteria for metals analyses.

6.3. Support Equipment Calibration Procedures

6.3.1. All support equipment is calibrated or verified at least annually using NIST traceable references over the entire range of use. The results of calibrations or verifications must be within the specifications required or the equipment will be removed from service until repaired. The laboratory maintains records to demonstrate the correction factors applied to working thermometers.

6.3.2. On each day the equipment is used, balances, ovens, refrigerators (those used to keep samples and standards at required temperatures), freezers, and water baths are checked in the expected use range with NIST traceable references in order to ensure the equipment meets laboratory specifications and these checks are documented appropriately.

6.3.3. Analytical Balances

6.3.3.1. Each analytical balance is calibrated or verified at least annually by a qualified service technician. The calibration of each balance is verified each day of use with weights traceable to NIST bracketing the range of use. Calibration weights are ASTM Class 1 or other class weights that have been calibrated against a NIST standard weight and are re-certified every 5 years at a minimum against a NIST traceable reference. Some accrediting agencies may require more frequent checks. If balances are calibrated by an external agency, verification of their weights must be provided. All information pertaining to balance maintenance and calibration is recorded in the individual balance logbook and/or is maintained on file in the Quality department.

6.3.4. Thermometers

6.3.4.1. Certified, or reference, thermometers are maintained for checking calibration of working thermometers. Reference thermometers are provided with NIST traceability for initial calibration and are re-certified, at a minimum, every 3 years with equipment directly traceable to NIST.

6.3.4.2. Working thermometers are compared with the reference thermometers annually according to corporate metrology procedures. Each thermometer is individually numbered and assigned a correction factor based on the NIST reference source. In addition, working thermometers are visually inspected by laboratory personnel prior to use and temperatures are documented.

6.3.4.3. Laboratory thermometer inventory and calibration data are maintained in the Quality department.

6.3.5. pH/Electrometers

6.3.5.1. The meter is calibrated before use each day, using fresh buffer solutions.

6.3.6. Spectrophotometers

6.3.6.1. During use, spectrophotometer performance is checked at established frequencies in analysis sequences against initial calibration verification (ICV) and continuing calibration verification (CCV) standards.

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 44 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

6.3.7. Mechanical Volumetric Dispensing Devices

6.3.7.1. Mechanical volumetric dispensing devices including bottle top dispensers, pipettes, and burettes, excluding Class A volumetric glassware, are checked for accuracy on a quarterly basis. The accuracy of glass microliter syringes is verified and documented prior to initial use.

6.3.7.2. Additional information regarding calibration and maintenance of laboratory support equipment can be found in SOP S-KS-Q-036 **Support Equipment** or its equivalent revision or replacement.

6.4. Instrument/Equipment Maintenance

6.4.1. The objectives of the Pace Analytical maintenance program are twofold: to establish a system of instrument care that maintains instrumentation and equipment at required levels of calibration and sensitivity, and to minimize loss of productivity due to repairs.

6.4.2. The Operations Manager and/or department manager/supervisors are responsible for providing technical leadership to evaluate new equipment, solve equipment problems, and coordinate instrument repair and maintenance. Analysts have the primary responsibility to perform routine maintenance.

6.4.3. To minimize downtime and interruption of analytical work, preventative maintenance is routinely performed on each analytical instrument. Up-to-date instructions on the use and maintenance of equipment are available to staff in the department where the equipment is used.

6.4.4. Department manager/supervisors are responsible for maintaining an adequate inventory of spare parts required to minimize equipment downtime. This inventory includes parts and supplies that are subject to frequent failure, have limited lifetimes, or cannot be obtained in a timely manner should a failure occur.

6.4.5. All major equipment and instrumentation items are uniquely identified to allow for traceability. Equipment/instrumentation is, unless otherwise stated, identified as a system and not as individual pieces. The laboratory maintains equipment records that include the following:

- The name of the equipment and its software
- The manufacturer's name, type, and serial number
- Approximate date received and date placed into service
- Current location in the laboratory
- Condition when received (new, used, etc.)
- Copy of any manufacturer's manuals or instructions
- Dates and results of calibrations and next scheduled calibration (if known)
- Details of past maintenance activities, both routine and non-routine
- Details of any damage, modification or major repairs

6.4.6. All instrument maintenance is documented in maintenance logbooks that are assigned to each particular instrument or system.

6.4.7. The maintenance log entry must include a summary of the results of that analysis and verification by the analyst that the instrument has been returned to an in-control status. In addition, each entry must include the initials of the analyst making the entry, the dates the maintenance actions were performed, and the date the entry was made in the maintenance logbook, if different from the date(s) of the maintenance.

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 45 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

6.4.8. Any equipment that has been subjected to overloading or mishandling, or that gives suspect results, or has been shown to be defective, is taken out of service and clearly identified. The equipment shall not be used to analyze customer samples until it has been repaired and shown to perform satisfactorily.

6.4.9. Additional information regarding instrument transport can be found in SOP S-KS-Q-024 **Instrument Transport** or its equivalent revision or replacement.

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 46 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

7.0. CONTROL OF DATA

Analytical results processing, verification, and reporting are procedures employed that result in the delivery of defensible data. These processes include, but are not limited to, calculation of raw data into final concentration values, review of results for accuracy, evaluation of quality control criteria and assembly of technical reports for delivery to the data user.

All analytical data undergo a well-defined, well-documented multi-tier review process prior to being reported to the customer. This section describes procedures used by PASI for translating raw analytical data into accurate final sample reports as well as PASI data storage policies.

7.1. Analytical Results Processing

7.1.1. When analytical, field, or product testing data is generated, it is either recorded in a bound laboratory logbook (e.g., Run log or Instrument log) or copies of computer-generated printouts that are appropriately labeled and filed. These logbooks and other laboratory records are kept in accordance with each facility's Standard Operating Procedure for documentation storage and archival. If the laboratory chooses to minimize or eliminate its paper usage, these records can be kept on electronic media. In this case, the laboratory must ensure that there are sufficient redundant electronic copies so no data is lost due to unforeseen computer issues.

7.1.2. The primary analyst is responsible for initial data reduction and review. This includes confirming compliance with required methodology, verifying calculations, evaluating quality control data, noting non-conformances in logbooks or as footnotes or narratives, and uploading analytical results into the LIMS. The primary analyst must be clearly identified in all applicable logbooks, spreadsheets and LIMS fields.

7.1.3. The primary analyst then compiles the initial data package for verification. This compilation must include sufficient documentation for data review. It may include standard calibrations, chromatograms, manual integration documentation, electronic printouts, chain of custody forms, and logbook copies.

7.1.4. Some agencies or customers require different levels of data reporting. For these special levels, the primary analyst may need to compile additional project information, such as initial calibration data or extensive spectral data, before the data package proceeds to the verification step.

7.1.5. Additional information regarding laboratory documentation requirements and the processing of analytical results can be found in the SOPs S-ALL-Q-009 **Laboratory Documentation** and S-KS-Q-005 **Data Reduction, Review, and Reporting** or their equivalent revisions or replacements.

7.2. Data Verification

7.2.1. Data verification is the process of examining data and accepting or rejecting it based on pre-defined criteria. This review step is designed to ensure that reported data are free from calculation and transcription errors, that quality control parameters are evaluated, and that any non-conformances are properly documented.

7.2.2. Analysts performing the analysis and subsequent data reduction have primary responsibility for quality of the data produced. The primary analyst initiates the data verification process by reviewing and accepting the data, provided QC criteria have been met for the samples being reported. Data review

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 47 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

checklists, either hardcopy or electronic, are used to document the data review process. The primary analyst is responsible for the initial input of the data into the LIMS. The primary analyst and reviewer must be clearly identified on all applicable data review checklists.

7.2.3. The completed data package is then sent to a designated qualified reviewer (this cannot be the primary analyst). The following criteria have been established to qualify someone as a data reviewer. To perform secondary data reviewer, the reviewer must:

7.2.3.1. Have a current Demonstration of Capability (DOC) study on file and have an SOP acknowledgement form on file for the method/procedure being reviewed; or, ^{See Note}

7.2.3.2. Have a DOC on file for a similar method/technology (i.e., GC/MS) and have an SOP acknowledgment form on file for the method/procedure being reviewed; or, ^{See Note}

7.2.3.3. Supervise or manage a Department and have an SOP acknowledgment form on file for the method/procedure being reviewed; or,

7.2.3.4. Have significant background in the department/methods being reviewed through education or experience and have an SOP acknowledgment form on file for the method/procedure being reviewed.

7.2.4. **Note:** Secondary reviewer status must be approved personally by the SQM/QM or SGM/GM/AGM/OM in the event that this person has no prior experience on the specific method or general technology.

7.2.5. This reviewer provides an independent technical assessment of the data package and technical review for accuracy according to methods employed and laboratory protocols. This assessment involves a quality control review for use of the proper methodology and detection limits, compliance to quality control protocol and criteria, presence and completeness of required deliverables, and accuracy of calculations and data quantitation. The reviewer also validates the data entered into the LIMS.

7.2.6. Once the data have been technically reviewed and approved, authorization for release of the data from the analytical section is indicated by initialing and dating the data review checklist or otherwise initialing and dating the data (or designating the review of data electronically). The Operations or Project Manager examines the report for method appropriateness, detection limits and QC acceptability. Any deviations from the referenced methods are checked for documentation and validity, and QC corrective actions are reviewed for successful resolution.

7.2.7. The data verification procedures are further supplemented by the LIMS Data Checker program that was developed to review test results for chemical incongruence (e.g. Total Metals > Dissolved Metals) and quality control outliers. This evaluation is performed and summarized during the generation of the final report and reviewed by the Project Manager.

7.2.8. Additional information regarding data review procedures can be found in SOPs S-KS-Q-005 **Data Reduction, Review, and Reporting**, S-ALL-Q-016 **Manual Integration**, S-ALL-Q-030 **Operation of Data Checker** or their equivalent revisions or replacements.

7.3. Data Reporting

7.3.1. Data for each analytical fraction pertaining to a particular PASI project number are delivered to the Project Manager for assembly into the final report. All points mentioned during technical and QC reviews are included in a case narrative if there is potential for data to be impacted.

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 48 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

7.3.2. Final reports are prepared according to the level of reporting required by the customer and can be transmitted to the customer via hardcopy or electronic deliverable. A standard PASI final report consists of the following components:

7.3.2.1. A title which designates the report as “Final Report”, “Laboratory Results”, “Certificate of Results”, etc.;

7.3.2.2. Name and address of laboratory (or subcontracted laboratories, if used);

7.3.2.3. Phone number and name of laboratory contact to where questions can be referred;

7.3.2.4. A unique identification number for the report. The pages of the report shall be numbered and a total number of pages shall be indicated;

7.3.2.5. Name and address of customer and name of project;

7.3.2.6. Unique identification of samples analyzed as well as customer sample IDs;

7.3.2.7. Identification of any sample that did not meet acceptable sampling requirements of the relevant governing agency, such as improper sample containers, holding times missed, sample temperature, etc.;

7.3.2.8. Date and time of collection of samples, date of sample receipt by the laboratory, dates of sample preparation and analysis, and times of sample preparation and analysis when the holding time for either is 72 hours or less;

7.3.2.9. Identification of the test methods used;

7.3.2.10. Identification of sampling procedures if sampling was conducted by the laboratory;

7.3.2.11. Deviations from, additions to, or exclusions from the test methods. These can include failed quality control parameters, deviations caused by the matrix of the sample, etc., and can be shown as a case narrative or as defined footnotes to the analytical data;

7.3.2.12. Identification of whether calculations were performed on a dry or wet-weight basis;

7.3.2.13. Reporting limits used;

7.3.2.14. Final results or measurements, supported by appropriate chromatograms, charts, tables, spectra, etc.;

7.3.2.15. A signature and title, electronic or otherwise, of person accepting responsibility for the content of the report;

7.3.2.16. Date report was issued;

7.3.2.17. A statement clarifying that the results of the report relate only to the samples tested or to the samples as they were received by the laboratory;

7.3.2.18. If necessary, a statement indicating that the report must not be reproduced except in full, without the written approval of the laboratory;

7.3.2.19. Identification of all test results provided by a subcontracted laboratory or other outside source;

7.3.2.20. Identification of results obtained outside of quantitation levels.

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 49 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

In addition to the requirements listed above, final reports shall also contain the following items when necessary for the interpretation of results:

7.3.2.21. Deviations from, additions to, or exclusions from the test method, and information on specific test conditions, such as environmental conditions;

7.3.2.22. Where relevant, a statement of compliance/non-compliance with requirements and/or specifications (e.g., the TNI standard);

7.3.2.23. Where applicable, a statement on the estimated uncertainty of measurement; information on uncertainty is needed in test reports when it is relevant to the validity or application of the test results, when a customer's instruction so requires, or when the uncertainty affects compliance to a specification limit;

7.3.2.24. Where appropriate and needed, opinions and interpretations, which may include opinions on the compliance/non-compliance of the results with requirements, fulfillment of contractual requirements, recommendations on how to use the results, and guidance to be used for improvement;

7.3.3. Any changes made to a final report shall be designated as "Revised" or equivalent wording. The laboratory must keep sufficient archived records of all laboratory reports and revisions. For higher levels of data deliverables, a copy of all supporting raw data is sent to the customer along with a final report of results. When possible, the PASI facility will provide electronic data deliverables (EDD) as required by contracts or upon customer request.

7.3.4. Customer data that requires transmission by telephone, telex, facsimile or other electronic means undergoes appropriate steps to preserve confidentiality.

7.3.5. The following positions are the only approved signatories for PASI final reports:

- Senior General Manager
- General Manager
- Assistant General Manager
- Senior Quality Manager
- Quality Manager
- Client Services Manager
- Project Manager
- Project Coordinator

Additional information regarding data reporting can be found in SOP S-KS-Q-005 **Data Reduction, Review, and Reporting** or its equivalent revision or replacement.

7.4. Data Security

7.4.1. All data including electronic files, logbooks, extraction/digestion/distillation worksheets, calculations, project files and reports, and any other information used to produce the technical report are maintained secured and retrievable by the PASI facility.

7.4.2. Additional information regarding data security can be found in SOPs S-KS-Q-007 **Laboratory Security Procedures** and S-ALL-IT-001 **System Security and Integrity** or their equivalent revisions or replacements.

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 50 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

7.5. Data Archiving

7.5.1. All records compiled by PASI are maintained legible and retrievable and stored secured in a suitable environment to prevent loss, damage, or deterioration by fire, flood, vermin, theft, and/or environmental deterioration. Records are retained for a minimum of five years unless superseded by federal, state, contractual, and/or accreditation requirements. These records may include, but are not limited to, customer data reports, calibration and maintenance of equipment, raw data from instrumentation, quality control documents, observations, calculations, and logbooks. These records are retained in order to provide for possible historical reconstruction including sampling, receipt, preparation, analysis, and personnel involved. TNI-related records will be made readily available to accrediting authorities. Access to archived data is documented and controlled by the SQM/QM or a designated Data Archivist.

7.5.2. Records that are computer generated have either a hard copy or electronic write protected backup copy. Hardware and software necessary for the retrieval of electronic data is maintained with the applicable records. Archived electronic records are stored protected against electronic and/or magnetic sources.

7.5.3. In the event of a change in ownership, accountability or liability, reports of analyses performed pertaining to accreditation will be maintained by the acquiring entity for a minimum of five years. In the event of bankruptcy, laboratory reports and/or records will be transferred to the customer and/or the appropriate regulatory entity upon request.

7.5.4. Additional information regarding data backup and data archiving and can be found in SOPs S-KS-Q-019 **Laboratory Data Filing and Archiving**, S-KS-IT-001 **Target Data Backup**, and S-KS-IT-002 **Server Backup** or their equivalent revisions or replacements.

7.6. Data Disposal

7.6.1. Data that has been archived for the facility's required storage time may be disposed of in a secure manner by shredding, returning to customer, or utilizing some other means that does not jeopardize data confidentiality. Records of data disposal will be archived for a minimum of five years unless superseded by federal, contractual, and/or accreditation requirements. Data disposal includes any preliminary or final reports that are disposed.

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 51 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

8.0. QUALITY SYSTEM AUDITS AND REVIEWS

8.1. Internal Audits

8.1.1. Responsibilities

8.1.1.1. The SQM/QM is responsible for designing and/or conducting internal audits in accordance with a predetermined schedule and procedure. Since internal audits represent an independent assessment of laboratory functions, the auditor must be functionally independent from laboratory operations to ensure objectivity. The auditor must be trained, qualified, and familiar enough with the objectives, principles, and procedures of laboratory operations to be able to perform a thorough and effective evaluation. The SQM/QM evaluates audit observations and verifies the completion of corrective actions. In addition, a periodic corporate audit will be conducted. The corporate audits will focus on the effectiveness of the Quality System as outlined in this manual but may also include other quality programs applicable to an individual laboratory.

8.1.2. Scope and Frequency of Internal Audits

8.1.2.1. The complete internal audit process consists of the following four sections:

- Raw Data Review audits- conducted according to a schedule per local SQM/QM. A certain number of these data review audits are conducted per quarter to accomplish this yearly schedule;
- Quality System audits- considered the traditional internal audit function and includes analyst interviews to help determine whether practice matches method requirements and SOP language;
- Final Report reviews;
- Corrective Action Effectiveness Follow-up.

8.1.2.2. Internal systems audits are conducted yearly at a minimum. The scope of these audits includes evaluation of specific analytical departments or a specific quality related system as applied throughout the laboratory.

8.1.2.3. Where the identification of non-conformities or departures cast doubt on the laboratory's compliance with its own policies and procedures, the lab must ensure that the appropriate areas of activity are audited as soon as possible. Examples of system-wide elements that can be audited include:

- Quality Systems documents, such as Standard Operating Procedures, training documents, Quality Assurance Manual, and all applicable addenda
- Data records and non-technical documents
- Personnel and training files.
- General laboratory safety protocols.
- Chemical handling practices, such as labeling of reagents, solutions, and standards as well as all associated documentation.
- Documentation concerning equipment and instrumentation, calibration/maintenance records, operating manuals.
- Sample receipt and management practices.
- Analytical documentation, including any discrepancies and corrective actions.

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 52 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

- General procedures for data security, review, documentation, reporting, and archiving.
- Data integrity issues such as proper manual integrations.

8.1.2.4. When the operations of a specific department are evaluated, a number of additional functions are reviewed including:

- Detection limit studies
- Internal chain of custody documentation
- Documentation of standard preparations
- Quality Control limits and Control charts

8.1.2.5. Certain projects may require an internal audit to ensure laboratory conformance to site work plans, sampling and analysis plans, QAPPs, etc.

8.1.2.6. A representative number of data audits are completed annually. Findings from these data audits are handled in the same manner as those from other internal and external audits.

8.1.2.7. The laboratory, as part of their overall internal audit program, ensures that a review is conducted with respect to any evidence of inappropriate actions or vulnerabilities related to data integrity. Discovery and reporting of potential data integrity issues are handled in a confidential manner. All investigations that result in findings of inappropriate activity are fully documented, including the source of the problem, the samples and customers affected the impact on the data, the corrective actions taken by the laboratory, and which final reports had to be re-issued. Customers must be notified within 30 days after the data investigation is completed and the impact to final results is assessed.

8.1.3. Internal Audit Reports and Corrective Action Plans

8.1.3.1. Additional information can be found in SOP S-ALL-Q-011 **Internal and External Audits** or its equivalent revision or replacement.

8.1.3.2. A full description of the audit, including the identification of the operation audited, the date(s) on which the audit was conducted, the specific systems examined, and the observations noted are summarized in an internal audit report. Although other personnel may assist with the performance of the audit, the SQM/QM writes and issues the internal audit report identifying which audit observations are deficiencies that require corrective action.

8.1.3.3. When audit findings cast doubt on the effectiveness of the operations or on the correctness of validity of the laboratory's environmental test results, the laboratory will take timely corrective action and notify the customer in writing within three business days, if investigations show that the laboratory results may have been affected.

8.1.3.4. Once completed, the internal audit report is issued jointly to the SGM/GM/AGM/OM and the manager(s)/supervisor(s) of the audited operation at a minimum. The responsible manager(s)/supervisor(s) responds within 14 days with a proposed plan to correct all of the deficiencies cited in the audit report. The SQM/QM may grant additional time for responses to large or complex deficiencies (not to exceed 30 days). Each response must include timetables for completion of all proposed corrective actions.

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 53 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

8.1.3.5. The SQM/QM reviews the audit responses. If the response is accepted, the SQM/QM uses the action plan and timetable as a guideline for verifying completion of the corrective action(s). If the SQM/QM determines that the audit response does not adequately address the correction of cited deficiencies, the response will be returned for modification.

8.1.3.6. To complete the audit process, the SQM/QM performs a re-examination of the areas where deficiencies were found to verify that all proposed corrective actions have been implemented. An audit deficiency is considered closed once implementation of the necessary corrective action has been audited and verified. This is usually within 60-90 days after implementation. If corrective action cannot be verified, the associated deficiency remains open until that action is completed.

8.2. External Audits

8.2.1. PASI laboratories are audited regularly by regulatory agencies to maintain laboratory certifications and by customers to maintain appropriate specific protocols.

8.2.2. Audit teams external to the company review the laboratory to assess the effectiveness of systems and degree of technical expertise. The SQM/QM and other QA staff host the audit team and assist in facilitation of the audit process. Generally, the auditors will prepare a formalized audit report listing deficiencies observed and follow-up requirements for the laboratory. In some cases, items of concern are discussed during a debriefing convened at the end of the on-site review process.

8.2.3. The laboratory staff and supervisors develop corrective action plans to address any deficiencies with the guidance of the SQM/QM. The SGM/GM/AGM/OM provides the necessary resources for staff to develop and implement the corrective action plans. The SQM/QM collates this information and provides a written response to the audit team. The response contains the corrective action plan and expected completion dates for each element of the plan. The SQM/QM follows-up with the laboratory staff to ensure corrective actions are implemented and that the corrective action was effective.

8.3. Quarterly Quality Reports

8.3.1. The SQM/QM is responsible for preparing a quarterly report to management summarizing the effectiveness of the laboratory Quality Systems. This status report will include:

- Overview of quality activities for the quarter
- Certification status
- Proficiency Testing study results
- SOP revision activities
- Company-wide 3P Document implementation (internal program)
- External audit findings
- Internal audit (method/system) findings
- Manual integration audit findings (Mintminer)
- Raw Data and Final Report review findings
- MDL activities
- Corrective action activities
- Training activity status
- Other significant Quality System items

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 54 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

8.3.2. The Corporate Director of Quality utilizes the information from each laboratory to make decisions impacting the quality program compliance of the company as a whole. Each SGM/GM/AGM/OM utilizes the quarterly report information to make decisions impacting Quality Systems and operational systems at a local level.

8.3.3. Additional information can be found in SOP S-ALL-Q-014 **Quality System Review** or its equivalent revision or replacement.

8.4. Annual Managerial Review

8.4.1. A managerial review of Quality Systems is performed on an annual basis at a minimum. This allows for assessing program effectiveness and introducing changes and/or improvements.

8.4.2. The managerial review must include the following topics of discussion:

- Suitability of quality management policies and procedures
- Manager/Supervisor reports
- Internal audit results
- Corrective and preventative actions
- External assessment results
- Proficiency testing studies
- Sample capacity and scope of work changes
- Customer feedback, including complaints
- Recommendations for improvement,
- Other relevant factors, such as quality control activities, resources, and staffing.

8.4.3. This managerial review must be documented for future reference by the SQM/QM and copies of the report are distributed to laboratory staff. Results should feed into the laboratory planning system and should include goals, objectives, and action plans for the coming year. The laboratory shall ensure that any actions identified during the review are carried out within an appropriate and agreed upon timescale.

8.4.4. Additional information regarding managerial review can be found in the SOP S-ALL-Q-015 **Review of Laboratory Management System** or its equivalent revision or replacement.

8.5. Customer Service Reviews

8.5.1. As part of the annual managerial review listed previously, the sales staff is responsible for reporting on customer feedback, including complaints. The acquisition of this information is completed by performing surveys.

8.5.2. The sales staff continually receives customer feedback, both positive and negative, and reports this feedback to the laboratory management in order for them to evaluate and improve their management system, testing activities and customer service.

8.5.3. In addition, the labs must be willing to cooperate with customers or their representatives to clarify customer requests and to monitor the laboratory's performance in relation to the work being performed for the customers. This cooperation may include providing the customer reasonable

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 55 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

access to relevant areas of the lab for the witnessing of tests being performed; or the preparation of samples or data deliverables to be used for verification purposes.

8.5.4. Customer service is an important aspect to Pace's overall objective of providing a quality product. Good communication should be provided to the customer's throughout projects. The lab should inform the customer of any delay or major deviations in the performance of analytical tests.

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 56 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

9.0. CORRECTIVE ACTION

Additional information can be found in SOPs S-ALL-Q-012 **Corrective and Preventive Actions**, S-ALL-Q-028 **Use and Operation of LabTrack**, and S-KS-Q-028 **Customer Complaint Resolution** or their equivalent revisions or replacements.

During the process of sample handling, preparation, and analysis, or during review of quality control records, or during reviews of non-technical portions of the lab, certain occurrences may warrant the necessity of corrective actions. These occurrences may take the form of analyst errors, deficiencies in quality control, method deviations, or other unusual circumstances. The Quality System of PASI provides systematic procedures for the documentation, monitoring, completion of corrective actions, and follow-up verification of the effectiveness of these corrective actions. This can be done using PASI's LabTrack system that lists among at a minimum, the deficiency by issue number, the deficiency source, responsible party, root cause, resolution, due date, and date resolved.

9.1. Corrective Action Documentation

9.1.1. The following items are examples of sources of laboratory deviations or non-conformances that warrant some form of documented corrective action:

- Internal Laboratory Non-Conformance Trends
- PE/PT Sample Results
- Internal and External Audits
- Data or Records Review (including non-technical records)
- Client Complaints
- Client Inquiries
- Holding Time violations

9.1.2. Documentation of corrective actions may be in the form of a comment or footnote on the final report that explains the deficiency (e.g., matrix spike recoveries outside of acceptance criteria) or it may be a more formal documentation (either paper system or computerized spreadsheet). This depends on the extent of the deficiency, the impact on the data, and the method or customer requirements for documentation.

9.1.3. The person who discovers the deficiency or non-conformance initiates the corrective action documentation on the Non-Conformance Corrective/ Preventative Action report and/or LabTrack. The documentation must include the affected projects and sample numbers, the name of the applicable Project Manager, the customer name, and the sample matrix involved. The person initiating the corrective action documentation must also list the known causes of the deficiency or non-conformance as well as any corrective/preventative actions that they have taken. Preventive actions must be taken in order to prevent or minimize the occurrence of the situation.

9.1.4. In the event that the laboratory is unable to determine the cause, laboratory personnel and management staff will start a root cause analysis by going through an investigative process. During this process, the following general steps must be taken into account: defining the non-conformance, assigning responsibilities, determining if the condition is significant, and investigating the root cause of the nonconformance. General non-conformance investigative techniques follow the path of the sample

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 57 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

through the process looking at each individual step in detail. The root cause must be documented within LabTrack or on the Corrective/Preventative Action Report.

9.1.5. After all the documentation is completed, the routing of the Corrective/Preventative Action Report and /or LabTrack will continue from the person initiating the corrective action, to their immediate supervisor or the applicable Project Manager and finally to the SQM/QM, if applicable, who may be responsible for final review and signoff of corrective/preventative actions.

9.1.6. In the event that analytical testing or results do not conform to documented laboratory policies or procedures, customer requirements, or standard specifications, the laboratory shall investigate the significance of the non-conformance and document appropriate corrective actions. The proper level of laboratory management will review any departure from these requirements for technical suitability. These departures are permitted only with the approval of the SGM/GM/AGM/OM or the SQM/QM. Where necessary, Project Management will notify the customer of the situation and will advise of any ramifications to data quality (with the possibility of work being recalled). The procedures for handling non-conforming work are detailed in SOP S-ALL-Q-012 **Corrective and Preventive Actions** or its equivalent revision or replacement.

9.2. Corrective Action Completion

9.2.1. Internal Laboratory Non-Conformance Trends

9.2.1.1. There are several types of non-conformance trends that may occur in the laboratory that would require the initiation of a corrective action report. Laboratories may choose to initiate a corrective action for all instances of one or more of these categories if they so choose, however the intent is that each of these would be handled according to its severity; one time instances could be handled with a footnote or qualifier whereas a systemic problem with any of these categories may require an official corrective action process. These categories, as defined in the Corrective Action SOP are as follows:

- Login error
- Preparation Error
- Contamination
- Calibration Failure
- Internal Standard Failure
- LCS Failure
- Laboratory accident
- Spike Failure
- Instrument Failure
- Final Reporting error

9.2.2. PE/PT Sample Results

9.2.2.1. Any PT result assessed as “not acceptable” requires an investigation and applicable corrective actions. The operational staff is made aware of the PT failures and they are responsible for reviewing the applicable raw data and calibrations and list possible causes for error. The SQM/QM reviews their findings and initiates another external PT sample or an internal PT sample to try and correct the previous failure. Replacement PT results must be monitored by the SQM/QM and reported to the applicable regulatory authorities.

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 58 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

9.2.3. Internal and External Audits

9.2.3.1. The SQM/QM is responsible for documenting all audit findings and their corrective actions. This documentation must include the initial finding, the persons responsible for the corrective action, the due date for responding to the auditing body, the root cause of the finding, and the corrective actions needed for resolution. The SQM/QM is also responsible for providing any back-up documentation used to demonstrate that a corrective action has been completed.

9.2.4. Data Review

9.2.4.1. In the course of performing primary and secondary review of data or in the case of raw data reviews (e.g., by the SQM/QM), errors may be found which require corrective actions. Any finding that affects the quality of the data requires some form of corrective action, which may include revising and re-issuing of final reports.

9.2.5. Client Complaints

9.2.5.1. Project Managers are responsible for issuing corrective action forms, when warranted, for customer complaints. As with other corrective actions, the possible causes of the problem are listed and the form is passed to the appropriate analyst or supervisor for investigation. After potential corrective actions have been determined, the Project Manager reviews the corrective action form to ensure all customer needs or concerns are being adequately addressed.

9.2.6. Client Inquiries

9.2.6.1. When an error on the customer report is discovered, the Project Manager is responsible for initiating a formal corrective action form that describes the failure (e.g., incorrect analysis reported, reporting units are incorrect, or reporting limits do not meet objectives). The Project Manager is also responsible for revising the final report if necessary and submitting it to the customer.

9.2.7. Holding Time Violations

9.2.7.1. In the event that a holding time has been missed, the analyst or supervisor must complete a formal corrective action form. The Project Manager and the SQM/QM must be made aware of all holding time violations.

9.2.7.2. The Project Manager must contact the customer in order that appropriate decisions are made regarding the hold time excursion and the ultimate resolution is then documented and included in the customer project file. The SQM/QM includes a list of all missed holding times in their Quarterly Report to the corporate quality office.

9.3. Preventive Action Documentation

9.3.1. Pace laboratories can take advantage of several available information sources in order to identify needed improvements in all of their systems including technical, managerial, and quality. These sources may include:

- Management Continuous Improvement Plan (CIP) metrics which are used by all production departments within Pace. When groups compare performance across the company, ways to improve systems may be discovered. These improvements can be made within a department or laboratory-wide.

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 59 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

- Annual managerial reviews- part of this TNI-required and NVLAP-required review is to look at all processes and procedures used by the laboratory over the past year and to determine ways to improve these processes in the future.
- Quality systems reviews- any frequent checks of quality systems (monthly logbook reviews, etc.) can uncover issues that can be corrected or adjusted before they become a larger issue.

9.3.2. When improvement opportunities are identified or if preventive action is required, the laboratory can develop, implement, and monitor preventive action plans.

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 60 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

10.0. GLOSSARY

The source of some of the definitions is indicated previous to the actual definition (e.g., TNI, DoD).

3P Program	The Pace Analytical continuous improvement program that focuses on Process, Productivity, and Performance. Best Practices are identified that can be used by all PASI labs.
Acceptance Criteria	TNI - Specified limits placed on characteristics of an item, process, or service defined in requirement documents.
Accreditation	TNI - The process by which an agency or organization evaluates and recognizes a laboratory as meeting certain predetermined qualifications or standards, thereby accrediting the laboratory.
Accrediting Authority	The Territorial, State or Federal agency having responsibility and accountability for environmental laboratory accreditation and which grants accreditation.
Accrediting (or Accreditation) Body	Authoritative body that performs accreditation.
Accuracy	TNI - The degree of agreement between an observed value and an accepted reference value. Accuracy includes a combination of random error (precision) and systematic error (bias) components that are due to sampling and analytical operations; a data quality indicator.
Aliquot	A discrete, measured, representative portion of a sample taken for analysis.
Analysis Code (Acode)	All the set parameters of a test, such as Analytes, Method, Detection Limits and Price.
Analysis Sequence	A compilation of all samples, standards and quality control samples run during a specific amount of time on a particular instrument in the order they are analyzed.
Analyst	TNI - The designated individual who performs the “hands-on” analytical methods and associated techniques and who is the one responsible for applying required laboratory practices and other pertinent quality controls to meet the required level of quality.
Analyte	The specific chemicals or components for which a sample is analyzed; it may be a group of chemicals that belong to the same chemical family, and which are analyzed together.
Analytical Uncertainty	TNI- A subset of Measurement Uncertainty that includes all laboratory activities performed as part of the analysis.
Assessment	TNI - The evaluation process used to measure or establish the performance, effectiveness, and conformance of an organization and/or its system to defined criteria (to the standards and requirements of laboratory accreditation).
Atomic Absorption Spectrometer	Instrument used to measure concentration in metals samples.
Atomization	A process in which a sample is converted to free atoms.
Audit	TNI- A systematic and independent examination of facilities, equipment, personnel, training, procedures, record-keeping, data validation, data management, and reporting aspects of a system to determine whether QA/QC and technical activities are being conducted as planned and whether these activities will effectively achieve quality objectives.

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 61 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

Batch	TNI - Environmental samples that are prepared and/or analyzed together with the same process and personnel, using the same lot(s) of reagents. A preparation batch is composed of one to 20 environmental samples of the same quality systems matrix, meeting the above-mentioned criteria and with a maximum time between the start of processing of the first and last sample in the batch to be 24 hours. An analytical batch is composed of prepared environmental samples (extracts, digestates or concentrates) which are analyzed together as a group. An analytical batch can include prepared samples originating from various quality system matrices and can exceed 20 samples.
Bias	TNI- The systematic or persistent distortion of a measurement process, which causes errors in one direction (i.e., the expected sample measurement is different from the sample's true value).
Blank	TNI - A sample that has not been exposed to the analyzed sample stream in order to monitor contamination during sampling, transport, storage or analysis. The blank is subjected to the usual analytical and measurement process to establish a zero baseline or background value and is sometimes used to adjust or correct routine analytical results.
Blind Sample	A sub-sample for analysis with a composition known to the submitter. The analyst/laboratory may know the identity of the sample but not its composition. It is used to test the analyst's or laboratory's proficiency in the execution of the measurement process.
BNA (Base Neutral Acid compounds)	A list of semi-volatile compounds typically analyzed by mass spectrometry methods. Named for the way they can be extracted out of environmental samples in an acidic, basic or neutral environment.
BOD (Biochemical Oxygen Demand)	Chemical procedure for determining how fast biological organisms use up oxygen in a body of water.
Calibration	TNI - A set of operations that establish, under specified conditions, the relationship between values of quantities indicated by a measuring instrument or measuring system, or values represented by a material measure or a reference material, and the corresponding values realized by standards. 1) In calibration of support equipment, the values realized by standards are established through the use of reference standards that are traceable to the International System of Units (SI); 2) In calibration according to test methods, the values realized by standards are typically established through the use of Reference Materials that are either purchased by the laboratory with a certificate of analysis or purity, or prepared by the laboratory using support equipment that has been calibrated or verified to meet specifications.
Calibration Curve	TNI- The mathematical relationship between the known values, such as concentrations, of a series of calibration standards and their instrument response.
Calibration Method	A defined technical procedure for performing a calibration.
Calibration Range	The range of values (concentrations) between the lowest and highest calibration standards of a multi-level calibration curve. For metals analysis with a single-point calibration, the low-level calibration check standard and the high standard establish the linear calibration range, which lies within the linear dynamic range.
Calibration Standard	TNI- A substance or reference material used for calibration.

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 62 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

Certified Reference Material (CRM)	TNI- Reference material accompanied by a certificate, having a value, measurement uncertainty, and stated metrological traceability chain to a national metrology institute.
Chain of Custody	An unbroken trail of accountability that verifies the physical security of samples, data, and records.
Chain of custody Form (COC)	TNI - Record that documents the possession of the samples from the time of collection to receipt in the laboratory. This record generally includes: the number and type of containers; the mode of collection, the collector, time of collection; preservation; and requested analyses.
Chemical Oxygen Demand (COD)	A test commonly used to indirectly measure the amount of organic compounds in water.
Client (referred to by ISO as Customer)	Any individual or organization for whom items or services are furnished or work performed in response to defined requirements and expectations.
Code of Federal Regulations (CFR)	A codification of the general and permanent rules published in the Federal Register by agencies of the federal government.
Comparability	An assessment of the confidence with which one data set can be compared to another. Comparable data are produced through the use of standardized procedures and techniques.
Completeness	The percent of valid data obtained from a measurement system compared to the amount of valid data expected under normal conditions. The equation for completeness is: $\% \text{ Completeness} = (\text{Valid Data Points} / \text{Expected Data Points}) * 100$
Confirmation	TNI - Verification of the identity of a component through the use of an approach with a different scientific principle from the original method. These may include, but are not limited to: second-column confirmation; alternate wavelength; derivatization; mass spectral interpretation; alternative detectors; or additional cleanup procedures.
Conformance	An affirmative indication or judgment that a product or service has met the requirements of the relevant specifications, contract, or regulation; also the state of meeting the requirements.
Congener	A member of a class of related chemical compounds (e.g., PCBs, PCDDs).
Consensus Standard	A standard established by a group representing a cross-section of a particular industry or trade, or a part thereof.
Continuing Calibration Blank (CCB)	A blank sample used to monitor the cleanliness of an analytical system at a frequency determined by the analytical method.
Continuing Calibration Check Compounds (CCC)	Compounds listed in mass spectrometry methods that are used to evaluate an instrument calibration from the standpoint of the integrity of the system. High variability would suggest leaks or active sites on the instrument column.
Continuing Calibration Verification	The verification of the initial calibration that is required during the course of analysis at periodic intervals. Continuing calibration verification applies to both external and internal standard calibration techniques, as well as to linear and non-linear calibration models.
Continuing Calibration Verification (CCV) Standard	Also referred to as a CVS in some methods, it is a standard used to verify the initial calibration of compounds in an analytical method. CCVs are analyzed at a frequency determined by the analytical method.

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 63 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

Continuous Emission Monitor (CEM)	A flue gas analyzer designed for fixed use in checking for environmental pollutants.
Contract Laboratory Program (CLP)	A national network of EPA personnel, commercial labs, and support contractors whose fundamental mission is to provide data of known and documented quality.
Contract Required Detection Limit (CRDL)	Detection limit that is required for EPA Contract Laboratory Program (CLP) contracts.
Contract Required Quantitation Limit (CRQL)	Quantitation limit (reporting limit) that is required for EPA Contract Laboratory Program (CLP) contracts.
Control Chart	A graphic representation of a series of test results, together with limits within which results are expected when the system is in a state of statistical control (see definition for Control Limit)
Control Limit	A range within which specified measurement results must fall to verify that the analytical system is in control. Control limit exceedances may require corrective action or require investigation and flagging of non-conforming data.
Corrective Action	The action taken to eliminate the causes of an existing non-conformity, defect, or other undesirable situation in order to prevent recurrence.
Corrective and Preventative Action (CAPA)	The primary management tools for bringing improvements to the quality system, to the management of the quality system's collective processes, and to the products or services delivered which are an output of established systems and processes.
Data Audit	A qualitative and quantitative evaluation of the documentation and procedures associated with environmental measurements to verify that the resulting data are of acceptable quality (i.e. that they meet specified acceptance criteria).
Data Quality Objective (DQO)	Systematic strategic planning tool based on the scientific method that identifies and defines the type, quality, and quantity of data needed to satisfy a specified use or end user.
Data Reduction	TNI- The process of transforming the number of data items by arithmetic or statistical calculation, standard curves, and concentration factors, and collating them into a more usable form.
Definitive Data	Analytical data of known quality, concentration and level of uncertainty. The levels of quality and uncertainty of the analytical data are consistent with the requirements for the decision to be made. Suitable for final decision-making.
Demonstration of Capability	TNI- A procedure to establish the ability of the analyst to generate analytical results of acceptable accuracy and precision.
Detection Limit (DL)	The smallest analyte concentration that can be demonstrated to be different than zero or a blank concentration at the 99% level of confidence. At the DL, the false positive rate is 1%.
Diesel Range Organics (DRO)	A range of compounds that denote all the characteristic compounds that make up diesel fuel (range can be state or program specific).
Digestion	A process in which a sample is treated (usually in conjunction with heat) to convert the sample to a more easily measured form.
Document Control	The act of ensuring that documents (and revisions thereto) are proposed, reviewed for accuracy, approved for release by authorized personnel, distributed properly and controlled to ensure use of the correct version at the location where the prescribed activity is performed.

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 64 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

Dry Weight	The weight after drying in an oven at a specified temperature.
Duplicate (also known as Replicate or Laboratory Duplicate)	The analyses or measurements of the variable of interest performed identically on two subsamples of the same sample. The results of duplicate analyses are used to evaluate analytical or measurement precision but not the precision of sampling, preservation or storage internal to the laboratory.
Electron Capture Detector (ECD)	Device used in GC methods to detect compounds that absorb electrons (e.g., PCB compounds).
Electronic Data Deliverable (EDD)	A summary of environmental data (usually in spreadsheet form) which clients request for ease of data review and comparison to historical results.
Eluent	A solvent used to carry the components of a mixture through a stationary phase.
Elute	To extract, specifically, to remove (absorbed material) from an absorbent by means of a solvent.
Elution	A process in which solutes are washed through a stationary phase by movement of a mobile phase.
Environmental Data	Any measurements or information that describe environmental processes, locations, or conditions; ecological or health effects and consequences; or the performance of environmental technology.
Environmental Monitoring	The process of measuring or collecting environmental data.
Environmental Sample	A representative sample of any material (aqueous, non-aqueous, or multimedia) collected from any source for which determination of composition or contamination is requested or required. Environmental samples can generally be classified as follows: • Non Potable Water (Includes surface water, ground water, effluents, water treatment chemicals, and TCLP leachates or other extracts) • Drinking Water - Delivered (treated or untreated) water designated as potable water • Water/Wastewater - Raw source waters for public drinking water supplies, ground waters, municipal influents/effluents, and industrial influents/effluents • Sludge - Municipal sludges and industrial sludges. • Soil - Predominately inorganic matter ranging in classification from sands to clays. • Waste - Aqueous and non-aqueous liquid wastes, chemical solids, and industrial liquid and solid wastes
Equipment Blank	A sample of analyte-free media used to rinse common sampling equipment to check effectiveness of decontamination procedures.
Facility	A distinct location within the company that has unique certifications, personnel and waste disposal identifications.
False Negative	An analyte incorrectly reported as absent from the sample, resulting in potential risks from their presence.
False Positive	An item incorrectly identified as present in the sample, resulting in a high reporting value for the analyte of concern.
Field Blank	A blank sample prepared in the field by filling a clean container with reagent water and appropriate preservative, if any, for the specific sampling activity being undertaken.

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 65 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

Field Measurement	Determination of physical, biological, or radiological properties, or chemical constituents that are measured on-site, close in time and space to the matrices being sampled/measured, following accepted test methods. This testing is performed in the field outside of a fixed-laboratory or outside of an enclosed structure that meets the requirements of a mobile laboratory.
Field of Accreditation	TNI- Those matrix, technology/method, and analyte combinations for which the accreditation body offers accreditation.
Finding	TNI- An assessment conclusion referenced to a laboratory accreditation standard and supported by objective evidence that identifies a deviation from a laboratory accreditation standard requirement.
Flame Atomic Absorption Spectrometer (FAA)	Instrumentation used to measure the concentration of metals in an environmental sample based on the fact that ground state metals absorb light at different wavelengths. Metals in a solution are converted to the atomic state by use of a flame.
Flame Ionization Detector (FID)	A type of gas detector used in GC analysis where samples are passed through a flame which ionizes the sample so that various ions can be measured.
Gas Chromatography (GC)	Instrumentation which utilizes a mobile carrier gas to deliver an environmental sample across a stationary phase with the intent to separate compounds out and measure their retention times.
Gas Chromatograph/Mass Spectrometry (GC/MS)	In conjunction with a GC, this instrumentation utilizes a mass spectrometer which measures fragments of compounds and determines their identity by their fragmentation patterns (mass spectra).
Gasoline Range Organics (GRO)	A range of compounds that denote all the characteristic compounds that make up gasoline (range can be state or program specific).
Graphite Furnace Atomic Absorption Spectrometry (GFAA)	Instrumentation used to measure the concentration of metals in an environmental sample based on the absorption of light at different wavelengths that are characteristic of different analytes.
High Pressure Liquid Chromatography (HPLC)	Instrumentation used to separate, identify and quantitate compounds based on retention times which are dependent on interactions between a mobile phase and a stationary phase.
Holding Time	TNI- The maximum time that can elapse between two specified activities. 40 CFR Part 136- The maximum time that samples may be held prior to preparation and/or analysis as defined by the method and still be considered valid or not compromised. For sample prep purposes, hold times are calculated using the time of the start of the preparation procedure. DoD- The time elapsed from the time of sampling to the time of extraction or analysis, or from extraction to analysis, as appropriate.
Homogeneity	The degree to which a property or substance is uniformly distributed throughout a sample.
Homologue	One in a series of organic compounds in which each successive member has one more chemical group in its molecule than the next preceding member. For instance, methanol, ethanol, propanol, butanol, etc., form a homologous series.

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 66 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

Inductively Coupled Plasma Atomic Emission Spectrometry (ICP-AES)	Analytical technique used for the detection of trace metals which uses plasma to produce excited atoms that emit radiation of characteristic wavelengths.
Inductively Coupled Plasma- Mass Spectrometry (ICP/MS)	An ICP-AES that is used in conjunction with a mass spectrometer so that the instrument is not only capable of detecting trace amounts of metals and non-metals but is also capable of monitoring isotopic speciation for the ions of choice.
Infrared Spectrometer (IR)	An instrument that uses infrared light to identify compounds of interest.
Initial Calibration (ICAL)	The process of analyzing standards, prepared at specified concentrations, to define the quantitative response relationship of the instrument to the analytes of interest. Initial calibration is performed whenever the results of a calibration verification standard do not conform to the requirements of the method in use or at a frequency specified in the method.
Initial Calibration Blank (ICB)	A blank sample used to monitor the cleanliness of an analytical system at a frequency determined by the analytical method. This blank is specifically run in conjunction with the Initial Calibration Verification (ICV) where applicable.
Initial Calibration Verification (ICV)	A standard obtained or prepared from a source independent of the source of the standards for the initial calibration. Its concentration should be at or near the middle of the calibration range. It is done after the initial calibration.
Inspection	An activity such as measuring, examining, testing, or gauging one or more characteristics of an entity and comparing the results with specified requirements in order to establish whether conformance is achieved for each characteristic.
Instrument Blank	A clean sample (e.g., distilled water) processed through the instrumental steps of the measurement process; used to determine instrument contamination.
Instrument Detection Limits (IDLs)	Limits determined by analyzing a series of reagent blank analyses to obtain a calculated concentration. IDLs are determined by calculating the average of the standard deviations of three runs on three non-consecutive days from the analysis of a reagent blank solution with seven consecutive measurements per day.
Interference, spectral	Occurs when particulate matter from the atomization scatters incident radiation from the source or when the absorption or emission from an interfering species either overlaps or is so close to the analyte wavelength that resolution becomes impossible.
Interference, chemical	Results from the various chemical processes that occur during atomization and later the absorption characteristics of the analyte.
Internal Standards	TNI - A known amount of standard added to a test portion of a sample as a reference for evaluating and controlling the precision and bias of the applied analytical method.
Intermediate Standard Solution	Reference solutions prepared by dilution of the stock solutions with an appropriate solvent.
International System of Units (SI)	The coherent system of units adopted and recommended by the General Conference on Weights and Measures.
Ion Chromatography (IC)	Instrumentation or process that allows the separation of ions and molecules based on the charge properties of the molecules.

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 67 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

Isomer	One of two or more compounds, radicals, or ions that contain the same number of atoms of the same element but differ in structural arrangement and properties. For example, hexane (C ₆ H ₁₄) could be n-hexane, 2-methylpentane, 3-methylpentane, 2,3-dimethylbutane, 2,2-dimethylbutane.
Laboratory	A body that calibrates and/or tests.
Laboratory Control Sample (LCS)	TNI - (however named, such as laboratory fortified blank, spiked blank, or QC check sample): A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes and taken through all sample preparation and analytical steps of the procedure unless otherwise noted in a reference method. It is generally used to establish intra-laboratory or analyst-specific precision and bias or to evaluate the performance of all or a portion of the measurement system.
Laboratory Duplicate	Aliquots of a sample taken from the same container under laboratory conditions and processed and analyzed independently.
Laboratory Information Management System (LIMS)	A computer system that is used to maintain all sample information from sample receipt, through preparation and analysis and including sample report generation.
LabTrack	Database used by Pace Analytical to store and track corrective actions and other laboratory issues.
Learning Management System (LMS)	A training database used by Pace Analytical to train their employees. This system is a self-paced system which is capable of tracking all employee training requirements and documentation.
Legal Chain-of-Custody Protocols	TNI- Procedures employed to record the possession of samples from the time of sampling through the retention time specified by the client or program. These procedures are performed at the special request of the client and include the use of a Chain-of-Custody Form that documents the collection, transport, and receipt of compliance samples by the laboratory. In addition, these protocols document all handling of the samples within the laboratory.
Limit(s) of Detection (LOD)	TNI- A laboratory's estimate of the minimum amount of an analyte in a given matrix that an analytical process can reliably detect in their facility. DoD- The smallest amount or concentration of a substance that must be present in a sample in order to be detected at a high level of confidence (99%). At the LOD, the false negative rate is 1%.
Limit(s) of Quantitation (LOQ)	TNI- The minimum levels, concentrations, or quantities of a target variable (e.g., target analyte) that can be reported with a specified degree of confidence. DoD- The lowest concentration that produces a quantitative result within specified limits of precision and bias. For DoD projects, the LOQ shall be set at or above the concentration of the lowest initial calibration standard.
Laboratory Information Management System (LIMS)	A computer system that is used to maintain all sample information from sample receipt, through preparation and analysis and including sample report generation.
Learning Management System (LMS)	A web-based database used by the laboratories to track and document training activities. The system is administered by the corporate training department and each laboratory's learn centers are maintained by a local administrator.

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 68 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

Lot	A quantity of bulk material of similar composition processed or manufactured at the same time.
Management	Those individuals directly responsible and accountable for planning, implementing, and assessing work.
Management System	System to establish policy and objectives and to achieve those objectives.
Manager (however named)	The individual designated as being responsible for the overall operation, all personnel, and the physical plant of the environmental laboratory. A supervisor may report to the manager. In some cases, the supervisor and the manager may be the same individual.
Matrix	TNI - The substrate of a test sample.
Matrix Duplicate	TNI- A replicate matrix prepared in the laboratory and analyzed to obtain a measure of precision.
Matrix Spike (MS) (spiked sample or fortified sample)	TNI- A sample prepared, taken through all sample preparation and analytical steps of the procedure unless otherwise noted in a referenced method, by adding a known amount of target analyte to a specified amount of sample for which an independent test result of target analyte concentration is available. Matrix spikes are used, for example, to determine the effect of the matrix on a method's recovery efficiency.
Matrix Spike Duplicate (MSD) (spiked sample or fortified sample duplicate)	TNI - A replicate matrix spike prepared in the laboratory and analyzed to obtain a measure of the precision of the recovery for each analyte.
Measurement System	TNI - A test method, as implemented at a particular laboratory, and which includes the equipment used to perform the test and the operator(s).
Method	TNI- A body of procedures and techniques for performing an activity (e.g., sampling, chemical analysis, quantification), systematically presented in the order in which they are to be executed.
Method Blank	TNI - A sample of a matrix similar to the batch of associated samples (when available) that is free from the analytes of interest and is processed simultaneously with and under the same conditions as samples through all steps of the analytical procedures, and in which no target analytes or interferences are present at concentrations that impact the analytical results for sample analyses.
Method Detection Limit (MDL)	One way to establish a Detection Limit; defined as the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix containing the analyte.
Method of Standard Additions	A set of procedures adding one or more increments of a standard solution to sample aliquots of the same size in order to overcome inherent matrix effects. The procedures encompass the extrapolation back to obtain the sample concentration.
MintMiner	Program used by Pace Analytical to review large amounts of chromatographic data to monitor for errors or data integrity issues.

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 69 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

Mobile Laboratory	TNI- A portable enclosed structure with necessary and appropriate accommodation and environmental conditions for a laboratory, within which testing is performed by analysts. Examples include but are not limited to trailers, vans, and skid-mounted structures configured to house testing equipment and personnel.
National Institute of Standards and Technology (NIST)	TNI- A federal agency of the US Department of Commerce's Technology Administration that is designed as the United States national metrology institute (or NMI).
National Pollutant Discharge Elimination System (NPDES)	A permit program that controls water pollution by regulating point sources that discharge pollutants into U.S. waters.
Negative Control	Measures taken to ensure that a test, its components, or the environment do not cause undesired effects, or produce incorrect test results.
Nitrogen Phosphorus Detector (NPD)	A detector used in GC analyses that utilizes thermal energy to ionize an analyte. With this detector, nitrogen and phosphorus can be selectively detected with a higher sensitivity than carbon.
Nonconformance	An indication or judgment that a product or service has not met the requirement of the relevant specifications, contract, or regulation; also the state of failing to meet the requirements.
Not Detected (ND)	The result reported for a compound when the detected amount of that compound is less than the method reporting limit.
Performance Audit	The routine comparison of independently obtained qualitative and quantitative measurement system data with routinely obtained data in order to evaluate the proficiency of an analyst or laboratory.
Performance Based Measurement System (PBMS)	An analytical system wherein the data quality needs, mandates or limitations of a program or project are specified and serve as criteria for selecting appropriate test methods to meet those needs in a cost-effective manner.
Photo-ionization Detector (PID)	An ion detector which uses high-energy photons, typically in the ultraviolet range, to break molecules into positively charged ions.
Polychlorinated Biphenyls (PCB)	A class of organic compounds that were used as coolants and insulating fluids for transformers and capacitors. The production of these compounds was banned in the 1970's due to their high toxicity.
Positive Control	Measures taken to ensure that a test and/or its components are working properly and producing correct or expected results from positive test subjects.
Post-Digestion Spike	A sample prepared for metals analyses that has analytes spike added to determine if matrix effects may be a factor in the results.
Power of Hydrogen (pH)	The measure of acidity or alkalinity of a solution.
Practical Quantitation Limit (PQL)	Another term for a method reporting limit. The lowest reportable concentration of a compound based on parameters set up in an analytical method and the laboratory's ability to reproduce those conditions.
Precision	TNI - The degree to which a set of observations or measurements of the same property, obtained under similar conditions, conform to themselves; a data quality indicator. Precision is usually expressed as standard deviation, variance or range, in either absolute or relative terms.
Preservation	TNI- Any conditions under which a sample must be kept in order to maintain chemical and/or biological integrity prior to analysis.

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 70 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

Procedure	TNI- A specified way to carry out an activity or process. Procedures can be documented or not.
Proficiency Testing	TNI - A means of evaluating a laboratory's performance under controlled conditions relative to a given set of criteria through analysis of unknown samples provided by an external source.
Proficiency Testing Program	TNI - The aggregate of providing rigorously controlled and standardized environmental samples to a laboratory for analysis, reporting of results, statistical evaluation of the results and the collective demographics and results summary of all participating laboratories.
Proficiency Testing Sample (PT)	TNI- A sample, the composition of which is unknown to the laboratory and is provided to test whether the laboratory can produce analytical results within the specified acceptance criteria.
Protocol	TNI - A detailed written procedure for field and/or laboratory operation (e.g., sampling, analysis) that must be strictly followed.
Quality Assurance (QA)	TNI- An integrated system of management activities involving planning, implementation, assessment, reporting and quality improvement to ensure that a process, item, or service is of the type and quality needed and expected by the client. DoD- An integrated system of activities involving planning, quality control, quality assessment, reporting, and quality improvement to ensure that a product or service meets defined standards of quality with a stated level of confidence.
Quality Assurance Manual (QAM)	A document stating the management policies, objectives, principles, organizational structure and authority, responsibilities, accountability, and implementation of an agency, organization, or laboratory, to ensure the quality of its product and the utility of its product to its users.
Quality Assurance Project Plan (QAPP)	A formal document describing the detailed quality control procedures by which the quality requirements defined for the data and decisions pertaining to a specific project are to be achieved.
Quality Control (QC)	TNI- The overall system of technical activities that measures the attributes and performance of a process, item, or service against defined standards to verify that they meet the stated requirements established by the customer; operational techniques and activities that are used to fulfill requirements for quality; also the system of activities and checks used to ensure that measurement systems are maintained within prescribed limits, providing protection against "out of control" conditions and ensuring that the results are of acceptable quality.
Quality Control Sample (QCS)	TNI- A sample used to assess the performance of all or a portion of the measurement system. One of any number of samples, such as Certified Reference Materials, a quality system matrix fortified by spiking, or actual samples fortified by spiking, intended to demonstrate that a measurement system or activity is in control.
Quality Manual	TNI - A document stating the management policies, objectives, principles, organizational structure and authority, responsibilities, accountability, and implementation of an agency, organization, or laboratory, to ensure the quality of its product and the utility of its product to its users.

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 71 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

Quality System	TNI - A structured and documented management system describing the policies, objectives, principles, organizational authority, responsibilities, accountability, and implementation plan of an organization for ensuring quality in its work processes, products (items), and services. The quality system provides the framework for planning, implementing, and assessing work performed by the organization and for carrying out required quality assurance and quality control activities.
Quality System Matrix	TNI - These matrix definitions are to be used for purposes of batch and quality control requirements: • Air and Emissions: Whole gas or vapor samples including those contained in flexible or rigid wall containers and the extracted concentrated analytes of interest from a gas or vapor that are collected with a sorbent tube, impinger solution, filter, or other device • Aqueous: Any aqueous sample excluded from the definition of Drinking Water or Saline/Estuarine. Includes surface water, groundwater effluents, and TCLP or other extracts. • Biological Tissue: Any sample of a biological origin such as fish tissue, shellfish or plant material. Such samples shall be grouped according to origin. • Chemical Waste: A product or by-product of an industrial process that results in a matrix not previously defined. • Drinking Water: Any aqueous sample that has been designated a potable or potentially potable water source. • Non-aqueous liquid: Any organic liquid with <15% settleable solids • Saline/Estuarine: Any aqueous sample from an ocean or estuary, or other salt water source such as the Great Salt Lake. • Solids: Includes soils, sediments, sludges, and other matrices with >15% settleable solids.
Quantitation Range	The range of values in a calibration curve between the LOQ and the highest successively analyzed initial calibration standard. The quantitation range lies within the calibration range.
Random Error	The EPA has established that there is a 5% probability that the results obtained for any one analyte will exceed the control limits established for the test due to random error. As the number of compounds measured increases in a given sample, the probability for statistical error also increases.
Raw Data	TNI- The documentation generated during sampling and analysis. This documentation includes, but is not limited to, field notes, electronic data, magnetic tapes, untabulated sample results, QC sample results, print outs of chromatograms, instrument outputs, and handwritten records.
Reagent Blank (method reagent blank)	A sample consisting of reagent(s), without the target analyte or sample matrix, introduced into the analytical procedure at the appropriate point and carried through all subsequent steps to determine the contribution of the reagents and of the involved analytical steps.
Reagent Grade	Analytical reagent (AR) grade, ACS reagent grade, and reagent grade are synonymous terms for reagents that conform to the current specifications of the Committee on Analytical Reagents of the American Chemical Society.

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 72 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

Reference Material	TNI- Material or substance one or more of whose property values are sufficiently homogenized and well established to be used for the calibration of an apparatus, the assessment of a measurement method, or for assigning values to materials.
Reference Standard	TNI- Standard used for the calibration of working measurement standards in a given organization or at a given location.
Reference Toxicant	The toxicant used in performing toxicity tests to indicate the sensitivity of a test organism and to demonstrate the laboratory's ability to perform the test correctly and obtain consistent results.
Relative Percent Difference (RPD)	A measure of precision defined as the difference between two measurements divided by the average concentration of the two measurements.
Reporting Limit (RL)	The level at which method, permit, regulatory and customer-specific objectives are met. The reporting limit may never be lower than the Limit of Detection (i.e. statistically determined MDL). Reporting limits are corrected for sample amounts, including the dry weight of solids, unless otherwise specified. There must be a sufficient buffer between the Reporting Limit and the MDL. DoD- A client-specified lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.
Reporting Limit Verification Standard (or otherwise named)	A standard analyzed at the reporting limit for an analysis to verify the laboratory's ability to report to that level.
Representativeness	A quality element related to the ability to collect a sample reflecting the characteristics of the part of the environment to be assessed. Sample representativeness is dependent on the sampling techniques specified in the project work plan.
Requirement	Denotes a mandatory specification; often designated by the term "shall".
Retention Time	The time between sample injection and the appearance of a solute peak at the detector.
Sample	Portion of material collected for analysis, identified by a single, unique alphanumeric code. A sample may consist of portions in multiple containers, if a single sample is submitted for multiple or repetitive analysis.
Sample Condition Upon Receipt Form (SCURF)	Form used by Pace Analytical sample receiving personnel to document the condition of sample containers upon receipt to the laboratory (used in conjunction with a COC).
Sample Delivery Group (SDG)	A unit within a single project that is used to identify a group of samples for delivery. An SDG is a group of 20 or fewer field samples within a project, received over a period of up to 14 calendar days. Data from all samples in an SDG are reported concurrently.
Sample Receipt Form (SRF)	Letter sent to the client upon login to show the tests requested and pricing.
Sample Tracking	Procedures employed to record the possession of the samples from the time of sampling until analysis, reporting and archiving. These procedures include the use of a Chain of custody Form that documents the collection, transport, and receipt of compliance samples to the laboratory. In addition, access to the laboratory is limited and controlled to protect the integrity of the samples.

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 73 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

Sampling	TNI- Activity related to obtaining a representative sample of the object of conformity assessment, according to a procedure.
Selective Ion Monitoring (SIM)	A mode of analysis in mass spectrometry where the detector is set to scan over a very small mass range, typically one mass unit. The narrower the range, the more sensitive the detector.
Selectivity	TNI- The ability to analyze, distinguish, and determine a specific analyte or parameter from another component that may be a potential interferent or that may behave similarly to the target analyte or parameter within the measurement system.
Sensitivity	TNI - The capability of a method or instrument to discriminate between measurement responses representing different levels (e.g., concentrations) of a variable of interest.
Serial Dilution	The stepwise dilution of a substance in a solution.
Shall	Denotes a requirement that is mandatory whenever the criterion for conformance with the specification requires that there be no deviation. This does not prohibit the use of alternative approaches or methods for implementing the specification as long as the requirement is fulfilled.
Should	Denotes a guideline or recommendation whenever noncompliance with the specification is permissible.
Signal-to-Noise Ratio	The signal carries information about the analyte, while noise is made up of extraneous information that is unwanted because it degrades the accuracy and precision of an analysis and also places a lower limit on the amount of analyte that can be detected. In most measurements, the average strength of the noise is constant and independent of the magnitude of the signal. Thus, the effect of noise on the relative error of a measurement becomes greater and greater as the quantity being measured (producing the signal) decreases in magnitude.
Spike	A known mass of target analyte added to a blank sample or sub-sample; used to determine recovery efficiency or for other quality control purposes.
Standard (Document)	TNI - The document describing the elements of a laboratory accreditation that has been developed and established within the consensus principles of standard setting and meets the approval requirements of standard adoption organizations procedures and policies.
Standard (Chemical)	Standard samples are comprised of a known amount of standard reference material in the matrix undergoing analysis. A standard reference material is a certified reference material produced by US NIST and characterized for absolute content, independent of analytical test method.
Standard Blank (or Reagent Blank)	A calibration standard consisting of the same solvent/reagent matrix used to prepare the calibration standards without the analytes. It is used to construct the calibration curve by establishing instrument background.
Standard Method	A test method issued by an organization generally recognized as competent to do so.
Standard Operating Procedure (SOP)	TNI- A written document that details the method for an operation, analysis, or action with thoroughly prescribed techniques and steps. SOPs are officially approved as the methods for performing certain routine or repetitive tasks.
Standard Reference Material (SRM)	A certified reference material produced by the US NIST or other equivalent organization and characterized for absolute content, independent of analytical method.

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 74 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

Statement of Qualifications (SOQ)	A document that lists information about a company, typically the qualifications of that company to compete on a bid for services.
Stock Standard	A concentrated reference solution containing one or more analytes prepared in the laboratory using an assayed reference compound or purchased from a reputable commercial source.
Supervisor	The individual(s) designated as being responsible for a particular area or category of scientific analysis. This responsibility includes direct day-to-day supervision of technical employees, supply and instrument adequacy and upkeep, quality assurance/quality control duties and ascertaining that technical employees have the required balance of education, training and experience to perform the required analyses.
Surrogate	A substance with properties that mimic the analyte of interest. It is unlikely to be found in environmental samples and is added to them for quality control purposes.
Systems Audit	An on-site inspection or assessment of a laboratory's quality system.
Target Analytes	Analytes specifically named by a client (also called project-specific analytes).
Technical Director	Individual(s) who has overall responsibility for the technical operation of the environmental testing laboratory.
Technology	TNI- A specific arrangement of analytical instruments, detection systems, and/or preparation techniques.
Test	A technical operation that consists of the determination of one or more characteristics or performance of a given product, material, equipment, organism, physical phenomenon, process or service according to a specified procedure. The result of a test is normally recorded in a document sometimes called a test report or a test certificate.
Test Method	An adoption of a scientific technique for performing a specific measurement as documented in a laboratory SOP or as published by a recognized authority.
Test Methods for Evaluating Solid Waste, Physical/ Chemical (SW-846)	EPA Waste's official compendium of analytical and sampling methods that have been evaluated and approved for use in complying with RCRA regulations.
Total Petroleum Hydrocarbons (TPH)	A term used to denote a large family of several hundred chemical compounds that originate from crude oil. Compounds may include gasoline components, jet fuel, volatile organics, etc.
Toxicity Characteristic Leaching Procedure (TCLP)	A solid sample extraction method for chemical analysis employed as an analytical method to simulate leaching of compounds through a landfill.
Traceability	TNI- The ability to trace the history, application, or location of an entity by means of recorded identifications. In a calibration sense, traceability relates measuring equipment to national or international standards, primary standards, basic physical conditions or properties, or reference materials. In a data collection sense, it relates calculations and data generated throughout the project back to the requirements for the quality of the project. DoD- The property of a result of a measurement whereby it can be related to appropriate standards, generally international or national standards, through an unbroken chain of comparisons.

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 75 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

Training Document	A training resource that provides detailed instructions to execute a specific method or job function.
Trip Blank	This blank sample is used to detect sample contamination from the container and preservative during transport and storage of the sample. A cleaned sample container is filled with laboratory reagent water and the blank is stored, shipped, and analyzed with its associated samples.
Tuning	A check and/or adjustment of instrument performance for mass spectrometry as required by the method.
Ultraviolet Spectrophotometer (UV)	Instrument routinely used in quantitative determination of solutions of transition metal ions and highly conjugated organic compounds.
Uncertainty Measurement	The parameter associated with the result of a measurement that characterized the dispersion of the values that could be reasonably attributed to the measurand (i.e. the concentration of an analyte).
Validation	The confirmation by examination and provision of objective evidence that the particular requirements for a specific intended use are fulfilled.
Verification	TNI - Confirmation by examination and objective evidence that specified requirements have been met. Note: In connection with the management of measuring equipment, verification provides a means for checking that the deviations between values indicated by a measuring instrument and corresponding known values of a measured quantity are consistently smaller than the maximum allowable error defined in a standard, regulation or specification peculiar to the management of the measuring equipment. The result of verification leads to a decision either to restore in service, to perform adjustment, to repair, to downgrade, or to declare obsolete. In all cases, it is required that a written trace of the verification performed shall be kept on the measuring instrument's individual record.
Whole Effluent Toxicity (WET)	The aggregate toxic effect to aquatic organisms from all pollutants contained in a facility's wastewater (effluent).
Work Cell	A well-defined group of analysts that together perform the method analysis. The members of the group and their specific functions within the work cell must be fully documented.

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 76 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

11.0. REFERENCES

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- 11.2. "Test Methods for Evaluating Solid Wastes: Physical/Chemical Methods." SW-846.
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UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 77 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

12.0. REVISIONS

The PASI Corporate Quality Office files both a paper copy and electronic version of a Microsoft Word document with tracked changes detailing all revisions made to the previous version of the Quality Assurance Manual. This document is available upon request. All revisions are summarized in the table below.

Document Number	Reason for Change	Date
Quality Assurance Manual 15.0	General: reformatted and renumbered several sections. General: corrected names/numbers of corporate SOP references. General: changed General Manager to SGM/GM/AGM where applicable to account for changes in management structure in each lab. General: changed Quality Manager to SQM/QM where applicable to account for changes in management structure in each lab. Section 1.3.3: removed specific industry standards. Section 1.5.4: added section with current anonymous hotline number. Sections 1.7.3, 1.7.4, 1.7.5, 1.7.6, and 1.7.8: reworded to match changes in management structure. Section 1.8.4: added new job description for Senior Quality Manager. Section 1.8.5 (first bullet point): added language from DoD QSM gray box 4, added connection to the Director of Quality, and added new language regarding the QM reporting structure. Section 1.8.5: added new second bullet point from DoD QSM. Section 1.8.5 (third bullet point): added responsibility to do quarterly reports. Section 1.8.5 (twelfth bullet point): added language from DoD QSM. Section 1.8.6: added Quality Analyst job description. Section 1.10.3: added the current anonymous hotline number. Section 1.12.2: changed Sample Custodian to red text in case locally that is not the person responsible. Section 2.6.5: changed region codes to division codes and added division codes for Pompano Beach and Dallas and added in MT and VA, MN to code 10. Removed code 38 for PGH radiochem (all now under code 30). Section 3.4.2: added sentence about Drinking Water DOCs. Section 4.2.4: added specific TNI language for every target component to be spiked in LCS over a 2-year period (V1M4 1.7.3.2.3.b). Section 4.3.4: added specific TNI language for every target component to be spiked in the MS/MSD over a 2-year period (V1M4 1.7.3.3.1.c). Section 4.9.9: added DoD definition for LOD. Section 4.10.3: added caveat from TNI standard regarding LOQ verification (V1M4 1.5.2.2.e). Section 4.13.2: added new section to clarify when the rounding step occurs. Section 4.13.4: clarified the significant figure rules depending on the LIMS used. Section 4.14: added section on retention time windows. Section 5.1.3: added requirement from DoD QSM. Section 5.1.7.4: reworded for clarity. Section 6.2.6.1.4: reworded to match language in SW-846. Sections 6.2.6.2, 6.2.6.3 and 6.2.7.1: added language which prohibits rounding to pass calibration acceptance criteria. Section 6.2.6.4.1: added red section with language from 2010 DoD QSM (gray box 37). Section 6.3.3.1: changed weight calibration frequency to 5 years to match Support Equipment SOT. Section 6.4.7: removed language about instrument maintenance for clarity. Sections 7.1.2 and 7.2.2: added language regarding documentation of primary analyst and data reviewer. Section 7.3.2.25: removed section.	06Feb2012

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 78 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

Document Number	Reason for Change	Date
	Section 7.3.7: Added AGM and SQM. Section 8.1.2.3: added clarifying language. Section 8.1.2.6: reworded for clarity. Section 8.5.3: added language from 2009 TNI standard (V1M2 4.7/ISO 4.7.1 note 1). Section 8.5.4: added new section with language from 2009 TNI standard (V1M2/ISO 4.7.1 note 2). Sections 9.1.5 and 9.1.6: reworded for clarity. Section 10: General- added indication of source of definitions within the chart (e.g., TNI, DoD, etc.) and added a sentence to that effect prior to the definition table. Section 10: Added clarification to the definition of 'batch' (TNI and DoD references) and corrected a couple of word deviations from previous version of QAM. Also added the 'batch' definition from the state of SC in red text based on their specific requirements. Section 10: revised definitions for accreditation, assessment, calibration curve, calibration standard, certified reference material, data reduction, finding, holding time (including caveat for prep start time), LCS, LOD, method, preservation, PT sample, protocol, quality system, raw data, reference material- per 2009 TNI standards (V1M2 section 3.1). Section 10: added definitions for measurement system, mobile laboratory, procedure, PT program, and technology- per 2009 TNI standards (V1M2 section 3.1). Section 10: added definitions for assessment, calibration curve, calibration standard, certified reference material, data reduction, demonstration of capability, finding, laboratory, matrix spike, preservation, PT sample, quality control, quality control sample, raw data, reference material, selectivity, SOP, and work cell- per 2010 DoD QSM 4.2 (Appendix B). Attachment VIII: completely revised the method/bottle/preservation table. Section 10: added definitions for facility, initial calibration blank, analysis sequence, serial dilution, post-digestion spike, and instrument detection limits- per review of document. Section 11.20: Added TNI standard reference.	
Quality Assurance Manual 15.1	Section 2.10.2: Revised to allow samples requiring thermal preservation to be stored at ambient temperature when the hold time is expired, the report has been delivered, and/or allowed by the customer, program, or contract	15May2012
Quality Assurance Manual 15.2	Section 6.2.6.1.4: Edited acceptable cause to read, "An acceptable cause is defined as an obvious sample introduction issue that resulted in no response, documentation of an incorrectly prepared standard, or a documented response of a single standard that is greater than 2X difference from the expected value of that standard."	05Jun2012
Quality Assurance Manual 15.2 (Local Revisions)	General: Edited/Removed red text and added SOP references for local implementation. Section 2.2.3: added	05Jun2012

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	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 79 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

ATTACHMENT I- QUALITY CONTROL CALCULATIONS

PERCENT RECOVERY (%REC)

$$\%REC = \frac{(MSConc - SampleConc)}{TrueValue} * 100$$

NOTE: The SampleConc is zero (0) for the LCS and Surrogate Calculations

PERCENT DIFFERENCE (%D)

$$\%D = \frac{MeasuredValue - TrueValue}{TrueValue} * 100$$

where:

TrueValue = Amount spiked (can also be the $\overline{CF}$ or $\overline{RF}$ of the ICAL Standards)

Measured Value = Amount measured (can also be the CF or RF of the CCV)

PERCENT DRIFT

$$\%Drift = \frac{CalculatedConcentration - TheoreticalConcentration}{TheoreticalConcentration} * 100$$

RELATIVE PERCENT DIFFERENCE (RPD)

$$RPD = \frac{|(R1 - R2)|}{(R1 + R2) / 2} * 100$$

where:

R1 = Result Sample 1

R2 = Result Sample 2

CORRELATION COEFFICIENT (R)

$$CorrCoeff = \frac{\sum_{i=1}^N W_i * (X_i - \bar{X}) * (Y_i - \bar{Y})}{\sqrt{\left(\sum_{i=1}^N W_i * (X_i - \bar{X})^2 \right) * \left(\sum_{i=1}^N W_i * (Y_i - \bar{Y})^2 \right)}}$$

With: N Number of standard samples involved in the calibration
i Index for standard samples
Wi Weight factor of the standard sample no. i
Xi X-value of the standard sample no. i
X(bar) Average value of all x-values
Yi Y-value of the standard sample no. i
Y(bar) Average value of all y-values

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	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 80 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

ATTACHMENT I- QUALITY CONTROL CALCULATIONS (CONTINUED)

STANDARD DEVIATION (S)

$$S = \sqrt{\frac{\sum_{i=1}^n (X_i - \bar{X})^2}{(n-1)}}$$

where:

n = number of data points
 X_i = individual data point
 $\bar{X}$ = average of all data points

AVERAGE ($\bar{X}$)

$$\bar{X} = \frac{\sum_{i=1}^n X_i}{n}$$

where:

n = number of data points
 X_i = individual data point

RELATIVE STANDARD DEVIATION (RSD)

$$RSD = \frac{S}{\bar{X}} * 100$$

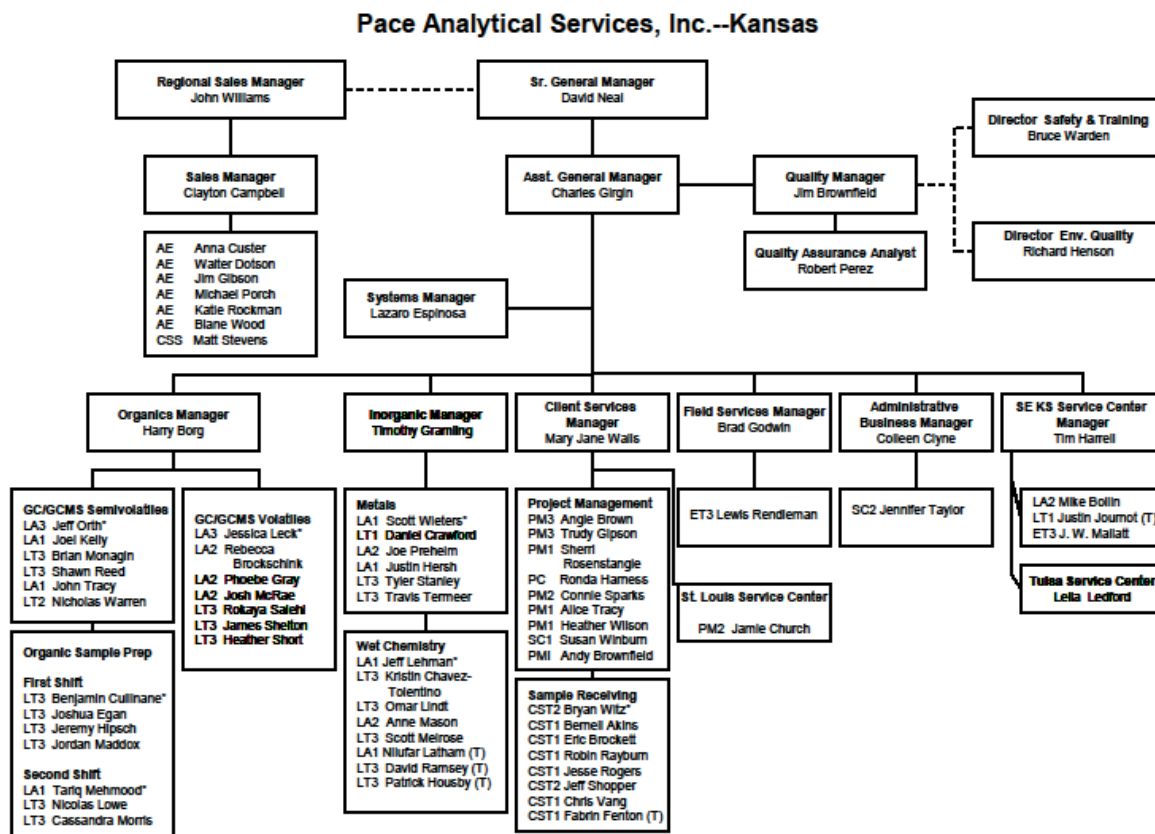
where:

S = Standard Deviation of the data points
 $\bar{X}$ = average of all data points

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	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 81 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

ATTACHMENT IIA- PASI-KANSAS ORGANIZATIONAL CHART (CURRENT AS OF ISSUE DATE)

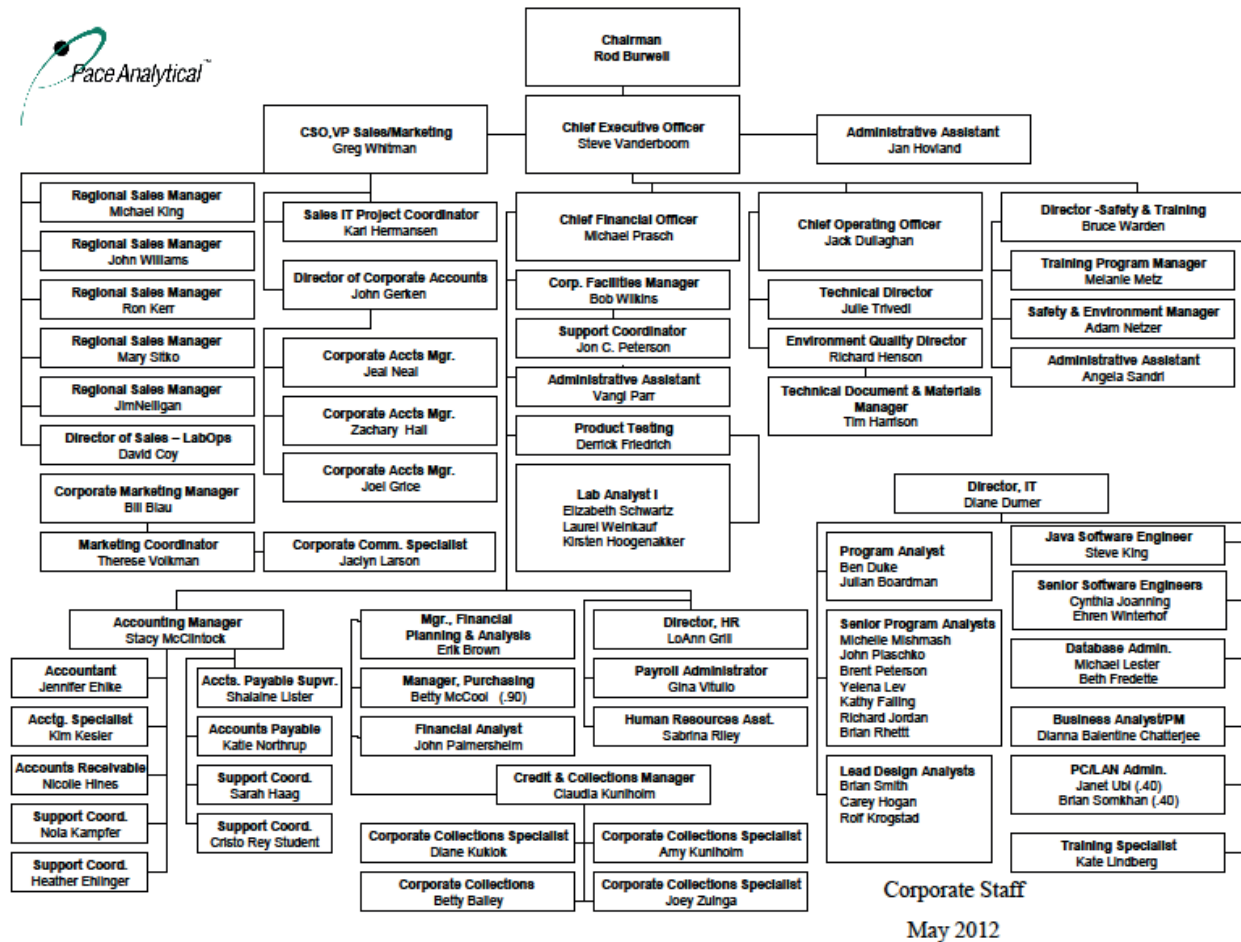


*Department /Shift Leader
Last Revised May 29, 2012
Last Reviewed May 29, 2012

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	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 82 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

ATTACHMENT IIB- PASI-CORPORATE ORGANIZATIONAL CHART (CURRENT AS OF ISSUE DATE)



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	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 83 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

ATTACHMENT III- EQUIPMENT LIST (CURRENT AS OF ISSUE DATE)
LENEXA, KANSAS LABORATORY

Instrument ID	Age	Manufacturer	Instrument Description	Model #/Type	Software
60HG02	2007	PE	Mercury Analyzer FIMS	FIAS-400	Winlab32 for AA
60HG02	2007	PE	Autosampler	90	N/A
60HG03	2012	Cetac	Quicktrace Mercury Analyzer	M-7500	Quicktrace
60HG03	2012	Cetac	Autosampler	ASX-260	N/A
60ICM1	2011	Thermo	ICPMS	XSeries 2	Plasmalab
60ICM1	2011	ESI	Autosampler	sc4DX	N/A
60ICM1	2011	Neslab	Chiller	ThermoFlex 2500	N/A
60ICP3	2009	Thermo	ICP	iCAP6500	Iteva
60ICP3	2009	Cetac	Autosampler	ASX520	N/A
60ICP3	2009	Neslab	Chiller	ThermoFlex 900	N/A
60ICP4	2011	Thermo	ICP	6500 Duo	Iteva
60ICP4	2011	Cetac	Chiller	ThermoFlex 900	N/A
60ICP4	2011	ESI	Autosampler	SC-4DX	N/A
60AWET4	2002	Fisher	Block Digester	TKN/T Phos	N/A
60WET1	1998	Accumet	DO Meter	150	N/A
60WET3	1998	LaMotte	UV/VIS	Smart Spectro	N/A
60WET5	1994	Hach	Turbidimeter	43900	N/A
60WET6	1993	Hach	Chlorine Amperometric Titrator	AutoCAT 9000	AutoCAT
60WET6	2003	HACH	Amperometric Titrator	AutoCat9000	N/A
60WET9	1998	Fisher	Conductivity	09-328	N/A
60WETB	2010	Thermo Scientific	pH Meter	Orion 350	NA
60WETC	2011	Thermo Scientific	pH meter	Orion Star LogR	N/A
60WETO	1990	Pensky Martens	Flashpoint	Manual	N/A
60WTA0	2009	Lachat	Flow Injection Analyzer	QuikChem 8500	Omnion
60WTA0	2009	Lachat	Reagent Pump	RP-100	N/A
60WTA0	2009	Lachat	Dilutor	PDS200	N/A
60WTA0	2009	Lachat	Autosampler	ASX520	N/A
60WTA2	2008	Dionex	Ion Chromatograph	ICS-2000	Chromeleon and Target
60WTA2	2008	Dionex	Autosampler	AS	N/A
60WTA2	2008	Dionex	Conductivity Cell	DS6	N/A
60WTA2	2008	Dionex	Chromatography Software	Chromeleon Release 6.8	N/A
60WTA4	1993	Radiometer	Autoburette	ABU93	N/A
60WTA4	1993	Radiometer	Autosampler	SAC90	N/A
60WTAB	2006	WEST CO	SMART Chem	c0084	Smartchem
60WTA9	2008	Shimadzu	UV-Vis Spectrophotometer	UV-1800	UV probe
60WTAA	2010	GE Sievers	TOC Analyzer	InnovOx	Sievers Innovoxlab
60WTAA	2010	GE Sievers	Autosampler	GE Autosampler	N/A
60WTAB	2011	Lachat	Flow Injection Analyzer	QuikChem 8500-Series 2	Omnion
60WTAB	2011	Lachat	Reagent Pump	RP-100	N/A
60WTAB	2011	Lachat	Autosampler	ASX520	N/A
60WTAC	2012	Dionex	Ion chromatograph	ICS1600	Chromeleon and Target
60WTAC	2012	Dionex	Autosampler	ASDV	N/A
60WTAD	2012	Dionex	Ion chromatograph	ICS1500	Chromeleon and Target
60WTAD	2012	Dionex	Autosampler	AS40	N/A
N/A	2002	Millipore	Milli-Q Water System	Synergy 185	N/A
60GCS1	1990	HP	GC ECD/ECD	5890 Series II	Turbochrom and Target
60GCS1	1990	HP	Autosampler & Injector	7673A	N/A
60GCS4	1991	HP	GC FID	5890 Series II	Turbochrom and Target
60GCS4	1991	HP	Autosampler & Injector	7673	N/A
60GCS6	1991	HP	GC FID	5890 Series II	Turbochrom and Target
60GCS6	1991	HP	Autosampler & Injector	7673A	N/A
60GCS8	2005	HP	GC ECD/ECD	6890	Chemstation and Target
60GCS8	2005	HP	Autosampler- Injector	5890 Series	N/A

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	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 84 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

LENEXA, KANSAS LABORATORY EQUIPMENT LIST (CONTINUED)

Instrument ID	Age	Manufacturer	Instrument Description	Model #/Type	Software
60GCS8	2005	HP	Autosampler- tray	18596C	N/A
60GCS8	2005	HP	Autosampler-Controller	G1512A	N/A
60GCS9	2008	Agilent	GC FID/FID	7890A	Chemstation and Target
60GCS9	2008	Agilent	Autosampler- Injector	7683B	N/A
60GCS9	2008	Agilent	Autosampler- tray	G2614A	N/A
60GCSA	2009	Agilent	GC FID/FID	7890A	Chemstation and Target
60GCSA	2009	Agilent	Autosampler- Injector	G4513A	N/A
60GCSA	2009	Agilent	Autosampler- Injector	G4513A	N/A
60GCSA	2009	Agilent	Autosampler- tray	7693	N/A
60GCV2	2012	Agilent	GC PID/FID	6890	Chemstation and Target
60GCV2	2012	Tekmar	P&T Concentrator	3000	N/A
60GCV2	2012	Archon	Autosampler	Aquatek 70	N/A
60MSS2	2002	HP	GC MS	6890	Chemstation and Target
60MSS2	2002	HP	Mass Selective Detector	5973N	N/A
60MSS2	2002	HP	Autosampler- Injector	7683B	N/A
60MSS2	2002	HP	Autosampler- tray	G2614A	N/A
60MSS3	2007	Agilent	GC MS	7890A	Chemstation and Target
60MSS3	2007	Agilent	Mass Selective Detector	5975C	N/A
60MSS3	2007	Agilent	Autosampler- Injector	7683B	N/A
60MSS3	2007	Agilent	Autosampler- tray	G2614A	N/A
60MSS4	2009	Agilent	GC MS	7890A	Chemstation and Target
60MSS4	2009	Agilent	Mass Selective Detector	5975C	N/A
60MSS4	2009	Agilent	Autosampler- Injector	7683B	N/A
60MSS4	2009	Agilent	Autosampler- tray	G2614A	N/A
60MSS5	2010	Agilent	GC MS	7890A	Chemstation and Target
60MSS5	2010	Agilent	Mass Spectrometer	5975C	N/A
60MSS5	2010	Agilent	Autosampler- Injector	7683B	N/A
60MSS5	2010	Agilent	Autosampler- tray	G2614A	N/A
60MSV1	2009	Agilent	GC	6850	Chemstation and Target
60MSV1	2009	Agilent	Mass Selective Detector	5975B	N/A
60MSV1	2010	Tekmar	Autosampler/Concentrator	AtomX	N/A
60MSV2	2007	Agilent	GC MS	6850	Chemstation and Target
60MSV2	2007	Agilent	Mass Selective Detector	5975B	N/A
60MSV2	2007	Tekmar	Autosampler	Aquatek 70	N/A
60MSV2	2009	Tekmar	P&T Concentrator	LSC-3000	N/A
60MSV5	2002	HP	GC	6890	Chemstation and Target
60MSV5	2002	HP	Mass Selective Detector	5973	N/A
60MSV5	2007	Tekmar	P&T Concentrator	3100	N/A
60MSV5	2007	EST	Autosampler	Centurion	N/A
60MSV8	2007	Agilent	GC	6850	Chemstation and Target
60MSV8	2007	Agilent	Mass Selective Detector	5975B	N/A
60MSV8	2007	EST	Autosampler	Centurion	N/A
60MSV8	2007	EST	P&T Concentrator	EnCon	N/A
60MSV9	2008	Agilent	GC	6850	Chemstation and Target
60MSV9	2008	Agilent	Mass Selective Detector	5975C	N/A
60MSV9	2008	Tekmar	P&T Concentrator	LSC 3000	N/A
60MSV9	2009	Tekmar	Autosampler	Aquatek 70	N/A
60MSVA	2010	Agilent	GC MS	6850	Chemstation and Target
60MSVA	2010	Agilent	Mass Spectrometer	5975C	N/A
60MSVA	2010	Tekmar	Autosampler/Concentrator	AtomX	N/A
60MSVB	2010	Agilent	GC MS	6890	Chemstation and Target
60MSVB	2010	Agilent	Mass Selective Detector	5975C	N/A
60MSVB	2010	Tekmar	Autosampler/Concentrator	AtomX	N/A
60MARS1	2006	CEM Corp.	Microwave Solvent Extractor	907501	N/A

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	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 85 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

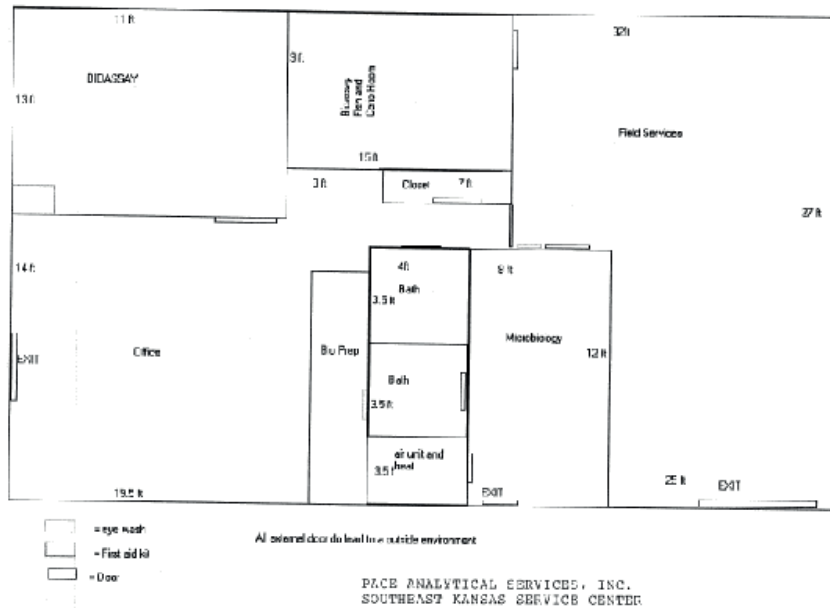
FRONTENAC, KANSAS LABORATORY EQUIPMENT LIST

Instrument	Age	Manufacturer	Model Number	Software
Ion Analyzer (pH)	2001	Accumet	AP61	N/A
Dissolved Oxygen	2006	YSI	550A	N/A
Conductivity Meter	2001	Accumet	AB30	N/A
Autoclave	2001	Tutnauer Brinkman	3870E	N/A
Incubator, water bath	2002	Precision	Precision	N/A
Incubator, thermal	1995	Equatherm	C1574	N/A
Bioassay Water Baths (Total of 5 units)	2001	ISO Temp	2100	N/A
Balance	1990	Metler	AE-240	N/A
Hach (pH, LDO, Cond)	2011	Hach	HQ40d	N/A

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	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 87 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

FRONTENAC KANSAS FLOOR PLAN (CURRENT AS OF ISSUE DATE)



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	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 88 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

ATTACHMENT V- LABORATORY SOP LIST (CURRENT AS OF ISSUE DATE)

SOP Number	SOP Title
S-ALL-C-002-rev.3	BOTTLE ORDER DATABASE
S-ALL-C-005-rev.2	PACEPORT CUSTOMER FEEDBACK FORM
S-ALL-IT-001-rev.2	SYSTEM SECURITY AND INTEGRITY
S-ALL-Q-001-rev.9	PREPARATION OF SOPS
S-ALL-Q-002-rev.3	DOCUMENT MANAGEMENT
S-ALL-Q-003-rev.6	DOCUMENT NUMBERING
S-ALL-Q-007-rev.2	EPIC Pro: ACODE VALIDATION
S-ALL-Q-008-rev.2	EPIC Pro: ACODE ADDITION/MODIFICATION
S-ALL-Q-009-rev.4	LABORATORY DOCUMENTATION
S-ALL-Q-011-rev.3	AUDITS AND INSPECTIONS
S-ALL-Q-012-rev.2	CORRECTIVE AND PREVENTIVE ACTIONS
S-ALL-Q-014-rev.2	QUALITY SYSTEM REPORTING
S-ALL-Q-015-rev.0	REVIEW OF LABORATORY MANAGEMENT SYSTEM
S-ALL-Q-016-rev.4	MANUAL INTEGRATION
S-ALL-Q-018-rev.3	MONITORING STORAGE UNITS
S-ALL-Q-020-rev.4	TRAINING PROCEDURES
S-ALL-Q-021-rev.4	SUB-SAMPLING (SAMPLE HOMOGENIZATION)
S-ALL-Q-022-rev.3	3P PROGRAM: CONTINUOUS PROCESS IMPROVEMENT
S-ALL-Q-025-rev.4	STANDARD AND REAGENT PREPARATION AND TRACEABILITY
S-ALL-Q-028-rev.2	LABTRACK SYSTEM
S-ALL-Q-029-rev.2	MINTMINER® DATA FILE REVIEW
S-ALL-Q-030-rev.4	EPIC PRO: DATA CHECKER
S-ALL-Q-032-rev.0	CONTROL CHART GENERATION AND ANALYSIS
S-ALL-Q-034-rev.1	ANONYMOUS HOTLINE PROCEDURE
S-ALL-Q-035-rev.1	DATA RECALL
S-ALL-Q-038-rev.0	TENTATIVELY IDENTIFIED COMPOUNDS
S-ALL-S-001-rev.3	HAZARD ASSESSMENT
S-KS-C-001-rev.3	SAMPLE MANAGEMENT
S-KS-C-002-rev.4	ASSEMBLY OF SAMPLE CONTAINER KITS
S-KS-C-003-rev.3	SUBCONTRACTING SAMPLES
S-KS-F-001-rev.3	FIELD MANUAL
S-KS-I-001-rev.7	ACIDITY
S-KS-I-002-rev.11	ALKALINITY
S-KS-I-003-rev.8	AMMONIA, NITROGEN BY 350.1
S-KS-I-004-rev.9	BOD/CBOD
S-KS-I-005-rev.8	CHEMICAL OXYGEN DEMAND
S-KS-I-006-rev.5	CHLORINE (AT)
S-KS-I-007-rev.9	CHLORINE(DPD)
S-KS-I-008-rev.11	HEXAVALENT CHROMIUM
S-KS-I-010-rev.8	DISSOLVED OXYGEN
S-KS-I-011-rev.4	FERROUS IRON
S-KS-I-013-rev.3	TKN BY 351.2
S-KS-I-014-rev.7	OIL AND GREASE/TPH BY 1664A
S-KS-I-015-rev.3	HEM/SGT-HEM BY 9071B MOD
S-KS-I-016-rev.10	TOTAL ORGANIC CARBON
S-KS-I-017-rev.5	TURBIDITY
S-KS-I-018-rev.8	pH IN WATER, SOIL AND WASTE
S-KS-I-019-rev.6	TOTAL RECOVERABLE PHENOLICS
S-KS-I-020-rev.10	TOTAL SOLIDS
S-KS-I-021-rev.11	TOTAL DISSOLVED SOLIDS
S-KS-I-022-rev.11	TOTAL SUSPENDED SOLIDS
S-KS-I-023-rev.7	SETTLABLE SOLIDS

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	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 89 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

LABORATORY SOP LIST (CONTINUED)

SOP Number	SOP Title
S-KS-I-024-rev.8	VOLATILE AND FIXED SOLIDS
S-KS-I-025-rev.9	CONDUCTIVITY
S-KS-I-028-rev.7	SULFITE
S-KS-I-029-rev.9	METHYLENE BLUE ACTIVE SUBSTANCES
S-KS-I-030-rev.7	FLASHPOINT
S-KS-I-031-rev.6	REACTIVE SULFIDE
S-KS-I-032-rev.5	REACTIVE CYANIDE
S-KS-I-033-rev.6	PAINT FILTER LIQUIDS TEST
S-KS-I-036-rev.8	TOTAL AND AMENABLE CYANIDE
S-KS-I-037-rev.9	AUTOMATED CHLORIDE
S-KS-I-038-rev.4	ORTHOPHOSPHATE
S-KS-I-039-rev.10	NITRATE/NITRITE BY 353.2
S-KS-I-040-rev.4	TOTAL PHOSPHORUS
S-KS-I-043-rev.7	ANIONS BY IC
S-KS-I-044-rev.3	COLOR ANALYSIS
S-KS-I-045-rev.2	SPECIFIC OXYGEN UPTAKE RATE
S-KS-I-046-rev.2	TOTAL/VOLATILE/FIXED SOLIDS IN SLUDGES
S-KS-I-047-rev.0	SULFIDE BY METHYLENE BLUE METHOD (SM4500-S2 ⁻ D)
S-KS-I-048-rev.0	SULFIDE BY IODOMETRIC TITRATION (SM 4500-S2 ⁻ F)
S-KS-IT-001-rev.3	TARGET DATA BACKUP
S-KS-IT-002-rev.0	SERVER BACKUP
S-KS-M-001-rev.2	MICRODIGESTION BY 3010A
S-KS-M-002-rev.9	ACID DIGESTION OF WATERS
S-KS-M-003-rev.8	ACID DIGESTION OF SOILS
S-KS-M-004-rev.4	ACID DIGESTION OF WIPES
S-KS-M-005-rev.11	METALS BY ICP-AES
S-KS-M-006-rev.7	MERCURY PREPARATION AND ANALYSIS
S-KS-M-007-rev.4	CATION EXCHANGE CAPACITY
S-KS-M-008-rev.3	ICP METALS by 6010C
S-KS-M-009-rev.1	METALS BY ICPMS
S-KS-MB-001-rev.7	FECAL COLIFORM
S-KS-MB-003-rev.8	HETEROTROPHIC PLATE COUNT
S-KS-MB-006-rev.6	SUITABILITY TEST
S-KS-MB-007-rev.5	INHIBITORY RESIDUE TEST
S-KS-MB-008-rev.5	ACUTE AQUATIC TOXICITY
S-KS-MB-010-rev.5	CHRONIC AQUATIC TOXICITY
S-KS-MB-012-rev.5	PREPARING YCT
S-KS-MB-013-rev.5	CULTURING BRINE SHRIMP
S-KS-MB-018-rev.5	LIGHT INTENSITY/PHOTOPERIOD
S-KS-MB-019-rev.3	CULTURING C. DUBIA/HATCHING MINNOWS
S-KS-MB-021-rev.2	TOTAL COLIFORM AND E. COLI (COLILERT)
S-KS-MB-022-rev.0	BIOASSAY CHEMICAL TESTS
S-KS-O-001-rev.8	TCLP BY METHOD 1311
S-KS-O-002-rev.3	SPLP BY METHOD 1312
S-KS-O-003-rev.5	ORGANIC EXTRACTION SPIKE FORTIFICATION VERIFICATION
S-KS-O-004-rev.8	EDB/DBCP BY METHOD 8011
S-KS-O-005-rev.11	TPH-DRO BY MODIFIED 8015
S-KS-O-007-rev.9	PCBs IN WATER AND SOIL
S-KS-O-008-rev.8	PCBs in OIL AND WIPES
S-KS-O-012-rev.12	VOCs BY 8260B
S-KS-O-013-rev.11	BNAs BY METHOD 8270C
S-KS-O-014-rev.7	EPH BY METHOD OA-2

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	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 90 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

LABORATORY SOP LIST (CONTINUED)

SOP Number	SOP Title
S-KS-O-015-rev.7	EXTRACTABLE HYDROCARBONS BY OKLAHOMA DRO
S-KS-O-016-rev.4	PURGABLE HYDROCARBONS BY OKLAHOMA GRO
S-KS-O-017-rev.8	PERCENT MOISTURE IN SOIL
S-KS-O-018-rev.8	EDB/DBCP BY 504.1
S-KS-O-019-rev.8	VOCs IN WATER BY 602
S-KS-O-020-rev.6	PCBs BY METHOD 608
S-KS-O-022-rev.4	VOCs IN WATER BY 624
S-KS-O-023-rev.5	BNAs BY METHOD 625
S-KS-O-024-rev.4	TPH-DRO/ORO BY 8270C
S-KS-O-025-rev.3	TPH-GRO BY 8260B
S-KS-O-026-rev.2	VOLATILE AROMATICS/GRO BY 8021B AND 8015B/C
S-KS-O-027-rev.4	TPH-DRO BY METHOD 8015B/C
S-KS-O-028-rev.5	PAHs BY 8270C (SIM)
S-KS-O-029-rev.4	SEPARATORY FUNNEL EXTRACTION
S-KS-O-032-rev.3	MICROWAVE SOIL EXTRACTION
S-KS-O-033-rev.2	VPH BY OA-1
S-KS-O-035-rev.0	WASTE DILUTION
S-KS-O-036-rev.1	PCB EXTRACT CLEANUP
S-KS-O-037-rev.2	TPH BY TNRC METHOD 1005/1006
S-KS-O-038-rev.1	SILICA GEL CLEANUP
S-KS-O-039-rev.0	MICROEXTRACTION OF AQUEOUS SAMPLES
S-KS-O-040-rev.0	SEPARATORY FUNNEL EXTRACTION (REDUCED VOLUME)
S-KS-Q-001-rev.6	LABORATORY GLASSWARE WASHING
S-KS-Q-005-rev.5	DATA REDUCTION, REVIEW AND REPORTING
S-KS-Q-006-rev.3	RECEIPT AND STORAGE OF LAB SUPPLIES
S-KS-Q-007-rev.6	LABORATORY SECURITY PROCEDURES
S-KS-Q-011-rev.4	REAGENT WATER QUALITY
S-KS-Q-012-rev.4	SIGNIFICANT FIGURES AND ROUNDING
S-KS-Q-018-rev.2	BP LaMP PROJECT MANAGEMENT
S-KS-Q-019-rev.3	LAB DATA FILING AND ARCHIVING
S-KS-Q-020-rev.3	USDA REGULATED SOIL
S-KS-Q-022-rev.2	ESTIMATION OF UNCERTAINTY
S-KS-Q-024-rev.2	INSTRUMENT TRANSPORT
S-KS-Q-025-rev.2	A2LA TERMS AND SYMBOLS
S-KS-Q-026-rev.4	PURCHASING OF LAB SUPPLIES
S-KS-Q-027-rev.1	SAMPLE COMPOSITING
S-KS-Q-028-rev.3	CUSTOMER COMPLAINT RESOLUTION
S-KS-Q-029-rev.1	LABORATORY HOUSEKEEPING
S-KS-Q-030-rev.0	MCL VIOLATION REPORTING
S-KS-Q-031-rev.0	SOFTWARE VALIDATION
S-KS-Q-032-rev.0	LIMIT OF DETECTION
S-KS-Q-033-rev.0	REVIEW OF ANALYTICAL REQUESTS
S-KS-Q-034-rev.0	MANAGEMENT OF CHANGE
S-KS-Q-035-rev.0	PROFICIENCY TESTING PROGRAM
S-KS-Q-036-rev.0	SUPPORT EQUIPMENT
S-KS-Q-040-rev.0	VENDOR QUALIFICATION
S-KS-S-002-rev.3	WASTE HANDLING
S-KS-S-003-rev.0	WASTE MGMT TRAINING REQUIREMENTS
S-KS-S-004-rev.1	WORKING ALONE

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	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 91 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

ATTACHMENT VI- LABORATORY CERTIFICATION LIST (CURRENT AS OF ISSUE DATE)

Accrediting Authority	Program Category	Accrediting Agency	Certification #	Expiration Date
A2LA	Wyoming STR	A2LA	2456.01	7/31/2012
Arkansas	Hazardous Waste	Dept of Environmental Quality	02-019-0	2/2/2013
Arkansas	Waste Water	Dept of Environmental Quality	02-019-0	2/2/2013
Arkansas	Bioassay-WET	Dept of Environmental Quality	02-019-0	2/2/2013
Illinois	Hazardous Waste	Illinois EPA	002885	2/4/2013
Illinois	Waste Water	Illinois EPA	002885	2/4/2013
Iowa	Hazardous Waste	Dept of Natural Resources	118	7/1/2012
Iowa	Waste Water	Dept of Natural Resources	118	7/1/2012
Iowa	UST Program	Dept of Natural Resources	118	7/1/2012
Kansas	Drinking Water	Dept of Health & Environment	E-10116	4/30/2013
Kansas	Hazardous Waste	Dept of Health & Environment	E-10116	4/30/2013
Kansas	Microbiology	Dept of Health & Environment	E-10116	4/30/2013
Kansas	Waste Water	Dept of Health & Environment	E-10116	4/30/2013
Kansas	Bioassay-WET	Dept of Health & Environment	E-10116	4/30/2013
Louisiana	Hazardous Waste	Dept of Environmental Quality	03055	6/30/2012
Louisiana	Waste Water	Dept of Environmental Quality	03055	6/30/2012
Louisiana	Bioassay-WET	Dept of Environmental Quality	03055	6/30/2012
Minnesota	Bioassay-WET	Dept of Health	375495	12/31/12
Nevada	Waste Water	Division of Environmental Protection	KS000212011A	7/31/2012
Nevada	Hazardous Waste	Division of Environmental Protection	KS000212011A	7/31/2012
Oklahoma	Waste Water/Sludge	Dept of Environmental Quality	2011-066	8/31/2012
Oklahoma	Microbiology	Dept of Environmental Quality	2011-080	8/31/2012
Oklahoma	Bioassay-WET	Dept of Environmental Quality	2011-080	8/31/2012
Texas	Bioassay-WET	Texas Commission on Environmental Quality	T104704407-11-2	6/30/2012
Texas	Hazardous Waste	Texas Commission on Environmental Quality	T104704407-11-2	6/30/2012
Texas	Waste Water	Texas Commission on Environmental Quality	T104704407-11-2	6/30/2012
USDA	Foreign Soil Import	USDA	P330-12-00088	3/30/2015
Utah	Waste Water	Dept of Health	PASKS	4/30/13
Utah	Hazardous Waste	Dept of Health	PASKS	4/30/13
Utah	Bioassay-WET	Dept of Health	PASKS	4/30/13

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	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 92 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

ATTACHMENT VII- PACE CHAIN-OF-CUSTODY (CURRENT AS OF ISSUE DATE)



CHAIN-OF-CUSTODY / Analytical Request Document
 The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: of

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:		Report To:		Attention:	
Address:		Copy To:		Company Name:	
Email To:		Purchase Order No.:		Address:	
Phone:		Project Name:		Pace Quote Reference:	
Fax:		Project Number:		Pace Project Manager:	
Requested Due Date/TAT:				Pace Profile #:	

Section D Required Client Information		Section E Requested Analysis Filtered (Y/N)		Section F Requested Analysis Filtered (Y/N)	
Matrix Codes Drinking Water DW Water WT Waste Water WW Product P Soil/Solid SL Oil OL Wipe WIP Tissue TR Other OT		Matrix Code (see valid codes to left)		Preservatives Unpreserved H2SO4 HNO3 HCl NaOH Na2SO3 Methanol Other	
Sample ID (A-Z, 0-9 / -) Sample IDs MUST BE UNIQUE		Sample Type (S=GRAB C=COMP)		Analysis Test	
Collected Composite Start Composite End/GRAB		Sample Temp at Collection		Temp in °C	
DATE TIME DATE TIME DATE TIME		DATE TIME DATE TIME DATE TIME		DATE TIME DATE TIME DATE TIME	
RELINQUISHED BY / AFFILIATION DATE DATE DATE		ACCEPTED BY / AFFILIATION DATE DATE DATE		SAMPLE CONDITIONS Received on Ice (Y/N) Custody Sealed (Y/N) Samples Intact (Y/N)	
ADDITIONAL COMMENTS		Pace Project No. / Lab I.D.			

SAMPLER NAME AND SIGNATURE	
PRINT Name of SAMPLER: SIGNATURE of SAMPLER:	DATE Signed (MM/DD/YY):

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 93 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

ATTACHMENT VIII- METHOD HOLD TIME, CONTAINER AND PRESERVATION GUIDE
(CURRENT AS OF ISSUE DATE)

Parameter	Method	Matrix	Container	Preservative	Max Hold Time
Acidity	SM2310B	Water	Plastic/Glass	≤ 6°C	14 Days
Actinides	HASL-300	Water		pH<2 HNO ₃	180 Days
Actinides	HASL-300	Solid		None	180 Days
Alkalinity	SM2320B/310.2	Water	Plastic/Glass	≤ 6°C	14 Days
Alkylated PAHs		Water		≤ 6°C; pH<2 1:1 HCl (optional)	14/40 Days preserved; 7/40 Days unpreserved
Alkylated PAHs		Solid		≤ 10°C	1 Year/40 Days
Total Alpha Radium (see note 3)	9315/903.0	Water	Plastic/Glass	pH<2 HNO ₃	180 days
Total Alpha Radium (see note 3)	9315	Solid		None	180 days
Anions (Br, Cl, F, NO ₂ , NO ₃ , o- Phos, SO ₄ , bromate, chlorite, chlorate)	300.0/300.1/SM4110B	Water	Plastic/Glass	≤ 6°C; EDA if bromate or chlorite run	All analytes 28 days except: NO ₂ , NO ₃ , o- Phos (48 Hours); chlorite (immediately for 300.0; 14 Days for 300.1). NO ₂ /NO ₃ combo 28 days.
Anions (Br, Cl, F, NO ₂ , NO ₃ , o- Phos, SO ₄ , bromate, chlorite, chlorate)	300.0	Solid	Plastic/Glass	≤ 6°C	All analytes 28 days except: NO ₂ , NO ₃ , o- Phos (48 hours); chlorite (immediately). NO ₂ /NO ₃ combo 28 days.
Anions (Br, Cl, F, NO ₂ , NO ₃ , o- Phos, SO ₄)	9056	Water/ Solid	Plastic/Glass	≤ 6°C	28 days
Aromatic and Halogenated Volatiles (see note 1)	8021	Solid	5035 vial kit	See note 1	14 days
Aromatic and Halogenated Volatiles	602/8021	Water	40mL vials	pH<2 HCl; ≤ 6°C; Na ₂ S ₂ O ₃ if Cl present	14 Days (7 Days for aromatics if unpreserved)
Acid Volatile Sulfide	Draft EPA 1629	Solid	8oz Glass	≤ 6°C	14 Days
Bacteria, Total Plate Count	SM9221D	Water	Plastic/WK	≤ 6°C; Na ₂ S ₂ O ₃	24 Hours
Base/Neutrals and Acids	8270	Solid	8oz Glass	≤ 6°C	14/40 Days
Base/Neutrals and Acids	625/8270	Water	1L Amber Glass	≤ 6°C; Na ₂ S ₂ O ₃ if Cl present	7/40 Days
Base/Neutrals, Acids &	525.2	Water	1L Amber	pH<2 HCl; ≤	14/30 Days

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	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 94 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

Parameter	Method	Matrix	Container	Preservative	Max Hold Time
Pesticides			Glass	6°C; Na sulfite if Cl present	
Biomarkers		Water	≤ 6°C; pH<2 1:1 HCl (optional)	14/40 Days preserved; 7/40 Days unpreserved	≤ 6°C; pH<2 1:1 HCl (optional)
Biomarkers		Solid	≤ 10°C	1 Year/40 Days	≤ 10°C
BOD/cBOD	SM5210B	Water	Plastic/Glass	≤ 6°C	48 hours
BTEX/Total Hydrocarbons	TO-3	Air	Summa Canister	None	14 Days
BTEX/Total Hydrocarbons	TO-3	Air	Tedlar Bag or equivalent	None	48 Hours
Cation/Anion Balance	SM1030E	Water	Plastic/Glass	None	None
Cation Exchange	9081	Solid	8oz Glass	None	unknown
Chloride	SM4500Cl-C,E	Water	Plastic/Glass	None	28 Days
Chlorine, Residual	SM4500Cl-D,E,G/330.5/Hach 8167	Water	Plastic/Glass	None	15 minutes
Chlorophyll	SM10200H	Water	Opaque bottle or aluminum foil		
COD	SM5220C, D/410.4/Hach 8000	Water	Plastic/Glass	pH<2 H ₂ SO ₄ ; ≤ 6°C	28 Days
Coliform, Fecal	SM9222D	Water	100mL Plastic	≤ 6°C	6 Hours
Coliform, Fecal	SM9222D	Solid	100mL Plastic	≤ 6°C	6 Hours
Coliform, Total and Escherichla (E. coli)	SM9223B	Water	100mL Plastic	≤ 10°C	48 Hours after collection; results from samples analyzed 30-48 Hours after collection must be qualified as analyzed >30 hours
Color	SM2120B,E	Water	Covered Plastic/Acid Washed Amber Glass	≤ 6°C	24 Hours
Condensable Particulate Emissions	EPA 202	Air	Solutions	None	6 Months
Cyanide, Reactive	SW846 chap.7	Water	Plastic/Glass	None	28 Days
Cyanide, Reactive	SW846 chap.7	Solid	Plastic/Glass	None	28 Days
Cyanide, Total and Amenable	SM4500CN-A,B,C,D,E,G,I,N/9010/	Water	Plastic/Glass	pH≥12 NaOH; ≤	14 Days (24 Hours if

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 95 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

Parameter	Method	Matrix	Container	Preservative	Max Hold Time
	9012/335.4			6°C; ascorbic acid if Cl present	sulfide present-applies to SM4500CN only)
Diesel Range Organics- Alaska DRO	AK102	Solid	8oz Glass	≤ 6°C	14/40 Days
Diesel Range Organics- Alaska DRO	AK102	Water	1L Glass	pH<2 HCl; ≤ 6°C	14/40 Days
Diesel Range Organics- TPH DRO	8015	Solid	8oz Glass Jar	≤ 6°C	14/40 Days
Diesel Range Organics- TPH DRO	8015	Water	1L Amber Glass	≤ 6°C; Na ₂ S ₂ O ₃ if Cl present	7/40 Days
Diesel Range Organics- TPH DRO	8015	Tissue	1L Amber Glass	≤ - 10°C	1 Year if frozen/40 Days
Diesel Range Organics- NwTPH-Dx	Nw-TPH-Dx	Solid	8oz Glass Jar	≤ 6°C	14/40 Days
Diesel Range Organics- NwTPH-Dx	Nw-TPH-Dx	Water	1L Amber Glass	pH <2 HCl; ≤ 6°C	14/40 Days; 7 Days from collection to extraction if unpreserved
Diesel Range Organics- Wisconsin DRO	WI MOD DRO	Solid	Tared 4oz Glass Jar	≤ 6°C	10/47 Days
Diesel Range Organics- Wisconsin DRO	WI MOD DRO	Water	1L Amber Glass	≤ 6°C	14/40 Days
Dioxins and Furans	1613B	Solid	8oz Glass	≤ -10°C	1 year
Dioxins and Furans	1613B	Water	1L Amber Glass	≤ 6°C; Na ₂ S ₂ O ₃ if Cl present	1 year
Dioxins and Furans	1613B	Fish/ Tissue	Aluminum foil	< -10°C	1 year
Dioxins and Furans	8290	Water	1L Amber Glass	≤ 6°C; Na ₂ S ₂ O ₃ if Cl present	30/45 Days
Dioxins and Furans	8290	Solid	8oz Glass	≤ 6°C	30/45 Days
Dioxins and Furans	8290	Fish/ Tissue	Not specified	< -10°C	30/45 Days
Dioxins and Furans	TO-9	Air	PUF	None	30/45 Days
EDB/DBCP (8011) EDB/DBCP/1,2,3-TCP (504.1)	504.1/8011	Water	40mL vials	≤ 6°C; Na ₂ S ₂ O ₃ if Cl present	14 Days
Explosives	8330/8332	Water	1L Amber Glass	≤ 6°C	7/40 Days
Explosives	8330/8332	Solid	8oz Glass Jar	≤ 6°C	14/40 Days
Extractable Petroleum Hydrocarbons (aliphatic and	MA-EPH	Water	1L Amber Glass	pH<2 HCl; ≤ 6°C	14/40 Days

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 96 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

Parameter	Method	Matrix	Container	Preservative	Max Hold Time
aromatic)					
Extractable Petroleum Hydrocarbons (aliphatic and aromatic)	MA-EPH	Solid	4oz Glass Jar	$\leq 6^{\circ}\text{C}$	7/40 Days
Ferrous Iron	SN3500Fe-D	Water	Glass	None	Immediate
Flashpoint/Ignitability	1010	Liquid	Plastic/Glass	None	28 Days
Fluoride	SM4500Fl-C,D	Water	Plastic	None	28 Days
Gamma Emitting Radionuclides	901.1	Water	Plastic/Glass	$\text{pH} < 2 \text{ HNO}_3$	180 days
Gasoline Range Organics	8015	Water	40mL vials	$\text{pH} < 2 \text{ HCl}$	14 Days
Gasoline Range Organics	8015	Solid	5035 vial kit	See note 1	14 days
Gasoline Range Organics-Alaska GRO	AK101	Solid	5035 vial kit	See 5035 note*	28 Days if GRO only (14 Days with BTEX)
Gasoline Range Organics-Alaska GRO	AK101	Water	40mL vials	$\text{pH} < 2 \text{ HCl}; \leq 6^{\circ}\text{C}$	14 Days
Gasoline Range Organics-NwTPH-Gx	Nw-TPH-Gx	Water	40mL vials	$\text{pH} < 2 \text{ HCl}; \leq 6^{\circ}\text{C}$	7 Days unpreserved; 14 Days preserved
Gasoline Range Organics-NwTPH-Gx	Nw-TPH-Gx	Solid	40mL vials	$\leq 6^{\circ}\text{C}$; packed jars with no headspace	14 Days
Gasoline Range Organics-Wisconsin GRO	WI MOD GRO	Water	40mL vials	$\text{pH} < 2 \text{ HCl}; \leq 6^{\circ}\text{C}$	14 Days
Gasoline Range Organics-Wisconsin GRO	WI MOD GRO	Solid	40mL MeOH vials	$\leq 6^{\circ}\text{C}$ in MeOH	21 Days
Gross Alpha (NJ 48Hr Method)	NJAC 7:18-6	Water	Plastic/Glass	$\text{pH} < 2 \text{ HNO}_3$	48 Hrs
Gross Alpha and Gross Beta	9310/900.0	Water	Plastic/Glass	$\text{pH} < 2 \text{ HNO}_3$	180 Days
Gross Alpha and Gross Beta	9310	Solid	Glass	None	180 Days
Haloacetic Acids	552.1/552.2	Water	40mL Amber vials	$\text{NH}_4\text{Cl}; \leq 6^{\circ}\text{C}$	14/7 Days if extracts stored $\leq 6^{\circ}\text{C}$ or 14/14 Days if extracts stored at $\leq -10^{\circ}\text{C}$
Hardness, Total (CaCO_3)	SM2340B,C/130.1	Water	Plastic/Glass	$\text{pH} < 2 \text{ HNO}_3$	6 Months
Heterotrophic Plate Count (MPC)	SM9215B	Water	100mL Plastic	$\leq 6^{\circ}\text{C}$	24 Hours
Herbicides, Chlorinated	8151	Solid	8oz Glass Jar	$\leq 6^{\circ}\text{C}$	14/40 Days
Herbicides, Chlorinated	8151	Water	1L Amber Glass	$\leq 6^{\circ}\text{C}$; $\text{Na}_2\text{S}_2\text{O}_3$ if Cl present	7/40 Days
Herbicides, Chlorinated	515.1/515.3	Water	1L Amber Glass	$\leq 6^{\circ}\text{C}$; $\text{Na}_2\text{S}_2\text{O}_3$ if Cl present	14/28 Days
Hexavalent Chromium	7196/218.6/SM3500Cr-C,D	Water	Plastic/Glass	$\leq 6^{\circ}\text{C}$	24 Hours

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 97 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

Parameter	Method	Matrix	Container	Preservative	Max Hold Time
Hexavalent Chromium	7196 (with 3060A)	Solid		$\leq 6^{\circ}\text{C}$	24 Hours after extraction
Hydrogen Halide and Halogen Emissions	EPA 26	Air	Solutions	None	6 Months
Ignitability of Solids	1030	Non-liquid Waste	Plastic/Glass	None	28 Days
Lead Emissions	EPA 12	Air	Filter/Solutions	None	6 Months
Lipids	Pace Lipids	Tissue	Plastic/Glass	$\leq -10^{\circ}\text{C}$	1 Year if frozen
Mercury, Low-Level	1631E	Solid			
Mercury, Low-Level	1631E	Water	Fluoropolymer bottles (Glass if Hg is only analyte being tested)	12N HCl or BrCl	48 Hours for preservation or analysis; 28 Days to preservation if sample oxidized in bottle; 90 Days for analysis if preserved
Mercury, Low-Level	1631E	Tissue	Plastic/Glass	$\leq -10^{\circ}\text{C}$	28 Days if frozen
Mercury	7471	Solid	8oz Glass Jar	$\leq 6^{\circ}\text{C}$	28 days
Mercury	7470/245.1/245.2	Water	Plastic/Glass	$\text{pH} < 2 \text{ HNO}_3$	28 Days
Mercury	7471/245.6	Tissue	Plastic/Glass	$\leq -10^{\circ}\text{C}$	28 Days if frozen
Metals (GFAA)	7000/200.9	Water	Plastic/Glass	$\text{pH} < 2 \text{ HNO}_3$	6 Months
Metals (ICP)	NIOSH 7300A/7303	Air	Filters	None	6 Months
Metals (ICP/ICPMS)	6010/6020	Solid	8oz Glass Jar	None	6 months
Metals (ICP/ICPMS)	6010/6020/200.7/200.8	Water	Plastic/Glass	$\text{pH} < 2 \text{ HNO}_3$	6 Months
Metals (ICP/ICPMS)	6020	Tissue	Plastic/Glass	$\leq -10^{\circ}\text{C}$	6 Months if frozen
Methane, Ethane, Ethene	8015 modified	Water	40mL vials	HCl	14 Days
Methane, Ethane, Ethene	RSK-175	Water	40mL vials	HCl	14 Days
Methane, Ethane, Ethene	EPA 3C	Air	Summa Canister	None	14 Days
Methane, Ethane, Ethene	EPA 3C	Air	Tedlar Bag or equivalent	None	48 Hours
Methanol, Ethanol	8015 modified	Water	40mL vials	$\leq 6^{\circ}\text{C}$	14 Days
Methanol, Ethanol	8015 modified	Solid	2oz Glass	$\leq 6^{\circ}\text{C}$	14 Days
Nitrogen, Ammonia	SM4500NH3/350.1	Water	Plastic/Glass	$\text{pH} < 2 \text{ H}_2\text{SO}_4$; $\leq 6^{\circ}\text{C}$	28 Days
Nitrogen, Kjeldahl (TKN)	351.2	Solid	Plastic/Glass	$\leq 6^{\circ}\text{C}$	28 Days
Nitrogen, Kjeldahl (TKN)	SM4500-Norg/351.2	Water	Plastic/Glass	$\text{pH} < 2 \text{ H}_2\text{SO}_4$; $\leq 6^{\circ}\text{C}$	28 Days
Nitrogen, Nitrate	SM4500-NO3/352.1	Water	Plastic/Glass	$\leq 6^{\circ}\text{C}$	24 Hours preferred
Nitrogen, Nitrate & Nitrite combination	353.2	Solid	Plastic/Glass	$\leq 6^{\circ}\text{C}$	28 Days
Nitrogen, Nitrate & Nitrite	SM4500-NO3/353.2	Water	Plastic/Glass	$\text{pH} < 2 \text{ H}_2\text{SO}_4$; $\leq 6^{\circ}\text{C}$	28 Days

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 98 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

Parameter	Method	Matrix	Container	Preservative	Max Hold Time
combination				$\leq 6^{\circ}\text{C}$	
Nitrogen, Nitrite or Nitrate separately	SM4500-NO2/353.2	Water	Plastic/Glass	$\leq 6^{\circ}\text{C}$	48 Hours
Nitrogen, Organic	SM4500-Norg/351.2	Water	Plastic/Glass	pH<2 H ₂ SO ₄ ; $\leq 6^{\circ}\text{C}$	28 Days
Non-Methane Organics	EPA 25C	Air	Summa Canister	None	14 Days
Non-Methane Organics	EPA 25C	Air	Tedlar Bag or equivalent	None	48 Hours
Odor	SM2150B	Water	Glass	$\leq 6^{\circ}\text{C}$	24 Hours
Oil and Grease/HEM	1664A/SM5520B/9070	Water	Glass	pH<2 H ₂ SO ₄ or HCl; $\leq 6^{\circ}\text{C}$	28 Days
Oil and Grease/HEM	9071	Solid	Glass	$\leq 6^{\circ}\text{C}$	28 Days
PBDEs	1614	Water	1L Amber Glass	$\leq 6^{\circ}\text{C}$	1 Year/1 Year
PBDEs	1614	Solid	Wide Mouth Jar	$\leq 6^{\circ}\text{C}$	1 Year/1 Year
PBDEs	1614	Tissue	Aluminum Foil	$\leq -10^{\circ}\text{C}$	1 Year/1 Year
PCBs and Pesticides, Organochlorine (OC)	TO-4/TO-10	Air	PUF	None	7/40 Days
PCBs and Pesticides, Organochlorine (OC)	608	Water	1L Amber Glass		Pest: 7/40 Days; PCB: 1 Year/1 Year
Pesticides, Organochlorine (OC)	8081	Water	1L Amber Glass	$\leq 6^{\circ}\text{C}$; Na ₂ S ₂ O ₃ if Cl present	7/40 Days
Pesticides, Organochlorine (OC)	8081	Solid	8oz Glass Jar	$\leq 6^{\circ}\text{C}$	14/40 Days
Pesticides, Organochlorine (OC)	8081	Tissue	8oz Glass Jar	$\leq -10^{\circ}\text{C}$	1 Year if frozen/40 Days
Pesticides, Organophosphorous (OP)	8141	Solid	8oz Glass Jar	$\leq 6^{\circ}\text{C}$	14/40 Days
Pesticides, Organophosphorous (OP)	8141	Water	1L Amber Glass	pH 5-8 with NaOH or H ₂ SO ₄ ; $\leq 6^{\circ}\text{C}$; Na ₂ S ₂ O ₃ if Cl present	7/40 Days
PCBs (Aroclors)	8082	Water	1L Amber Glass	$\leq 6^{\circ}\text{C}$; Na ₂ S ₂ O ₃ if Cl present	1 Year/1 Year
PCBs (Aroclors)	8082	Solid	8oz Glass Jar	$\leq 6^{\circ}\text{C}$	1 Year/1 Year
PCBs (Aroclors)	8082	Tissue	Plastic/Glass	$\leq -10^{\circ}\text{C}$	1 Year if frozen/1 Year
PCB Congeners	1668A	Water	1L Amber Glass	$\leq 6^{\circ}\text{C}$ but above freezing	1 Year/1 Year

UNCONTROLLED COPY

	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 99 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

Parameter	Method	Matrix	Container	Preservative	Max Hold Time
PCB Congeners	1668A	Solid	4-8oz Glass Jar	$\leq 6^{\circ}\text{C}$ but above freezing	1 Year/1 Year
PCB Congeners	1668A	Tissue	4-8oz Glass Jar	$\leq -10^{\circ}\text{C}$	1 Year/1 Year
Oil Range Organics- ORO					
Oxygen, Dissolved (Probe)	SM4500-O	Water	Glass	None	15 minutes
Paint Filter Liquid Test	9095	Water	Plastic/Glass	None	N/A
Particulates	PM-10	Air	Filters	None	6 Months
Permanent Gases	EPA 3C	Air	Summa Canister	None	14 Days
Permanent Gases	EPA 3C	Air	Tedlar Bag or equivalent	None	48 Hours
pH	SM4500H+B/9040	Water	Plastic/Glass	None	15 minutes
pH	9045	Solid	Plastic/Glass	None	
Phenol, Total	420.1/420.4/9065/9066	Water	Glass	$\text{pH} < 2 \text{ H}_2\text{SO}_4$; $\leq 6^{\circ}\text{C}$	28 Days
Phosphorus, Orthophosphate	SM4500P/365.1/365.3	Water	Plastic	Filter; $\leq 6^{\circ}\text{C}$	Filter within 15 minutes, Analyze within 48 Hours
Phosphorus, Total	SM4500P/365.1/365.3/365.4	Water	Plastic/Glass	$\text{pH} < 2 \text{ H}_2\text{SO}_4$; $\leq 6^{\circ}\text{C}$	28 Days
Phosphorus, Total	365.4	Solid	Plastic/Glass	$\leq 6^{\circ}\text{C}$	28 Days
Polynuclear Aromatic Hydrocarbons (PAH)	TO-13	Air	PUF	None	7/40 Days
Polynuclear Aromatic Hydrocarbons (PAH)	8270 SIM	Solid	8oz Glass Jar	$\leq 6^{\circ}\text{C}$	14/40 Days
Polynuclear Aromatic Hydrocarbons (PAH)	8270 SIM	Water	1L Amber Glass	$\leq 6^{\circ}\text{C}$; $\text{Na}_2\text{S}_2\text{O}_3$ if Cl present	7/40 Days
Polynuclear Aromatic Hydrocarbons (PAH)	8270 SIM	Tissue	Plastic/Glass	$\leq -10^{\circ}\text{C}$	1 Year if frozen/40 Days
Radioactive Strontium	905.0	Water	Plastic/Glass	$\text{pH} < 2 \text{ HNO}_3$	180 days
Radium-226	903.0/903.1	Water	Plastic/Glass	$\text{pH} < 2 \text{ HNO}_3$	180 days
Radium-228 (see note 3)	9320/904.0	Water	Plastic/Glass	$\text{pH} < 2 \text{ HNO}_3$	180 days
Radium-228 (see note 3)	9320	Solid			
Residual Range Organics- Alaska RRO	AK103	Solid	8oz Glass	$\leq 6^{\circ}\text{C}$	14/40 Days
Saturated Hydrocarbons		Water	$\leq 6^{\circ}\text{C}$; $\text{pH} < 2$ 1:1 HCl (optional)	14/40 Days preserved; 7/40 Days unpreserved	$\leq 6^{\circ}\text{C}$; $\text{pH} < 2$ 1:1 HCl (optional)
Saturated Hydrocarbons		Solid	$\leq 10^{\circ}\text{C}$	1 Year/40 Days	$\leq 10^{\circ}\text{C}$
Silica, Dissolved	SM4500Si-D	Water	Plastic	$\leq 6^{\circ}\text{C}$	28 Days
Solids, Settleable	SM2540F	Water	Glass	$\leq 6^{\circ}\text{C}$	48 Hours

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	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 100 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

Parameter	Method	Matrix	Container	Preservative	Max Hold Time
Solids, Total	SM2540B	Water	Plastic/Glass	$\leq 6^{\circ}\text{C}$	7 Days
Solids, Total	SM2540G	Solid	Plastic/Glass	$\leq 6^{\circ}\text{C}$	7 Days
Solids, Total (FOC, OM, Ash)	ASTM D2974	Solid	Plastic/Glass	$\leq 6^{\circ}\text{C}$	7 Days
Solids, Total Dissolved	SM2540C	Water	Plastic/Glass	$\leq 6^{\circ}\text{C}$	7 Days
Solids, Total Suspended	SM2540D/USGS I-3765-85	Water	Plastic/Glass	$\leq 6^{\circ}\text{C}$	7 Days
Solids, Total Volatile	160.4/SM2540E	Water	Plastic/Glass	$\leq 6^{\circ}\text{C}$	7 Days
Solids, Total Volatile	160.4	Solid	Plastic/Glass	$\leq 6^{\circ}\text{C}$	7 Days
Specific Conductance	SM2510B/9050/120.1	Water	Plastic/Glass	$\leq 6^{\circ}\text{C}$	28 Days
Stationary Source Dioxins and Furans	EPA 23	Air	XAD Trap	None	30/45 Days
Stationary Source Mercury	EPA 101	Air	Filters	None	6 Months, 28 Days for Hg
Stationary Source Metals	EPA 29	Air	Filters	None	6 Months, 28 Days for Hg
Stationary Source PM10	EPA 201A	Air	Filters	None	6 Months
Stationary Source Particulates	EPA 5	Air	Filter/Solutions	None	6 Months
Sulfate	SM4500SO4/9036/9038/375.2/ASTM D516	Water	Plastic/Glass	$\leq 6^{\circ}\text{C}$	28 Days
Sulfide, Reactive	SW-846 Chap.7	Water	Plastic/Glass	None	28 Days
Sulfide, Reactive	SW-846 Chap.7	Solid	Plastic/Glass	None	28 Days
Sulfide, Total	SM4500S/9030	Water	Plastic/Glass	pH>9 NaOH; ZnOAc; $\leq 6^{\circ}\text{C}$	7 Days
Sulfite	SM4500SO3	Water	Plastic/Glass	None	15 minutes
Surfactants (MBAS)	SM5540C	Water	Plastic/Glass	$\leq 6^{\circ}\text{C}$	48 Hours
Total Organic Carbon (TOC)	SM5310B,C,D/9060	Water	Glass	pH<2 H ₂ SO ₄ or HCl; $\leq 6^{\circ}\text{C}$	28 Days
Total Organic Carbon (TOC)	9060/Walkley Black	Solid	Glass	$\leq 6^{\circ}\text{C}$	14 Days
Total Organic Halogen (TOX)	SM5320/9020/9021	Water	Glass; no headspace	$\leq 6^{\circ}\text{C}$	14 Days
Tritium	906.0	Water	Glass	None	180 days
Turbidity	SM2130B/180.1	Water	Plastic/Glass	$\leq 6^{\circ}\text{C}$	48 Hours
Total Uranium	908.0/ASTM D5174-97	Water	Plastic/Glass	pH<2 HCl	180 days
Volatile Petroleum Hydrocarbons (aliphatic and aromatic)	MA-VPH	Water	40mL vials	pH<2 HCl; $\leq 6^{\circ}\text{C}$	14 Days preserved
Volatile Petroleum Hydrocarbons (aliphatic and aromatic)	MA-VPH	Solid	4-8oz Glass Jar	$\leq 6^{\circ}\text{C}$; packed jars with no headspace	7/28 Days
Volatiles	TO-14	Air	Summa Canister	None	30 Days

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	Document Name: Quality Assurance Manual	Document Revised: June 5, 2012 Page 101 of 101
	Document No.: Quality Assurance Manual rev.15.2	Issuing Authorities: Pace Corporate Quality Office and Pace Kansas Quality Office

Parameter	Method	Matrix	Container	Preservative	Max Hold Time
Volatiles	TO-14	Air	Tedlar Bag or equivalent	None	48 Hours
Volatiles	TO-15	Air	Summa Canister	None	30 Days
Volatiles	8260	Solid	5035 vial kit	See note 1	14 days
Volatiles	8260	Water	40mL vials	pH<2 HCl; $\leq 6^{\circ}\text{C}$; $\text{Na}_2\text{S}_2\text{O}_3$ if Cl present	14 Days
Volatiles	8260	Conc. Waste	5035 vial kit or 40mL vials	$\leq 6^{\circ}\text{C}$	14 Days
Volatiles	624	Water	40mL vials	pH<2 HCl; $\leq 6^{\circ}\text{C}$; $\text{Na}_2\text{S}_2\text{O}_3$ if Cl present	14 Days (7 Days for aromatics if unpreserved)
Volatiles (see note 2)	524.2	Water	40mL vials (in duplicate)	pH<2 HCl; $\leq 6^{\circ}\text{C}$; Ascorbic acid or $\text{Na}_2\text{S}_2\text{O}_3$ if Cl present ²	14 Days

¹ **5035/5035A Note:** 5035 vial kit typically contains 2 vials water, preserved by freezing **or**, 2 vials aqueous sodium bisulfate preserved at 4°C , **and** one vial methanol preserved at $\leq 6^{\circ}\text{C}$ **and** one container of unpreserved sample stored at $\leq 6^{\circ}\text{C}$.

² Method 524.2 lists ascorbic acid as the preservative when residual chlorine is suspected, unless gases or Table 7 compounds are NOT compounds of interest and then sodium thiosulfate is the preservative recommended.

³ Methods 9315 and 9320 both state that if samples are unpreserved, the samples should be brought to the lab within 5 days of collection, preserved in the lab, and then allowed to sit for a minimum of 16 hours before sample preparation/analysis.

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ANALYTICAL GUIDE

DIOXIN & FURAN** (See Note 1)

Matrix	Parameter	Method	Container	Preservative	Max Hold Time (Prep/Analysis)
Potable water	2,3,7,8-TCDD	EPA 1613	2 - 1000 mL Amber Glass	≤6°C, Na ₂ S ₂ O ₃	1 Year
Aqueous	2,3,7,8-TCDD	EPA 1613	2 - 1000 mL Amber Glass	≤6°C	1 Year
Aqueous	2,3,7,8-TCDD	EPA 8280M / 8290	2 - 1000 mL Amber Glass	≤6°C	30 Days
Aqueous	Dioxins & Furans	EPA 1613	2 - 1000 mL Amber Glass	≤6°C	1 Year
Aqueous	Dioxins & Furans	EPA 8280M / 8290	2 - 1000 mL Amber Glass	≤6°C	30 Days
Solid	2,3,7,8-TCDD	EPA 1613	4 oz Glass Jar	≤6°C	1 Year
Solid	2,3,7,8-TCDD	EPA 8280M / 8290	4 oz Glass Jar	≤6°C	30 Days
Solid	Dioxins & Furans	EPA 8280M / 8290	4 oz Glass Jar	≤6°C	30 Days
Tissue	Dioxins & Furans	EPA 1613	Aluminum Foil / ziptop bag	Freeze	1 Year
Air	Stack Testing Dioxins & Furans (see note 2)	Method 23	XAD-II Trap	N/A	30 Days
Air	Ambient Air Dioxins & Furans (see note 2)	EPA TO-9	High Vol PUF/Filter	N/A	7/45 Days*

PCB CONGENERS** (See Note 1)

Matrix	Parameter	Method	Container	Preservative	Max Hold Time
Aqueous	WHO List (12 PCB Congeners)	EPA 1668	2 - 1000 mL Amber Glass	≤6°C	1 Year
Aqueous	209 PCB Congeners and Totals	EPA 1668	2 - 1000 mL Amber Glass	≤6°C	1 Year
Aqueous	Total Maximum Daily Load (TMDL)-209 PCB Congeners and Totals	EPA 1668	2 - 2000 mL Amber Glass	≤6°C	1 Year
Solid	WHO List (12 PCB Congeners)	EPA 1668	4 oz Glass Jar	≤6°C	1 Year
Solid	209 PCB Congeners and Totals	EPA 1668	4 oz Glass Jar	≤6°C	1 Year
Tissue	WHO List (12 PCB Congeners)	EPA 1668	Aluminum Foil / ziptop bag	Freeze	1 Year
Tissue	209 PCB Congeners and Totals	EPA 1668	Aluminum Foil / ziptop bag	Freeze	1 Year

TISSUE (PLANT AND ANIMAL)

Parameter	Method	Container	Preservative	Max Hold Time
Dioxins & Furans (see note 1)	EPA 1613	Aluminum Foil / ziptop bag	Freeze	1 Year
Mercury	EPA 245.6 / 7471 / 7473 / 1631	ziptop type bag	Freeze	1 Year
Metals	EPA 6020	ziptop type bag	Freeze	1 Year
PCBs	EPA 8082	ziptop type bag	Freeze	1 Year
PCB Congeners (WHO List-12 congeners-see note 1)	EPA 1668	Aluminum Foil / ziptop bag	Freeze	1 Year
PCB Congeners (209 congeners and Totals-see note 1)	EPA 1668	Aluminum Foil / ziptop bag	Freeze	1 Year
PFAS	Pace® SOP	HDPE Container / ziptop bag	Freeze	1 Year
Polynuclear Aromatic Hydrocarbons (PAH-SIM)	EPA 8270 SIM	ziptop type bag	Freeze	1 Year

PFAS

Matrix	Method	Container	Preservative	Max Hold Time (Prep/Analysis)
Potable Water	EPA 533	2 - 250 mL plastic	Ammonium Acetate, ≤6°C	14/28 Days *
Potable Water	EPA 537.1	2 - 250 mL plastic	Trizma, ≤6°C	14/28 Days *
Aqueous	PFAS by Isotope Dilution	2 - 250 mL plastic	≤6°C	28/28 Days *
Aqueous (DOD)	PFAS by Isotope Dilution / QSM 5.3 Table B-15	2 - 250 mL plastic	≤6°C	28/28 Days *
Total Oxidizable Precursors Assay in Water (TOP, Pre-Oxidation)	PFAS by Isotope Dilution	3 - 250 mL plastic	≤6°C	28/28 Days *
Total Oxidizable Precursors Assay in Water (TOP, Post-Oxidation)	PFAS by Isotope Dilution	3 - 250 mL plastic	≤6°C	28/28 Days *
Solid	PFAS by Isotope Dilution	125 mL plastic	≤6°C	28/28 Days *
Solid (DOD)	PFAS by Isotope Dilution / QSM 5.3 Table B-15	125 mL plastic	≤6°C	28/28 Days *
AFFF	PFAS by Isotope Dilution	250 mL plastic	≤6°C	28/28 Days *

Contact the Pace® PFAS Team with any questions: PFAS@pacelabs.com

*Max Hold Time for Sample Prep/Max Hold Time for Analysis after Sample Prep

**All methods require samples to remain in darkness or out of direct contact with sunlight.

1) Some State or Federal agencies may have alternative hold times and those must be met.

2) Sample Train preparation fee will be charged separately. Air sample can be calculated by "per sample," or by recorded volume sampled

ORGANIC PARAMETERS IN SOLID SAMPLES

Parameter	Method	Container	Preservative	Max Hold Time (Prep/Analysis)
Base / Neutrals and Acids	EPA 8270	4 oz Glass Jar	≤6°C	14/40 Days*
Diesel Range Organics (DRO)	EPA 8015	4 oz Glass Jar	≤6°C	14/40 Days*
Explosives	EPA 8330 / 8332	4 oz Glass Jar	≤6°C	14/40 Days*
Gasoline Range Organics (GRO)	EPA 8015	5035/5035A Methanol Vial Kit	≤6°C	14 Days
Herbicides, Chlorinated	EPA 8151 / 8321	4 oz Glass Jar	≤6°C	14/40 Days*
PCBs	EPA 8082	4 oz Glass Jar	≤6°C	1 Year
Pesticides, Organochlorine	EPA 8081	4 oz Glass Jar	≤6°C	14/40 Days*
Pesticides, Organophosphorus	EPA 8141	4 oz Glass Jar	≤6°C	7/40 Days*
Polynuclear Aromatic Hydrocarbons	EPA 8270 SIM	4 oz Glass Jar	≤6°C	14/40 Days*
State Specific Petroleum Methods	Various (contact local Pace® Lab)	Various (contact local Pace® lab)	≤6°C	Varies per Method
Volatiles	EPA 8260	5035 vial kit or 4 oz Glass Jar	≤6°C	14 Days
Volatiles	EPA 8260 (EZ SOIL)	5035/5035A Methanol Vial Kit (see note 3)	≤6°C	14 Days

ORGANIC PARAMETERS IN AQUEOUS SAMPLES

Parameter	Method			Container	Preservative	Max Hold Time (Prep/Analysis)
	Drinking Water	Non-Potable Water	SW-846			
Alcohols and Glycols			EPA 8015	3 - 40mL vials	≤6°C (zero headspace)	14 Days
Aromatic & Halogenated Volatiles		EPA 601 / 602 / 624	EPA 8260 / SM6200B	3 - 40mL vials	pH<2 HCl, ≤6°C (zero headspace)	14 Days
Aromatic Volatiles		EPA 601 / 602 / 624	EPA 8260 / SM6200B	3 - 40mL vials	≤6°C (zero headspace)	7 Days (if unpreserved)
Base/Neutrals and Acids	EPA 525.3			4 - 1000 mL Amber Glass	L-Ascorbic Acid, EDTA, Potassium Dihydrogen citrate, ≤6°C	14/28 Days*
		EPA 625 / 625.1	EPA 8270	2 - 1000 mL Amber Glass	≤6°C	7/40 Days*
		EPA 625 / 625.1 (RVT)	EPA 8270 (RVT)	2 - 100 mL Amber Glass	≤6°C	7/40 Days* (see note 6)
Diesel Range Organics (DRO)			EPA 8015	2 - 1000 mL Amber Glass	≤6°C	7/40 Days* (see note 4)
			EPA 8015 (RVT)	3 - 40mL vials	≤6°C	7/40 Days* (see note 6)
EDB & DBCP	EPA 504.1			3 - 40mL vials	Na ₂ S ₂ O ₃ , ≤6°C (zero headspace)	14 Days
			EPA 8011	3 - 40mL vials	pH<2 HCl or Na ₂ S ₂ O ₃ , ≤6°C (zero headspace)	14 Days
Explosives			EPA 8330	2 - 1000 mL Amber Glass	≤6°C	7/40 Days*
Gasoline Range Organics (GRO)			EPA 8015	3 - 40mL vials	pH<2 HCl, ≤6°C (zero headspace)	14 Days (see note 4)
Haloacetic Acids (HAAs)	EPA 552.2 / 552.3			1 - 250 mL Amber Glass	NH ₄ Cl, ≤6°C	14 Days
Herbicides, Chlorinated	EPA 515.1 / 515.3			2 - 1000 mL Amber Glass	≤6°C, Na ₂ S ₂ O ₃ if Cl present	14/28 Days*
			EPA 8151	2 - 1000 mL Amber Glass	≤6°C	7/40 Days*
			EPA 8321	2 - 40 mL vials or 2 - 500 mL Amber Glass	≤6°C	7/40 Days* (see note 6)
PCBs			EPA 8082	2 - 1000 mL Amber Glass	≤6°C	1 Year
			EPA 8082 (RVT)	2 - 100 mL Amber Glass	≤6°C	1 Year (see note 6)
PCBs & Pesticides, Organochlorine		EPA 608 / 608.3		2 - 1000 mL Amber Glass	≤6°C	7/40 Days*
		EPA 608 / 608.3 (RVT)		2 - 100 mL Amber Glass	≤6°C	7/40 Days* (see note 6)
Pesticides, Organochlorine			EPA 8081	2 - 1000 mL Amber Glass	≤6°C	7/40 Days*
			EPA 8081 (RVT)	2 - 100 mL Amber Glass	≤6°C	7/40 Days* (see note 6)
Pesticides, Organophosphorus			EPA 8141	2 - 1000 mL Amber Glass	≤6°C	7/40 Days*
			EPA 8141 (RVT)	2 - 100 mL Amber Glass	≤6°C	7/40 Days* (see note 6)
Polynuclear Aromatic Hydrocarbons (PAH)			EPA 8270, 8270 SIM	2 - 1000 mL Amber Glass	≤6°C	7/40 Days*
			EPA 8270 (RVT), 8270 SIM (RVT)	3 - 40 mL Amber vials or 2 - 100 mL Amber Glass	≤6°C	7/40 Days* (see note 6)
State Specific Petroleum Methods		Various (contact local Pace® Lab)		Various (contact local Pace® lab)	≤6°C	Varies per Method
Volatiles (DW / Trihalomethanes (THM))	EPA 524.2			3 - 40mL vials	Ascorbic Acid, pH<2 HCl, ≤6°C (zero headspace)	14 Days (see note 5)
Volatiles (Acrolein and Acrylonitrile)		EPA 624 / 624.1		3 - 40mL vials	≤6°C (zero headspace)	72 Hours (unpreserved)
Volatiles		EPA 624 / 624.1	EPA 8260	3 - 40mL vials	pH<2 HCl, ≤6°C (zero headspace)	14 Days
		EPA 624 / 624.1	EPA 8260	3 - 40mL vials	≤6°C (zero headspace)	7 Days (if unpreserved)

*Max Hold Time for Sample Prep/Max Hold Time for Analysis after Sample Prep

3) Not all Pace® network labs are able to analyze 8260 solid samples from a Methanol Vial kit. Confirm with local laboratory of capability.

4) States may have specific method requirements

5) EPA 524.2 lists ascorbic acid as the preservative when residual chlorine is suspected, unless gases or Table 7 compounds are NOT compounds of interest and then HCL is the preservative recommended.

6) Reduce Volume Technology (RVT) methods may require a different sample container (volume) depending on location; verify with local Pace® Laboratory.

INORGANIC PARAMETERS IN AQUEOUS SAMPLES

Parameter	Method			Container	Preservative	Max Hold Time
	Drinking Water	Non-Potable Water	SW-846			
Acidity		SM2310B		250 mL Plastic	≤6°C	14 Days
Alkalinity	EPA 310.2	SM2320B		250 mL Plastic	≤6°C	14 Days
BOD		SM5210B / Hach 10360		1000 mL Plastic	≤6°C	48 Hours
Bromide	EPA 300.0	EPA 300.0	EPA 9056	250 mL Plastic	None	28 Days
Carbonaceous BOD (cBOD)		SM5210B / Hach 10360		1000 mL Plastic	≤6°C	48 Hours
Chloride	EPA 300.0	EPA 300.0 / SM4500Cl-E	EPA 9056	250 mL Plastic	None	28 Days
Chlorine, Residual	EPA 330.5	SM4500Cl-D, G / Hach 8167		250 mL Plastic	None	15 Minutes
COD	EPA 410.4	SM5220 D / Hach 8000		125 mL Plastic	pH<2 H ₂ SO ₄ , ≤6°C	28 Days
Color	SM2120B, E			250 mL Plastic	≤6°C	48 Hours
Cyanide, Amenable	EPA 353.3/335.4	SM4500CN- E, G	EPA 9012/9014	250 mL Plastic	pH>12 NaOH; ≤6°C ascorbic acid if Cl present	14 Days
Cyanide, Available		OIA 1677-09		250 mL Plastic / Glass	pH 11-12 NaOH; ≤6°C	14 Days
Cyanide, Free		OIA 1677-09, ASTM D7237-10, D4282-02, SM4500-CN E, I	EPA 9014	250 mL Plastic / Glass	pH 11-12 NaOH; ≤6°C	14 Days
Cyanide, Reactive			Chapter 7	250 mL Plastic	None	14 Days
Cyanide, Total	EPA 335.4	SM4500CN- E	EPA 9012/9014	250 mL Plastic	pH>12 NaOH; ≤6°C	14 Days
Dissolved Organic Carbon (DOC)		SM5310 B, C		3 - 40 mL vials	pH<2 H ₂ SO ₄ or HCl, ≤6°C	28 Days (if unpreserved 48 Hours)
Ferrous Iron		SM3500Fe-B, D		250 mL Plastic unpreserved	None	Immediate
Flashpoint / Ignitability			EPA 1010 / 1020	250 mL Glass	None	28 Days
Fluoride	EPA 300.0	EPA 300.0, SM4500FI-C	EPA 9056	250 mL Plastic	None	28 Days
Hardness, Total (CaCO ₃)	EPA 130.1	SM2340B, C		250 mL Plastic	pH<2 HNO ₃	180 Days
Hexavalent Chromium	EPA 218.6 / 218.7	SM3500Cr-B	EPA 7196 / 7199	250 mL Plastic	≤6°C	24 Hours, unless aqueous samples preserved per method; then 28 Days
Mercury	EPA 245.1 / 245.2		EPA 7470	250 mL Plastic	pH<2 HNO ₃	28 Days
Mercury, Low Level	EPA 1631E/245.7			250 mL Glass	12N HCl or BrCl	48 hours for preservation or analysis; 28 days to preservation if sample oxidized in bottle; 90 days for analysis if preserved
Metals (ICP / ICPMS)		EPA 200.7 / 200.8	EPA 6010/6020	250 mL Plastic	pH<2 HNO ₃	180 Days
Metals (DW-Lead/Copper) (See Note 7)	EPA 200.7 / 200.8			1000 mL Plastic	None	Preserve with HNO ₃ , pH<2 within 14 days of collection, 180 Days
Nitrogen, Ammonia	EPA 350.1	SM4500NH3 D, G, H		125 mL Plastic	pH<2 H ₂ SO ₄ , ≤6°C	28 Days
Nitrogen, Kjeldahl	EPA 351.2	SM4500-Norg		125 mL Plastic	pH<2 H ₂ SO ₄ , ≤6°C	28 Days
Nitrogen, Nitrate & Nitrite	EPA 300.0 / 352.1 / 353.2	EPA 300.0 / EPA 353.2 / SM4500-NO3	EPA 9056	125 mL Plastic	≤6°C	48 Hours
Nitrogen, Nitrate plus Nitrite	EPA 300.0 / 353.2	EPA 300.0 / EPA 353.2 / SM4500-NO3	EPA 9056	125 mL Plastic	pH<2 H ₂ SO ₄ , ≤6°C	28 Days
Nitrogen, Organic	EPA 351.2 / 350.1			Calculation	pH<2 H ₂ SO ₄ , ≤6°C	28 Days
Odor		SM2150B		500 mL Amber Glass	≤6°C	24 Hours
Oil & Grease (HEM)		EPA 1664		2 - 1000 mL Amber Glass	pH<2 H ₂ SO ₄ or HCl, ≤6°C	28 Days
Oxygen, Dissolved	EPA 360.1 / 360.2	SM4500-O G		500 mL Plastic	None	15 Minutes
Phenolics, Total		EPA 420.1 / 420.4	EPA 9065 / 9066	250 mL Amber Glass	pH<2 H ₂ SO ₄ , ≤6°C	28 Days
Phosphorus, Orthophosphate		SM4500P E		250 mL Plastic	Field Filter, ≤6°C	Field Filter within 15 minutes, analyze within 48 hours
Phosphorus, Total	EPA 365.1 / 365.3 / 365.4	SM4500P		125 mL Plastic	pH<2 H ₂ SO ₄ , ≤6°C	28 Days
Silica		EPA 200.7	EPA 6010	250 mL Plastic	≤6°C	180 Days
Solids, Settleable		SM2540F		2 - 1000 mL Plastic	≤6°C	48 Hours
Solids, Total		SM2540B		250 mL Plastic	≤6°C	7 Days
Solids, Total Dissolved		SM2540C		500 mL Plastic	≤6°C	7 Days
Solids, Total Suspended		SM2540D		1000 mL Plastic	≤6°C	7 Days
Solids, Total Volatile		EPA 160.4 / SM2540E		500 mL Plastic	≤6°C	7 Days
Specific Conductance		SM2510B	EPA 9050	250 mL Plastic	≤6°C	28 Days
Specific Conductance	EPA 120.1			250 mL Plastic	≤6°C	24 hrs to Filter; then 28 days
Sulfate	EPA 300.0	SM4500SO4 / ASTM D516	EPA 9038 / 9056	250 mL Plastic	≤6°C	28 Days
Sulfide, Reactive			Chapter 7	250 mL Plastic	None	7 Days
Sulfide, Total		SM4500S		125 mL Plastic	pH>9 NaOH and ZnOAc; ≤6°C	7 Days
Sulfide, Total			EPA 9030 / 9034	125 mL Plastic	pH>9 NaOH and ZnOAc; ≤6°C (zero headspace)	7 Days
Sulfite		SM4500SO3B		250 mL Plastic	None	15 Minutes
Surfactants (MBAS)		SM5540C		500 mL Plastic	≤6°C	48 Hours
Total Organic Carbon (TOC)		SM5310B, C	EPA 9060	Amber Glass	pH<2 H ₂ SO ₄ or HCl or H ₃ PO ₄ , ≤6°C	28 Days
Total Organic Halogen (TOX)			EPA 9020 / 9076	Amber Glass	pH<2 H ₂ SO ₄ , ≤6°C (zero headspace)	28 Days
Turbidity	EPA 180.1	SM2130B		250 mL Plastic	≤6°C	48 Hours

7) The Lead and Copper Rule is for sampling at the tap (residential, daycares, nursing homes, schools... etc); not intended for drinking water plants

INORGANIC PARAMETERS IN SOLID SAMPLES

Parameter	METHOD		Container	Preservative	Max Hold Time
	Soil/Solid	SW-846			
Asbestos (PLM-bulk)		EPA 600/R-93/116	4 oz Glass Jar	None	N/A
Chloride	EPA 300.0	EPA 9056	4 oz Glass Jar	None	28 Days
Cyanide, Available		OIA 1677-09	4 oz Glass Jar	≤6°C	14 Days
Cyanide, Free		EPA 9014	4 oz Glass Jar	≤6°C	14 Days
Cyanide, Reactive		Chapter 7	4 oz Glass Jar	None	14 Days
Cyanide, Total		EPA 9012 / EPA 9014 / SM4500CN-E	4 oz Glass Jar	≤6°C	14 Days
Extractable Organic Halides (EOX)		EPA 9023	4 oz Glass Jar	≤6°C	28 Days
Flashpoint / Ignitability		EPA 1010 / 1020	4 oz Glass Jar	None	28 Days
Ignitability		EPA 1030	4 oz Glass Jar	None (zero headspace)	28 Days
Fluoride	EPA 300.0	EPA 9056	4 oz Glass Jar	None	28 Days
Fractional Organic Carbon (FOC)		ASTM D2974	4 oz Glass Jar	≤6°C	7 Days
Hexavalent Chromium		EPA 7196 / 7199	4 oz Glass Jar	≤6°C	30 Days
Mercury		EPA 7471	4 oz Glass Jar	≤6°C	28 Days
Metals (ICP / ICPMS)		EPA 6010/6020	4 oz Glass Jar	None	180 Days
Nitrogen, Ammonia	EPA 350.1	SM4500NH3 C, D, G, H	4 oz Glass Jar	≤6°C	28 Days
Nitrogen, Kjeldahl	EPA 351.2		4 oz Glass Jar	≤6°C	28 Days
Nitrogen, Nitrate & Nitrite		EPA 9056	4 oz Glass Jar	≤6°C	48 Hours
Nitrogen, Nitrate plus Nitrite	EPA 353.2	EPA 9056 / SM4500-NO3	4 oz Glass Jar	≤6°C	28 Days
Nitrogen, Organic	EPA 351.2 / 350.1		Calculation	≤6°C	28 Days
Oil & Grease (HEM)		EPA 9071	4 oz Glass Jar	≤6°C	28 Days
Paint Filter Liquid Test		EPA 9095	4 oz Glass Jar	None	N / A
Phenolics, Total		EPA 9065 / 9066	4 oz Glass Jar	≤6°C	28 Days
Phosphorus, Total	EPA 365.4 / SM4500P		4 oz Glass Jar	≤6°C	28 Days
Solids, Total	SM2540G		4 oz Glass Jar	≤6°C	7 Days
Solids, Total Volatile	SM2540G		4 oz Glass Jar	≤6°C	7 Days
Specific Conductance	SM2510B	EPA 9050	4 oz Glass Jar	≤6°C	28 Days
Sulfate	EPA 300.0	EPA 9038 / 9056	4 oz Glass Jar	≤6°C	28 Days
Sulfide, Reactive		Chapter 7	4 oz Glass Jar	None	7 Days
Sulfide, Total	SM4500S	EPA 9030 / 9034	4 oz Glass Jar	≤6°C	7 Days
Total Organic Carbon (TOC)		EPA 9060 / Lloyd Kahn / Walkley Black	4 oz Glass Jar	≤6°C	28 Days

MICROBIOLOGY

Matrix	Parameter	Method	Container	Preservative	Max Hold Time
Potable Water	Coliform, Total	SM9222B, 9223B, Colisure	Sterile 120 mL Plastic	<10°C, Na ₂ S ₂ O ₃	Short Hold Time: Check with local lab for required holding times
Potable Water	Coliform, E.Coli	SM9222B, 9223B, Colisure	Sterile 120 mL Plastic	<10°C, Na ₂ S ₂ O ₃	Short Hold Time: Check with local lab for required holding times
Potable Water	Coliform, Total (MPN)	SM9221B	Sterile 120 mL Plastic	<10°C, Na ₂ S ₂ O ₃	Short Hold Time: Check with local lab for required holding times
Potable Water	Coliform, Fecal	SM9222D, Colilert 18	Sterile 250 mL Plastic	≤6°C, Na ₂ S ₂ O ₃	Short Hold Time: Check with local lab for required holding times
Potable Water	Coliform, Fecal (MPN)	SM9221 C, E	Sterile 250 mL Plastic	≤6°C, Na ₂ S ₂ O ₃	Short Hold Time: Check with local lab for required holding times
Potable Water	Cryptosporidium, Giardia	EPA 1623	10 L Cubatainer	≤6°C	96 Hours
Potable Water	Heterotrophic Plate Count (HPC)	Simplate	Sterile 120 mL Plastic	≤6°C, Na ₂ S ₂ O ₃	8 Hours
Potable Water	Legionella	CDC Method	Sterile 250 mL Plastic	Na ₂ S ₂ O ₃	24 Hours
Aqueous	Legionella	ISO 11731:2017	Sterile 250 mL Plastic	Na ₂ S ₂ O ₃	24 Hours
Aqueous	Salmonella	Culture Method	Sterile 250 mL Plastic	Na ₂ S ₂ O ₃	24 Hours
Aqueous	SARs-COV2	Pace® SOP	250 mL HDPE	≤6°C	N/A
Solid	Fecal Coliform	EPA 1681	Sterile 250 mL Plastic	≤6°C, Na ₂ S ₂ O ₃	24 Hours

AIR TOXICS (See Note 8)

Parameter	Method	Container	Max Hold Time (Prep/Analysis)
BTEX, MTBE, TPH low fraction	Method 18M	Sampling Bag (Tedlar)	48 Hours
BTEX, MTBE, TPH low fraction	Method 18M	Summa Canister	28 Days
BTEX, Trimethylbenzenes	EPA TO-3	Sampling Bag (Tedlar)	48 Hours
BTEX, Trimethylbenzenes	EPA TO-3	Summa Canister	28 Days
Dioxins & Furans (Ambient Air)	EPA TO-9	High Vol PUF/Filter	7/45 Days*
Dioxins & Furans (Stack Testing)	Method 23	XAD-II Trap	30 Days
Fine Particulate Matter in Indoor Air	PM 2.5	Teflon Filter (47mm)	30 Days
Fine Particulate Matter in Indoor Air	PM 10	Quartz Filter	360 Days
MA Air Phase Petroleum Hydrocarbon	MA-APH	Summa Canister	28 Days
Metals (ICP)	NIOSH 5503	37mm Cassette	180 Days
Mercury	NIOSH 6009	Sorbent Tube	28 Days
Methane, Ethane, Ethene, Propane	EPA TO-3M	Sampling Bag (Tedlar)	48 Hours
Methane, Ethane, Ethene, Propane	EPA TO-3M	Summa Canister	28 Days
Methane, Ethane, Ethene	EPA 8015M	Sampling Bag (Tedlar)	48 Hours
Methane, Ethane, Ethene	EPA 8015M	Summa Canister	28 Days
Particulate/Dust	NIOSH 0500	37mm Cassette	28 Days
Particulate/Dust	NIOSH 0600	37mm Cassette	28 Days
Passive Benzene	Method 325B	Passive Diffusion Tube	30 Days
"Permanent/Fixed Gases (He, CH ₄ , N ₂ , CO ₂ , O ₂ , CO)"	EPA 3C / ASTM 1946	Sampling Bag (Tedlar)	48 Hours
"Permanent/Fixed Gases (He, CH ₄ , N ₂ , CO ₂ , O ₂ , CO)"	EPA 3C / ASTM 1946	Summa Canister	28 Days
Pesticides and Polychlorinated Biphenyls Aroclors Congeners Homologs	EPA TO-4A	High Volume PUF	7/40 Days*
Pesticides and Polychlorinated Biphenyls	EPA TO-10A	Low Volume PUF	7/40 Days*
Polycyclic Aromatic Hydrocarbons in Ambient Air	EPA TO-13A	High or Low Volume PUF	7/40 Days*
Volatile Organic Compounds	EPA TO-14A	Sampling Bag (Tedlar)	48 Hours
Volatile Organic Compounds	EPA TO-14A	Summa Canister	28 Days
Volatile Organic Compounds	EPA TO-15	Sampling Bag (Tedlar)	48 Hours
Volatile Organic Compounds	EPA TO-15	Summa Canister	28 Days
Volatile Organic Compounds ultra low level SIM	EPA TO-15 SIM	Summa Canister	28 Days
Volatile Organic Compounds low level scan + ultra low level SIM	EPA TO-15 SIM scan	Summa Canister	28 Days
Volatile Organic Compounds (sorbent based)	EPA TO-17	Summa Canister	30 Days
Volatile Organic Compounds in Products/Materials	Product Off-Gassing	Project specific	

Contact the Pace® Air Toxics Team with any questions: Air@pacelabs.com

FIELD SERVICES STACK/EMISSIONS

Parameter	Method	Container	Max Hold Time
Carbon Monoxide	EPA 10	On-site Real Time Analysis	NA
Dioxin/Furans	Method 23	On-site testing - Lab Analysis	NA
Gaseous Organic and Inorganic Compounds, Includes VOCs and HAPs	EPA 320, ASTM D7653, NIOSH 3800	On-site Real Time Analysis or 5 Liter Tedlar Bag	Compound dependent
Halides & Halogens	EPA 26 & 26A	On-site testing - Lab Analysis	NA
Hydrogen Sulfide	EPA 15	1L Tedlar Bag	24 Hours
Inorganic Lead	Method 12	On-site testing - Lab Analysis	NA
Metals	EPA 29	On-site testing - Lab Analysis	NA
Mercury	EPA 30B	On-site testing - Lab Analysis	NA
Methanol, Formaldehyde, Phenol	NCASI Method 98.01	On-site testing - Lab Analysis	NA
Methanol, Acetone, Acetaldehyde, Methyl Ethyl Ketone, Formaldehyde	NCASI Method 94.02	On-site testing - Lab Analysis	NA
Nitrogen Oxides	EPA 7E	On-site Real Time Analysis	NA
Opacity	EPA 5 and 22	On-site Real Time Analysis	NA
Oxygen & Carbon Dioxide	EPA 3A	On-site Real Time Analysis	NA
Particulate	EPA 5, 17, 201A, and 202	On-site testing - Lab Analysis	NA
Sulfur Dioxide	EPA 6C	On-site Real Time Analysis	NA
Sulfuric Acid Mist & Sulfur Dioxide	METHOD 8	On-site testing - Lab Analysis	NA
Total Hydrocarbons	EPA 25 & 25A	On-site Real Time Analysis	NA
Total Reduced Sulfur	EPA 16C	On-site testing - Lab Analysis	NA

*Max Hold Time for Sample Prep/Max Hold Time for Analysis after Sample Prep
8) Available compounds/analytes & capability are air lab location dependent

RADIOCHEMISTRY

Matrix	Parameter	Technique	Container	Preservative	Max Hold Time
Aqueous	Gamma Emitting Radionuclides	Gamma Spectroscopy	2 - 1000 mL Plastic	pH<2 HNO ₃	180 Days
Aqueous	Gross Alpha & Gross Beta	Gas Flow Proportional Counting	500 mL Plastic	pH<2 HNO ₃	180 Days
Aqueous	Gross Alpha (High Solids)	Co-Precipitation	500 mL Plastic	pH<2 HNO ₃	180 Days
Aqueous	NORM	Gamma Spectroscopy	2 - 1000 mL Plastic	pH<2 HNO ₃	180 Days
Aqueous	Radium-226	Radon Emanation; Alpha Spectroscopy	1000 mL Plastic	pH<2 HNO ₃	180 Days
Aqueous	Radium-228	Gas Flow Proportional Counting	1000 mL Plastic	pH<2 HNO ₃	180 Days
Aqueous	Strontium-90	Gas Flow Proportional Counting	500 mL Plastic	pH<2 HNO ₃	180 Days
Aqueous	Total Alpha Radium	Gas Flow Proportional Counting	1000 mL Plastic	pH<2 HNO ₃	180 Days
Aqueous	Total Uranium	KPA, ICPMS, Alpha Spec	50 mL Plastic	pH<2 HNO ₃	180 Days
Aqueous	Tritium	Liquid Scintillation	200 mL Glass	None	180 Days
Aqueous	Isotopic Actinides [U, Th, Pu, Am, Cm]	Alpha Spectroscopy	500 mL Plastic	pH<2 HNO ₃	180 Days
Aqueous	Radon	Liquid Scintillation	3 - 40 mL vials	None (zero headspace)	96 Hours
Aqueous	Polonium-210	Alpha Spectroscopy	500 mL Plastic	pH<2 HNO ₃	180 Days
Aqueous	Lead-210	Gas Flow Proportional Counting	500 mL Plastic	pH<2 HNO ₃	180 Days
Aqueous	Neptunium-237	Alpha Spectroscopy	500 mL Plastic	pH<2 HNO ₃	180 Days
Aqueous	Carbon-14	Liquid Scintillation	500 mL Plastic	pH<2 HNO ₃	180 Days
Aqueous	Iron-55	Liquid Scintillation	500 mL Plastic	pH<2 HNO ₃	180 Days
Aqueous	Nickel-63	Liquid Scintillation	500 mL Plastic	pH<2 HNO ₃	180 Days
Aqueous	Technetium-99	Liquid Scintillation	500 mL Plastic	pH<2 HNO ₃	180 Days
Aqueous	Plutonium-241	Liquid Scintillation	500 mL Plastic	pH<2 HNO ₃	180 Days
Solid	Gamma Emitting Radionuclides	Gamma Spectroscopy	16 oz Glass Jar	None	180 Days
Solid	Gross Alpha & Gross Beta	Gas Flow Proportional Counting	8 oz Glass Jar	None	180 Days
Solid	NORM	Gamma Spectroscopy	16 oz Glass Jar	None	180 Days
Solid	Radium-226	Gamma Spectroscopy	16 oz Glass Jar	None	180 Days
Solid	Radium-228	Gamma Spectroscopy	16 oz Glass Jar	None	180 Days
Solid	Strontium-90	Gas Flow Proportional Counting	8 oz Glass Jar	None	180 Days
Solid	Total Uranium	KPA, ICPMS, Alpha Spec	8 oz Glass Jar	None	180 Days
Solid	Tritium	Liquid Scintillation	8 oz Glass Jar	None	180 Days
Solid	Isotopic Actinides [U, Th, Pu, Am, Cm]	Alpha Spectroscopy	8 oz Glass Jar	None	180 Days
Solid	Polonium-210	Alpha Spectroscopy	8 oz Glass Jar	None	180 Days
Solid	Lead-210	Gas Flow Proportional Counting	8 oz Glass Jar	None	180 Days
Solid	Neptunium-237	Alpha Spectroscopy	8 oz Glass Jar	None	180 Days
Solid	Carbon-14	Liquid Scintillation	8 oz Glass Jar	None	180 Days
Solid	Iron-55	Liquid Scintillation	8 oz Glass Jar	None	180 Days
Solid	Nickel-63	Liquid Scintillation	8 oz Glass Jar	None	180 Days
Solid	Technetium-99	Liquid Scintillation	8 oz Glass Jar	None	180 Days
Solid	Plutonium-241	Liquid Scintillation	8 oz Glass Jar	None	180 Days

Contact the Pace® Radiochemistry Team with any questions: Radiochemistry@pacelabs.com

MONITORED NATURAL ATTENUATION PARAMETERS (MNA)

Matrix	Parameter	Method	Container	Preservative	Max Hold Time
Aqueous	Acetylene	AM 20 GAX	3 - 40 mL vials	TSP, ≤6°C (zero headspace)	14 Days
Aqueous	Hydrogen (bubble strip)	AM 20 GAX	1 - 22cc Vial (bubble strip sampler)	None	14 Days
Aqueous	Methane, Ethane, Ethene, Propane, Propene, Butane	AM 20 GAX	3 - 40 ml clear	TSP, ≤6°C (zero headspace)	14 Days
Aqueous	Methane, ethene, ethane	RSK 175	3 - 40 mL vials	Unpreserved, ≤6°C (zero headspace)	7 Days
Aqueous	Methane, ethene, ethane	RSK 175	3 - 40 mL vials	HCL, TSP, ≤6°C (zero headspace)	14 Days
Aqueous	Permanent Fixed Gases-Nitrogen, Oxygen, Carbon Monoxide	AM 20 GAX	2 - 40 mL vials	BAK, ≤6°C (zero headspace)	14 Days
Aqueous	Volatile Fatty Acids (Std: acetic, lactic, pyruvic, butyric, propionic, pentanoic, i-pentanoic, hexanoic, i-hexanoic, and formic)	AM 23 G	2 - 40 ml Amber (white septa)	BAK, ≤6°C (zero headspace)	28 Days
Vapor	Acetylene	AM 20 GAX	2 - 22cc vapor vials	None	14 Days
Vapor	Methane, Ethane, Ethene, Propane, Propene, Butane	AM 20 GAX	2 - 22cc vapor vials	None	14 Days
Vapor	Permanent Fixed Gases-Nitrogen, Oxygen, Carbon Monoxide	AM 20 GAX	2 - 22cc vapor vials	None	14 Days

Jon Niermann, *Chairman*
Emily Lindley, *Commissioner*
Bobby Janecka, *Commissioner*
Toby Baker, *Executive Director*



TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

September 06, 2022

Mr. Kenneth P. Busch
Pace Analytical Services, LLC - **Lenexa KS**
9608 Loiret Boulevard
Lenexa, KS 66219-2406

Subject: Texas NELAP accreditation renewal

Dear Mr. Busch:

I am pleased to advise you the Texas Commission on Environmental Quality is renewing your laboratory's accreditation. The accreditation is valid until the expiration date on the certificate and scope, contingent on continued compliance with the standards for accreditation and requirements of the state of Texas.

We are also continuing secondary accreditation based on your application and primary NELAP accreditation from the state of Kansas according to the attached Fields of Accreditation.

Your laboratory's secondary accreditation is valid until the expiration date on the certificate and scope, contingent on continued compliance with the requirements of the state of Texas as well as those of your primary accreditation body.

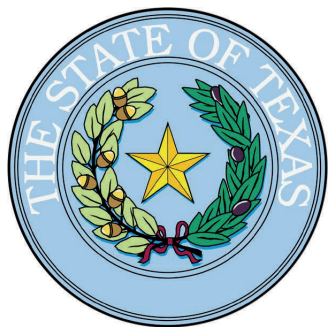
Please contact me at frank.jamison@tceq.texas.gov if I can provide any additional information or assistance.

Sincerely,

A handwritten signature in blue ink, appearing to read "Frank Jamison".

Frank Jamison
Data and Records Specialist

Enclosures



Texas Commission on Environmental Quality

NELAP-Recognized Laboratory Accreditation is hereby awarded to



Pace Analytical Services, LLC - Lenexa, KS

9608 Loiret Boulevard
Lenexa, KS 66219-2406

in accordance with Texas Water Code Chapter 5, Subchapter R, Title 30 Texas Administrative Code Chapter 25, and the National Environmental Laboratory Accreditation Program.

The laboratory's scope of accreditation includes the fields of accreditation that accompany this certificate. Continued accreditation depends upon successful ongoing participation in the program. The Texas Commission on Environmental Quality urges customers to verify the laboratory's current location(s) and accreditation status for particular methods and analyses (www.tceq.texas.gov/goto/lab). Accreditation does not imply that a product, process, system or person is approved by the Texas Commission on Environmental Quality.

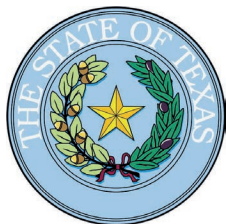
A handwritten signature in black ink, likely of the Executive Director, Texas Commission on Environmental Quality.

Certificate Number: T104704407-22-16

Effective Date: 10/1/2022

Expiration Date: 9/30/2023

**Executive Director Texas Commission on
Environmental Quality**



Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation



Pace Analytical Services, LLC - Lenexa, KS

9608 Loiret Boulevard
Lenexa, KS 66219-2406

Certificate: T104704407-22-16

Expiration Date: 9/30/2023

Issue Date: 10/1/2022

These fields of accreditation supercede all previous fields. The Texas Commission on Environmental Quality urges customers to verify the laboratory's current accreditation status for particular methods and analyses.

Matrix: *Non-Potable Water*

Method EPA 1010

Analyte	AB	Analyte ID	Method ID
Ignitability	KS	1780	10116606

Method EPA 120.1

Analyte	AB	Analyte ID	Method ID
Conductivity	KS	1610	10006403

Method EPA 1311

Analyte	AB	Analyte ID	Method ID
TCLP	KS	849	10118806

Method EPA 1312

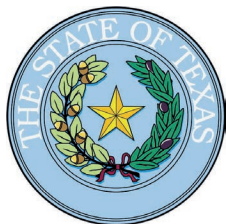
Analyte	AB	Analyte ID	Method ID
SPLP	KS	850	10119003

Method EPA 1664

Analyte	AB	Analyte ID	Method ID
n-Hexane Extractable Material (HEM) (O&G)	KS	1803	10127807
Silica Gel Treated n-Hexane Extractable Material (SGT-HEM)	KS	10220	10127807

Method EPA 200.7

Analyte	AB	Analyte ID	Method ID
Aluminum	KS	1000	10013806
Antimony	KS	1005	10013806
Arsenic	KS	1010	10013806
Barium	KS	1015	10013806
Beryllium	KS	1020	10013806
Boron	KS	1025	10013806
Cadmium	KS	1030	10013806
Calcium	KS	1035	10013806
Chromium	KS	1040	10013806
Cobalt	KS	1050	10013806
Copper	KS	1055	10013806
Iron	KS	1070	10013806
Lead	KS	1075	10013806



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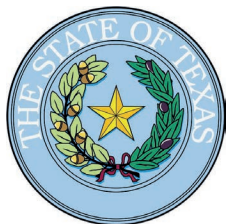
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Matrix: *Non-Potable Water*

Magnesium	KS	1085	10013806
Manganese	KS	1090	10013806
Molybdenum	KS	1100	10013806
Nickel	KS	1105	10013806
Potassium	KS	1125	10013806
Selenium	KS	1140	10013806
Silver	KS	1150	10013806
Sodium	KS	1155	10013806
Thallium	KS	1165	10013806
Tin	KS	1175	10013806
Vanadium	KS	1185	10013806
Zinc	KS	1190	10013806

Method EPA 200.8

Analyte	AB	Analyte ID	Method ID
Aluminum	KS	1000	10014605
Antimony	KS	1005	10014605
Arsenic	KS	1010	10014605
Barium	KS	1015	10014605
Beryllium	KS	1020	10014605
Cadmium	KS	1030	10014605
Chromium	KS	1040	10014605
Cobalt	KS	1050	10014605
Copper	KS	1055	10014605
Iron	KS	1070	10014605
Lead	KS	1075	10014605
Manganese	KS	1090	10014605
Molybdenum	KS	1100	10014605
Nickel	KS	1105	10014605
Selenium	KS	1140	10014605
Silver	KS	1150	10014605



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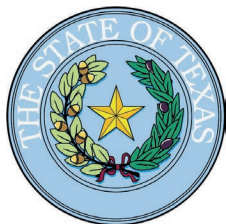
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Issue Date: 10/1/2022

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Matrix: Non-Potable Water

Thallium	KS	1165	10014605
Vanadium	KS	1185	10014605
Zinc	KS	1190	10014605
Method EPA 245.1			
Analyte	AB	Analyte ID	Method ID
Mercury	KS	1095	10036609
Method EPA 300.0			
Analyte	AB	Analyte ID	Method ID
Bromide	KS	1540	10053200
Chloride	KS	1575	10053200
Fluoride	KS	1730	10053200
Nitrate as N	KS	1810	10053200
Nitrite as N	KS	1840	10053200
Sulfate	KS	2000	10053200
Method EPA 350.1			
Analyte	AB	Analyte ID	Method ID
Ammonia as N	KS	1515	10063408
Method EPA 351.2			
Analyte	AB	Analyte ID	Method ID
Kjeldahl Nitrogen (Total Kjeldahl Nitrogen-TKN)	KS	1790	10065404
Method EPA 353.2			
Analyte	AB	Analyte ID	Method ID
Nitrate as N	KS	1810	10067400
Nitrate-nitrite	KS	1820	10067400
Nitrite as N	KS	1840	10067400
Method EPA 365.1			
Analyte	AB	Analyte ID	Method ID
Orthophosphate as P	KS	1870	10070005
Method EPA 365.4			
Analyte	AB	Analyte ID	Method ID
Phosphorus	KS	1910	10071202



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Matrix: *Non-Potable Water*

Method EPA 410.4

Analyte	AB	Analyte ID	Method ID
Chemical oxygen demand (COD)	KS	1565	10077404

Method EPA 420.1

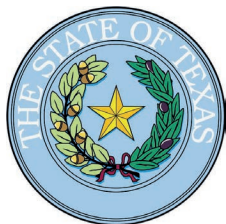
Analyte	AB	Analyte ID	Method ID
Total phenolics	KS	1905	10079400

Method EPA 420.4

Analyte	AB	Analyte ID	Method ID
Total phenolics	KS	1905	10080203

Method EPA 6010

Analyte	AB	Analyte ID	Method ID
Aluminum	KS	1000	10155201
Antimony	KS	1005	10155201
Arsenic	KS	1010	10155201
Barium	KS	1015	10155201
Beryllium	KS	1020	10155201
Boron	KS	1025	10155201
Cadmium	KS	1030	10155201
Calcium	KS	1035	10155201
Chromium	KS	1040	10155201
Cobalt	KS	1050	10155201
Copper	KS	1055	10155201
Iron	KS	1070	10155201
Lead	KS	1075	10155201
Lithium	KS	1080	10155201
Magnesium	KS	1085	10155201
Manganese	KS	1090	10155201
Molybdenum	KS	1100	10155201
Nickel	KS	1105	10155201
Potassium	KS	1125	10155201
Selenium	KS	1140	10155201



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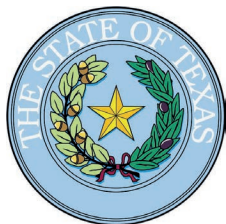
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Matrix: Non-Potable Water

Silica as SiO ₂	KS	1990	10155201
Silver	KS	1150	10155201
Sodium	KS	1155	10155201
Strontium	KS	1160	10155201
Thallium	KS	1165	10155201
Tin	KS	1175	10155201
Titanium	KS	1180	10155201
Vanadium	KS	1185	10155201
Zinc	KS	1190	10155201

Method EPA 6020

Analyte	AB	Analyte ID	Method ID
Aluminum	KS	1000	10156204
Antimony	KS	1005	10156204
Arsenic	KS	1010	10156204
Barium	KS	1015	10156204
Beryllium	KS	1020	10156204
Cadmium	KS	1030	10156204
Chromium	KS	1040	10156204
Cobalt	KS	1050	10156204
Copper	KS	1055	10156204
Iron	KS	1070	10156204
Lead	KS	1075	10156204
Manganese	KS	1090	10156204
Nickel	KS	1105	10156204
Selenium	KS	1140	10156204
Silver	KS	1150	10156204
Strontium	KS	1160	10156204
Thallium	KS	1165	10156204
Tin	KS	1175	10156204
Titanium	KS	1180	10156204



Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation



Pace Analytical Services, LLC - Lenexa, KS

9608 Loiret Boulevard
Lenexa, KS 66219-2406

Certificate: T104704407-22-16

Expiration Date: 9/30/2023

Issue Date: 10/1/2022

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Matrix: Non-Potable Water

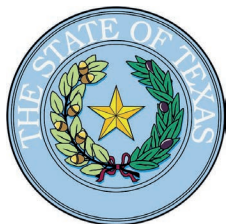
Vanadium	KS	1185	10156204
Zinc	KS	1190	10156204

Method EPA 608.3

Analyte	AB	Analyte ID	Method ID
alpha-BHC (alpha-Hexachlorocyclohexane)	KS	7110	10296625
Aroclor-1016 (PCB-1016)	KS	8880	10296625
Aroclor-1221 (PCB-1221)	KS	8885	10296625
Aroclor-1232 (PCB-1232)	KS	8890	10296625
Aroclor-1242 (PCB-1242)	KS	8895	10296625
Aroclor-1248 (PCB-1248)	KS	8900	10296625
Aroclor-1254 (PCB-1254)	KS	8905	10296625
Aroclor-1260 (PCB-1260)	KS	8910	10296625
beta-BHC (beta-Hexachlorocyclohexane)	KS	7115	10296625
gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	KS	7120	10296625

Method EPA 624.1

Analyte	AB	Analyte ID	Method ID
1,1,1-Trichloroethane	KS	5160	10298121
1,1,2,2-Tetrachloroethane	KS	5110	10298121
1,1,2-Trichloroethane	KS	5165	10298121
1,1-Dichloroethane	KS	4630	10298121
1,1-Dichloroethylene	KS	4640	10298121
1,2-Dibromoethane (EDB, Ethylene dibromide)	KS	4585	10298121
1,2-Dichlorobenzene	KS	4610	10298121
1,2-Dichloroethane (Ethylene dichloride)	KS	4635	10298121
1,2-Dichloropropane	KS	4655	10298121
1,3-Dichlorobenzene	KS	4615	10298121
1,4-Dichlorobenzene	KS	4620	10298121
2-Butanone (Methyl ethyl ketone, MEK)	KS	4410	10298121
2-Chloroethyl vinyl ether	KS	4500	10298121
Acetone (2-Propanone)	KS	4315	10298121
Acrolein (Propenal)	KS	4325	10298121



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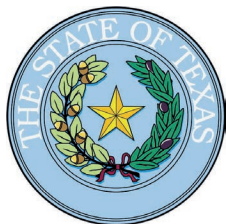
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Matrix: Non-Potable Water

Acrylonitrile	KS	4340	10298121
Benzene	KS	4375	10298121
Bromodichloromethane	KS	4395	10298121
Bromoform	KS	4400	10298121
Carbon tetrachloride	KS	4455	10298121
Chlorobenzene	KS	4475	10298121
Chlorodibromomethane	KS	4575	10298121
Chloroethane (Ethyl chloride)	KS	4485	10298121
Chloroform	KS	4505	10298121
cis-1,2-Dichloroethylene	KS	4645	10298121
cis-1,3-Dichloropropene	KS	4680	10298121
Ethylbenzene	KS	4765	10298121
m+p-xylene	KS	5240	10298121
Methyl bromide (Bromomethane)	KS	4950	10298121
Methyl chloride (Chloromethane)	KS	4960	10298121
Methyl tert-butyl ether (MTBE)	KS	5000	10298121
Methylene chloride (Dichloromethane)	KS	4975	10298121
Naphthalene	KS	5005	10298121
o-Xylene	KS	5250	10298121
Tetrachloroethylene (Perchloroethylene)	KS	5115	10298121
Toluene	KS	5140	10298121
trans-1,2-Dichloroethylene	KS	4700	10298121
trans-1,3-Dichloropropylene	KS	4685	10298121
Trichloroethene (Trichloroethylene)	KS	5170	10298121
Trichlorofluoromethane (Fluorotrichloromethane, Freon 11)	KS	5175	10298121
Vinyl chloride	KS	5235	10298121
Xylene (total)	KS	5260	10298121

Method EPA 625.1

Analyte	AB	Analyte ID	Method ID
1,2,4,5-Tetrachlorobenzene	KS	6715	10300024



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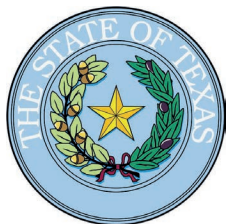
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Matrix: *Non-Potable Water*

1,2,4-Trichlorobenzene	KS	5155	10300024
1,2-Dichlorobenzene	KS	4610	10300024
1,2-Diphenylhydrazine	KS	6221	10300024
1,3-Dichlorobenzene	KS	4615	10300024
1,4-Dichlorobenzene	KS	4620	10300024
2,2'-Oxybis(1-chloropropane) (bis(2-Chloro-1-methylethyl)ether)	KS	4659	10300024
2,3,4,6-Tetrachlorophenol	KS	6735	10300024
2,4,5-Trichlorophenol	KS	6835	10300024
2,4,6-Trichlorophenol	KS	6840	10300024
2,4-Dichlorophenol	KS	6000	10300024
2,4-Dimethylphenol	KS	6130	10300024
2,4-Dinitrophenol	KS	6175	10300024
2,4-Dinitrotoluene (2,4-DNT)	KS	6185	10300024
2,6-Dinitrotoluene (2,6-DNT)	KS	6190	10300024
2-Chlorophenol	KS	5800	10300024
2-Methyl-4,6-dinitrophenol (4,6-Dinitro-2-methylphenol)	KS	6360	10300024
2-Methylphenol (o-Cresol)	KS	6400	10300024
2-Nitrophenol	KS	6490	10300024
3,3'-Dichlorobenzidine	KS	5945	10300024
4-Bromophenyl phenyl ether (BDE-3)	KS	5660	10300024
4-Chloro-3-methylphenol	KS	5700	10300024
4-Chlorophenyl phenylether	KS	5825	10300024
4-Methylphenol (p-Cresol)	KS	6410	10300024
4-Nitrophenol	KS	6500	10300024
Acenaphthene	KS	5500	10300024
Acenaphthylene	KS	5505	10300024
Anthracene	KS	5555	10300024
Benzidine	KS	5595	10300024
Benzo(a)anthracene	KS	5575	10300024
Benzo(a)pyrene	KS	5580	10300024



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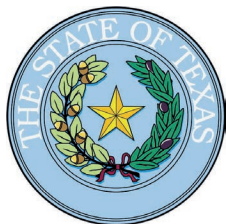
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Matrix: *Non-Potable Water*

Benzo(b)fluoranthene	KS	5585	10300024
Benzo(g,h,i)perylene	KS	5590	10300024
Benzo(k)fluoranthene	KS	5600	10300024
bis(2-Chloroethoxy)methane	KS	5760	10300024
bis(2-Chloroethyl) ether	KS	5765	10300024
bis(2-Ethylhexyl) phthalate (Di(2-Ethylhexyl) phthalate, DEHP)	KS	6065	10300024
Chrysene	KS	5855	10300024
Dibenz(a,h) anthracene	KS	5895	10300024
Diethyl phthalate	KS	6070	10300024
Dimethyl phthalate	KS	6135	10300024
Di-n-butyl phthalate	KS	5925	10300024
Di-n-octyl phthalate	KS	6200	10300024
Fluoranthene	KS	6265	10300024
Fluorene	KS	6270	10300024
Hexachlorobenzene	KS	6275	10300024
Hexachlorobutadiene	KS	4835	10300024
Hexachlorocyclopentadiene	KS	6285	10300024
Hexachloroethane	KS	4840	10300024
Indeno(1,2,3-cd) pyrene	KS	6315	10300024
Isophorone	KS	6320	10300024
Naphthalene	KS	5005	10300024
Nitrobenzene	KS	5015	10300024
n-Nitrosodimethylamine	KS	6530	10300024
n-Nitrosodi-n-butylamine	KS	5025	10300024
n-Nitrosodi-n-propylamine	KS	6545	10300024
n-Nitrosodiphenylamine	KS	6535	10300024
Pentachlorophenol	KS	6605	10300024
Phenanthrene	KS	6615	10300024
Phenol	KS	6625	10300024
Pyrene	KS	6665	10300024



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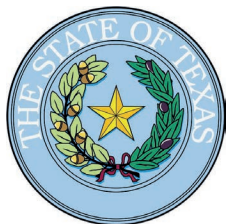
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Matrix: Non-Potable Water

Pyridine	KS	5095	10300024
Method EPA 7196			
Analyte	AB	Analyte ID	Method ID
Chromium (VI)	KS	1045	10162206
Method EPA 7470			
Analyte	AB	Analyte ID	Method ID
Mercury	KS	1095	10165603
Method EPA 7471			
Analyte	AB	Analyte ID	Method ID
Mercury	KS	1095	10166004
Method EPA 8011			
Analyte	AB	Analyte ID	Method ID
1,2-Dibromo-3-chloropropane (DBCP)	KS	4570	10173009
1,2-Dibromoethane (EDB, Ethylene dibromide)	KS	4585	10173009
Method EPA 8015			
Analyte	AB	Analyte ID	Method ID
Diesel range organics (DRO)	KS	9369	10173203
Gasoline range organics (GRO)	KS	9408	10173203
Method EPA 8082			
Analyte	AB	Analyte ID	Method ID
Aroclor-1016 (PCB-1016)	KS	8880	10179007
Aroclor-1221 (PCB-1221)	KS	8885	10179007
Aroclor-1232 (PCB-1232)	KS	8890	10179007
Aroclor-1242 (PCB-1242)	KS	8895	10179007
Aroclor-1248 (PCB-1248)	KS	8900	10179007
Aroclor-1254 (PCB-1254)	KS	8905	10179007
Aroclor-1260 (PCB-1260)	KS	8910	10179007
Method EPA 8260			
Analyte	AB	Analyte ID	Method ID
1,1,1,2-Tetrachloroethane	KS	5105	10184404
1,1,1-Trichloroethane	KS	5160	10184404



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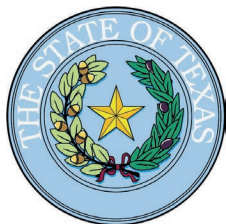
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Matrix: *Non-Potable Water*

1,1,2,2-Tetrachloroethane	KS	5110	10184404
1,1,2-Trichloroethane	KS	5165	10184404
1,1-Dichloroethane	KS	4630	10184404
1,1-Dichloroethylene	KS	4640	10184404
1,1-Dichloropropene	KS	4670	10184404
1,2,3-Trichlorobenzene	KS	5150	10184404
1,2,3-Trichloropropane	KS	5180	10184404
1,2,4-Trichlorobenzene	KS	5155	10184404
1,2,4-Trimethylbenzene	KS	5210	10184404
1,2-Dibromo-3-chloropropane (DBCP)	KS	4570	10184404
1,2-Dibromoethane (EDB, Ethylene dibromide)	KS	4585	10184404
1,2-Dichlorobenzene	KS	4610	10184404
1,2-Dichloroethane (Ethylene dichloride)	KS	4635	10184404
1,2-Dichloropropane	KS	4655	10184404
1,3,5-Trimethylbenzene	KS	5215	10184404
1,3-Dichlorobenzene	KS	4615	10184404
1,3-Dichloropropane	KS	4660	10184404
1,4-Dichlorobenzene	KS	4620	10184404
1,4-Dioxane (1,4-Diethyleneoxide)	KS	4735	10184404
2,2-Dichloropropane	KS	4665	10184404
2-Butanone (Methyl ethyl ketone, MEK)	KS	4410	10184404
2-Chloroethyl vinyl ether	KS	4500	10184404
2-Chlorotoluene	KS	4535	10184404
2-Hexanone (MBK)	KS	4860	10184404
4-Chlorotoluene	KS	4540	10184404
4-Isopropyltoluene (p-Cymene)	KS	4915	10184404
4-Methyl-2-pentanone (MIBK)	KS	4995	10184404
Acetone (2-Propanone)	KS	4315	10184404
Acetonitrile	KS	4320	10184404
Acrolein (Propenal)	KS	4325	10184404



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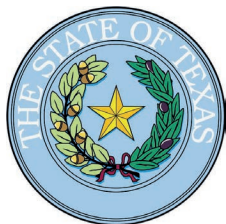
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Matrix: Non-Potable Water

Acrylonitrile	KS	4340	10184404
Benzene	KS	4375	10184404
Bromobenzene	KS	4385	10184404
Bromochloromethane	KS	4390	10184404
Bromodichloromethane	KS	4395	10184404
Bromoform	KS	4400	10184404
Carbon disulfide	KS	4450	10184404
Carbon tetrachloride	KS	4455	10184404
Chlorobenzene	KS	4475	10184404
Chlorodibromomethane	KS	4575	10184404
Chloroethane (Ethyl chloride)	KS	4485	10184404
Chloroform	KS	4505	10184404
cis-1,2-Dichloroethylene	KS	4645	10184404
cis-1,3-Dichloropropene	KS	4680	10184404
Dibromochloropropane	KS	4580	10184404
Dibromomethane (Methylene bromide)	KS	4595	10184404
Dichlorodifluoromethane (Freon-12)	KS	4625	10184404
Diethyl ether	KS	4725	10184404
Di-isopropylether (DIPE)	KS	9375	10184404
Ethylbenzene	KS	4765	10184404
Ethyl-t-butylether (ETBE) (2-Ethoxy-2-methylpropane)	KS	4770	10184404
Hexachlorobutadiene	KS	4835	10184404
Iodomethane (Methyl iodide)	KS	4870	10184404
Isopropylbenzene (Cumene)	KS	4900	10184404
m+p-xylene	KS	5240	10184404
Methyl bromide (Bromomethane)	KS	4950	10184404
Methyl chloride (Chloromethane)	KS	4960	10184404
Methyl tert-butyl ether (MTBE)	KS	5000	10184404
Methylene chloride (Dichloromethane)	KS	4975	10184404
Naphthalene	KS	5005	10184404



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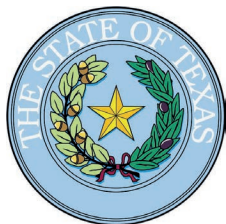
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Matrix: Non-Potable Water

n-Butylbenzene	KS	4435	10184404
n-Propylbenzene	KS	5090	10184404
o-Xylene	KS	5250	10184404
sec-Butylbenzene	KS	4440	10184404
Styrene	KS	5100	10184404
T-amylmethylether (TAME)	KS	4370	10184404
tert-Butyl alcohol	KS	4420	10184404
tert-Butylbenzene	KS	4445	10184404
Tetrachloroethylene (Perchloroethylene)	KS	5115	10184404
Toluene	KS	5140	10184404
trans-1,2-Dichloroethylene	KS	4700	10184404
trans-1,3-Dichloropropylene	KS	4685	10184404
trans-1,4-Dichloro-2-butene	KS	4605	10184404
Trichloroethene (Trichloroethylene)	KS	5170	10184404
Trichlorofluoromethane (Fluorotrichloromethane, Freon 11)	KS	5175	10184404
Vinyl acetate	KS	5225	10184404
Vinyl chloride	KS	5235	10184404
Xylene (total)	KS	5260	10184404

Method EPA 8270

Analyte	AB	Analyte ID	Method ID
1,2,4,5-Tetrachlorobenzene	KS	6715	10185805
1,2,4-Trichlorobenzene	KS	5155	10185805
1,2-Dichlorobenzene	KS	4610	10185805
1,2-Diphenylhydrazine	KS	6220	10185805
1,3-Dichlorobenzene	KS	4615	10185805
1,4-Dichlorobenzene	KS	4620	10185805
2,2'-Oxybis(1-chloropropane) (bis(2-Chloro-1-methylethyl)ether)	KS	4659	10185805
2,3,4,6-Tetrachlorophenol	KS	6735	10185805
2,4,5-Trichlorophenol	KS	6835	10185805
2,4,6-Trichlorophenol	KS	6840	10185805



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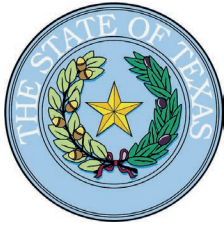
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Matrix: Non-Potable Water

2,4-Dichlorophenol	KS	6000	10185805
2,4-Dimethylphenol	KS	6130	10185805
2,4-Dinitrophenol	KS	6175	10185805
2,4-Dinitrotoluene (2,4-DNT)	KS	6185	10185805
2,6-Dichlorophenol	KS	6005	10185805
2,6-Dinitrotoluene (2,6-DNT)	KS	6190	10185805
2-Chlorophenol	KS	5800	10185805
2-Methyl-4,6-dinitrophenol (4,6-Dinitro-2-methylphenol)	KS	6360	10185805
2-Methylnaphthalene	KS	6385	10185805
2-Methylphenol (o-Cresol)	KS	6400	10185805
2-Nitroaniline	KS	6460	10185805
2-Nitrophenol	KS	6490	10185805
3,3'-Dichlorobenzidine	KS	5945	10185805
3-Methylphenol (m-Cresol)	KS	6405	10185805
3-Nitroaniline	KS	6465	10185805
4-Bromophenyl phenyl ether (BDE-3)	KS	5660	10185805
4-Chloro-3-methylphenol	KS	5700	10185805
4-Chloroaniline	KS	5745	10185805
4-Chlorophenyl phenylether	KS	5825	10185805
4-Methylphenol (p-Cresol)	KS	6410	10185805
4-Nitroaniline	KS	6470	10185805
4-Nitrophenol	KS	6500	10185805
7,12-Dimethylbenz(a) anthracene	KS	6115	10185805
Acenaphthene	KS	5500	10185805
Acenaphthylene	KS	5505	10185805
Aniline	KS	5545	10185805
Anthracene	KS	5555	10185805
Azobenzene	KS	5562	10185805
Benzenethiol (Thiophenol)	KS	6750	10185805
Benzidine	KS	5595	10185805



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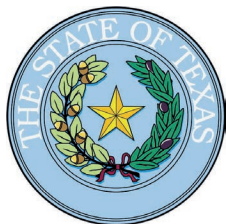
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Matrix: Non-Potable Water

Benzo(a)anthracene	KS	5575	10185805
Benzo(a)pyrene	KS	5580	10185805
Benzo(b)fluoranthene	KS	5585	10185805
Benzo(g,h,i)perylene	KS	5590	10185805
Benzo(k)fluoranthene	KS	5600	10185805
Benzoic acid	KS	5610	10185805
Benzyl alcohol	KS	5630	10185805
bis(2-Chloroethoxy)methane	KS	5760	10185805
bis(2-Chloroethyl) ether	KS	5765	10185805
bis(2-Ethylhexyl) phthalate (Di(2-Ethylhexyl) phthalate, DEHP)	KS	6065	10185805
Butyl benzyl phthalate	KS	5670	10185805
Carbazole	KS	5680	10185805
Chrysene	KS	5855	10185805
Dibenz(a,h) anthracene	KS	5895	10185805
Dibenz(a,j) acridine	KS	5900	10185805
Dibenzofuran	KS	5905	10185805
Diethyl phthalate	KS	6070	10185805
Dimethyl phthalate	KS	6135	10185805
Di-n-butyl phthalate	KS	5925	10185805
Di-n-octyl phthalate	KS	6200	10185805
Fluoranthene	KS	6265	10185805
Fluorene	KS	6270	10185805
Hexachlorobenzene	KS	6275	10185805
Hexachlorobutadiene	KS	4835	10185805
Hexachlorocyclopentadiene	KS	6285	10185805
Hexachloroethane	KS	4840	10185805
Indeno(1,2,3-cd) pyrene	KS	6315	10185805
Isophorone	KS	6320	10185805
Naphthalene	KS	5005	10185805
Nitrobenzene	KS	5015	10185805



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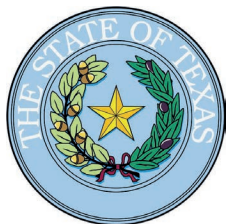
Expiration Date: 9/30/2023

Issue Date: 10/1/2022

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Matrix: Non-Potable Water

n-Nitrosodimethylamine	KS	6530	10185805
n-Nitrosodi-n-butylamine	KS	5025	10185805
n-Nitrosodi-n-propylamine	KS	6545	10185805
n-Nitrosodiphenylamine	KS	6535	10185805
n-Nitrosomethylethylamine	KS	6550	10185805
Pentachlorophenol	KS	6605	10185805
Phenanthrene	KS	6615	10185805
Phenol	KS	6625	10185805
Pyrene	KS	6665	10185805
Pyridine	KS	5095	10185805
Quinoline	KS	6670	10185805
Method EPA 9012			
Analyte	AB	Analyte ID	Method ID
Amenable cyanide	KS	1510	10193201
Total cyanide	KS	1645	10193201
Method EPA 9040			
Analyte	AB	Analyte ID	Method ID
pH	KS	1900	10196802
Method EPA 9050			
Analyte	AB	Analyte ID	Method ID
Conductivity	KS	1610	10198604
Method EPA 9056			
Analyte	AB	Analyte ID	Method ID
Bromide	KS	1540	10199209
Chloride	KS	1575	10199209
Fluoride	KS	1730	10199209
Nitrate as N	KS	1810	10199209
Nitrate-nitrite	KS	1820	10199209
Nitrite as N	KS	1840	10199209
Sulfate	KS	2000	10199209



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Matrix: *Non-Potable Water*

Method EPA 9060

Analyte

Total Organic Carbon (TOC)

AB

KS

Analyte ID

2040

Method ID

10200201

Method EPA 9066

Analyte

Total phenolics

AB

KS

Analyte ID

1905

Method ID

10200609

Method EPA 9070

Analyte

n-Hexane Extractable Material (HEM) (O&G)

AB

KS

Analyte ID

1803

Method ID

10201000

Silica Gel Treated n-Hexane Extractable Material (SGT-HEM)

KS

10220

10201000

Method SM 2120 B

Analyte

Color

AB

KS

Analyte ID

1605

Method ID

20223807

Method SM 2320 B

Analyte

Alkalinity as CaCO₃

AB

KS

Analyte ID

1505

Method ID

20045005

Method SM 2340 B

Analyte

Total hardness as CaCO₃

AB

KS

Analyte ID

1755

Method ID

20046008

Method SM 2540 B

Analyte

Residue-total (total solids)

AB

KS

Analyte ID

1950

Method ID

20004608

Method SM 2540 C

Analyte

Residue-filterable (TDS)

AB

KS

Analyte ID

1955

Method ID

20049803

Method SM 2540 D

Analyte

Residue-nonfilterable (TSS)

AB

KS

Analyte ID

1960

Method ID

20004802

Method SM 2540 F

Analyte

Residue-settleable

AB

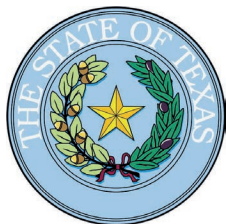
KS

Analyte ID

1965

Method ID

20005009



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Matrix: *Non-Potable Water*

Method SM 3500-Cr B

Analyte
Chromium (VI)

AB
KS

Analyte ID
1045

Method ID
20065809

Method SM 3500-Fe B

Analyte
Iron

AB
KS

Analyte ID
1070

Method ID
20068604

Method SM 4500-Cl G

Analyte
Total residual chlorine

AB
KS

Analyte ID
1940

Method ID
20020604

Method SM 4500-Cl⁻ E

Analyte
Chloride

AB
KS

Analyte ID
1575

Method ID
20019209

Method SM 4500-CN⁻ E

Analyte
Total cyanide

AB
KS

Analyte ID
1645

Method ID
20021209

Method SM 4500-CN⁻ G

Analyte
Amenable cyanide

AB
KS

Analyte ID
1510

Method ID
20021607

Method SM 4500-H⁺ B

Analyte
pH

AB
KS

Analyte ID
1900

Method ID
20104603

Method SM 4500-O G

Analyte
Oxygen, dissolved

AB
KS

Analyte ID
1880

Method ID
20025405

Method SM 4500-S₂⁻ D

Analyte
Sulfide

AB
KS

Analyte ID
2005

Method ID
20125400

Method SM 4500-S₂⁻ F

Analyte
Sulfide

AB
KS

Analyte ID
2005

Method ID
20126209

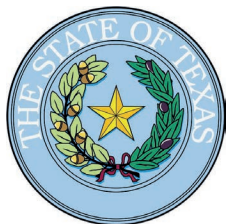
Method SM 4500-SO₃⁻ B

Analyte

AB

Analyte ID

Method ID



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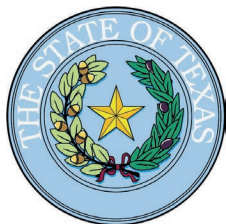
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Matrix: *Non-Potable Water*

Sulfite	KS	2015	20026806
Method SM 5210 B			
Analyte	AB	Analyte ID	Method ID
Biochemical oxygen demand (BOD)	KS	1530	20027401
Carbonaceous BOD, CBOD	KS	1555	20027401
Method SM 5310 C			
Analyte	AB	Analyte ID	Method ID
Total Organic Carbon (TOC)	KS	2040	20138209
Method SM 5540 C			
Analyte	AB	Analyte ID	Method ID
Surfactants - MBAS	KS	2025	20144405
Method TCEQ 1005			
Analyte	AB	Analyte ID	Method ID
Total Petroleum Hydrocarbons (TPH)	TX	2050	90019208



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Matrix: Solid & Chemical Materials

Method EPA 1311

Analyte	AB	Analyte ID	Method ID
TCLP	KS	849	10118806

Method EPA 1312

Analyte	AB	Analyte ID	Method ID
SPLP	KS	850	10119003

Method EPA 6010

Analyte	AB	Analyte ID	Method ID
Aluminum	KS	1000	10155201
Antimony	KS	1005	10155201
Arsenic	KS	1010	10155201
Barium	KS	1015	10155201
Beryllium	KS	1020	10155201
Boron	KS	1025	10155201
Cadmium	KS	1030	10155201
Calcium	KS	1035	10155201
Chromium	KS	1040	10155201
Cobalt	KS	1050	10155201
Copper	KS	1055	10155201
Iron	KS	1070	10155201
Lead	KS	1075	10155201
Magnesium	KS	1085	10155201
Manganese	KS	1090	10155201
Molybdenum	KS	1100	10155201
Nickel	KS	1105	10155201
Potassium	KS	1125	10155201
Selenium	KS	1140	10155201
Silica as SiO ₂	KS	1990	10155201
Silver	KS	1150	10155201
Sodium	KS	1155	10155201
Strontium	KS	1160	10155201



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Matrix: Solid & Chemical Materials

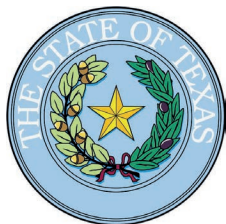
Thallium	KS	1165	10155201
Tin	KS	1175	10155201
Titanium	KS	1180	10155201
Vanadium	KS	1185	10155201
Zinc	KS	1190	10155201

Method EPA 6020

Analyte	AB	Analyte ID	Method ID
Aluminum	KS	1000	10156204
Antimony	KS	1005	10156204
Arsenic	KS	1010	10156204
Barium	KS	1015	10156204
Beryllium	KS	1020	10156204
Cadmium	KS	1030	10156204
Chromium	KS	1040	10156204
Cobalt	KS	1050	10156204
Copper	KS	1055	10156204
Iron	KS	1070	10156204
Lead	KS	1075	10156204
Manganese	KS	1090	10156204
Molybdenum	KS	1100	10156204
Nickel	KS	1105	10156204
Selenium	KS	1140	10156204
Silver	KS	1150	10156204
Strontium	KS	1160	10156204
Thallium	KS	1165	10156204
Tin	KS	1175	10156204
Titanium	KS	1180	10156204
Vanadium	KS	1185	10156204
Zinc	KS	1190	10156204

Method EPA 7470

Analyte	AB	Analyte ID	Method ID



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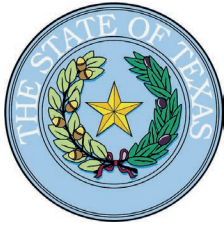
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Matrix: Solid & Chemical Materials

Mercury	KS	1095	10165603
Method EPA 7471			
Analyte	AB	Analyte ID	Method ID
Mercury	KS	1095	10166004
Method EPA 8015			
Analyte	AB	Analyte ID	Method ID
Diesel range organics (DRO)	KS	9369	10173203
Gasoline range organics (GRO)	KS	9408	10173203
Method EPA 8082			
Analyte	AB	Analyte ID	Method ID
Aroclor-1016 (PCB-1016)	KS	8880	10179007
Aroclor-1221 (PCB-1221)	KS	8885	10179007
Aroclor-1232 (PCB-1232)	KS	8890	10179007
Aroclor-1242 (PCB-1242)	KS	8895	10179007
Aroclor-1248 (PCB-1248)	KS	8900	10179007
Aroclor-1254 (PCB-1254)	KS	8905	10179007
Aroclor-1260 (PCB-1260)	KS	8910	10179007
Method EPA 8260			
Analyte	AB	Analyte ID	Method ID
1,1,1,2-Tetrachloroethane	KS	5105	10184404
1,1,1-Trichloroethane	KS	5160	10184404
1,1,2,2-Tetrachloroethane	KS	5110	10184404
1,1,2-Trichloroethane	KS	5165	10184404
1,1-Dichloroethane	KS	4630	10184404
1,1-Dichloroethylene	KS	4640	10184404
1,1-Dichloropropene	KS	4670	10184404
1,2,3-Trichlorobenzene	KS	5150	10184404
1,2,3-Trichloropropane	KS	5180	10184404
1,2,4-Trichlorobenzene	KS	5155	10184404
1,2,4-Trimethylbenzene	KS	5210	10184404
1,2-Dibromo-3-chloropropane (DBCP)	KS	4570	10184404



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Matrix: *Solid & Chemical Materials*

1,2-Dibromoethane (EDB, Ethylene dibromide)	KS	4585	10184404
1,2-Dichlorobenzene	KS	4610	10184404
1,2-Dichloroethane (Ethylene dichloride)	KS	4635	10184404
1,2-Dichloropropane	KS	4655	10184404
1,3,5-Trimethylbenzene	KS	5215	10184404
1,3-Dichlorobenzene	KS	4615	10184404
1,3-Dichloropropane	KS	4660	10184404
1,4-Dichlorobenzene	KS	4620	10184404
1,4-Dioxane (1,4-Diethyleneoxide)	KS	4735	10184404
2-Butanone (Methyl ethyl ketone, MEK)	KS	4410	10184404
2-Chloroethyl vinyl ether	KS	4500	10184404
2-Chlorotoluene	KS	4535	10184404
2-Hexanone (MBK)	KS	4860	10184404
4-Chlorotoluene	KS	4540	10184404
4-Isopropyltoluene (p-Cymene)	KS	4915	10184404
4-Methyl-2-pentanone (MIBK)	KS	4995	10184404
Acetone (2-Propanone)	KS	4315	10184404
Acetonitrile	KS	4320	10184404
Acrolein (Propenal)	KS	4325	10184404
Acrylonitrile	KS	4340	10184404
Benzene	KS	4375	10184404
Bromobenzene	KS	4385	10184404
Bromochloromethane	KS	4390	10184404
Bromodichloromethane	KS	4395	10184404
Bromoform	KS	4400	10184404
Carbon disulfide	KS	4450	10184404
Carbon tetrachloride	KS	4455	10184404
Chlorobenzene	KS	4475	10184404
Chlorodibromomethane	KS	4575	10184404
Chloroethane (Ethyl chloride)	KS	4485	10184404



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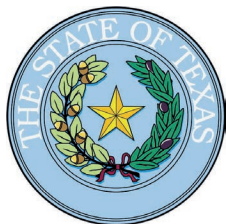
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Matrix: Solid & Chemical Materials

Chloroform	KS	4505	10184404
cis-1,2-Dichloroethylene	KS	4645	10184404
cis-1,3-Dichloropropene	KS	4680	10184404
Dibromomethane (Methylene bromide)	KS	4595	10184404
Dichlorodifluoromethane (Freon-12)	KS	4625	10184404
Ethylbenzene	KS	4765	10184404
Hexachlorobutadiene	KS	4835	10184404
Iodomethane (Methyl iodide)	KS	4870	10184404
Isopropylbenzene (Cumene)	KS	4900	10184404
m+p-xylene	KS	5240	10184404
Methyl bromide (Bromomethane)	KS	4950	10184404
Methyl chloride (Chloromethane)	KS	4960	10184404
Methyl tert-butyl ether (MTBE)	KS	5000	10184404
Methylene chloride (Dichloromethane)	KS	4975	10184404
Naphthalene	KS	5005	10184404
n-Butylbenzene	KS	4435	10184404
n-Propylbenzene	KS	5090	10184404
o-Xylene	KS	5250	10184404
sec-Butylbenzene	KS	4440	10184404
Styrene	KS	5100	10184404
tert-Butyl alcohol	KS	4420	10184404
tert-Butylbenzene	KS	4445	10184404
Tetrachloroethylene (Perchloroethylene)	KS	5115	10184404
Toluene	KS	5140	10184404
trans-1,2-Dichloroethylene	KS	4700	10184404
trans-1,3-Dichloropropylene	KS	4685	10184404
trans-1,4-Dichloro-2-butene	KS	4605	10184404
Trichloroethene (Trichloroethylene)	KS	5170	10184404
Trichlorofluoromethane (Fluorotrichloromethane, Freon 11)	KS	5175	10184404
Vinyl acetate	KS	5225	10184404



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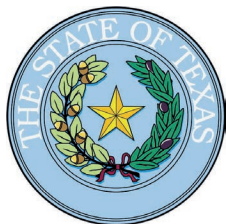
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Matrix: Solid & Chemical Materials

Vinyl chloride	KS	5235	10184404
Xylene (total)	KS	5260	10184404
Method EPA 8270			
Analyte	AB	Analyte ID	Method ID
1,2,4,5-Tetrachlorobenzene	KS	6715	10185805
1,2,4-Trichlorobenzene	KS	5155	10185805
1,2-Dichlorobenzene	KS	4610	10185805
1,2-Diphenylhydrazine	KS	6220	10185805
1,3-Dichlorobenzene	KS	4615	10185805
1,4-Dichlorobenzene	KS	4620	10185805
2,2'-Oxybis(1-chloropropane) (bis(2-Chloro-1-methylethyl)ether)	KS	4659	10185805
2,3,4,6-Tetrachlorophenol	KS	6735	10185805
2,4,5-Trichlorophenol	KS	6835	10185805
2,4,6-Trichlorophenol	KS	6840	10185805
2,4-Dichlorophenol	KS	6000	10185805
2,4-Dimethylphenol	KS	6130	10185805
2,4-Dinitrophenol	KS	6175	10185805
2,4-Dinitrotoluene (2,4-DNT)	KS	6185	10185805
2,6-Dichlorophenol	KS	6005	10185805
2,6-Dinitrotoluene (2,6-DNT)	KS	6190	10185805
2-Chloronaphthalene	KS	5795	10185805
2-Chlorophenol	KS	5800	10185805
2-Methyl-4,6-dinitrophenol (4,6-Dinitro-2-methylphenol)	KS	6360	10185805
2-Methylnaphthalene	KS	6385	10185805
2-Methylphenol (o-Cresol)	KS	6400	10185805
2-Nitroaniline	KS	6460	10185805
2-Nitrophenol	KS	6490	10185805
3,3'-Dichlorobenzidine	KS	5945	10185805
3-Methylphenol (m-Cresol)	KS	6405	10185805
3-Nitroaniline	KS	6465	10185805



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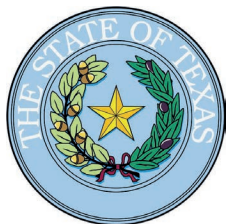
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Matrix: *Solid & Chemical Materials*

4-Bromophenyl phenyl ether (BDE-3)	KS	5660	10185805
4-Chloro-3-methylphenol	KS	5700	10185805
4-Chloroaniline	KS	5745	10185805
4-Chlorophenyl phenylether	KS	5825	10185805
4-Methylphenol (p-Cresol)	KS	6410	10185805
4-Nitroaniline	KS	6470	10185805
4-Nitrophenol	KS	6500	10185805
7,12-Dimethylbenz(a) anthracene	KS	6115	10185805
Acenaphthene	KS	5500	10185805
Acenaphthylene	KS	5505	10185805
Aniline	KS	5545	10185805
Anthracene	KS	5555	10185805
Azobenzene	KS	5562	10185805
Benzenethiol (Thiophenol)	KS	6750	10185805
Benzidine	KS	5595	10185805
Benzo(a)anthracene	KS	5575	10185805
Benzo(a)pyrene	KS	5580	10185805
Benzo(b)fluoranthene	KS	5585	10185805
Benzo(g,h,i)perylene	KS	5590	10185805
Benzo(k)fluoranthene	KS	5600	10185805
Benzoic acid	KS	5610	10185805
Benzyl alcohol	KS	5630	10185805
bis(2-Chloroethoxy)methane	KS	5760	10185805
bis(2-Chloroethyl) ether	KS	5765	10185805
bis(2-Ethylhexyl) phthalate (Di(2-Ethylhexyl) phthalate, DEHP)	KS	6065	10185805
Butyl benzyl phthalate	KS	5670	10185805
Carbazole	KS	5680	10185805
Chrysene	KS	5855	10185805
Dibenz(a,h) anthracene	KS	5895	10185805
Dibenz(a,j) acridine	KS	5900	10185805



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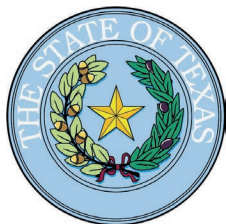
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Matrix: Solid & Chemical Materials

Dibenzofuran	KS	5905	10185805
Diethyl phthalate	KS	6070	10185805
Dimethyl phthalate	KS	6135	10185805
Di-n-butyl phthalate	KS	5925	10185805
Di-n-octyl phthalate	KS	6200	10185805
Fluoranthene	KS	6265	10185805
Fluorene	KS	6270	10185805
Hexachlorobenzene	KS	6275	10185805
Hexachlorobutadiene	KS	4835	10185805
Hexachlorocyclopentadiene	KS	6285	10185805
Hexachloroethane	KS	4840	10185805
Indeno(1,2,3-cd) pyrene	KS	6315	10185805
Isophorone	KS	6320	10185805
Naphthalene	KS	5005	10185805
Nitrobenzene	KS	5015	10185805
n-Nitrosodimethylamine	KS	6530	10185805
n-Nitrosodi-n-butylamine	KS	5025	10185805
n-Nitrosodi-n-propylamine	KS	6545	10185805
n-Nitrosodiphenylamine	KS	6535	10185805
n-Nitrosomethylethylamine	KS	6550	10185805
Pentachlorophenol	KS	6605	10185805
Phenanthrene	KS	6615	10185805
Phenol	KS	6625	10185805
Pyrene	KS	6665	10185805
Pyridine	KS	5095	10185805
Quinoline	KS	6670	10185805

Method EPA 9012

Analyte	AB	Analyte ID	Method ID
Amenable cyanide	KS	1510	10193201
Total cyanide	KS	1645	10193201



Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation



Pace Analytical Services, LLC - Lenexa, KS

9608 Loiret Boulevard
Lenexa, KS 66219-2406

Certificate: T104704407-22-16

Expiration Date: 9/30/2023

Issue Date: 10/1/2022

These fields of accreditation supercede all previous fields. The Texas Commission on Environmental Quality urges customers to verify the laboratory's current accreditation status for particular methods and analyses.

Matrix: Solid & Chemical Materials

Method EPA 9045

Analyte	AB	Analyte ID	Method ID
pH	KS	1900	10197805

Method EPA 9056

Analyte	AB	Analyte ID	Method ID
Bromide	KS	1540	10199209
Chloride	KS	1575	10199209
Fluoride	KS	1730	10199209
Nitrate as N	KS	1810	10199209
Nitrate-nitrite	KS	1820	10199209
Nitrite as N	KS	1840	10199209
Sulfate	KS	2000	10199209

Method EPA 9066

Analyte	AB	Analyte ID	Method ID
Total phenolics	KS	1905	10200609

Method EPA 9071

Analyte	AB	Analyte ID	Method ID
n-Hexane Extractable Material (HEM) (O&G)	KS	1803	10201204
Silica Gel Treated n-Hexane Extractable Material (SGT-HEM)	KS	10220	10201204

Method EPA 9081

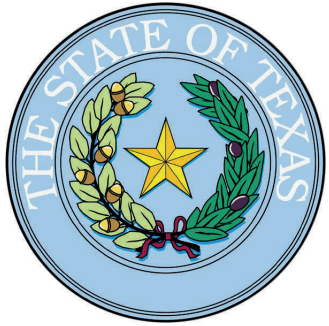
Analyte	AB	Analyte ID	Method ID
Cation exchange capacity	KS	1560	10203404

Method EPA 9095

Analyte	AB	Analyte ID	Method ID
Paint Filter Liquids Test	KS	10312	10204009

Method TCEQ 1005

Analyte	AB	Analyte ID	Method ID
Total Petroleum Hydrocarbons (TPH)	TX	2050	90019208



Texas Commission on Environmental Quality

NELAP-Recognized Laboratory Accreditation is hereby awarded to



Pace Analytical Services, LLC - Minneapolis MN

1700 Elm Street SE Suite 200
Minneapolis, MN 55414-2485

in accordance with Texas Water Code Chapter 5, Subchapter R, Title 30 Texas Administrative Code Chapter 25, and the National Environmental Laboratory Accreditation Program.

The laboratory's scope of accreditation includes the fields of accreditation that accompany this certificate. Continued accreditation depends upon successful ongoing participation in the program. The Texas Commission on Environmental Quality urges customers to verify the laboratory's current location(s) and accreditation status for particular methods and analyses (www.tceq.texas.gov/goto/lab). Accreditation does not imply that a product, process, system or person is approved by the Texas Commission on Environmental Quality.

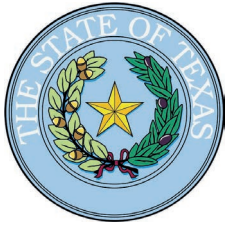
Certificate Number: T104704192-22-17

Effective Date: 3/1/2022

Expiration Date: 2/28/2023

A handwritten signature in black ink, appearing to read "T. G. Baker".

**Executive Director Texas Commission on
Environmental Quality**



Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation



Pace Analytical Services, LLC - Minneapolis MN

1700 Elm Street SE Suite 200
Minneapolis, MN 55414-2485

Certificate:

T104704192-22-17

Expiration Date:

2/28/2023

Issue Date:

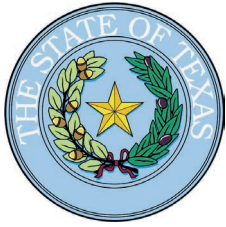
3/1/2022

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Matrix: Air & Emissions

Method EPA TO-15

Analyte	AB	Analyte ID	Method ID
1,1,1-Trichloroethane	MN	5160	10248803
1,1,2,2-Tetrachloroethane	MN	5110	10248803
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	MN	5195	10248803
1,1,2-Trichloroethane	MN	5165	10248803
1,1-Dichloroethane	MN	4630	10248803
1,1-Dichloroethylene	MN	4640	10248803
1,2,3-Trimethylbenzene	MN	5182	10248803
1,2,4-Trichlorobenzene	MN	5155	10248803
1,2,4-Trimethylbenzene	MN	5210	10248803
1,2-Dibromoethane (EDB, Ethylene dibromide)	MN	4585	10248803
1,2-Dichloro-1,1,2,2-tetrafluoroethane (Freon 114)	MN	4695	10248803
1,2-Dichlorobenzene	MN	4610	10248803
1,2-Dichloroethane (Ethylene dichloride)	MN	4635	10248803
1,2-Dichloropropane	MN	4655	10248803
1,3,5-Trimethylbenzene	MN	5215	10248803
1,3-Butadiene	MN	9318	10248803
1,3-Dichlorobenzene	MN	4615	10248803
1,4-Dichlorobenzene	MN	4620	10248803
1,4-Dioxane (1,4-Diethyleneoxide)	MN	4735	10248803
1-Propene (Propylene)	MN	4836	10248803
2,2,4-Trimethylpentane (Isooctane)	MN	5220	10248803
2-Butanone (Methyl ethyl ketone, MEK)	MN	4410	10248803
4-Ethyltoluene	MN	4542	10248803
Acrylonitrile	MN	4340	10248803
Benzene	MN	4375	10248803
Benzyl chloride	MN	5635	10248803
Bromodichloromethane	MN	4395	10248803
Bromoform	MN	4400	10248803



Texas Commission on Environmental Quality

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Expiration Date:

2/28/2023

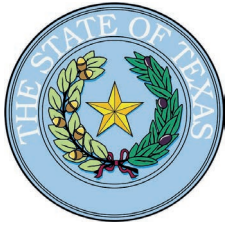
Issue Date:

3/1/2022

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Matrix: *Air & Emissions*

Carbon tetrachloride	MN	4455	10248803
Chlorobenzene	MN	4475	10248803
Chlorodibromomethane	MN	4575	10248803
Chloroethane (Ethyl chloride)	MN	4485	10248803
Chloroform	MN	4505	10248803
cis-1,2-Dichloroethylene	MN	4645	10248803
cis-1,3-Dichloropropene	MN	4680	10248803
Cyclohexane	MN	4555	10248803
Dichlorodifluoromethane (Freon-12)	MN	4625	10248803
Ethylbenzene	MN	4765	10248803
Ethyl-t-butylether (ETBE) (2-Ethoxy-2-methylpropane)	MN	4770	10248803
Hexachlorobutadiene	MN	4835	10248803
Isopropylbenzene (Cumene)	MN	4900	10248803
m+p-xylene	MN	5240	10248803
Methyl bromide (Bromomethane)	MN	4950	10248803
Methyl chloride (Chloromethane)	MN	4960	10248803
Methyl isobutyl ketone (Hexone) (MIBK)	MN	4985	10248803
Methyl methacrylate	MN	4990	10248803
Methyl tert-butyl ether (MTBE)	MN	5000	10248803
Methylcyclohexane	MN	4965	10248803
Methylene chloride (Dichloromethane)	MN	4975	10248803
n-Heptane	MN	4825	10248803
n-Hexane	MN	4850	10248803
n-Propylbenzene	MN	5090	10248803
o-Xylene	MN	5250	10248803
Styrene	MN	5100	10248803
T-amylmethylether (TAME)	MN	4370	10248803
Tetrachloroethylene (Perchloroethylene)	MN	5115	10248803
Toluene	MN	5140	10248803
trans-1,2-Dichloroethylene	MN	4700	10248803



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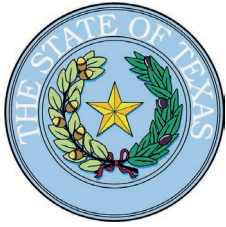
Issue Date:

3/1/2022

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Matrix: *Air & Emissions*

trans-1,3-Dichloropropylene	MN	4685	10248803
Trichloroethene (Trichloroethylene)	MN	5170	10248803
Trichlorofluoromethane (Fluorotrichloromethane, Freon 11)	MN	5175	10248803
Vinyl acetate	MN	5225	10248803
Vinyl bromide (Bromoethene)	MN	5230	10248803
Vinyl chloride	MN	5235	10248803
Xylene (total)	MN	5260	10248803



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Matrix: *Drinking Water*

Method EPA 1613

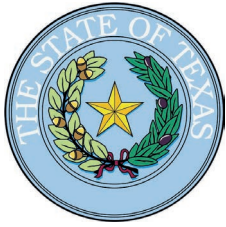
Analyte	AB	Analyte ID	Method ID
2,3,7,8-Tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD)	MN	9618	10120408

Method EPA 200.8

Analyte	AB	Analyte ID	Method ID
Aluminum	MN	1000	10014605
Antimony	MN	1005	10014605
Arsenic	MN	1010	10014605
Barium	MN	1015	10014605
Beryllium	MN	1020	10014605
Cadmium	MN	1030	10014605
Chromium	MN	1040	10014605
Copper	MN	1055	10014605
Lead	MN	1075	10014605
Manganese	MN	1090	10014605
Nickel	MN	1105	10014605
Selenium	MN	1140	10014605
Silver	MN	1150	10014605
Thallium	MN	1165	10014605
Uranium	MN	3035	10014605
Zinc	MN	1190	10014605

Method EPA 245.1

Analyte	AB	Analyte ID	Method ID
Mercury	MN	1095	10036609



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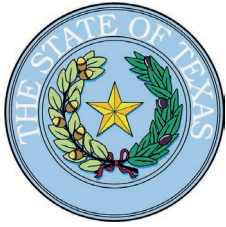
Matrix: Non-Potable Water

Method EPA 1613

Analyte	AB	Analyte ID	Method ID
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	MN	9516	10120408
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	MN	9519	10120408
1,2,3,4,6,7,8-Heptachlorodibenzofuran (1,2,3,4,6,7,8-HpCDF)	MN	9420	10120408
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (1,2,3,4,6,7,8-HpCDD)	MN	9426	10120408
1,2,3,4,7,8,9-Heptachlorodibenzofuran (1,2,3,4,7,8,9-HpCDF)	MN	9423	10120408
1,2,3,4,7,8-Hexachlorodibenzofuran (1,2,3,4,7,8-HxCDF)	MN	9471	10120408
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (1,2,3,4,7,8-HxCDD)	MN	9453	10120408
1,2,3,6,7,8-Hexachlorodibenzofuran (1,2,3,6,7,8-HxCDF)	MN	9474	10120408
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (1,2,3,6,7,8-HxCDD)	MN	9456	10120408
1,2,3,7,8,9-Hexachlorodibenzofuran (1,2,3,7,8,9-HxCDF)	MN	9477	10120408
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (1,2,3,7,8,9-HxCDD)	MN	9459	10120408
1,2,3,7,8-Pentachlorodibenzofuran (1,2,3,7,8-PeCDF)	MN	9543	10120408
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (1,2,3,7,8-PeCDD)	MN	9540	10120408
2,3,4,6,7,8-Hexachlorodibenzofuran (2,3,4,6,7,8-HxCDF)	MN	9480	10120408
2,3,4,7,8-Pentachlorodibenzofuran (2,3,4,7,8-PeCDF)	MN	9549	10120408
2,3,7,8-Tetrachlorodibenzofuran (2,3,7,8-TCDF)	MN	9612	10120408
2,3,7,8-Tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD)	MN	9618	10120408
Total Heptachlorodibenzofuran (Total HpCDF)	MN	9444	10120408
Total Heptachlorodibenzo-p-dioxin (Total HpCDD)	MN	9438	10120408
Total Hexachlorodibenzofuran (Total HxCDF)	MN	9483	10120408
Total Hexachlorodibenzo-p-dioxin (Total HxCDD)	MN	9468	10120408
Total Pentachlorodibenzofuran (Total PeCDF)	MN	9552	10120408
Total Pentachlorodibenzo-p-dioxin (Total PeCDD)	MN	9555	10120408
Total Tetrachlorodibenzofuran (Total TCDF)	MN	9615	10120408
Total Tetrachlorodibenzo-p-dioxin (Total TCDD)	MN	9609	10120408

Method EPA 8280

Analyte	AB	Analyte ID	Method ID
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	MN	9516	10186604
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	MN	9519	10186604



Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation



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Minneapolis, MN 55414-2485

Certificate:

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Expiration Date:

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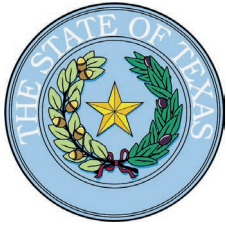
These fields of accreditation supercede all previous fields. The Texas Commission on Environmental Quality urges customers to verify the laboratory's current accreditation status for particular methods and analyses.

Matrix: *Non-Potable Water*

1,2,3,4,6,7,8-Heptachlorodibenzofuran (1,2,3,4,6,7,8-HpCDF)	MN	9420	10186604
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (1,2,3,4,6,7,8-HpCDD)	MN	9426	10186604
1,2,3,4,7,8,9-Heptachlorodibenzofuran (1,2,3,4,7,8,9-HpCDF)	MN	9423	10186604
1,2,3,4,7,8-Hexachlorodibenzofuran (1,2,3,4,7,8-HxCDF)	MN	9471	10186604
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (1,2,3,4,7,8-HxCDD)	MN	9453	10186604
1,2,3,6,7,8-Hexachlorodibenzofuran (1,2,3,6,7,8-HxCDF)	MN	9474	10186604
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (1,2,3,6,7,8-HxCDD)	MN	9456	10186604
1,2,3,7,8,9-Hexachlorodibenzofuran (1,2,3,7,8,9-HxCDF)	MN	9477	10186604
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (1,2,3,7,8,9-HxCDD)	MN	9459	10186604
1,2,3,7,8-Pentachlorodibenzofuran (1,2,3,7,8-PeCDF)	MN	9543	10186604
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (1,2,3,7,8-PeCDD)	MN	9540	10186604
2,3,4,6,7,8-Hexachlorodibenzofuran (2,3,4,6,7,8-HxCDF)	MN	9480	10186604
2,3,4,7,8-Pentachlorodibenzofuran (2,3,4,7,8-PeCDF)	MN	9549	10186604
2,3,7,8-Tetrachlorodibenzofuran (2,3,7,8-TCDF)	MN	9612	10186604
2,3,7,8-Tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD)	MN	9618	10186604
Total Heptachlorodibenzofuran (Total HpCDF)	MN	9444	10186604
Total Heptachlorodibenzo-p-dioxin (Total HpCDD)	MN	9438	10186604
Total Hexachlorodibenzofuran (Total HxCDF)	MN	9483	10186604
Total Hexachlorodibenzo-p-dioxin (Total HxCDD)	MN	9468	10186604
Total Pentachlorodibenzofuran (Total PeCDF)	MN	9552	10186604
Total Pentachlorodibenzo-p-dioxin (Total PeCDD)	MN	9555	10186604
Total Tetrachlorodibenzofuran (Total TCDF)	MN	9615	10186604
Total Tetrachlorodibenzo-p-dioxin (Total TCDD)	MN	9609	10186604

Method EPA 8290

Analyte	AB	Analyte ID	Method ID
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	MN	9516	10187209
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	MN	9519	10187209
1,2,3,4,6,7,8-Heptachlorodibenzofuran (1,2,3,4,6,7,8-HpCDF)	MN	9420	10187209
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (1,2,3,4,6,7,8-HpCDD)	MN	9426	10187209
1,2,3,4,7,8,9-Heptachlorodibenzofuran (1,2,3,4,7,8,9-HpCDF)	MN	9423	10187209



Texas Commission on Environmental Quality

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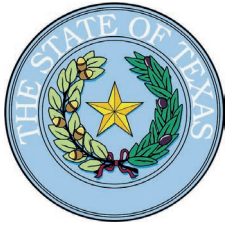
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Matrix: Non-Potable Water

1,2,3,4,7,8-Hexachlorodibenzofuran (1,2,3,4,7,8-HxCDF)	MN	9471	10187209
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (1,2,3,4,7,8-HxCDD)	MN	9453	10187209
1,2,3,6,7,8-Hexachlorodibenzofuran (1,2,3,6,7,8-HxCDF)	MN	9474	10187209
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (1,2,3,6,7,8-HxCDD)	MN	9456	10187209
1,2,3,7,8,9-Hexachlorodibenzofuran (1,2,3,7,8,9-HxCDF)	MN	9477	10187209
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (1,2,3,7,8,9-HxCDD)	MN	9459	10187209
1,2,3,7,8-Pentachlorodibenzofuran (1,2,3,7,8-PeCDF)	MN	9543	10187209
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (1,2,3,7,8-PeCDD)	MN	9540	10187209
2,3,4,6,7,8-Hexachlorodibenzofuran (2,3,4,6,7,8-HxCDF)	MN	9480	10187209
2,3,4,7,8-Pentachlorodibenzofuran (2,3,4,7,8-PeCDF)	MN	9549	10187209
2,3,7,8-Tetrachlorodibenzofuran (2,3,7,8-TCDF)	MN	9612	10187209
2,3,7,8-Tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD)	MN	9618	10187209
Total Heptachlorodibenzofuran (Total HpCDF)	MN	9444	10187209
Total Heptachlorodibenzo-p-dioxin (Total HpCDD)	MN	9438	10187209
Total Hexachlorodibenzofuran (Total HxCDF)	MN	9483	10187209
Total Hexachlorodibenzo-p-dioxin (Total HxCDD)	MN	9468	10187209
Total Pentachlorodibenzofuran (Total PeCDF)	MN	9552	10187209
Total Pentachlorodibenzo-p-dioxin (Total PeCDD)	MN	9555	10187209
Total Tetrachlorodibenzofuran (Total TCDF)	MN	9615	10187209
Total Tetrachlorodibenzo-p-dioxin (Total TCDD)	MN	9609	10187209

Method EPA RSK 175

Analyte	AB	Analyte ID	Method ID
Ethane	MN	4747	10212905
Ethene	MN	4752	10212905
Methane	MN	4926	10212905
n-Propane	MN	5029	10212905



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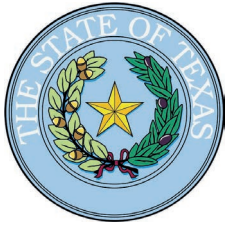
Matrix: Solid & Chemical Materials

Method EPA 1668

Analyte	AB	Analyte ID	Method ID
Decachlorobiphenyls	MN	10332	10262007
Dichlorobiphenyls	MN	464	10262007
Heptachlorobiphenyls	MN	486	10262007
Hexachlorobiphenyls	MN	487	10262007
Monochlorobiphenyls	MN	501	10262007
Nonachlorobiphenyls	MN	507	10262007
Octachlorobiphenyls	MN	508	10262007
Pentachlorobiphenyls	MN	515	10262007
Tetrachlorobiphenyls	MN	528	10262007
Trichlorobiphenyls	MN	541	10262007

Method EPA 8280

Analyte	AB	Analyte ID	Method ID
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	MN	9516	10186604
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	MN	9519	10186604
1,2,3,4,6,7,8-Heptachlorodibenzofuran (1,2,3,4,6,7,8-HpCDF)	MN	9420	10186604
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (1,2,3,4,6,7,8-HpCDD)	MN	9426	10186604
1,2,3,4,7,8,9-Heptachlorodibenzofuran (1,2,3,4,7,8,9-HpCDF)	MN	9423	10186604
1,2,3,4,7,8-Hexachlorodibenzofuran (1,2,3,4,7,8-HxCDF)	MN	9471	10186604
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (1,2,3,4,7,8-HxCDD)	MN	9453	10186604
1,2,3,6,7,8-Hexachlorodibenzofuran (1,2,3,6,7,8-HxCDF)	MN	9474	10186604
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (1,2,3,6,7,8-HxCDD)	MN	9456	10186604
1,2,3,7,8,9-Hexachlorodibenzofuran (1,2,3,7,8,9-HxCDF)	MN	9477	10186604
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (1,2,3,7,8,9-HxCDD)	MN	9459	10186604
1,2,3,7,8-Pentachlorodibenzofuran (1,2,3,7,8-PeCDF)	MN	9543	10186604
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (1,2,3,7,8-PeCDD)	MN	9540	10186604
2,3,4,6,7,8-Hexachlorodibenzofuran (2,3,4,6,7,8-HxCDF)	MN	9480	10186604
2,3,4,7,8-Pentachlorodibenzofuran (2,3,4,7,8-PeCDF)	MN	9549	10186604
2,3,7,8-Tetrachlorodibenzofuran (2,3,7,8-TCDF)	MN	9612	10186604
2,3,7,8-Tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD)	MN	9618	10186604



Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation



Pace Analytical Services, LLC - Minneapolis MN

1700 Elm Street SE Suite 200
Minneapolis, MN 55414-2485

Certificate:

T104704192-22-17

Expiration Date:

2/28/2023

Issue Date:

3/1/2022

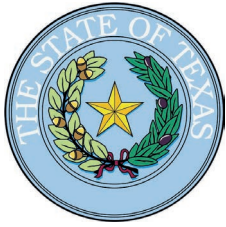
These fields of accreditation supercede all previous fields. The Texas Commission on Environmental Quality urges customers to verify the laboratory's current accreditation status for particular methods and analyses.

Matrix: Solid & Chemical Materials

Total Heptachlorodibenzofuran (Total HpCDF)	MN	9444	10186604
Total Heptachlorodibenzo-p-dioxin (Total HpCDD)	MN	9438	10186604
Total Hexachlorodibenzofuran (Total HxCDF)	MN	9483	10186604
Total Hexachlorodibenzo-p-dioxin (Total HxCDD)	MN	9468	10186604
Total Pentachlorodibenzofuran (Total PeCDF)	MN	9552	10186604
Total Pentachlorodibenzo-p-dioxin (Total PeCDD)	MN	9555	10186604
Total Tetrachlorodibenzofuran (Total TCDF)	MN	9615	10186604
Total Tetrachlorodibenzo-p-dioxin (Total TCDD)	MN	9609	10186604

Method EPA 8290

Analyte	AB	Analyte ID	Method ID
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	MN	9516	10187209
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	MN	9519	10187209
1,2,3,4,6,7,8-Heptachlorodibenzofuran (1,2,3,4,6,7,8-HpCDF)	MN	9420	10187209
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (1,2,3,4,6,7,8-HpCDD)	MN	9426	10187209
1,2,3,4,7,8,9-Heptachlorodibenzofuran (1,2,3,4,7,8,9-HpCDF)	MN	9423	10187209
1,2,3,4,7,8-Hexachlorodibenzofuran (1,2,3,4,7,8-HxCDF)	MN	9471	10187209
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (1,2,3,4,7,8-HxCDD)	MN	9453	10187209
1,2,3,6,7,8-Hexachlorodibenzofuran (1,2,3,6,7,8-HxCDF)	MN	9474	10187209
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (1,2,3,6,7,8-HxCDD)	MN	9456	10187209
1,2,3,7,8,9-Hexachlorodibenzofuran (1,2,3,7,8,9-HxCDF)	MN	9477	10187209
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (1,2,3,7,8,9-HxCDD)	MN	9459	10187209
1,2,3,7,8-Pentachlorodibenzofuran (1,2,3,7,8-PeCDF)	MN	9543	10187209
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (1,2,3,7,8-PeCDD)	MN	9540	10187209
2,3,4,6,7,8-Hexachlorodibenzofuran (2,3,4,6,7,8-HxCDF)	MN	9480	10187209
2,3,4,7,8-Pentachlorodibenzofuran (2,3,4,7,8-PeCDF)	MN	9549	10187209
2,3,7,8-Tetrachlorodibenzofuran (2,3,7,8-TCDF)	MN	9612	10187209
2,3,7,8-Tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD)	MN	9618	10187209
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Total Heptachlorodibenzo-p-dioxin (Total HpCDD)	MN	9438	10187209
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Matrix: *Solid & Chemical Materials*

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Total Pentachlorodibenzofuran (Total PeCDF)	MN	9552	10187209
Total Pentachlorodibenzo-p-dioxin (Total PeCDD)	MN	9555	10187209
Total Tetrachlorodibenzofuran (Total TCDF)	MN	9615	10187209
Total Tetrachlorodibenzo-p-dioxin (Total TCDD)	MN	9609	10187209