

PRE-PUBLICATION NOTICE

On July 13, 2023, Michael S. Regan, the EPA Administrator, signed the following document:

Action: **NPRM**
Title: **Carbon Tetrachloride (CTC); Regulation under the Toxic Substances Control Act (TSCA)**
FRL #: **8206-01-OCSP**
Docket ID #: **EPA-HQ-OPPT-2020-0592**

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ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 751

[EPA-HQ-OPPT-2020-0592; FRL-8206-01-OCSPP]

RIN 2070-AK82

Carbon Tetrachloride (CTC); Regulation under the Toxic Substances Control Act (TSCA)

AGENCY: Environmental Protection Agency (EPA).

ACTION: Proposed rule.

SUMMARY: The Environmental Protection Agency (EPA) is proposing to address the unreasonable risk of injury to human health presented by carbon tetrachloride (CTC) under its conditions of use as documented in EPA's 2020 Risk Evaluation for Carbon Tetrachloride and 2022 Revised Unreasonable Risk Determination for Carbon Tetrachloride pursuant to the Toxic Substances Control Act (TSCA). CTC is a volatile, organic compound that is primarily used as a feedstock (i.e., processed as a reactant) in the making of products such as refrigerants, aerosol propellants, and foam-blowing agents. TSCA requires that EPA address by rule any unreasonable risk of injury to health or the environment identified in a TSCA risk evaluation and apply requirements to the extent necessary so that the chemical no longer presents unreasonable risk. EPA determined that CTC presents an unreasonable risk of injury to health due to cancer from chronic inhalation and dermal exposures and liver toxicity from chronic inhalation, chronic dermal, and acute dermal exposures in the workplace. To address the identified unreasonable risk, EPA is proposing under TSCA to establish workplace safety requirements for most conditions of use, including the condition of use related to the making of low Global Warming Potential (GWP) hydrofluoroolefins (HFOs), prohibit the manufacture (including import), processing, distribution in commerce, and industrial/commercial use of CTC for conditions of

use where information indicates use of CTC has already been phased out, and establish recordkeeping and downstream notification requirements. The use of CTC in low GWP HFOs is particularly important in the Agency's efforts to support the American Innovation and Manufacturing Act of 2020 (AIM Act) and the Kigali Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer, which was ratified on October 26, 2022.

DATES: Comments must be received on or before **[INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE *FEDERAL REGISTER*]**. Under the Paperwork Reduction Act (PRA), comments on the information collection provisions are best ensured of consideration if the Office of Management and Budget (OMB) receives a copy of your comments on or before **[INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE *FEDERAL REGISTER*]**.

ADDRESSES: Submit your comments, identified by docket identification (ID) number EPA-HQ-OPPT-2020-0592, through the Federal eRulemaking Portal at <https://www.regulations.gov>. Follow the online instructions for submitting comments. Do not submit electronically any information you consider to be Confidential Business Information (CBI) or other information whose disclosure is restricted by statute. Additional instructions on commenting or visiting the docket, along with more information about dockets generally, is available at <https://www.epa.gov/dockets>.

FOR FURTHER INFORMATION CONTACT: *For technical information contact:* Claudia Menasche, Existing Chemicals Risk Management Division (7404M), Office of Pollution Prevention and Toxics, Environmental Protection Agency, 1200 Pennsylvania Ave., NW., Washington, DC 20460-0001; telephone number (202) 564-3391; email address: CarbonTetrachlorideTSCA@epa.gov.

For general information contact: The TSCA-Hotline, ABVI-Goodwill, 422 South

Clinton Ave., Rochester, NY 14620; telephone number: (202) 554-1404; email address: *TSCA-Hotline@epa.gov*.

SUPPLEMENTARY INFORMATION:

I. Executive Summary

A. Does this action apply to me?

You may be potentially affected by this action if you manufacture (defined under TSCA to include import), process, distribute in commerce, use, or dispose of CTC. The following list of 2022 North American Industrial Classification System (NAICS) codes is not intended to be exhaustive, but rather provides a guide to help readers determine whether this document applies to them. Potentially affected entities may include:

- NAICS code 325—Chemical Manufacturing;
- NAICS code 327—Nonmetallic Mineral Product Manufacturing;
- NAICS code 331—Primary Metal Manufacturing;
- NAICS code 562—Waste Management and Remediation Services;
- NAICS code 325110—Petrochemical Manufacturing;
- NAICS code 325120—Industrial Gas Manufacturing;
- NAICS code 325180—Other Basic Inorganic Chemical Manufacturing;
- NAICS code 325194—Cyclic Crude, Intermediate, and Gum and Wood Chemical Manufacturing;
- NAICS code 325199—All Other Basic Organic Chemical Manufacturing;
- NAICS code 325211—Plastics Material and Resin Manufacturing;
- NAICS code 325320—Pesticide and Other Agricultural Chemical Manufacturing;
- NAICS code 325998—All Other Miscellaneous Chemical Product and Preparation Manufacturing;

- NAICS code 327310—Cement Manufacturing;
- NAICS code 327992—Ground or Treated Mineral and Earth Manufacturing;
- NAICS code 331410—Nonferrous Metal (except Aluminum) Smelting and Refining;
- NAICS code 562211—Hazardous Waste Treatment and Disposal; and
- NAICS code 562213—Solid Waste Combustors and Incinerators.

This action may also affect certain entities through pre-existing import, including import certification, and export notification rules under TSCA. Persons who import any chemical substance governed by a final TSCA section 6(a) rule are subject to the TSCA section 13 (15 U.S.C. 2612), which requires that the Secretary of the Treasury “refuse entry into the customs territory of the United States” of any substance, mixture, or article containing a chemical substance or mixture that fails to comply with any rule issued under TSCA or that “is offered for entry in violation” of TSCA or certain rules or orders issued under TSCA, including rules issued under TSCA section 6(a). Persons who import any chemical substance in bulk form, as part of a mixture, or as part of an article (if required by rule) are also subject to TSCA section 13 import certification requirements and the corresponding regulations at 19 CFR 12.118 through 12.127; see also 19 CFR 127.28. Those persons must certify that the shipment of the chemical substance complies with all applicable rules and orders under TSCA. The EPA policy in support of import certification appears at 40 CFR part 707, subpart B. In addition, any persons who export or intend to export a chemical substance that is the subject of this proposed rule are subject to the export notification provisions of TSCA section 12(b) (15 U.S.C. 2611(b)), and must comply with the export notification requirements in 40 CFR part 707, subpart D.

If you have any questions regarding the applicability of this proposed action to a particular entity, consult the technical information contact listed under **FOR FURTHER INFORMATION CONTACT**.

B. What is the Agency's authority for taking this action?

Under TSCA section 6(a) (15 U.S.C. 2605(a)), if the U.S. Environmental Protection Agency (hereinafter EPA or “the Agency”) determines through a TSCA section 6(b) risk evaluation that a chemical substance presents an unreasonable risk of injury to health or the environment, EPA must by rule apply one or more requirements listed in section 6(a) to the extent necessary so that the chemical substance or mixture no longer presents such risk.

C. What action is the Agency taking?

Pursuant to TSCA section 6(b), EPA determined that CTC presents an unreasonable risk of injury to health, without consideration of costs or other nonrisk factors, including an unreasonable risk to potentially exposed or susceptible subpopulations (PESS) identified as relevant to the 2020 Risk Evaluation for Carbon Tetrachloride, under the conditions of use (Refs. 1, 2, and 3). A detailed description of the conditions of use that drive EPA’s determination that CTC presents an unreasonable risk is provided in Unit III.B.1. Accordingly, to address the unreasonable risk, EPA is proposing, under TSCA section 6(a) to:

(i) Require a CTC workplace chemical protection program (WCPP), which would include an existing chemical exposure limit (ECEL) of 0.03 ppm as an 8-hour time-weighted average (TWA) to address risk from inhalation exposure in combination with direct dermal contact controls (DDCC) for the following conditions of use. EPA is also proposing working with the regulated community and industrial hygiene experts to develop methodologies to measure CTC concentrations at or below the ECEL. The WCPP would apply to the manufacturing (including import) of CTC and other conditions of use which account for essentially all of the production volume of CTC (Ref. 4), as outlined in Unit IV.A.1.:

- Domestic manufacture;
- Import;

- Processing as a reactant in the production of HCFCs, HFCs, HFOs, and perchloroethylene (PCE);
 - Incorporation into formulation, mixture or reaction products in agricultural products manufacturing and other basic organic and inorganic chemical manufacturing;
 - Repackaging for use as a laboratory chemical;
 - Recycling;
 - Industrial and commercial use as an industrial processing aid in the manufacture of agricultural products;
 - Industrial and commercial use in the elimination of nitrogen trichloride in the production of chlorine and caustic soda; and
 - Disposal.
- (ii) Require use of a fume hood and dermal personal protective equipment (PPE) for the industrial and commercial use as a laboratory chemical, as outlined in Unit IV.A.2.;
- (iii) Prohibit these additional conditions of use, for which the Agency understands use of CTC has already been phased out, as outlined in Unit IV.A.3.:
- Incorporation into formulation, mixture or reaction products in petrochemical-derived manufacturing;
 - Industrial and commercial use as an industrial processing aid in the manufacture of petrochemicals-derived products;
 - Industrial and commercial use in the manufacture of other basic chemicals (including manufacturing of chlorinated compounds used in solvents, adhesives, asphalt, and paints and coatings), except for use in the elimination of nitrogen trichloride in the production of chlorine and caustic soda (for which EPA is proposing a WCPP);
 - Industrial and commercial use in metal recovery;

- Industrial and commercial use as an additive; and
- Industrial and commercial use in specialty uses by the U.S. Department of Defense (DoD).

(iv) Require manufacturers (including importers), processors, and distributors to provide downstream notification of the requirements, as outlined in Unit IV.A.4.

(v) Require recordkeeping, as outlined in Unit IV.A.4.

EPA notes that not all TSCA conditions of use of CTC are subject to regulation under this proposal. As described in the 2020 Risk Evaluation for Carbon Tetrachloride (Ref. 1) and the 2022 Revised Unreasonable Risk Determination for Carbon Tetrachloride (Ref. 3), two conditions of use of CTC do not drive the unreasonable risk: distribution in commerce and processing as a reactant/intermediate in reactive ion etching. EPA is not proposing any restrictions for the processing of CTC as a reactant/intermediate in reactive ion etching. However, under TSCA section 6(a), EPA may select from among a suite of risk management requirements in TSCA section 6(a), including requirements related to distribution in commerce, as part of its regulatory options to address the unreasonable risk; EPA's proposed regulatory action and primary alternative regulatory action include prohibitions on the distribution in commerce of CTC for certain downstream conditions of use.

The 2020 Risk Evaluation (Ref. 1) and the 2022 Revised Unreasonable Risk Determination (Ref. 3) contain the full list of CTC's conditions of use that were evaluated for risk to health or the environment. The term "conditions of use" is defined in TSCA section 3(4) to mean the circumstances under which a chemical substance is intended, known, or reasonably foreseen to be manufactured, processed, distributed in commerce, used, or disposed of. As mentioned, a detailed description of the conditions of use that drive EPA's determination that CTC presents an unreasonable risk is provided in Unit III.B.1. In addition, Unit III.B.2. contains

a description of the conditions of use that do not drive the unreasonable risk of CTC.

In addition, EPA is proposing to amend the general provision of 40 CFR part 751, Subpart A, to define “authorized person,” “direct dermal contact,” “ECEL,” “exposure group,” “owner or operator,” “potentially exposed person,” and “regulated area” so that these definitions may be commonly applied to this and other rules under TSCA section 6 that would be codified under 40 CFR part 751. EPA is requesting public comment on all aspects of this proposal.

D. Why is the Agency taking this action?

Under TSCA section 6(a), “[i]f the Administrator determines in accordance with subsection (b)(4)(A) that the manufacture, processing, distribution in commerce, use or disposal of a chemical substance or mixture, or that any combination of such activities, presents an unreasonable risk of injury to health or the environment, the Administrator shall by rule... apply one or more of the [section 6(a)] requirements to such substance or mixture to the extent necessary so that the chemical substance no longer presents such risk.” CTC was the subject of a risk evaluation under TSCA section 6(b)(4)(A) that was issued in November 2020 (2020 Risk Evaluation) (Ref. 1). In addition, EPA issued a revised unreasonable risk determination for CTC in December 2022 (Ref. 3), determining that CTC, as a whole chemical substance, presents an unreasonable risk of injury to health under the conditions of use. As a result, EPA is proposing to take action to the extent necessary so that CTC no longer presents such risk. The unreasonable risk is described in Unit III.B.3. and the conditions of use that drive the unreasonable risk for CTC are described in Unit III.B.1.

EPA is not proposing a complete ban on CTC. CTC is primarily used as a feedstock to make products such as refrigerants, aerosol propellants, and foam-blowing agents. Requirements under the Montreal Protocol and Title VI of the Clean Air Act (CAA), which were included in the CAA Amendments of 1990 and are codified at 42 U.S.C. Chapter 85, Subchapter VI, led to a

phaseout of CTC production in the United States for most non-feedstock domestic uses, such as degreasers and fire suppressants. In addition, the Consumer Product Safety Commission (CPSC) banned the use of CTC in consumer products (excluding unavoidable residues not exceeding 10 ppm atmospheric concentration) in 1970. The Agency has considered the benefits of CTC for various uses as required under TSCA section 6(c)(2)(A) and (B), and recognizes that continued use of CTC in some TSCA conditions of use should be maintained for several reasons. The use of CTC may provide benefits that complement the Agency's efforts to address climate-damaging HFCs under the AIM Act and the Kigali Amendment to the Montreal Protocol, and supporting human health and environmental protection under these programs. In addition, the use of CTC may provide other benefits due to certain unique properties of CTC (e.g., it does not react with the process gasses when used as a process agent in the manufacture of agricultural products (Ref. 5). Finally, strict workplace controls can be implemented to address unreasonable risk across many conditions of use. For some workplaces, EPA understands that existing controls may already reduce exposures enough to meet the inhalation exposure concentration limit proposed in this rulemaking or to prevent direct dermal contact with CTC. For these reasons, this rule proposes to allow CTC's continued use with additional worker protection to address unreasonable risk for several conditions of use, including the processing of CTC as a reactant in the production of HFOs.

E. What are the estimated incremental impacts of this Action?

EPA's Economic Analysis of the estimated incremental impacts associated with this rulemaking can be found in the rulemaking docket (Ref. 4). As described in more detail in the Economic Analysis and in Units VI.D. and X.D., EPA's estimate of the incremental costs of this proposed rule is \$18.8 million per year annualized over 20-years at a 3% discount rate and \$18.5 million per year at a 7% discount rate (Ref. 4). The estimated cost of the primary alternative

regulatory action is \$2.3 million per year annualized over 20-years at both a 3% and 7% discount rate. While the cost of the proposed regulatory action is higher than the cost of the primary alternative regulatory action, the proposed regulatory action is the action with the least uncertainty regarding the protection afforded to workers, requires regulated entities to consider more protective controls in the hierarchy, and lessens the burden on workers. Under the WCPP, regulated entities would be required to implement the hierarchy of controls and only consider respirators and dermal PPE after all other steps have been taken to reduce exposures using other and more effective controls in the hierarchy (Ref. 8). The primary alternative regulatory action, on the other hand, would neither allow nor require regulated entities to consider other, more effective exposure controls in the hierarchy. In addition, the Agency recognizes that workplaces have unique processes and equipment in place and that varying levels of respiratory APFs may be needed for different workplaces. Therefore, there is uncertainty as to whether a specific respiratory APF or a dermal PPE would be sufficient for all workplaces so that CTC no longer presents unreasonable risk. Finally, there is an unquantified cost to workers associated with prolonged use of respirators, which could interfere with work tasks. The potential for respirator use to cause discomfort and productivity losses could lead companies to offer higher wages as compensation, but the extent of this effect is unknown and thus unquantified. To the extent that this unquantified cost of respirator use applies more to prescriptive controls, it is an unmonetized benefit of the proposed regulatory action relative to the primary alternative action. More details regarding the rationale for the proposed regulatory action and the primary alternative regulatory action are in Unit IV and Unit V. The costs are estimated as incremental to baseline conditions, including current use of personal protective equipment. The costs represent a high-end cost estimate because the high estimates for the number of entities and workers affected by the regulation were used. To the extent that EPA's approach overestimates the number of entities

subject to the regulation, actual realized costs of this action will be lower. These costs take into consideration the proposed requirements to mitigate unreasonable risk of injury to health from CTC under the conditions of use. Costs are higher for the proposed action compared to the primary alternative action because the proposed action would require a WCPP for many conditions of use, which includes monitoring and WCPP recordkeeping requirements that are more costly than the primary alternative action's prescriptive controls requirement. In the primary alternative action, facilities will not incur monitoring or WCPP recordkeeping costs, but will need to provide a respirator to all employees. The cost of the primary alternative action's prescriptive controls option includes the PPE. The cost estimates include the equipment itself, as well as the costs of a medical evaluation, fit testing, and equipment cleaning that ensure proper use and maintenance of the PPE. There is an unquantified cost to workers associated with prolonged use of respirators, which could interfere with work tasks. The potential for respirator use to cause discomfort and productivity losses could lead companies to offer higher wages as compensation, but the extent of this effect is unknown and thus unquantified. To the extent that this unquantified cost of respirator use applies more to prescriptive controls, it is an unmonetized benefit of the proposed regulatory action relative to the primary alternative action. More details regarding the rationale for the proposed regulatory action and the primary alternative regulatory action are in Unit IV and Unit V

Unit IV. details which actions apply to which conditions of use. EPA estimates that 30 firms associated with 71 sites may be manufacturing (including importing), processing, or releasing CTC.

Industry is expected to incur costs associated with performing inspections, documenting efforts to meet the regulatory requirements associated with the WCPP, including reducing exposure and occurrences of exposure, monitoring, respirators and dermal PPE, training on the

use of respirators and dermal PPE, and notification and recordkeeping burdens and costs associated with the WCPP. Industry is also expected to incur equipment costs associated with dermal PPE for laboratory use. EPA assumes that industry would not incur equipment costs associated with the fume hood requirement for laboratory settings because they are considered to be part of baseline industry practices. All manufacturers (including importers), processors, and distributors will bear downstream notification and recordkeeping costs.

EPA estimates that the proposed rule would affect at least four small entities. EPA compared the highest annualized per-facility cost of the proposed regulatory action with ultimate parent company annual revenues of the affected small businesses. EPA found impacts under 1% of annual revenues for three of the four small entities. One small entity was estimated to have a cost-to-revenue impact ratio greater than 1%, and that entity would incur a cost-to-impact ratio of between 1% and 3%. EPA requests public comments regarding the number of small businesses subject to the proposed rule and the potential impacts of the proposed rule on these small businesses.

EPA's Economic Analysis for the rule monetized the benefits from avoided cases of adrenal and liver cancers. Cancer avoidance benefits are calculated based on reductions in inhalation exposure using the 2020 Risk Evaluation for Carbon Tetrachloride (Ref. 1) for those uses which are continuing but with a WCPP in place. Therefore, benefits are only calculated for the WCPP in the proposed regulatory action, which could include respiratory protection, and prescriptive workplace controls in the primary alternative regulatory action. The estimated monetized benefit of the proposed regulatory action ranges from approximately \$0.09 to \$0.1 million per year annualized over 20-years at a 3% discount rate and from \$0.04 to \$0.07 million per year at a 7% discount rate. The estimated monetized benefit of the primary alternative regulatory action is \$.09 to \$.1 million per year annualized over 20-years at a 3% discount rate

and \$.04 to \$.07 million per year at a 7% discount rate. The APFs of respirators required under the prescriptive workplace controls primary alternative regulatory action are higher on average than those expected to be required based on projected monitoring outcomes under the ECEL as part of the WCPP under the proposed regulatory action. To estimate the costs and benefits of respirators under the ECEL, the Economic Analysis generated a likely distribution of air monitoring outcomes at CTC facilities. This distribution was used to project the number of facilities that would require each APF. These estimates are subject to uncertainties, and there could be facilities with higher or lower air exposures than estimated in the Economic Analysis. In practice, the WCPP would require facility personnel to select appropriate PPE based on actual monitored levels to ensure adequate protection. Under the prescriptive workplace controls in the primary alternative regulatory action, the APFs of respirators for each condition of use are based on high-end exposure scenarios to ensure that workers are sufficiently protected, without accounting for differences in air exposures across facilities, including the unique processes and engineering controls that may already be implemented. This results in more workers wearing higher APFs in the primary alternative regulatory action. The quantified benefits from the primary alternative regulatory action are comparable to those of the proposed action, with a difference of less than five percent between the benefits of the two regulatory options.

Using the high-end estimates for the number of entities and workers affected by the proposed regulation, the monetized net benefit of the proposed regulatory action, which is negative, is -\$18.7 million per year annualized over 20-years at a 3% discount rate and ranges from -\$18.5 to -\$18.4 million per year at a 7% discount rate. The monetized net benefit of the primary alternative regulatory action is also negative and ranges from -\$2.3 to -\$2.2 million per year annualized over 20-years at a 3% discount rate and is -\$2.3 million per year at a 7% discount rate. The range in the monetized net benefits estimate at each discount rate reflects

uncertainty in cancer risk reductions given the shorter exposure durations being considered and the life stage at which the changes in exposure occur. Although the estimated monetized net benefits are negative, there are also non-monetized benefits due to other potential avoided adverse health effects associated with CTC exposure, including liver, reproductive, renal, developmental, and central nervous system (CNS) toxicity endpoints. These are serious health endpoints, even though the change in risk due to CTC exposure was not quantified in the 2020 Risk Evaluation for Carbon Tetrachloride.

Section 6.6 of the Economic Analysis, addressing environmental justice impacts, provides sociodemographic data on communities and workers in industries affected by the rule and people that live in proximity to potentially affected facilities. EPA analyzed the baseline conditions facing communities near CTC and HFO manufacturing facilities as well as those of workers in the same industry and county as CTC facilities and HFO manufacturing facilities.

The environmental justice analysis found that, across the entire population within 1- and 3-miles of CTC facilities, there are higher percentages of people who identify as Black and living below the poverty line and a similar percentage of people who identify as Hispanic compared to the national averages. CTC facilities are concentrated in Texas and Louisiana, especially near Houston and Baton Rouge.

F. What should I consider as I prepare my comments for EPA?

1. *Submitting CBI.* Do not submit this information to EPA through <https://www.regulations.gov> or email. Clearly mark the part or all of the information that you claim to be CBI. In addition to one complete version of the comment that includes information claimed as CBI, a copy of the comment that does not contain the information claimed as CBI must be submitted for inclusion in the public docket. Information so marked will not be disclosed except in accordance with procedures set forth in 40 CFR part 2.

2. *Tips for preparing your comments.* When preparing and submitting your comments, see the commenting tips at <https://www.epa.gov/dockets/commenting-epa-dockets>.

II. Background

A. Overview of Carbon Tetrachloride

This proposed rule applies to CTC (CASRN 56-23-5) and is specifically intended to address the unreasonable risks of injury to health EPA identified in the 2020 Risk Evaluation for Carbon Tetrachloride (Ref. 1) and the 2022 Revised Unreasonable Risk Determination for Carbon Tetrachloride (Ref. 3), as described in Unit III.B.3. CTC is a volatile organic compound that is primarily used as a feedstock in the production of HCFCs, HFCs, and HFOs. EPA identified liver toxicity and cancer adverse effects from chronic inhalation and dermal exposures, as well as liver toxicity from acute dermal exposures in the workplace as the basis for the unreasonable risk determination for CTC (Ref. 1, 2, and 3).

According to data collected as a result of EPA's 2016 and 2020 Chemical Data Reporting (CDR) Rule, in Reporting Years (RY) 2015 and 2019, between 100 and 250 million pounds of CTC were manufactured or imported in the United States (Ref. 4). CTC's use as a feedstock in the production of HCFCs, HFCs, and HFOs is described in Unit III.B.1., with a description of proposed requirements to address the unreasonable risk in Unit IV.A.

B. Regulatory actions pertaining to Carbon Tetrachloride

CTC is subject to numerous State, Federal, and international regulations restricting and regulating its use; a summary of the regulatory actions pertaining to CTC is in the docket (Refs. 1 and 6).

C. Consideration of Occupational Safety and Health Administration (OSHA) occupational health standards in TSCA risk evaluations and TSCA risk management actions

Although EPA must consider and factor in, to the extent practicable, certain non-risk

factors as part of TSCA section 6(a) rulemaking (see TSCA section 6(c)(2)), EPA must nonetheless still ensure that the selected regulatory requirements apply “to the extent necessary so that the chemical substance or mixture no longer presents [unreasonable] risk.” 15 U.S.C. 2605(a). This requirement to eliminate unreasonable risk is distinguishable from approaches mandated by some other laws, including the Occupational Safety and Health Act (OSH Act), which includes both significant risk and feasibility (technical and economic) considerations in the setting of standards.

Congress intended for EPA to consider occupational risks from chemicals it evaluates under TSCA, among other potential exposures, as relevant and appropriate. As noted previously, TSCA section 6(b) requires EPA to evaluate risks to PESS identified as relevant by the Administrator. TSCA section 3(12) defines the term “potentially exposed or susceptible subpopulation” as “a group of individuals within the general population identified by the Administrator who, due to either greater susceptibility or greater exposure, may be at greater risk than the general population of adverse health effects from exposure to a chemical substance or mixture, such as infants, children, pregnant women, workers, or the elderly.”

The OSH Act similarly requires OSHA to evaluate risk specific to workers prior to promulgating new or revised standards and requires OSHA standards to substantially reduce significant risk to the extent feasible, even if workers are exposed over a full working lifetime. *See* 29 U.S.C. 655(b)(5); *Indus. Union Dep’t, AFL-CIO v. Am. Petroleum Inst.*, 448 U.S. 607, 642 (1980) (plurality opinion).

Thus, the standards for chemical hazards that OSHA promulgates under the OSH Act share a broadly similar purpose with the standards that EPA promulgates under TSCA section 6(a). The control measures OSHA and EPA require to satisfy the objectives of their respective statutes may also, in many circumstances, overlap or coincide. However, as this section outlines,

there are important differences between EPA's and OSHA's regulatory approaches and jurisdiction, and EPA considers these differences when deciding whether and how to account for OSHA requirements when evaluating and addressing potential unreasonable risk to workers so that compliance requirements are clearly explained to the regulated community.

1. *OSHA requirements.*

OSHA's mission is to ensure that employees work in safe and healthful conditions. The OSH Act establishes requirements that each employer comply with the General Duty Clause of the Act (29 U.S.C. 654(a)), as well as with occupational safety and health standards issued under the Act.

a. *General Duty Clause of the OSH Act.*

The General Duty Clause of the OSH Act requires employers to keep their workplaces free from recognized hazards that are causing or are likely to cause death or serious physical harm to employees. The General Duty Clause is cast in general terms, and does not establish specific requirements like exposure limits, PPE, or other specific protective measures that EPA could potentially consider when developing its risk evaluations or risk management requirements. OSHA, under limited circumstances, has cited the General Duty Clause for regulating exposure to chemicals. To prove a violation of the General Duty Clause, OSHA must prove employer or industry recognition of the hazard, that the hazard was causing or likely to cause death or serious physical harm, and a feasible method to eliminate or materially reduce the hazard was available. In rare situations, OSHA has cited employers for violation of the General Duty Clause where exposures were below a chemical-specific Permissible Exposure Limit (PEL), a time weighted average (TWA) based on an employee's average airborne exposure in any 8-hour work shift of a 40-hour work week which shall not be exceeded (Ref. 7). In such situations, OSHA must demonstrate that the employer had actual knowledge that the PEL was

inadequate to protect its employees from death or serious physical harm. Because of the heavy evidentiary burden on OSHA to establish violations of the General Duty Clause, it is not frequently used to cite employers for employee exposure to chemical hazards.

b. OSHA Standards.

OSHA standards are issued pursuant to the OSH Act and are found in title 29 of the CFR. There are separate standards for general industry, construction, maritime and agriculture sectors, and general standards applicable to a number of sectors (e.g., OSHA's Respiratory Protection standard). OSHA has numerous standards that apply to employers who operate chemical manufacturing and processing facilities, as well as to downstream employers whose employees may be occupationally exposed to hazardous chemicals.

OSHA sets legally enforceable limits on the airborne concentrations of hazardous chemicals, referred to as PELs, established for employers to protect their workers against the health effects of exposure to hazardous substances (29 CFR part 1910, subpart Z, part 1915, subpart Z, and part 1926, subparts D and Z). Under section 6(a) of the OSH Act, OSHA was permitted an initial 2-year window after the passage of the Act to adopt "any national consensus standard and any established Federal standard." 29 U.S.C. 655(a). OSHA used this authority in 1971 to establish PELs that were adopted from Federal health standards originally set by the U.S. Department of Labor through the Walsh-Healy Act, in which approximately 400 Occupational Exposure Limits (OELs) were selected based on the American Conference of Governmental Industrial Hygienists (ACGIH) 1968 list of Threshold Limit Values (TLVs). In addition, about 25 exposure limits recommended by the American Standards Association (now called the American National Standards Institute) (ANSI) were adopted as PELs.

Following the 2-year window provided under section 6(a) of the OSH Act for the adoption of national consensus and existing Federal standards, OSHA issued health standards

following the requirements in section 6(b) of the Act. OSHA has established approximately 30 PELs under section 6(b)(5) as part of comprehensive substance-specific standards that include additional requirements for protective measures such as use of PPE, establishment of regulated areas, exposure assessment, hygiene facilities, medical surveillance, and training. These ancillary provisions in substance-specific OSHA standards further mitigate residual risk that could be present due to exposure at the PEL.

Many OSHA PELs have not been updated since they were established in 1971, including the PEL for CTC. In many instances, scientific evidence has accumulated suggesting that the current limits of many PELs are not sufficiently protective. On October 10, 2014, OSHA published a *Federal Register* document in which it recognized that many of its PELs are outdated and inadequate for ensuring protection of worker health (79 FR 61384, October 14, 2014). In addition, health standards issued under section 6(b)(5) of the OSH Act must reduce significant risk only to the extent that it was technologically and economically feasible at the time they were issued. OSHA's legal requirement to demonstrate that its section 6(b)(5) standards are technologically and economically feasible at the time they are promulgated often precludes OSHA from imposing exposure control requirements sufficient to ensure that the chemical substance no longer presents a significant risk to workers. As described in that notice, while new advancements or developments in science and technology from the time a PEL is promulgated may improve the scientific basis for making findings of significant risk, technical feasibility or economic feasibility, OSHA has been unable to update most of the PELs established in 1971 and they remain frozen at levels at which they were initially adopted (79 FR 61384, October 10, 2014). One example of how industries have evolved in the intervening 50 years as to what is technologically and economically feasible is the halogenated solvent cleaning industry, which, in response to EPA's National Emission Standards for Hazardous Air Pollutants

(NESHAP) promulgated under Section 112 of the 1990 CAA Amendments (see National Emissions Standards for Halogenated Solvent Cleaning, 40 CFR part 63, subpart T), has made equipment improvements that conserve solvent resources and reduce workplace exposure.

In sum, the great majority of OSHA's chemical standards are outdated or do not sufficiently reduce risk to workers. While it is possible in some cases that the OSHA standards for some chemicals reviewed under TSCA will eliminate unreasonable risk, based on EPA's experience thus far in conducting occupational risk assessments under TSCA EPA believes that OSHA chemical standards would in general be unlikely to address unreasonable risk to workers within the meaning of TSCA, since TSCA section 6(b) unreasonable risk determinations may account for unreasonable risk to more sensitive endpoints and working populations than OSHA's risk evaluations typically contemplate, and EPA is obligated to apply TSCA section 6(a) risk management requirements to the extent necessary so that the unreasonable risk is no longer presented.

Because the requirements and application of TSCA and OSHA regulatory analyses differ, and because many of OSHA's chemical-specific standards are based on outdated information regarding the technological and economic feasibility of the standards and the risks associated with exposure, it is necessary for EPA to conduct risk evaluations and, where it finds unreasonable risk to workers, develop risk management requirements for chemical substances that OSHA also regulates, and it is expected that EPA's findings and requirements may sometimes diverge from OSHA's. However, it is also appropriate that EPA consider the chemical standards that OSHA has already developed to limit the compliance burden to employers by aligning management approaches required by the agencies, where alignment will adequately address unreasonable risk to workers. The following section discusses EPA's consideration of OSHA standards in its risk evaluation and management strategies under TSCA.

2. Consideration of OSHA standards in TSCA risk evaluations.

When characterizing the risk during risk evaluation under TSCA, EPA believes it is appropriate to evaluate the levels of risk present in scenarios where no mitigation measures are assumed to be in place for the purpose of determining unreasonable risk (see Unit II.C.2.a.). (It should be noted that there are some cases where scenarios may reflect certain mitigation measures, such as in instances where exposure estimates are based on monitoring data at facilities that have existing engineering controls in place. For example, the Chemical Manufacturing Area Sources NESHAP, last updated in 2012, requires that certain chemical manufacturing synthetic area sources that installed controls obtain a title V permit under the CAA, requiring sources to obtain and operate in compliance with an operating permit (40 CFR Part 63, Subpart VVVVVV) (77 FR 75740, December 21, 2012). Consequently, emissions monitoring from facilities meeting the NESHAP would reflect emissions reduction resulting from existing engineering controls already in place to meet the standards.) In addition, EPA believes it may be appropriate to also evaluate the levels of risk present in scenarios considering applicable OSHA requirements as well as scenarios considering industry or sector best practices for industrial hygiene that are clearly articulated to the Agency. EPA may evaluate risk under scenarios that consider industry or sector best practices for industrial hygiene that are clearly articulated to the Agency, when doing so serves to inform its risk management efforts. Characterizing risks using scenarios that reflect different levels of mitigation can help inform potential risk management actions by providing information that could be used during risk management to tailor risk mitigation appropriately to address any unreasonable risk identified (see Unit II.C.2.b. and Unit II.C.3.).

a. Risk characterization for unreasonable risk determination.

When making unreasonable risk determinations as informed by TSCA risk evaluations,

EPA cannot assume as a general matter that all workers are always equipped with and appropriately using sufficient PPE, although it does not question the veracity of public comments received on 2020 Risk Evaluation for Carbon Tetrachloride regarding the occupational safety practices often followed by industry respondents. When characterizing the risk to human health from occupational exposures during risk evaluation under TSCA, EPA believes it is appropriate to evaluate the levels of risk present in scenarios where PPE is not assumed to be used by workers. This approach of not assuming PPE use by workers considers the risk to PESS (workers and occupational non-users (ONUs)) who may not be covered by OSHA standards, such as self-employed individuals and public sector workers who are not covered by a State Plan. Mitigation scenarios included in the EPA risk evaluation in order to inform its risk management efforts (e.g., scenarios considering use of PPE) likely represent current practice in many facilities where companies effectively address worker and bystander safety requirements. However, the Agency cannot assume that all facilities across all uses of the chemical substance will have adopted these practices for the purposes of making the TSCA risk determination.

Therefore, EPA makes its determinations of unreasonable risk based on scenarios that do not assume compliance with OSHA standards, including any applicable exposure limits or requirements for use of respiratory protection or other PPE. Making unreasonable risk determinations based on such scenarios should not be viewed as an indication that EPA believes there are no occupational safety protections in place at any location, or that there is widespread noncompliance with applicable OSHA standards. Rather, it reflects EPA's recognition that unreasonable risk may exist for subpopulations of workers that may be highly exposed because they are not covered by OSHA standards, such as self-employed individuals and public sector workers who are not covered by an OSHA State Plan, or because their employer is out of compliance with OSHA standards, or because EPA finds unreasonable risk for purposes of

TSCA notwithstanding assumed compliance with existing OSHA requirements.

b. Risk evaluation to inform risk management requirements

In addition to the scenarios described previously, EPA risk evaluations may characterize the levels of risk present in scenarios considering applicable OSHA requirements (e.g., chemical-specific PELs and/or chemical-specific health standards with PELs and additional ancillary provisions) as well as scenarios considering industry or sector best practices for industrial hygiene that are clearly articulated to the Agency to help inform risk management decisions.

3. Consideration of OSHA standards in TSCA risk management actions.

When undertaking risk management actions, EPA: 1) develops occupational risk mitigation measures to address any unreasonable risk identified by EPA, striving for compatibility with applicable OSHA requirements and industry best practices, including appropriate application of the hierarchy of controls, when those measures would address an unreasonable risk; and 2) ensures that EPA requirements apply to all potentially exposed workers in accordance with TSCA requirements. Consistent with TSCA section 9(d), EPA consults and coordinates TSCA activities with OSHA and other relevant Federal agencies for the purpose of achieving the maximum applicability of TSCA while avoiding the imposition of duplicative requirements.

Informed by the mitigation scenarios and information gathered during the risk evaluation and risk management process, the Agency might propose rules to require risk management practices that may already be common practice in many or most facilities. Adopting clear, broadly applicable regulatory standards will foster compliance across all facilities (ensuring a level playing field) and ensure protections for all affected workers, especially in cases where current OSHA standards may not apply to them or not be sufficient to address the unreasonable risk.

For evaluation scenarios which involve OSHA chemical-specific PELs, EPA's risk evaluation in some cases may illustrate that limiting exposure to OSHA's PEL would result in acceptable levels of risk under TSCA under certain conditions of use. In these cases, TSCA risk management requirements could incorporate and reinforce requirements in OSHA standards and ensure that risks are addressed, including for circumstances where OSHA requirements are not applicable (e.g., public sector workers not covered by an OSHA State plan, and self-employed workers) by asserting TSCA compliance/enforcement as well. EPA's risk evaluation may also find unreasonable risk under TSCA associated with some occupational conditions of use, even when the applicable OSHA requirements are being met. In these cases, EPA would need to develop risk management requirements beyond those included in OSHA's standards.

4. Carbon Tetrachloride and OSHA requirements.

EPA incorporated the considerations described earlier in this unit in the 2020 Risk Evaluation (Ref. 1), the 2022 Revised Unreasonable Risk Determination (Ref. 3), and this rulemaking. Specifically, in the TSCA 2020 Risk Evaluation, EPA presented risk estimates based on workers' exposures with and without respiratory protection. Additional consideration of OSHA standards in the 2022 Revised Unreasonable Risk Determination is discussed further in the *Federal Register* document of December 27, 2022 (87 FR 79303) (FRL-9948-02-OCSP), announcing the availability of the Final Revised Unreasonable Risk Determination for Carbon Tetrachloride. In Unit III.B.4. and Unit V., EPA outlines the importance of considering the hierarchy of controls utilized by the industrial hygiene community (hereafter referred to as "hierarchy of controls") when developing risk management actions in general, and specifically when determining if and how regulated entities may meet a risk-based exposure limit for CTC. The hierarchy of controls includes: elimination of the hazard, substitution with a less hazardous substance, engineering controls, administrative controls such as training or exclusion zones with

warning signs, and, finally, use of PPE (Ref. 8). Under the hierarchy of controls, the use of respirators and dermal PPE should only be considered after all other steps have been taken to reduce exposures. As discussed in Units IV.A. and V.A.1., EPA's risk management approach would not rely solely or primarily on the use of respirators and dermal PPE to address unreasonable risk to workers; instead, EPA is proposing a WCPP for most conditions of use and prohibitions for certain uses. The WCPP would require consideration of the hierarchy of controls before use of respirators and other PPE. The WCPP is discussed in full in Units IV.A.1. and V.A.1.

In accordance with the approach described earlier in Unit II.C.3., EPA intends for this regulation to be as compatible as possible with the existing OSHA standards, with additional requirements as necessary to address the unreasonable risk. One notable difference between the WCPP and the OSHA standards are the exposure limits. This WCPP would include an Existing Chemical Exposure Limit (ECEL) of 0.03 ppm as an 8-hour TWA to address unreasonable risk for cancer and chronic toxicity for non-cancer effects. EPA recognizes that for CTC, the ECEL would be significantly lower than the 1971 OSHA PEL (10 ppm as an 8-hour TWA). In addition to the distinctions in statutory requirements described in this unit, EPA has identified several factors contributing to the differences in these levels, summarized here.

The TSCA ECEL value for CTC is a lower value than the OSHA PEL (and other existing occupational exposure limits (OELs), discussed in Unit II.C.5) for many reasons, including the age of the data and studies the values are based on and that the values may not fully capture either the complete database of studies considered in the 2020 Risk Evaluation for Carbon Tetrachloride or more recent advances in modeling and scientific interpretation of toxicological data applied in the calculation of the CTC ECEL, in particular CTC's carcinogenicity. EPA considers the CTC ECEL to represent the best available science under TSCA section 26(h),

because it was derived from information in the 2020 Risk Evaluation for Carbon Tetrachloride, which was subject to peer review, and was the result of a systematic review process that investigated the reasonably available information in order to identify relevant adverse health effects (Ref. 1). Additionally, by using the information from the 2020 Risk Evaluation for Carbon Tetrachloride, the ECEL incorporates advanced modeling and peer-reviewed methodologies, and accounts for exposures to potentially exposed and susceptible subpopulations, as required by TSCA. For example, the CTC ECEL is based on a study conducted in 2007, which was rated a high quality study during the systematic review process and was the principal study used to derive the IRIS reference concentration for liver effects (Ref. 1). The data from the 2007 study used to derive the IRIS reference concentration for liver effects for the CTC ECEL is more recent than the data OSHA had available when OSHA set the PEL for CTC in 1971. OSHA attempted to reduce the CTC PEL in 1989 from 10 ppm to 2 ppm after new data about CTC cancer risk became available, but, as explained later in this unit, the reduced CTC PEL was later vacated by court order.

For CTC, the EPA ECEL is an 8-hour occupational inhalation exposure limit based on liver cancer and takes into consideration the uncertainties identified in the 2020 Risk Evaluation for Carbon Tetrachloride (Ref. 9). The ECEL represents the concentration at which an adult human, including a member of a potentially exposed or susceptible subpopulation, would be unlikely to suffer adverse effects if exposed for a working lifetime. EPA has determined as a matter of risk management policy that ensuring exposures remain at or below the ECEL will eliminate any unreasonable risk of injury to health driven by inhalation exposures. In addition to the ECEL, as part of this rulemaking EPA is proposing an ECEL action level, a value based on two-thirds of the ECEL, that would trigger additional monitoring to ensure that workers are not exposed to concentrations above the ECEL.

For CTC, the ECEL of 0.03 ppm is based on the most sensitive point of departure (POD) across cancer, chronic non-cancer, and acute endpoints. EPA identified cancer PODs for inhalation exposures based on liver tumor effects observed in mice. The chronic PODs for inhalation exposures are based on a study observing increased fatty changes in rodent livers. As explained in the ECEL memo, the point of departure for liver cancer was the basis of the CTC ECEL. Additional information on the ECEL and how it was derived can be found in Unit IV.A.1.b.i. Overall, based on strong evidence in highly rated animal studies, the weight of the scientific evidence supported liver cancer effects following CTC exposure (Ref. 1). Monitoring data submitted via public comment by a trade association during the 2020 Risk Evaluation for Carbon Tetrachloride indicating exposures near or below the ECEL supports EPA's confidence that meeting the ECEL is feasible for facilities engaging in the use of CTC (Ref. 10).

The OSHA PEL for CTC of 10 ppm as an 8-hour TWA was established in 1971 (29 CFR 1910.1000 Table Z-2). OSHA is required to promulgate a standard that reduces significant risk to the extent that it is technologically and economically feasible to do so (Ref. 7). A 1989 update to 2 ppm based on a quantitative cancer risk assessment—a level at which “residual risk continues to be significant,” according to OSHA's 1989 final rule preamble—was later vacated by court order, reverting to the original PEL of 10 ppm, because the court found OSHA had not made sufficiently detailed findings that the new PEL would eliminate significant risk and would be feasible in each industry in which the chemical was used (see 54 FR 2332, 2679 through 2681 ; *AFL-CIO v. OSHA*, 965 F.2d 962 (11th Cir. 1992)). Most original PELs were based on acute health effects only observable at higher concentrations as more sensitive chronic studies, including the chronic exposure studies used to inform the CTC ECEL, were not available at the time the PEL was established (see, e.g., 79 FR 61383, 61388). As discussed in Units IV.A.1.b.i. and VII.D., the TSCA ECEL represents the best available science at the time of publication of

the 2020 Risk Evaluation for CTC. As described earlier, in a 2014 request for information OSHA described how, while new developments in science and technology from the time the PEL for CTC was established in 1971 may improve the scientific basis for making findings of significant risk, technical feasibility, or economic feasibility as required under section 6(b)(5) of the OSH Act, OSHA has been unable to update the PEL for CTC and it remains at the level that was originally adopted in 1971 (79 FR 61383, October 10, 2014).

5. Carbon tetrachloride and other occupational exposure limits

EPA is aware of other occupational exposure recommendations or limits for CTC, including the ACGIH TLV, the California Division of Occupational Safety and Health (Cal/OSHA) PEL, and the National Institute for Occupational Safety and Health (NIOSH) Recommended Exposure Limit (REL).

a. ACGIH TLV.

The 1996 ACGIH TLV is 5 ppm (Ref. 11). This 8-hour TWA TLV recommended by the ACGIH in 1996 has a different endpoint than the CTC ECEL and instead of being based on the 2007 study indicating a liver cancer endpoint is based on broad liver toxicity that was observed in several earlier studies in rodents, primates, and humans exposed to CTC concentrations of 10 ppm and above. Additionally, a PBPK model used by ACGIH to develop a Short-Term Exposure Limit (STEL) TLV indicated that acute exposure at 10 ppm results in equivalent liver metabolism as a chronic occupational exposure at 5 ppm, which results in a much lower liver concentration than the level that caused toxicity in rats. Therefore, ACGIH recommended an 8-hour TWA TLV of 5 ppm as long as the 15-minute STEL did not exceed 10 ppm. However, even ACGIH's TLV report acknowledges that the 5 ppm value is not protective of susceptible subpopulations, and there were no uncertainty factors assigned to account for inter- or intra-species variability (Ref. 11). Additionally, while ACGIH designated CTC as a suspected human

carcinogen in 2001 based on a threshold mode of action, it did not update its 1996 TLV to derive a TLV based on cancer.

b. *NIOSH REL.*

The 1975 NIOSH REL for CTC is 2 ppm was originally based on systemic effects and local effects on the skin and eyes. The 1975 NIOSH REL for CTC was a 10-hour TWA in a 40-hour work week (Ref. 12). In 1989, as part of a joint project with OSHA, NIOSH changed the 10-hour TWA to a 60-minute STEL and added the Ca designation (potential occupational carcinogen). In general, RELs that are set as STELs or ceilings instead of 8- or 10-hour TWAs are typically based on concern for acute health effects, but in the case of CTC, NIOSH also recognized its carcinogenicity.

c. *Cal/OSHA PEL.*

Generally, Cal/OSHA updates its PELs every other year. The Cal/OSHA PEL is 2 ppm, lower than the 1971 OSHA PEL of 10 ppm, and equivalent to the NIOSH REL and the vacated 1989 OSHA PEL, which was based on a quantitative cancer risk assessment but was acknowledged by OSHA to leave significant residual risk. Despite the Cal/OSHA PEL being equivalent to the vacated 1989 OSHA PEL based on cancer, Cal/OSHA did not perform a quantitative cancer risk assessment, and the Cal/OSHA PEL cites the 1989 NIOSH 60-min STEL.

D. Summary of EPA's Risk Evaluation Activities on Carbon Tetrachloride

In December 2016, EPA selected CTC as one of the first 10 chemicals for risk evaluation under TSCA section 6. EPA published the Scope of the Risk Evaluation for Carbon Tetrachloride in July 2017 (82 FR 31592, July 7, 2017) (FRL-9963-57), and, after receiving public comments, published the problem formulation in June 2018 (83 FR 26998, June 11, 2018) (FRL-9978-40). In January 2020, EPA published a draft risk evaluation (85 FR 4658, January

27, 2020) (FRL-10003-92), and, after public comment and peer review by the Science Advisory Committee on Chemicals (SACC), EPA issued the Risk Evaluation for Carbon Tetrachloride in November 2020 in accordance with TSCA section 6(b) (Ref. 1) (85 FR 70147, November 4, 2020) (FRL-10015-51). EPA subsequently issued a Draft Revised Unreasonable Risk Determination for Carbon Tetrachloride in August 2022 (87 FR 52766, August 29, 2022) (FRL-9948-01-OCSPP), and, after public notice and receipt of comments, published a Revised Unreasonable Risk Determination for Carbon Tetrachloride in December 2022 (Ref. 3) (87 FR 79303, December 27, 2022) (FRL-9948-02-OCSPP). The 2020 Risk Evaluation for Carbon Tetrachloride and supplemental materials are in docket ID No. EPA-HQ-OPPT-2019-0499, and the 2022 Revised Unreasonable Risk Determination for Carbon Tetrachloride and additional materials supporting the risk evaluation process in docket ID No. EPA-HQ-OPPT-2016-0733.

1. 2020 Risk Evaluation.

In the 2020 Risk Evaluation for Carbon Tetrachloride (Ref. 1), EPA evaluated risks associated with 15 conditions of use within the following categories: manufacture (including import), processing, distribution in commerce, industrial and commercial use, and disposal. Descriptions of the conditions of use that drive unreasonable risk are in Unit III.B.1. The 2020 Risk Evaluation for Carbon Tetrachloride identified significant adverse health effects associated with short-term and long-term exposure to CTC, specifically cancer and liver toxicity from chronic inhalation and dermal exposures. Additional risks associated with liver toxicity and central nervous system effects were identified for acute inhalation exposures. A further discussion of the unreasonable risk of CTC is in Unit III.B.3.

2. 2022 Revised Unreasonable Risk Determination.

EPA has been revisiting specific aspects of its first ten TSCA existing chemical risk evaluations, including the 2020 Risk Evaluation for Carbon Tetrachloride, to ensure that the risk

evaluations upon which risk management decisions are made better align with TSCA's objective of protecting health and the environment. For CTC, EPA revised the original unreasonable risk determination based on the 2020 Risk Evaluation for Carbon Tetrachloride and issued a final Revised Unreasonable Risk Determination for Carbon Tetrachloride in December 2022 (Ref. 3). EPA revised the risk determination for the 2020 Risk Evaluation for Carbon Tetrachloride pursuant to TSCA section 6(b) and Executive Order 13990, "Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis," and other Administration priorities (Ref. 3). The revisions consisted of making the risk determination for the whole chemical substance rather than for individual conditions of use (which resulted in the revised risk determination superseding the prior "no unreasonable risk" determinations and the withdrawal of the associated TSCA section 6(i)(1) "no unreasonable risk" order); and clarifying that the risk determination does not reflect an assumption that all workers are always provided and appropriately wear PPE (Ref. 3).

In determining whether CTC presents unreasonable risk under the conditions of use, EPA considered relevant risk-related factors, including, but not limited to: the effects of the chemical substance on health (including cancer and non-cancer risks) and human exposure to the substance under the conditions of use (including duration, magnitude and frequency of exposure); the effects of the chemical substance on the environment and environmental exposure under the conditions of use; the population exposed (including any potentially exposed or susceptible subpopulations); the severity of hazard (including the nature of the hazard, the irreversibility of the hazard); and uncertainties, including the strengths, and limitations associated with the information used to calculate the risk estimates.

EPA determined that CTC presents an unreasonable risk of injury to health. This unreasonable risk determination is driven by risks to workers and ONUs (workers who do not

directly handle the chemical but perform work in an area where the chemical is present). EPA did not identify risks of injury to the environment that drive the unreasonable risk determination for CTC (Ref. 1). The CTC conditions of use that drive EPA's determination that the chemical substance poses unreasonable risk to health are listed in the unreasonable risk determination (Ref. 3) and in Unit III.B.1., with descriptions to aid chemical manufacturers, processors, and users in determining how their particular use or activity would be impacted by the proposed regulatory provisions. The conditions of use that do not drive the unreasonable risk for CTC (distribution in commerce and processing as a reactant/intermediate in reactive ion etching) are also listed in the unreasonable risk determination (Ref. 3) and in Unit III.B.2. EPA's proposed regulatory action and primary alternative regulatory action include prohibitions on the distribution in commerce of CTC for certain downstream uses, but do not include any restrictions for the processing as a reactant/intermediate in reactive ion etching.

3. Fenceline Screening Analysis.

The 2020 Risk Evaluation for Carbon Tetrachloride excluded the assessment of certain exposure pathways that were or could be regulated under another EPA-administered statute (see Section 1.4.3 of the 2020 Risk Evaluation for Carbon Tetrachloride) (Refs. 1 and 3). This resulted in the surface water, drinking water, and ambient air pathways for CTC exposure not being assessed for human health risk to the general population. In June 2021, EPA made a policy announcement on the path forward for TSCA chemical risk evaluations, indicating that EPA would, among other things, examine whether the exclusion of certain exposure pathways from the risk evaluations could lead to a failure to identify and protect fenceline communities (Ref. 13). EPA then conducted a screening analysis to identify where there may be potential risks to people living near the fenceline of facilities releasing CTC.

In order to assess the potential risk to the general population in proximity to a facility

releasing CTC, EPA developed the TSCA Screening Level Approach for Assessing Ambient Air and Water Exposures to Fenceline Communities Version 1.0, which was presented to the SACC in March 2022, with a report issued by the SACC on May 18, 2022 (Ref. 14). This analysis and a follow up screening level analysis to consider SACC feedback are discussed in Unit VI.A.

III. Regulatory Approach

A. Background

Under TSCA section 6(a), if the Administrator determines through a TSCA section 6(b) risk evaluation that the manufacture (including import), processing, distribution in commerce, use, or disposal of a chemical substance or mixture, or any combination of such activities, presents an unreasonable risk of injury to health or the environment, EPA must by rule apply one or more of the following requirements to the extent necessary so that the chemical substance or mixture no longer presents such risk.

- Prohibit or otherwise restrict the manufacturing, processing, or distribution in commerce of the substance or mixture, or limit the amount of such substance or mixture which may be manufactured, processed, or distributed in commerce (TSCA section 6(a)(1)).
- Prohibit or otherwise restrict the manufacturing, processing, or distribution in commerce of the substance or mixture for a particular use or above a specific concentration for a particular use (TSCA section 6(a)(2)).
- Limit the amount of the substance or mixture which may be manufactured, processed, or distributed in commerce for a particular use or above a specific concentration for a particular use specified (TSCA section 6(a)(2)).
- Require clear and adequate minimum warnings and instructions with respect to the substance or mixture's use, distribution in commerce, or disposal, or any combination of those activities, to be marked on or accompanying the substance or mixture (TSCA section 6(a)(3)).

- Require manufacturers and processors of the substance or mixture to make and retain certain records, or conduct certain monitoring or testing (TSCA section 6(a)(4)).
- Prohibit or otherwise regulate any manner or method of commercial use of the substance or mixture (TSCA section 6(a)(5)).
- Prohibit or otherwise regulate any manner or method of disposal of the substance or mixture, or any article containing such substance or mixture, by its manufacturer or processor or by any person who uses or disposes of it for commercial purposes (TSCA section 6(a)(6)).
- Direct manufacturers or processors of the substance or mixture to give notice of the unreasonable risk determination to distributors, certain other persons, and the public, and to replace or repurchase the substance or mixture (TSCA section 6(a)(7)).

As described in Unit III.B.4, EPA assessed how the TSCA section 6(a) requirements could be applied to address the unreasonable risk identified in the 2020 Risk Evaluation for Carbon Tetrachloride and the final revised unreasonable risk determination, so that CTC no longer presents such unreasonable risk. EPA's proposed regulatory action and a primary alternative regulatory action are described in Unit IV. EPA is requesting public comment on all elements of the proposed regulatory action and the primary alternative regulatory action and is providing notice that based on consideration of comments and any new information submitted to EPA during the comment period on this proposed rule, EPA may in the final rule modify elements of the proposed regulatory action. The public should understand that the Agency's consideration of public comments could result in changes to elements of the proposed and alternative regulatory actions when this rule is finalized. For example, elements such as timelines for implementation could be lengthened or shortened, ECELs could be modified, or the WCPP could have conditions added or eliminated.

Under the authority of TSCA section 6(g), EPA may consider granting a time-limited

exemption from a requirement of a TSCA section 6(a) rule for a specific condition of use if EPA finds that: 1) The specific condition of use is a critical or essential use for which no technically and economically feasible, safer alternative is available, taking into consideration hazard and exposure; 2) compliance with the requirement, as applied with respect to the specific condition of use, would significantly disrupt the national economy, national security, or critical infrastructure; or 3) the specific condition of use of the chemical substance, as compared to reasonably available alternatives, provides a substantial benefit to health, the environment, or public safety. Based on reasonably available information, EPA has analyzed the need for an exemption and is not proposing to grant an exemption from the rule requirements at this time. EPA is requesting public comment regarding the need for exemptions from the rule (and under what specific circumstances) pursuant to the provisions of TSCA section 6(g). Based on information submitted to EPA during the comment period on this proposed rule, EPA may issue a supplemental notice proposing an exemption under TSCA section 6(g). EPA is also requesting comment on, in lieu of proposing a 6(g) exemption in a separate regulatory action, whether any elements of the primary alternative regulatory action should be considered in combination with elements of the proposed regulatory action as EPA develops the final regulatory action.

TSCA section 6(c)(2)(C) requires that, in deciding whether to prohibit or restrict in a manner that substantially prevents a specific condition of use and in setting an appropriate transition period for such action, EPA consider, to the extent practicable, whether technically and economically feasible alternatives that benefit health or the environment will be reasonably available as a substitute when the proposed prohibition or restriction takes effect. Unit V.B. includes more information regarding EPA's consideration of alternatives, and Unit VI. provides more information on EPA's considerations more broadly under TSCA section 6(c)(2).

EPA carried out required consultations as described in this unit and also considered

impacts on children's environmental health as part of its approach to developing this TSCA section 6 regulatory action.

1. Consultations.

EPA conducted consultations and outreach as part of development of this proposed regulatory action. The Agency held a federalism consultation from December 17, 2020, until February 17, 2021, as part of this rulemaking process and pursuant to Executive Order 13132 (see description in Unit X.E.). During the consultation, EPA met with State and local officials early in the process of developing the proposed action in order to receive meaningful and timely input into its development (Ref. 15). During the consultation, participants and EPA discussed preemption, EPA's authority under TSCA section 6 to regulate identified unreasonable risk, and what activities would be potentially regulated in the proposed rule, and the relationship between TSCA and existing statutes (Ref. 15). EPA received no written comments as part of this consultation.

CTC is not manufactured (including imported), processed, distributed in commerce, or regulated by Tribal governments. However, EPA consulted with Tribal officials during the development of this proposed action (Ref. 16). The Agency held a Tribal consultation from December 7, 2020, through March 12, 2021, with meetings held on January 6 and 12, 2021. Tribal officials were given the opportunity to meaningfully interact with EPA risk managers concerning the status of risk management. During the consultation, EPA discussed risk management under TSCA section 6(a), findings from the 2020 Risk Evaluation for Carbon Tetrachloride, types of information that would be helpful to inform risk management, principles for transparency during the risk management process, and types of information EPA is seeking from Tribes (Ref. 16). EPA received no written comments as part of this consultation.

In addition to the formal consultations, EPA also conducted outreach to advocates for

communities that might be subject to disproportionate exposure to CTC, such as minority populations, low-income populations, and indigenous peoples. EPA's Environmental Justice (EJ) consultation occurred from February 2, 2021, through April 2, 2021 (Ref. 17). On February 2 and 18, 2021, EPA held public meetings as part of this consultation. These meetings were held pursuant to and in compliance with Executive Orders 12898 and 14008. EPA received one written comment following the EJ meeting, in addition to oral comments provided during the consultation (Ref. 17). Commenters supported strong regulation of CTC to protect lower-income communities and workers. In addition, commenters recommended EPA conduct analysis of additional exposure pathways, including air and water.

Units X.C., X.E., X.F. and X.J. provide more information regarding the consultations.

2. Other stakeholder consultations.

In addition to the formal consultations described in Unit X., EPA attended a Small Business Administration (SBA) Roundtable on December 4, 2020, and held a public webinar on December 10, 2020. At both events EPA staff provided an overview of the TSCA risk management process and the findings in the 2020 Risk Evaluation for Carbon Tetrachloride (Ref. 1). Attendees of these meetings were given an opportunity to voice their concerns on both the risk evaluation and risk management.

Furthermore, EPA has engaged in discussions with representatives from different industries, non-governmental organizations, technical experts, and users of CTC. A list of external meetings held during the development of this proposed rule is in the docket (Ref. 18); meeting materials and summaries are also in the docket. The purpose of these discussions was to hear from users, academics, manufacturers, and members of the public health community about practices related to industrial and commercial uses of CTC; public health impacts of CTC; the importance of CTC in the various uses subject to this proposed rule; frequently used substitute

chemicals or alternative methods; engineering control measures and personal protective equipment currently in use or feasibly adoptable; and other risk-reduction approaches that may have already been adopted or considered for industrial or commercial uses.

3. Children's environmental health.

The Agency's 2021 Policy on Children's Health (Ref. 19) requires EPA to protect children from environmental exposures by consistently and explicitly considering early life exposures (from conception, infancy, early childhood and through adolescence until 21 years of age) and lifelong health in all human health decisions through identifying and integrating children's health data and information when conducting risk assessments. TSCA section 6(b)(4)(A) also requires EPA to conduct risk evaluations "to determine whether a chemical substance presents an unreasonable risk of injury to health or the environment . . . including an unreasonable risk to a potentially exposed or susceptible subpopulation identified as relevant to the risk evaluation by the Administrator, under the conditions of use." Infants, children, and pregnant women are listed as examples of subpopulations that may be considered relevant "potentially exposed or susceptible subpopulations" in the TSCA section 3(12) definition of that term. In addition, TSCA section 6(a) requires EPA to apply one or more risk management requirements under TSCA section 6(a) so that CTC no longer presents an unreasonable risk (including unreasonable risk to PESS).

The 2020 Risk Evaluation for Carbon Tetrachloride considered impacts on workers ages 17 and older from occupational use from inhalation and dermal exposures, as applicable. The risk evaluation considered males (>16 years of age) and females of reproductive age (>16 years of age) for both dermal and inhalation exposures. While risks to children (workers 17 through 20 years of age) are not disproportionate, effects observed in studies include cancer and liver toxicity from chronic inhalation and dermal exposures and central nervous system impairment

from acute inhalation exposure. The risks identified would be addressed by both the proposed regulatory action and primary alternative action described in Unit IV.

B. Regulatory Assessment of Carbon Tetrachloride

1. Description of conditions of use that drive the unreasonable risk.

This unit describes the TSCA conditions of use that drive EPA's unreasonable risk determination for the chemical substance CTC. Condition of use descriptions were obtained from EPA sources such as the 2020 Risk Evaluation for Carbon Tetrachloride and related documents, and include clarifications based on the CDR use codes, as well as the Organisation for Economic Co-operation and Development (OECD) harmonized use codes and feedback from stakeholders regarding how they describe their uses. For additional description of the conditions of use, including process descriptions and worker activities considered in the risk evaluation, see the Problem Formulation of the 2020 Risk Evaluation for Carbon Tetrachloride, the 2020 Risk Evaluation for Carbon Tetrachloride, and supplemental files (Refs. 1 and 20). EPA acknowledges that some of the terms used in this unit may also be defined under other statutes; however, the descriptions in this unit are intended to provide clarity to the regulated entities subject to the provisions of this rule under TSCA section 6(a).

a. Manufacturing.

i. Domestic manufacture.

This condition of use refers to making or producing a chemical substance within the United States (including manufacturing for export), including the extraction of a component chemical substance from a previously existing chemical substance or a complex combination of substances. For purposes of this proposed rule, this condition of use does not include CTC generated as a byproduct, which was not evaluated in the 2020 Risk Evaluation for Carbon Tetrachloride (Ref. 1). As explained in Section 1.4.2.3 of the 2020 Risk Evaluation for Carbon

Tetrachloride, EPA anticipates that any risks presented by the presence of CTC generated as byproduct during the manufacture of 1,2-dichloroethane is being assessed in the risk evaluation for 1,2-dichloroethane (Ref. 21).

ii. *Import.*

Import refers to the act of causing a chemical substance or mixture to arrive within the customs territory of the United States. This condition of use includes loading/unloading and repackaging associated with import.

b. *Processing.*

i. *Processing as a reactant in the production of hydrochlorofluorocarbon, hydrofluorocarbon, hydrofluoroolefin, and perchloroethylene.*

CTC serves as a feedstock in the production of another chemical product via a chemical reaction in which CTC is consumed. Currently, CTC is used as a reactant to manufacture HCFCs, HFCs, HFOs, and PCE, which are used in the making of a variety of products including refrigerants, aerosol propellants, and foam-blowing agents. The specifics of the reaction process (e.g., use and types of catalysts, reaction temperature) vary depending on the product being produced; however, a typical reaction process involves unloading CTC from containers and feeding into the reaction vessel(s), where CTC either completely or partially reacts with other raw materials to form the final product. Following the reaction, the product may be purified to remove unreacted CTC or other materials if needed.

ii. *Processing: Incorporation into formulation, mixtures, or reaction products (petrochemicals-derived manufacturing; agricultural products manufacturing; other basic organic and inorganic chemical manufacturing).*

Incorporation into formulation, mixture, or reaction products refers to the process of mixing or blending several raw materials to obtain a single product or preparation or

formulation. CTC is incorporated into hydrochloric acid (HCl), vinyl chloride, ethylene dichloride (EDC), chloroform, hafnium tetrachloride, thiophosgene, and methylene chloride. CTC may be incorporated into various products and formulations at varying concentrations for further distribution. For example, CTC may be unloaded from transport containers either directly into mixing equipment or into an intermediate storage vessel either manually or through automation via a pumping system. Mixing of components can occur in either a batch or continuous system. The mixture that contains CTC may be used as a reactant to manufacture a chlorinated compound that is subsequently formulated into a product or a processing aid used to aid in the manufacture of formulated products, including agricultural chemicals, petrochemicals-derived products, and any other basic organic and inorganic chemical manufacturing.

iii. *Processing: Repackaging for use as a laboratory chemical.*

Repackaging means the physical transfer of a chemical substance or mixture, as is, from one container to another container or containers in preparation for distribution of the chemical substance or mixture in commerce. Depending on the product, formulation products may be filtered prior to packaging. Final packaging occurs either through manual dispensing from transfer lines or through utilization of an automatic system. Typically, repackaging sites receive the chemical in bulk containers and transfer the chemical from the bulk container into another smaller container in preparation for distribution in commerce.

iv. *Processing: Recycling.*

This condition of use refers to the process of treating generated spent chemical (which would otherwise be disposed of as waste) that is collected on-site or transported to third-party sites for reclamation/recycling. Certain spent chemicals, such as CTC, can be restored to a condition that permits reuse via reclamation/recycling. The reclamation/recycling process involves an initial vapor recovery (e.g., condensation, adsorption, and absorption) or mechanical

separation step (e.g., decanting, filtering, draining, settling and centrifuging) followed by distillation, purification, and final packaging.

c. Industrial and commercial use.

i. Industrial and commercial use as an industrial processing aid in the manufacture of petrochemical-derived products and agricultural products.

A processing aid is a “chemical that is added to a reaction mixture to aid in the manufacture or synthesis of another chemical substance but is not intended to remain in or become part of the product or product mixture.” Additionally, processing agents are intended to improve the processing characteristics or the operation of process equipment, but not intended to affect the function of a substance or article created. CTC is used as a processing aid/agent to aid in the manufacture of formulated products, including agricultural chemicals and petrochemical-derived products. The condition of use includes the use of CTC as a process agent in the manufacture of chlorosulphonated polyolefin; the use of CTC in the manufacture of styrene butadiene rubber; the use of CTC in the manufacture of endosulfan (insecticide); the use of CTC in the manufacture of 1-1 Bis (4-chlorophenyl) 2,2,2-trichloroethanol (dicofol insecticide); and the use of CTC in the production of tralomethrin (insecticide) (Ref. 1).

ii. Industrial and commercial use in the manufacture of other basic chemicals (including chlorinated compounds used in solvents, adhesives, asphalt, paints and coatings, and elimination of nitrogen trichloride in the production of chlorine and caustic soda).

In addition to the other industrial and commercial uses for CTC outlined in this unit, CTC is used as a processing aid/agent in basic organic and inorganic chemical manufacturing. CTC may be used as a processing agent in the manufacturing of chlorinated compounds that are subsequently used in the formulation of solvents, adhesives, asphalt, and paints and coatings; in the manufacturing of chlorinated paraffins (e.g., plasticizer in rubber, paints, adhesives, sealants,

plastics), and chlorinated rubber (e.g., additive in paints, adhesives); and in the manufacturing of inorganic chlorinated compounds, such as in the production of chlorine and caustic soda and the recovery of chlorine in tail gas from the production of chlorine.

iii. Industrial and commercial use in metal recovery.

CTC is used as a processing aid or agent to aid in metal recovery.

iv. Industrial and commercial use as an additive.

Additives are chemicals combined with a chemical product to enhance the properties of the product. Additives typically stay mixed within the finished product and remain unreacted. The risk evaluation examined the use of CTC as an additive for the manufacture of petrochemical-derived products and agricultural products. CTC is used as an additive in fuel and in plastic components used in the automotive industry.

v. Industrial and commercial use in specialty uses by the U.S. Department of Defense.

During the risk evaluation, DoD provided monitoring data for CTC uses in various processes that include worker activities such as cleaning and sampling residual metal and ash; destruction of munitions and storage of resulting liquid waste; and sampling of energetics with solvent.

vi. Industrial and commercial use as a laboratory chemical.

For laboratory uses, CTC is typically received in small containers and used in small quantities on a laboratory bench in a fume cupboard or hood. After use, waste CTC is collected and disposed or recycled.

After the risk evaluation was published, DoD did further analysis and provided additional information clarifying their current use of CTC as a laboratory chemical and risk management measures implemented. DoD provided information on their use of CTC as a laboratory chemical in chemical weapons destruction, indicating that CTC is used in small amounts in a confined,

laboratory-like setting with advanced engineering controls. There is no waste CTC generated during this process.

d. Disposal.

This condition of use refers to the process of disposing generated wasted streams from each of the conditions of use of CTC, that are collected and transported to third-party sites, such as waste incineration sites, for disposal.

e. Terminology in this proposed rule.

For the purposes of this proposed rulemaking, “occupational conditions of use” refers to the TSCA conditions of use described in Units III.B.1.a. through d. Although EPA identified both industrial and commercial uses in the 2020 Risk Evaluation for Carbon Tetrachloride for purposes of distinguishing exposure scenarios, the Agency clarified then and clarifies now that EPA interprets the authority over “any manner or method of commercial use” under TSCA section 6(a)(5) to reach both. In the 2020 Risk Evaluation for Carbon Tetrachloride, EPA identified and assessed all known, intended, and reasonably foreseen uses of CTC.

EPA is not proposing to incorporate the descriptions of known, intended or reasonably foreseen conditions of uses of CTC presented in Unit III.B.1.a. through d. into the regulatory text as definitions because these conditions of use represent those evaluated in the 2020 Risk Evaluation for Carbon Tetrachloride. EPA requests comment on whether EPA should promulgate definitions for those conditions of use evaluated in the 2020 Risk Evaluation for Carbon Tetrachloride, and, if so, whether the descriptions in this unit are consistent with the conditions of use evaluated in the 2020 Risk Evaluation for Carbon Tetrachloride and whether they provide a sufficient level of detail to improve the clarity and readability of the regulation if EPA were to promulgate a regulation that contains a list of all prohibited or otherwise regulated industrial and commercial conditions of use.

EPA further notes that this proposed rule does not apply to any substance excluded from the definition of “chemical substance” under TSCA section 3(2)(B)(ii) through (vi). Those exclusions include, but are not limited to, any pesticide (as defined by the Federal Insecticide, Fungicide, and Rodenticide Act) when manufactured, processed, or distributed in commerce for use as a pesticide; and any food, food additive, drug, cosmetic, or device, as defined in section 201 of the Federal Food, Drug, and Cosmetic Act (FFDCA), when manufactured, processed, or distributed in commerce for use as a food, food additive, drug, cosmetic or device. EPA did not identify any use of CTC that falls under the authority of the Federal Insecticide, Fungicide, and Rodenticide Act or the Federal Food, Drug, and Cosmetic Act (FFDCA).

2. Description of conditions of use that do not drive the unreasonable risk.

As described in the 2020 Risk Evaluation for Carbon Tetrachloride (Ref. 1) and the 2022 Revised Unreasonable Risk Determination for Carbon Tetrachloride (Ref. 3), two conditions of use of CTC do not drive the unreasonable risk determination: distribution in commerce; and processing as a reactant/intermediate in reactive ion etching, which is a microfabrication technique used in miniature electronic component manufacturing that involves using ion bombardment and reactive gas, such as small quantities of CTC, to selectively etch wafers.

As outlined in Unit II.D.2., EPA revised the risk determination for the 2020 Risk Evaluation for Carbon Tetrachloride pursuant to TSCA section 6(b) and consistent with Executive Order 13990 and other Administration priorities (Ref. 3). The 2022 Revised Risk Determination for Carbon Tetrachloride is based on the whole chemical substance instead of individual conditions of use. Consistent with the statutory requirements of TSCA section 6(a), EPA is proposing risk management regulatory action to the extent necessary so that CTC no longer presents an unreasonable risk. EPA’s proposed risk management action focuses primarily on the conditions of use that drive the unreasonable risk (described in Unit III.B.1). However, it

should be noted that, under TSCA section 6(a), EPA is not limited to regulating the specific activities found to drive unreasonable risk and may select from among a suite of risk management requirements in TSCA section 6(a) related to manufacture (including import), processing, distribution in commerce, commercial use, and disposal as part of its regulatory options to address the unreasonable risk. EPA's proposed regulatory action and primary alternative regulatory action, described in Unit IV.A and Unit IV.B., include prohibitions on the distribution in commerce of CTC for certain downstream conditions of use, but do not include any restrictions for the processing of CTC as a reactant/intermediate in reactive ion etching.

3. Description of unreasonable risk under the conditions of use.

EPA has determined that CTC presents an unreasonable risk of injury to human health under the conditions of use based on cancer and acute and chronic toxicity for non-cancer effects. As described in the 2020 Risk Evaluation for Carbon Tetrachloride and the July 2022 errata memorandum correcting risk estimates for acute dermal exposures, EPA identified cancer and liver toxicity adverse effects from chronic inhalation and dermal exposures as well as liver toxicity from acute dermal exposures to CTC (Refs. 1, 2, and 3). Cancer adverse effects (e.g., liver, pheochromocytoma, neuroblastoma) were identified for chronic inhalation and dermal exposures. In the 2020 Risk Evaluation for Carbon Tetrachloride, EPA presented two approaches for the assessment of carcinogenic risk from CTC: a linear extrapolation approach for adrenal gland and brain tumors in conjunction with a threshold approach for assessing risks for liver tumors. The approaches are based on conclusions on the mode of action for the different cancer tumors evaluated. The threshold approach used for the risk calculations for the POD for liver cancer were recommended during the peer review by the Science Advisory Committee on Chemicals (SACC). For chronic and acute non-cancer inhalation exposure scenarios to CTC, liver toxicity due to fatty change in the liver was indicative of cellular damage and selected as

the most sensitive non-cancer endpoint. However, EPA also identified additional risks associated with other adverse effects (e.g., immediate and temporary depression of the central nervous system, kidney toxicity, reproductive and developmental toxicity, irritation and sensitization, and genetic toxicity) resulting from acute and chronic exposures (Ref. 1). By targeting liver cancer for risk management, EPA's action will also eliminate the acute, chronic non-cancer, and additional cancer risks from CTC (Ref. 9). Unit VI.A. summarizes the health effects and the magnitude of the exposures.

To make the unreasonable risk determination for CTC, EPA evaluated exposures to human receptors including workers and occupational non-users (ONUs) using reasonably available monitoring and modeling data for inhalation and dermal exposures. EPA did not evaluate risks to consumers or bystanders to consumer use because the CPSC banned the use of CTC in consumer products (excluding unavoidable residues not exceeding 10 ppm atmospheric concentration) in 1970. After the 2020 Risk Evaluation for Carbon Tetrachloride was completed, EPA conducted a screening level analysis to assess potential risks from the air and water pathways to fenceline communities. A discussion of EPA's analysis and the expected effects of this rulemaking on fenceline communities is in Unit VI.A.

For the 2020 Risk Evaluation for Carbon Tetrachloride, EPA considered PESS and identified groups of individuals with greater exposure to CTC relative to the general population, including: 1) workers of either gender (>16 years old), including pregnant women, and 2) individual workers who do not use CTC but may be indirectly exposed due to their proximity to the user who is directly handling CTC (ONUs) (Ref. 1). All PESS are included in the quantitative and qualitative analyses described in the 2020 Risk Evaluation for Carbon Tetrachloride and were considered in the determination of unreasonable risk for CTC. As discussed in Unit II.D and Unit VI.A., the 2020 Risk Evaluation for Carbon Tetrachloride

excluded the air and water exposure pathways to the general population from the published risk evaluation and may have caused some risks to be unaccounted for in the risk evaluation. EPA considers people in the vicinity of facilities releasing CTC and exposed to CTC through ambient air and drinking or surface water pathways to constitute a subset of the general population and categorizes them as fenceline communities; they may also be considered PESS. See Unit VI.A. for further discussion on assessing risk to fenceline communities.

4. Description of TSCA section 6 requirements for risk management.

EPA considered the TSCA section 6(a) requirements (listed in Unit III.A.) to identify which ones have the potential to eliminate the unreasonable risk for CTC.

As required under TSCA, EPA developed a proposed regulatory action and one primary alternative regulatory action, which are described in Units IV.A. and IV.B., respectively. To identify and select a regulatory action, EPA considered the two routes of exposure driving the unreasonable risk, inhalation and dermal, and the exposed populations. For occupational conditions of use (see Unit III.B.1.), EPA considered how it could directly regulate manufacturing (including import), processing, distribution in commerce, industrial and commercial use, or disposal to address the unreasonable risk.

As required by TSCA section 6(c)(2), EPA considered several factors, in addition to identified unreasonable risk, when selecting among possible TSCA section 6(a) requirements. To the extent practicable, EPA factored into its decisions: (i) The effects of CTC on health and the magnitude of exposure of human beings to CTC, (ii) the effects of CTC on the environment and the magnitude of exposure of the environment to CTC, (iii) the benefits of CTC for various uses, and (iv) the reasonably ascertainable economic consequences of the rule. In evaluating the reasonably ascertainable economic consequences of the rule, EPA considered: i) The likely effect of the rule on the national economy, small business, technological innovation, the

environment, and public health, ii) the costs and benefits of the proposed regulatory action and of the primary alternative regulatory action considered, and iii) the cost effectiveness of the proposed regulatory action and of the primary alternative regulatory action considered. See Unit VI. for further discussion related to TSCA section 6(c)(2)(A) considerations, including the statement of effects of the proposed rule with respect to these considerations.

EPA also considered the regulatory authorities under statutes administered by other agencies such as OSHA's implementation of the OSH Act, as well as other EPA-administered statutes to examine: (1) whether there are opportunities for all or part of this risk management action to be addressed under other statutes, such that a referral may be warranted under TSCA sections 9(a) or 9(b); or (2) whether TSCA section 6(a) regulation could include alignment of requirements and definitions in and under existing statutes and regulations to minimize confusion to the regulated entities and the general public.

In addition, EPA followed other TSCA requirements such as considering the availability of alternatives when contemplating a prohibition or a substantial restriction (TSCA section 6(c)(2)(C), as outlined in Unit V.B.), and setting proposed compliance dates in accordance with the requirements in TSCA section 6(d)(1)(B) (described in the proposed and alternative regulatory action in Units IV.A and IV.B.).

To the extent information was reasonably available, EPA considered pollution prevention strategies and the hierarchy of controls adopted by OSHA and NIOSH when selecting regulatory actions, with the goal of identifying risk management control methods that are permanent, feasible, and effective. EPA also considered how to address the unreasonable risk while providing flexibility to the regulated entity, where appropriate, and took into account the information presented in the 2020 Risk Evaluation for Carbon Tetrachloride, as well as additional input from stakeholders (as described in Unit III.A.) and anticipated compliance

strategies from regulated entities.

Taken together, these considerations led EPA to the proposed regulatory action and primary alternative regulatory action described in Unit IV. Additional details related to how the requirements in this unit were incorporated into development of those actions are in Unit V.

IV. Proposed Regulatory and Alternative Regulatory Actions

This unit describes the proposed regulatory action by EPA so that CTC will no longer present an unreasonable risk of injury to health. In addition, as indicated by TSCA section 6(c)(2)(A), EPA must consider the costs and benefits and the cost-effectiveness of the proposed regulatory action and one or more primary alternative regulatory actions. In the case of CTC, the proposed regulatory action is described in Unit IV.A. and the primary alternative regulatory action considered is described in Unit IV.B. This unit also describes the proposed compliance timeframes. The rationale for the proposed and alternative regulatory actions and associated compliance timeframes are discussed in this unit and in more detail in Unit V.A.

A. Proposed Regulatory Action

EPA is proposing under TSCA section 6(a) to: (1) Require a WCPP, including an ECEL and DDCC requirements, for the manufacturing (including import) of CTC and for other conditions of use (accounting for essentially all of the production volume of CTC manufactured annually) that occur in industrial settings or in tightly controlled, closed systems, where monitoring data submitted for the 2020 Risk Evaluation for Carbon Tetrachloride indicate values below the ECEL, or where technically and economically feasible safer alternatives may not be reasonably available, or where industry has indicated a reliance on CTC and EPA has found that an ECEL and DDCC requirements would address the unreasonable risk; (2) Require prescriptive controls for one condition of use, industrial and commercial use as a laboratory chemical, where codifying existing practices of use of a fume hood for all laboratory uses (and for DoD's use of

CTC as a laboratory chemical codifying advanced engineering controls) and requiring dermal PPE would address the unreasonable risk; and (3) Prohibit certain processing, industrial, and commercial conditions of use and the manufacture, processing, and distribution for those uses, which the Agency understands have already been phased out. EPA is also proposing to require recordkeeping and to require manufacturers (including importers), processors, and distributors of CTC for any use to provide downstream notification of regulatory requirements. As the manufacture and processing of CTC presents an unreasonable risk to health in the United States, the manufacture and processing of CTC for export would also be prohibited or restricted in accordance with TSCA section 12(a)(2).

1. Workplace Chemical Protection Program (WCPP) for certain manufacturing, processing, industrial and commercial uses, and disposal.

a. Overview.

As described in Unit III.B.4, under TSCA section 6(a), EPA is required to issue a regulation applying one or more of the TSCA section 6(a) requirements to the extent necessary so that the unreasonable risk of injury to human health or the environment from a chemical substance is no longer present. The TSCA section 6(a) requirements provide EPA the authority to limit or prohibit a number of activities, including, but not limited to, restricting or regulating the manufacture, processing, distribution in commerce, commercial use, or disposal of the chemical substance. Given this statutory authority, EPA may find it appropriate in certain circumstances to propose a WCPP for certain occupational conditions of use (i.e., manufacturing, processing, distribution in commerce, industrial and commercial use, or disposal). This unit describes the proposed WCPP, which consists of an ECEL and DDCC requirements, and ancillary provisions necessary for successful implementation such as periodic monitoring, consideration of the hierarchy of controls, an exposure control plan, and respirators and dermal

PPE programs (if applicable). Under a WCPP, owners or operators would have some flexibility, within the parameters outlined in this unit, regarding how they prevent exceedances of the identified EPA exposure limit thresholds or prevent direct dermal contact. In the case of CTC, meeting the EPA exposure limits and implementing the DDCC requirements for certain occupational conditions of use would address the unreasonable risk to potentially exposed persons from inhalation and dermal exposure.

EPA uses the term “potentially exposed person” in this unit and in the regulatory text to include workers, occupational non-users, employees, independent contractors, employers, and all other persons in the work area where CTC is present and who may be exposed to CTC under the conditions of use for which a WCPP would apply. EPA’s intention is to require a comprehensive WCPP that would address the unreasonable risk from CTC to potentially exposed persons directly handling the chemical or in the work area where the chemical is being used. Similarly, the 2020 Risk Evaluation for Carbon Tetrachloride did not distinguish between employers, contractors, or other legal entities or businesses that manufacture, process, distribute in commerce, use, or dispose of CTC. For this reason, EPA uses the term “owner or operator” to describe the entity responsible for implementing the WCPP in any workplace where an applicable condition of use described in Units III.B.1.a. through d. and subject to the WCPP is occurring. The term includes any person who owns, leases, operates, controls, or supervises such a workplace.

EPA is proposing a WCPP for manufacturing (including import) of CTC and the following other conditions of use which account for essentially all of the production volume of CTC manufactured annually:

- Processing as a reactant in the production of HCFCs, HFCs, HFOs, and PCE;
- Processing: Incorporation into a formulation, mixture or reaction product in agricultural

products manufacturing and other basic organic and inorganic chemical manufacturing;

- Processing: Repackaging for use as a laboratory chemical;
- Processing: Recycling;
- Industrial and commercial use as an industrial processing aid in the manufacture of

agricultural products;

- Industrial and commercial use in the elimination of nitrogen trichloride in the production of chlorine and caustic soda; and

- Disposal.

EPA recognizes that CTC may be a minor input in the production of HCFCs, HFCs, and PCE. EPA understands that CTC may still be used to manufacture HCFCs and HFCs, including HFC-245fa, HFC-365mfc, and HFC-236fa; however, more recently industry has expressed particular reliance on CTC for the manufacture of HFOs. In addition, CTC may be a minor input when recycled to make additional PCE. Therefore, EPA is soliciting comments on the expected need for a WCPP with an ECEL and DDCC requirements for these uses, whether prescriptive controls, including respirators and dermal PPE, should be required for these uses (as outlined in Unit IV.B.1. in the primary alternative regulatory action), or whether the Agency should instead consider prohibiting these uses because they will likely phase out, including timing for such expected phaseout.

EPA is proposing to exclude from WCPP requirements for manufacturers those workplaces that manufacture CTC solely as a byproduct. Section 1.4.2.3 of the 2020 Risk Evaluation for Carbon Tetrachloride stated that EPA excluded from the scope of the risk evaluation conditions of use associated with CTC generated as a byproduct (Ref. 1). In addition, EPA is assessing the manufacture of CTC as a byproduct during the manufacture of 1,2-dichloroethane in the risk evaluation for 1,2-dichloroethane (Ref. 21).

b. Workplace Chemical Protection Program (WCPP) requirements.

i. Existing Chemical Exposure Limit (ECEL) and ECEL Action Level.

To reduce exposures in the workplace and address the unreasonable risk of injury to health resulting from inhalation exposures to CTC identified under the conditions of use in the TSCA Risk Evaluation, EPA is proposing an ECEL of 0.03 parts per million (ppm) (0.2 mg/m³) for inhalation exposures to CTC as an 8-hour time-weighted average (TWA) and, based on industrial hygiene practices, owners and operators may implement various controls to consider different lengths of exposure at the workplace. This ECEL is based on the POD for liver cancer. The ECEL memo includes linear risk calculations for adrenal gland tumors in the equation for “Cancer risk for other tumor types (e.g., adrenal glands) at the ECEL,” showing that the ECEL is protective of all tumor types, including adrenal gland and brain tumors (Ref. 9). EPA has determined, as a matter of risk management policy, that ensuring exposures remain at or below the ECEL would eliminate the contribution to the unreasonable risk of injury to health for CTC resulting from inhalation exposures in an occupational setting. If ambient exposures are kept at or below the 8-hour TWA ECEL of 0.03 ppm, EPA expects that a potentially exposed person in the workplace would also be protected against all non-cancer effects resulting from occupational inhalation exposures, as well as excess risk of cancer (Ref. 9).

EPA is also proposing to establish an ECEL action level of 0.02 ppm as an 8-hour TWA for CTC. Air concentrations at or above the action level would trigger more frequent periodic monitoring of exposures to CTC, as described in this unit. EPA is proposing to adopt the action level approach in implementing the TSCA ECEL, similar to the action level approach utilized by OSHA in most of their standards. As explained by OSHA, due to the variable nature of employee exposures, compliance with an action level (which OSHA generally establishes at half the 8-hour TWA exposure limit) provides employers with greater assurance that their employees will not be

exposed to concentrations above the PELs (62 FR 1494, January 10, 1997). EPA agrees with this reasoning and, like OSHA, expects the inclusion of an ECEL action level at a value below the ECEL will stimulate innovation within industry to reduce exposures to levels below the action level. In this case EPA is proposing an action level for CTC of 0.02 ppm which is two-thirds of the ECEL rather than 0.015 ppm (the value that represents half the ECEL). Because EPA's understanding of current industry practices is that it may be more feasible for owners or operators to measure concentrations with values closer to the ECEL, such as within 10% of the ECEL, EPA is soliciting comment regarding an ECEL action level that is two-thirds the ECEL, including considerations for a different ECEL action level value, and any associated or alternative provisions related to the ECEL action level since the ECEL is significantly lower than the OSHA PEL.

EPA acknowledges that the values of the ECEL and the ECEL action level outlined in this unit may mean that some entities that are currently in compliance with OSHA requirements would have to do more in order to achieve compliance with the requirements being proposed in this action. It may be necessary to implement engineering controls to reduce exposures to the extent feasible, increase the frequency of periodic exposure monitoring (Unit IV.A.1.b.ii.), implement respiratory protection (Unit IV.A.1.e.i.), and provide notification of monitoring results (Unit IV.A.1.g.), and EPA is soliciting comment on these actions and the cost associated with them. Nevertheless, as discussed further in Unit V.A.1.c., based on monitoring data submitted by industry for the 2020 Risk Evaluation for Carbon Tetrachloride indicating industry was already achieving values below the ECEL, EPA has confidence that requirements to meet an ECEL can be implemented in highly standardized and industrialized settings, including those where CTC is manufactured, processed, and used (EPA-HQ-OPPT-2016-0733-0101).

Each owner or operator of a workplace where these conditions of use occur would be

responsible for compliance with the ECEL and the associated requirements. EPA's description for how the requirements related to an ECEL would address the unreasonable risk resulting from inhalation exposures and the rationale for this regulatory approach is outlined in Units III.B.3 and V.A. The proposed requirements of the WCPP ECEL are not applicable to owners and operators of workplaces where manufacturing and processing solely for the industrial and commercial conditions of use that EPA is proposing to prohibit occurs, as described Unit IV.A.3.

In summary, EPA is proposing that each owner or operator of a workplace subject to the ECEL must ensure that no person is exposed to airborne concentration of CTC in excess of 0.03 ppm (0.2 mg/m³) as an 8-hour TWA (ECEL), with an action level identified as 0.02 ppm (0.13 mg/m³) as an 8-hour TWA (ECEL action level). For conditions of use for which the requirements to meet an ECEL are being proposed, EPA expects that the regulated community can measure CTC at the ECEL and ECEL action level because they are above the level of detection for air sampling analytical methods for CTC, which are as low as 4 micrograms per sample (Ref. 9). Nevertheless, EPA understands that the regulated community may have difficulty measuring at or below the ECEL consistently over an entire work shift (Ref. 22). Therefore, EPA is requesting comment regarding the amount of time, if any, it would take the regulated community to develop a method to measure at or below the ECEL over an entire work shift. EPA is interested in what levels of detection are possible over an entire work shift based on existing monitoring methods, justification for the timeframe of the specific steps needed to develop a more sensitive monitoring method, cost associated with a more sensitive monitoring method, and any additional detailed information related to establishing a monitoring program to reliably measure CTC at or below the ECEL.

EPA expects that many workplaces already have stringent controls in place that reduce exposures to CTC; for some workplaces, EPA understands that these existing controls may

already reduce CTC air concentration levels to levels near or below the ECEL. As noted previously in this unit, EPA expects that, if inhalation exposures for affected occupational conditions of use are kept at or below the ECEL, potentially exposed persons reasonably likely to be exposed in the workplace would be protected from unreasonable risk. EPA is also proposing to require owners or operators to comply with additional requirements under the WCPP that would be needed to ensure successful implementation of the ECEL.

ii. *Monitoring Requirements for the ECEL.*

(A) *Overview.*

Monitoring requirements are a key component of implementing EPA's proposed ECEL. Initial exposure monitoring for CTC is critical for establishing a baseline of exposure for potentially exposed persons; similarly, periodic exposure monitoring ensures continued compliance so that potentially exposed persons in the workplace are not exposed to levels that would result in an unreasonable risk of injury. Periodic exposure monitoring frequency could change if certain conditions are met, which are described in this unit. Additionally, in some cases, a change in workplace conditions with the potential to impact exposure levels would warrant additional exposure monitoring, which is also described. This unit also describes the proposed monitoring records required.

(B) *Initial exposure monitoring.*

Under the proposed regulation, each owner or operator of a workplace where any condition of use listed earlier in this unit is occurring would be required to perform initial exposure monitoring for all persons who may be exposed to CTC to establish a baseline of the magnitude of exposure within 180 days after date of publication of the final rule in the *Federal Register* or within 30 days of the introduction of CTC into the workplace, whichever is later. Initial exposure monitoring would notify owner or operators of the magnitude of exposures to

their potentially exposed persons with respect to their unique work conditions and environments.

The results from the initial exposure monitoring would determine the frequency of future periodic exposure monitoring and whether additional exposure controls are necessary (such as engineering controls, administrative controls, and/or respiratory protection), and whether the owner or operator would need to demarcate a regulated area as described in this unit.

Where CTC is present in the workplace, each owner or operator would be required to determine each potentially exposed person's exposure by either taking a personal breathing zone air sample of each potentially exposed person or taking personal breathing zone air samples that are representative of each potentially exposed person's exposure performing the same or substantially similar operations in each work shift, in each job classification, in each work area (hereinafter identified as an "exposure group"). Representative 8-hour TWA exposures must be determined based on one or more samples representing full-shift exposures for each shift for each person in each job classification in each work area. Monitoring samples must be taken when and where the operating conditions are best representative of each potentially exposed person's full-shift exposures. EPA expects that owners and operators would attempt to monitor exposures for all of the tasks during the same timeframe; however, EPA understands that certain tasks occur less frequently, and EPA is soliciting comments regarding the timing of the initial exposure monitoring so that it is representative of all tasks involving CTC where exposures may approach the ECEL. If the owner or operator chooses a representative sample, such sampling must include persons that are the closest to the source of CTC, so that the monitoring results are representative of the most highly exposed persons in the workplace. EPA is also soliciting comments regarding use of area source monitoring instead of personal breathing zone as a representative sample of exposures.

EPA also recognizes that some entities may already have exposure monitoring data. If the

owner or operator has monitoring data conducted within five years prior to the effective date of the final rule and the monitoring satisfies all other proposed requirements, including the requirement that the data represents the highest CTC exposures likely to occur under reasonably foreseeable conditions of use, the owner or operator may rely on such earlier monitoring results for the initial baseline monitoring sample.

(C) Periodic exposure monitoring.

Based on the results of the initial exposure monitoring, EPA is proposing to require each owner or operator to conduct, for those exposure groups that result in the following airborne concentration levels, the following periodic monitoring:

- If all samples taken during the initial exposure monitoring reveal a concentration below the ECEL action level (0.02 ppm 8-hr TWA), the owner or operator must repeat the periodic exposure monitoring at least once every five years.
- If the most recent exposure monitoring reveals a concentration above the ECEL (0.03 ppm 8-hr TWA), the owner or operator must repeat the periodic exposure monitoring at least every 3 months.
- If the most recent exposure monitoring reveals a concentration at or above the ECEL action level (0.02 ppm 8-hr TWA) but at or below the ECEL (0.03 ppm 8-hr TWA), the owner or operator must repeat the periodic exposure monitoring at least every 6 months.
- If the most recent (non-initial) exposure monitoring indicates that airborne exposure is below the ECEL action level, the owners or operators must repeat such monitoring within 6 months of the most recent monitoring until two consecutive monitoring measurements, taken at least seven days apart, are below the ECEL action level (<0.02 ppm 8-hour TWA), at which time the owner or operator must repeat the periodic exposure monitoring at least once every 5 years.

Additionally, in instances where an owner or operator does not manufacture, process, use,

or dispose of CTC for a condition of use for which the restrictions would be in place over the entirety of time since the last required periodic exposure monitoring event, EPA is proposing that the owner or operator may forgo the next periodic exposure monitoring event. However, documentation of cessation of use of CTC must be maintained and periodic exposure monitoring would be required to resume should the condition of use restart.

The proposed periodic exposure monitoring requirements are also outlined in Table 1. EPA requests comment on the timeframes for periodic exposure monitoring outlined in this unit. EPA may finalize significantly shorter, longer or different timeframes based on consideration of public comments.

Table 1 — Periodic Monitoring Requirements

Air Concentration Condition	Periodic Exposure Monitoring Requirement
If all initial exposure monitoring is below the ECEL action level (< 0.02 ppm 8-hour TWA)	Periodic exposure monitoring is required at least once every five years.
If the most recent exposure monitoring indicates that airborne exposure is above the ECEL (> 0.03 ppm 8-hour TWA)	Periodic exposure monitoring is required within 3 months of the most recent exposure monitoring.
If the most recent exposure monitoring indicates that airborne exposure is at or above the ECEL action level but at or below the ECEL (≥ 0.02 ppm 8-hour TWA, ≤ 0.03 ppm 8-hour TWA)	Periodic exposure monitoring is required within 6 months of the most recent exposure monitoring.
If the two most recent (non-initial) exposure monitoring measurements, taken at least seven days apart within a 6-month period, indicate exposure is below the ECEL action level (< 0.02 ppm 8-hour TWA)	Periodic exposure monitoring is required within 5 years of the most recent exposure monitoring.
If the owner or operator engages in a condition of use for which WCPP ECEL would be required but does not manufacture, process, use, or dispose of CTC in that condition of use over the entirety of time since the last required monitoring event	The owner or operator may forgo the next periodic monitoring event. However, documentation of cessation of use of CTC is required; and periodic monitoring would be required when the owner or operator resumes the condition of use.

(D) Additional exposure monitoring.

In addition to the initial and periodic exposure monitoring, EPA is proposing that each

owner or operator conduct additional exposure monitoring whenever: (i) A change in the production, process, control equipment, personnel, work practices may reasonably be expected to result in new or additional exposures at or above the ECEL action level, or (ii) the owner or operator has any reason to believe that new or additional exposures at or above the ECEL action level have occurred. In the event of start-up, shutdown, malfunctions or other breakdowns that may lead to exposure to any person in the workplace, EPA is proposing that each owner or operator must conduct additional exposure monitoring (using personal breathing zone sampling) after the cleanup, repair or remedial action to ensure that exposures are below the ECEL or the ECEL action level. An additional exposure monitoring event may result in an increased frequency of periodic exposure monitoring. For example, if the initial exposure monitoring results from a workplace are above the ECEL action level, but below the ECEL, periodic exposure monitoring is required every 6 months. If additional exposure monitoring is performed because increased exposures are suspected, and the results are above the ECEL, subsequent periodic exposure monitoring would have to be performed every 3 months. The required additional exposure monitoring should not delay implementation of any necessary cleanup or other remedial action to reduce the exposures to persons in the workplace. The additional exposure monitoring is also included in Table 1. EPA requests comment on the timeframes and frequency for additional exposure monitoring outlined in this unit.

(E) Other exposure monitoring requirements.

For each exposure monitoring event, EPA is proposing to require that owners or operators ensure that their analytical methods be accurate, to a confidence level of 95 percent, to within plus or minus 25 percent for airborne concentrations of CTC at an appropriate level of detection for the ECEL and ECEL action level. Also, EPA is proposing to require use of appropriate sampling and analytical methods used to determine CTC exposure, including as

relevant: (A) Use of an analytical method already approved by EPA, OSHA or NIOSH, or another analytical method that has been demonstrated to meet the proposed accuracy requirement at an appropriate level of detection for the ECEL and ECEL action level; (B) Compliance with the Good Laboratory Practice Standards at 40 CFR Part 792. Also, EPA is proposing to require owners and operators to re-monitor within 15 working days after receipt of the results of any exposure monitoring when results indicate non-detect or air monitoring equipment malfunction, unless an Environmental Professional as defined at 40 CFR 312.10 or a Certified Industrial Hygienist reviews the exposure monitoring results and determines that re-monitoring is not necessary.

EPA is also proposing to require that each owner or operator maintain exposure monitoring records that include the following information for each exposure monitoring event:

- Dates, duration, and results of each sample taken.
- All measurements that may be necessary to determine the conditions that may affect the exposure monitoring results.
- Name, workplace address, work shift, job classification, and work area of the person monitored; documentation of all other persons whose exposures the monitoring is intended to represent if using a representative sample; and type of respiratory protective device worn by the monitored person, if any.
- Use of appropriate sampling and analytical methods, such as analytical methods already approved by EPA, OSHA or NIOSH, or compliance with an analytical method verification procedure.
- Compliance with the Good Laboratory Practice Standards at 40 CFR Part 792.
- Information regarding air monitoring equipment, including: type, maintenance, performance tests, and any malfunctions.

iii. *Direct Dermal Contact Control (DDCC) Requirements.*

DDCC requirements are a process-based set of provisions to address unreasonable risk driven by direct dermal contact in the workplace. DDCC requirements would include controls to prevent direct dermal contact in the workplace by separating, distancing, physically removing, or isolating all person(s) from direct handling of CTC or from contact with surfaces that may be contaminated with CTC (i.e., equipment or materials on which CTC may be present) under routine conditions in the workplace (hereafter referred to as direct dermal contact).

EPA requests comment on available methods to measure the effectiveness of controls in preventing or reducing the potential for direct dermal contact to CTC. EPA is also requesting comment on available monitoring methods, such as charcoal patch testing, as feasible or effective methods to measure potential direct dermal contact with CTC.

As discussed further in Unit V.A.1., EPA expects that many workplaces already have stringent controls in place that reduce dermal exposures to CTC; for some workplaces, EPA understands that these existing controls may already prevent or reduce direct dermal contact with CTC.

c. *Incorporation of the Hierarchy of Controls.*

EPA recommends and encourages the use of pollution prevention as a means of controlling exposures whenever practicable. Pollution prevention, also known as source reduction, is any practice that reduces, eliminates, or prevents pollution at its source (e.g., elimination and substitution). Similarly, the hierarchy of controls includes elimination, substitution, engineering controls, and administrative controls, prior to relying on PPE as a means of controlling exposures (Ref. 8). EPA is proposing to require owners or operators to reduce inhalation exposures below the ECEL and implement DDCC requirements in accordance with the hierarchy of controls. The establishment of an ECEL and DDCC requirements is

intended to allow more flexibility to owners and operators to choose their controls when compared with requiring specific prescriptive controls. EPA is soliciting comment regarding the exposure control strategies required under the WCPP and documented in the exposure control plan, including the implementation of additional engineering controls, increase frequency of exposure monitoring, implementation of respiratory and dermal protection and notification of monitoring, and associated costs with the WCPP exposure control strategies implementation.

EPA expects owners or operators to identify and implement feasible exposure controls such as elimination, substitution, engineering controls, and administrative controls. If these controls are not sufficient to reduce exposures to or below the ECEL and/or prevent direct dermal contact with CTC in the workplace, EPA proposes to require each owner or operator to use such controls to reduce CTC air concentrations in the workplace and/or to prevent direct dermal contact to the extent achievable, and supplement these controls using respiratory protection and/or dermal PPE before persons are permitted to enter a regulated area, as described in this unit. If an owner or operator chooses to replace CTC with a substitute, EPA recommends that they carefully review the available hazard and exposure information on the potential substitute to avoid a regrettable substitution. In addition, EPA proposes that a regulated entity would be prohibited from rotating work schedules of potentially exposed persons to comply with these requirements, similar to OSHA's Methylene Chloride Standard (29 CFR 1910.1052). EPA expects that, for conditions of use where EPA is proposing these requirements, compliance at most workplaces would be part of an existing industrial hygiene program. EPA is soliciting comment on whether any of the requirements for the exposure control strategies, including EPA's proposed prohibition of rotating work schedules for potentially exposed persons, should be modified and considered in the final rule.

Examples of engineering controls that may prevent or reduce the potential for direct

dermal contact include automation, physical barriers between contaminated and clean work areas, enclosed transfer liquid lines (with purging mechanisms in place (e.g., nitrogen, aqueous) for operations such as product changes or cleaning), and design of tools (e.g., a closed loop container system providing contact-free connection for unloading fresh and collecting spent solvents, pneumatic tools, tongs, funnels, glove bags, etc.). Examples of administrative controls that may reduce inhalation exposures or prevent or reduce the potential for direct dermal contact include adjusting work practices (i.e., implementing policies and procedures) such as providing safe working distances from areas where direct handling of CTC may occur.

The Agency understands that certain engineering controls can reduce exposures to people inside the workplace but may lead to increased ventilation of CTC outside of the workplace, thereby increasing risks to people in fenceline communities of adverse health effects from exposures to CTC in ambient air. Therefore, EPA is proposing to prohibit increased releases of CTC to outdoor air associated with the implementation of the WCPP/ECEL. This proposed requirement is intended to avoid unintended increases in exposures to people from CTC emissions to ambient air. The proposed rule would require owners and operators to attest in their WCPP/ECEL exposure control plan that engineering controls selected do not increase emissions of CTC to ambient air outside of the workplace and document in their exposure control plan whether additional equipment was installed to capture emissions of CTC to ambient air. EPA requests comment on how this proposed requirement may impact the availability, feasibility, or cost of engineering controls as a means to reduce workplace exposures to or below the proposed ECEL.

d. Regulated area.

Based on the exposure monitoring, EPA is proposing to require that owners or operators of workplaces subject to a WCPP demarcate any area where airborne concentrations of CTC

exceed or are reasonably expected to exceed the ECEL. Regulated areas would be demarcated using administrative controls, such as warning signs or highly visible signifiers, in multiple languages as appropriate (e.g., based on languages spoken by potentially exposed persons), placed in conspicuous areas, and documented through training and recordkeeping. The owner or operator would be required to restrict access to the regulated area from any potentially exposed person that lacks proper training, is not wearing required PPE as described in this unit or is otherwise unauthorized to enter. EPA is proposing to require owners and operators demarcate a regulated area beginning 9 months after the date of publication of the final rule, or within 3 months after receipt of any exposure monitoring that indicates exposures exceeding the ECEL. EPA is soliciting comment on requiring warning signs to demarcate regulated areas, such as the requirements found in OSHA's General Industry Standard for Beryllium (29 CFR 1910.1024(m)(2)).

e. Exposure Control Plan.

EPA proposes to require that owners and operators document their exposure control strategy, implementation and compliance with the WCPP, including ECEL and DDCC requirements, in an exposure control plan. An exposure control plan may include relevant existing documentation of the facility's safety and health program that may already be developed as part of meeting OSHA requirements or other safety and health standards (Ref. 23). EPA proposes to require that the exposure control plan documentation include the following:

(i) Identification and rationale of exposure controls selected including: elimination of CTC, substitution of CTC, engineering controls, and administrative controls selected and used to reduce inhalation exposures in the workplace to either at or below the ECEL or to the lowest level achievable and to prevent or reduce direct dermal contact with CTC in the workplace, and the rationale explaining why each exposure control was selected (e.g., the hierarchy of controls,

feasibility, effectiveness, or other relevant considerations);

(ii) For any category of exposure control not selected, document the efforts identifying why these are not feasible, not effective, or otherwise not implemented;

(iii) Actions taken to implement exposure controls selected, including proper installation, maintenance, training or other steps taken;

(iv) Description of any regulated area and how it is demarcated, and identification of authorized persons; and description of when the owner or operator expects exposures may be likely to exceed the ECEL;

(v) Attestation that exposure controls selected do not increase emissions of CTC to ambient air outside of the workplace and whether additional equipment was installed to capture or otherwise prevent increased emissions of CTC to ambient air;

(vi) Regular inspections, evaluations, and updating of the exposure controls no less frequent than every five years to ensure effectiveness and confirm that all persons are implementing them as required;

(vii) Occurrence and duration of any change in the production, process, control equipment, personnel or work practices and explanation of why the owner or operator may expect to result in new or additional exposures above the ECEL or not, and occurrence and duration of any other change that may result in new or additional exposures above the ECEL have occurred;

(viii) Occurrence and duration of any start-up, shutdown, or malfunction of the facility that causes air concentrations above the ECEL and/or direct dermal contact with CTC and subsequent corrective actions taken during start-up, shutdown, or malfunctions to mitigate exposures to CTC; and

(ix) Availability of the exposure control plan and associated records for potentially

exposed persons.

EPA may require more, less, or different documentation regarding exposure control strategies in the final rule based on public comment.

f. Personal Protective Equipment (PPE).

Where elimination, substitution, engineering controls, and administrative controls are not feasible to reduce the air concentration to or below the ECEL and/or prevent direct dermal contact with CTC for all potentially exposed persons, EPA is proposing to require implementation of a PPE program in alignment with OSHA's General Requirements for Personal Protective Equipment at 29 CFR 1910.132. Consistent with 29 CFR 1910.132, owners and operators would be required to provide PPE, including respiratory protection and dermal protection selected in accordance with the guidelines described in this unit, that is of safe design and construction for the work to be performed. EPA is proposing to require owners and operators ensure each potentially exposed person who is required by this unit to wear PPE to use and maintain PPE in a sanitary, reliable, and undamaged condition. Owners and operators would be required to select and provide PPE that properly fits each potentially exposed person who is required by this unit to use PPE and communicate PPE selections to each affected person.

i. Required Respiratory Protection.

EPA is proposing to require a respiratory protection program with worksite-specific procedures and elements for required respirator use. The respiratory protection program proposed by EPA would be implemented when the most recent exposure monitoring concentration measured as an 8-hour TWA is above the ECEL and after exhausting all other feasible controls as described in this unit. The proposed program must be administered by a suitably trained administrator. EPA is proposing to require each owner or operator to select respiratory protection in accordance with the requirements described in this unit and also to

comply with OSHA's general PPE training requirements at 29 CFR 1910.132(f) and 29 CFR 1910.134(a) through (1), except (d)(1)(iii), for selection, proper use, maintenance, fit-testing, medical evaluation, and training when using respirators. EPA is proposing that owners and operators would provide PPE training to each potentially exposed person who is required by this unit to wear PPE prior to or at the time of initial assignment to a job involving potential exposure to CTC. Owners and operators would also have to re-train each affected person at least once annually or whenever the owner or operator has reason to believe that a previously trained person does not have the required understanding and skill to properly use PPE, or when changes in the workplace or in the PPE to be used render the previous training obsolete. EPA is not proposing to cross reference 29 CFR 1910.134(d)(1)(iii) because the WCPP contains requirements for identifying CTC respiratory hazards in the workplace.

EPA is proposing to require each owner or operator supply a respirator, selected in accordance with this unit, to each potentially exposed person who enters a regulated area within 3 months after the receipt of any exposure monitoring that indicates exposures exceeding the ECEL or 6 months after publication of the final rule if initial monitoring was completed prior to publication of the rule, and to ensure that all potentially exposed persons within the regulated area are using the provided respirators whenever CTC exposures exceed or can reasonably be expected to exceed the ECEL. EPA recognizes that implementing exposure controls and a respiratory protection program meeting the requirements outlined in this unit may require different compliance timeframes depending on existing health and safety programs at various facilities. EPA is soliciting comment on whether 6 months is a reasonable timeframe to implement a respiratory protection program or if a different timeframe is needed. Additionally, EPA is proposing that the owner or operator must ensure that all filters, cartridges and canisters used in the workplace are labeled and color coded with the NIOSH approval label and that the

label is not removed and remains legible. EPA is requesting comment on whether there should be a requirement to replace cartridges or canisters after a certain number of hours, such as the requirements found in OSHA's General Industry Standard for 1,3-Butadiene (29 CFR 1910.1051(h)), or a requirement for a minimum service life of non-powered air-purifying respirators such as the requirements found in OSHA's General Industry Standard for Benzene (29 CFR 1910.1028(g)(3)(D)).

EPA is proposing the following requirements for respiratory protection, based on the exposure monitoring concentrations measured as an eight-hour TWA that exceed the ECEL (0.03 ppm). EPA is proposing to establish minimum respiratory protection requirements, such that any respirator affording a higher degree of protection than the following proposed requirements may be used. While this unit includes respirator selection requirements for respirators of APF of 1,000 or greater, EPA does not anticipate that respirators beyond APF 50 will be widely or regularly used to address unreasonable risk, particularly when other controls are put in place.

- If the measured exposure concentration is at or below 0.03 ppm: no respiratory protection is required.
- If the measured exposure concentration is above 0.03 ppm and less than or equal to 0.3 ppm (10 times ECEL): Any NIOSH-certified air-purifying half mask respirator equipped with NIOSH-approved organic vapor cartridges or canisters; or any negative pressure (demand mode) supplied-air respirator equipped with a half mask (APF 10).
- If the measured exposure concentration is above 0.3 ppm and less than or equal to 0.75 ppm (25 times ECEL): Any NIOSH-certified powered air-purifying respirator with a loose-fitting hood or helmet equipped with NIOSH-approved organic vapor cartridges or canisters; or any NIOSH-certified continuous flow supplied-air respirator equipped with a hood or helmet

(APF 25).

- If the measured exposure concentration is above 0.75 ppm and less than or equal to 1.5 ppm (50 times ECEL): Any NIOSH-certified air-purifying full facepiece respirator equipped with NIOSH-approved organic vapor cartridges or canisters; any NIOSH-certified powered air-purifying respirator equipped with a tight-fitting half or full facepiece and NIOSH-approved organic vapor cartridges or canisters; any NIOSH-certified negative pressure (demand mode) supplied-air respirator equipped with a full facepiece; any NIOSH-certified continuous flow supplied-air respirator equipped with a tight-fitting half or full facepiece; or any NIOSH-certified negative pressure (demand mode) self-contained respirator equipped with a full facepiece (APF 50).

- If the measured exposure concentration is above 1.5 ppm and less than or equal to 30 ppm (1,000 times ECEL): Any NIOSH-certified powered air-purifying respirator equipped with a tight-fitting full facepiece and NIOSH-approved organic vapor cartridges or canisters; or any NIOSH-certified supplied air respirator equipped with a full facepiece and operated in a continuous flow mode or pressure demand or other positive pressure mode (APF 1,000).

- If the measured exposure concentration is greater than 30 ppm (1,000 times ECEL) or the concentration is unknown: Any NIOSH-certified self-contained breathing apparatus equipped with a full facepiece and operated in a pressure demand or other positive pressure mode (APF 10,000).

ii. *Required Dermal Personal Protective Equipment (PPE).*

Where elimination, substitution, engineering controls, and administrative controls are not feasible or sufficient to fully prevent direct dermal contact with CTC, EPA is proposing to require a dermal protection program with worksite-specific procedures and elements for required dermal PPE, and administered by a suitably trained administrator. In choosing appropriate

dermal PPE, owners and operators would be required to select gloves, clothing, and protective gear (which covers any exposed dermal area of arms, legs, torso, and face) based on specifications from the manufacturer or supplier that demonstrate an impervious barrier to CTC during expected durations of use and normal conditions of exposure within the workplace, accounting for potential chemical permeation or breakthrough times.

For example, owners and operators can select gloves that have been tested in accordance with the American Society for Testing Material (ASTM) F739 “Standard Test Method for Permeation of Liquids and Gases through Protective Clothing Materials under Conditions of Continuous Contact.” EPA is proposing that dermal PPE be provided for use for a time period only to the extent and no longer than the time period for which testing has demonstrated that the dermal PPE will be impermeable during expected durations of use and conditions of exposure. EPA is proposing to require that owners and operators also consider other factors when selecting appropriate dermal PPE, including effectiveness of glove type when preventing exposures from CTC alone and in likely combination with other chemical substances used in the work area or when used with glove liners, permeation, degree of dexterity required to perform task, and temperature, as identified in the Hand Protection section of OSHA’s Personal Protective Equipment guidance (Ref. 24).

EPA is proposing that owners and operators would be required to establish, either through manufacturer or supplier-provided documentation or individually prepared third party testing, that the selected dermal PPE will be impervious for the expected duration and conditions of exposure, such as using the format specified in ASTM F1194-99 (2010) “Standard Guide for Documenting the Results of Chemical Permeation Testing of Materials Used in Protective Clothing Materials,” reporting cumulative permeation rate as a function of time, or equivalent manufacturer or supplier provided testing. Owners and operators would also be required to

consider likely combinations of chemical substances to which the clothing may be exposed in the work area when selecting the appropriate PPE such that the PPE will prevent direct dermal contact to CTC. EPA is proposing that dermal PPE must be immediately provided and replaced if any person is dermally exposed to CTC longer than the breakthrough time period for which testing has demonstrated that the PPE will be impermeable or if there is a chemical permeation or breakage of the PPE.

And compatible with the OSHA Hand Protection PPE Standard (29 CFR 1910.138), owners and operators would be required to select dermal PPE based on an evaluation of the performance characteristics of the PPE relative to the task(s) to be performed, conditions present, and the duration of use. In addition, EPA recommends that owners and operators consider 29 CFR 1910.133(b) for the selection and use of eye and face protection.

EPA proposes to require that owners and operators document in the dermal protection program the following information, as applicable:

(A) The name, workplace address, work shift, job classification, and work area of each person reasonably likely to directly handle CTC or handle equipment or materials on which CTC may present and the type of dermal PPE selected to be worn by each of these persons;

(B) The basis for specific dermal PPE selection (e.g., demonstration based on permeation testing or manufacturer specifications that each item of PPE selected provides an impervious barrier to prevent exposure during expected duration and conditions of exposure, including the likely combinations of chemical substances to which the PPE may be exposed in the work area); and

(C) Appropriately sized PPE and training on proper application, wear, and removal of dermal PPE, and proper care/disposal of dermal PPE.

EPA is soliciting comments on the requirements proposed for appropriate dermal PPE

selection, the effectiveness of PPE in preventing direct dermal contact with CTC in the workplace, and general absorption and permeation effects to PPE from direct dermal exposure. In addition, EPA understands that some workplaces rinse and reuse PPE after minimal use and is therefore soliciting comments on the impact on effectiveness of rinsing and reusing certain types of PPE, either gloves or protective clothing and gear. EPA also requests comment on the degree to which additional guidance related to use of dermal PPE might be appropriate.

EPA is proposing to require each owner or operator supply dermal PPE, selected in accordance with this unit, to each potentially exposed person within 6 months after publication of the final rule.

g. Workplace Information and training.

To ensure that potentially exposed persons in the workplace are informed of the hazards associated with CTC exposure, EPA is proposing to require that owners or operators of workplaces subject to an ECEL and DDCC requirements institute a training program for all potentially exposed persons. EPA is proposing to require implementation of a training program compatible with the OSHA Hazard Communication Standard (29 CFR 1910.1200) and the OSHA General Industry Standard for Methylene Chloride (29 CFR 1910.1052). To ensure that potentially exposed persons in the workplace are informed of the hazards associated with CTC exposure, EPA is proposing to require that owners or operators of workplaces subject to the WCPP institute a training and information program for potentially exposed persons and ensure their participation in the training and information program.

As part of the training and information program, the owner or operator would be required to provide information and comprehensive training in an understandable manner (i.e., in plain language) and in multiple languages as appropriate (e.g., based on languages spoken by potentially exposed persons) to potentially exposed persons prior to or at the time of initial

assignment to a job involving potential exposure or direct dermal contact to CTC. Compatible with the OSHA Hazard Communication Standard, owners and operators would be required to provide information and training to all potentially exposed persons that includes:

- (i) The requirements of the CTC WCPP and how to access or obtain a copy of the requirements of the WCPP;
- (ii) The quantity, location, manner of use, release, and storage of CTC and the specific operations in the workplace that could result in CTC exposure;
- (iii) Principles of safe use and handling of CTC in the workplace, including specific measures the owner or operator has implemented to reduce inhalation exposures to at or below the ECEL or prevent direct dermal contact with CTC, such as work practices and PPE used;
- (iv) The methods and observations that may be used to detect the presence or release of CTC in the workplace (such as monitoring conducted by the owner or operator, continuous monitoring devices, visual appearance or odor of CTC when being released, etc.); and
- (v) The health hazards associated with exposure with CTC.

In addition to providing training at the time of initial assignment to a job involving potential inhalation exposure or direct dermal contact to CTC, and similar to annual retraining requirements in the OSHA General Industry Standard for Beryllium (29 CFR 1910.1024), owners and operators subject to an ECEL and DDCC requirements would be required to retrain each potentially exposed person at minimum annually to ensure employees understand the principles of safe use and handling of CTC in the workplace. Owners and operators would also need to update the training as necessary whenever there are changes in the workplace, such as new tasks or modifications of tasks; in particular whenever there are changes in the workplace that increase exposure to CTC, where exposure to CTC can reasonably be expected to exceed the ECEL action level, or whenever there are changes in the workplace that may result in direct

dermal contact to CTC without appropriate PPE use. To support compliance, EPA is proposing that each owner or operator of a workplace subject to the WCPP would be required to provide to the EPA, upon request, all available materials related to workplace information and training.

h. Workplace participation.

EPA encourages owners or operators subject to ECEL and DDCC requirements to consult with potentially exposed persons on the development and implementation of an exposure control plan and respirator and dermal PPE program. EPA is proposing to require owners or operators to provide potentially exposed persons regular access to the exposure control plan, exposure monitoring records, and respirator and dermal PPE program implementation plan (documenting proper application, wear, and removal of PPE). To ensure compliance with the requirement for workplace access to the exposure control plan and PPE program documentation, EPA is proposing that owners or operators document the notice to and ability of any potentially exposed person that may reasonably be affected by inhalation exposure and/or direct dermal contact to CTC to readily access the exposure control plans, facility exposure monitoring records, respiratory protection program documentation, dermal PPE program documentation, or any other information relevant to CTC exposure in the workplace. EPA is requesting comment on how owners and operators can engage with potentially exposed persons on the development and implementation of an exposure control plan and PPE program.

EPA proposes that the owner or operator must, within 15 work days after receipt of the results of any exposure monitoring, notify each person whose exposure is represented by that monitoring in writing, either individually to each potentially exposed person or by posting the information in an appropriate and accessible location accessible to all persons whose exposure is represented by the monitoring, such as public spaces or common areas, outside the regulated area. This notice must include the exposure monitoring results, identification and explanation of

the ECEL and ECEL action level in plain language, any corresponding required respiratory protection, if applicable, the quantity, location, manner of CTC use and identified releases of CTC that could result in exposure to CTC, and whether the airborne concentration of CTC exceeds the ECEL. The notice must also include a description of actions taken by the owner or operator to reduce inhalation exposures to or below the ECEL, if applicable, or refer to a document available to the potentially exposed persons which would state the actions to be taken to reduce exposures and would be posted in multiple languages if necessary.

i. Recordkeeping.

To support and demonstrate compliance, EPA is proposing that owners and operators of a workplace subject to an ECEL and DDCC requirements retain compliance records for five years. These proposed requirements are not intended to supersede or otherwise relieve regulated entities from any recordkeeping requirement imposed by other federal laws or regulations. EPA is proposing to require records to include:

- (A) The exposure control plan;
- (B) PPE program implementation and documentation, including as necessary, respiratory protection and dermal protection used and related PPE training; and
- (C) Information and training provided to each person prior to or at the time of initial assignment and any retraining.

In addition, EPA is proposing that owners and operators subject to the WCPP ECEL requirements maintain records to include:

- (A) The exposure monitoring records;
- (B) Notification of exposure monitoring results; and
- (C) If the owner or operator relies on exposure monitoring data generated within the last five years as their initial exposure monitoring, records that demonstrate that it meets all of the

requirements of this section.

The owners and operators, upon request by EPA, would be required to make all records maintained by this unit available to EPA for examination and copying. All records required to be maintained by this unit could be kept in the most administratively convenient form (electronic or paper).

j. *Compliance Timeframes.*

EPA is proposing to require owners or operators of workplaces subject to these restrictions to conduct initial exposure monitoring for an ECEL and implement the DDCC requirements as outlined in this unit within 6 months after the date of publication of the final rule in the *Federal Register* or within 30 days of introduction of CTC into the workplace if CTC use commences at least 6 months after the date of publication. EPA is proposing to require that each owner or operator ensure that the airborne concentration of CTC does not exceed the ECEL for all potentially exposed persons within 9 months after the date of publication of the final rule in the *Federal Register*, or beginning 4 months after introduction of CTC into the workplace if CTC use commences at least 6 months after the date of publication. EPA is also proposing to require owners and operators demarcate a regulated area wherever exposures exceed or can reasonably be expected to exceed the ECEL beginning 9 months after the date of publication of the final rule in the *Federal Register*, or beginning 4 months after introduction of CTC into the workplace if CTC use commences at least 6 months after the date of publication. If applicable, EPA is also proposing that each owner or operator must provide respiratory protection sufficient to reduce inhalation exposures to below the ECEL to all potentially exposed persons in the regulated area within 3 months after the receipt of the results of any exposure monitoring that indicates exposures exceeding the ECEL or, if using monitoring data conducted within five years prior to the effective date of this rule that satisfies all other requirements of this section, within 9 months

after the date of publication of the final rule in the *Federal Register*. Regulated entities should then proceed accordingly to implement an exposure control plan within 12 months after date of publication of the final rule in the *Federal Register*. EPA is also proposing to require each owner or operator to provide information and training for each person prior to or at the time of initial assignment to a job involving potential exposure to CTC within 6 months after the date of initial exposure monitoring or within 6 months after the date of publication of the final rule in the *Federal Register* if initial exposure monitoring was completed prior to publication of the rule. EPA will consider compliance timeframes that may be substantially longer or shorter than the proposed timeframes for owners or operators to conduct initial exposure monitoring for the ECEL, implement the ECEL and DDCC requirements, and any procedural adjustments needed to comply with the requirements outlined in this unit, and is requesting comment on the feasibility of the proposed compliance timeframes, as well as longer or shorter timeframes.

2. Prescriptive Workplace Controls: Fume Hood and Dermal PPE.

a. Overview.

In contrast to the proposed non-prescriptive requirements of the ECEL and DDCC where regulated entities would have flexibility to select controls in accordance with the hierarchy of controls to comply with the parameters outlined in this unit, EPA may also find it appropriate in certain circumstances to require specific prescriptive controls for certain conditions of use with occupational exposures. In the 2020 Risk Evaluation for Carbon Tetrachloride, EPA identified certain workplace controls that reduce exposures from the industrial and commercial use of CTC as a laboratory chemical. Therefore, EPA is proposing to require specific prescriptive controls for the industrial and commercial use of CTC as a laboratory chemical, as described in this unit. This unit describes proposed requirements for a fume hood and dermal PPE for the industrial and commercial use of CTC as a laboratory chemical and advanced engineering controls specifically

for DoD's industrial and commercial use of CTC as a laboratory chemical in chemical weapons destruction, including additional requirements proposed for recordkeeping. This unit also describes compliance timeframes for these proposed requirements. Each owner or operator of a workplace where the industrial and commercial use as a laboratory chemical occurs would be responsible for compliance with the requirements outlined in this unit.

b. Workplace Requirements for Laboratory Use

To address the unreasonable risk of injury to health resulting from dermal exposures to CTC identified for the industrial and commercial use as a laboratory chemical, including DoD's use of CTC as a laboratory chemical in chemical weapons destruction, EPA is proposing to require dermal PPE, including impermeable gloves and protective clothing, in combination with comprehensive training for tasks particularly related to the use of CTC in a laboratory setting as specified in this unit for each potentially exposed person to direct dermal contact in the work area to CTC through direct handling of the substance or from contact with surfaces that may be contaminated with CTC. For dermal PPE, EPA is proposing to require that each owner or operator comply with the requirements outlined in Units IV.A.1.e.ii. and IV.A.1.f. for selection of dermal PPE and training for all potentially exposed persons. EPA's description for how the requirements for the industrial and commercial use as a laboratory chemical would address the unreasonable risk resulting from dermal exposures under the conditions of use and the rationale for this regulatory approach is outlined in Unit V.

In addition, EPA is proposing to require the use of fume hoods in workplace laboratory settings for the industrial and commercial use of CTC as a laboratory chemical, except for DoD's use of CTC as a laboratory chemical in chemical weapons destruction, to codify existing good laboratory practices that EPA relied upon as a key basis for its evaluation of risk from this condition of use. EPA is proposing to require each owner or operator of a workplace laboratory

setting, except for DoD's use of CTC as a laboratory chemical in chemical weapons destruction, to ensure fume hoods are in use and functioning properly to minimize exposures to persons in the area where CTC is used as a laboratory chemical. EPA suggests owners or operators refer to OSHA's 29 CFR 1910.1450, Appendix A, for National Research Council recommendations concerning laboratory chemical hood ventilation system characteristics and practices to minimize exposures to workers in the area. As noted in these non-mandatory recommendations, which are based on the National Research Council's 2011 edition of "Prudent Practices in the Laboratory: Handling and Management of Chemical Hazards," recommended practices for laboratory chemical hoods include, but are not limited to, regularly inspecting and maintaining the ventilation system, ensuring a negative pressure differential between the amount of air exhausted from the laboratory and the amount supplied to the laboratory to prevent uncontrolled chemical vapors from leaving the laboratory, and preventing laboratory air from recirculating back into the laboratory (29 CFR 1910.1450, Appendix A). EPA requests comment on whether it should incorporate in the rule best practices to ensure proper and adequate performance of laboratory fume hoods, such as those identified in OSHA's 29 CFR 1910.1450, Appendix A National Research Council Recommendations Concerning Chemical Hygiene in Laboratory. EPA recognizes that there are several types of fume hoods used in a laboratory setting with differences in design and specifications to meet performance standards. The Agency is requesting comment on whether it should incorporate in the rule specific requirements for laboratory hoods, such as design characteristics and/or a range of face velocities, or some other type of performance standard.

Rather than fume hoods, EPA understands that DoD uses CTC in small amounts in a confined, laboratory-like setting with advanced engineering controls (Ref. 25). Therefore, for DoD's industrial and commercial use of CTC as a laboratory chemical in chemical weapons

destruction, EPA is proposing to require advanced engineering controls that essentially codify existing practices at DoD facilities. EPA is not proposing to require a WCPP, specifically with monitoring requirements, for DoD's industrial and commercial use of CTC as a laboratory chemical in chemical weapons destruction.

To support and demonstrate compliance, EPA is proposing that each owner or operator of a laboratory workplace subject to the requirements of this unit retain compliance records for five years. EPA is proposing to require records of:

(A) PPE program implementation and documentation as outlined in this unit; and

(B) Implementation of a properly functioning fume hood using manufacturer's instructions for installation, use, and maintenance of the fume hood, including inspections, tests, development of maintenance procedures, the establishment of criteria for acceptable test results, and documentation of test and inspection results. Every five years, the owner or operator would be required to re-assess and update these records.

With regards to the compliance timeframe, EPA is proposing to require that each owner or operator of a workplace engaged in the industrial and commercial of CTC as a laboratory chemical ensure fume hoods are in use and functioning properly and that dermal PPE is provided to all potentially exposed persons with direct dermal contact with CTC within 6 months after publication of the final rule. While EPA is proposing requirements within 6 months of publication of the final rule, the Agency will consider compliance timeframes that may be substantially longer or shorter than the proposed timeframe and is soliciting comments on the feasibility of the proposed compliance timeframes, as well as longer or shorter timeframes. Similarly, EPA is proposing to require that DoD facilities engaged in the industrial and commercial use of CTC as a laboratory chemical in chemical weapons destruction ensure that advanced engineering controls are in use and functioning properly and dermal PPE is provided to

all potentially exposed persons with direct dermal contact with CTC within 12 months after publication of the final rule.

3. Prohibition of manufacturing, processing, distribution in commerce, and use of CTC for certain industrial and commercial uses.

EPA is proposing to prohibit the manufacturing, processing, distribution in commerce, and use of CTC for the following industrial and commercial uses:

- Industrial and commercial use as a processing aid in the manufacture of petrochemical-derived products;
- Industrial and commercial use in the manufacture of other basic chemicals (including chlorinated compounds used in solvents, adhesives, asphalt, and paints and coatings), except for use in the elimination of nitrogen trichloride in the production of chlorine and caustic soda (for which EPA is proposing a WCPP);
- Industrial and commercial use in metal recovery; and
- Industrial and commercial use as an additive.

EPA is also proposing to explicitly prohibit:

- Processing: Incorporation into formulation, mixture or reaction products in petrochemical-derived manufacturing (the upstream processing condition of use for the industrial and commercial use of CTC as a processing aid in the manufacture of petrochemicals-derived products).

EPA has attempted to identify users of CTC for the conditions of use the Agency is proposing to prohibit; however, the Agency has not found any ongoing users of CTC for these conditions of use. EPA expects that this is a result of the phaseout of CTC manufacturing in the United States for most non-feedstock domestic uses due to the Montreal Protocol and Title VI of the CAA, and EPA believes it is reasonable to assume that industry has found alternatives for

these uses. Therefore, the Agency understands that CTC is no longer needed for these uses and is proposing that the prohibitions described in this unit would take effect 180 days after the publication date of the final rule. EPA has no reasonably available information indicating that the proposed compliance dates are not practicable or that additional time is needed. However, EPA requests comment on whether CTC is still used in any of the conditions of use EPA is proposing to prohibit, and if so, whether additional time is needed to cease use, whether the compliance dates should be staggered by lifecycle, whether the proposed prohibitions would impact the production and availability of any pesticide, drug, or other substance excluded from the definition of “chemical substance” under TSCA section 3(2)(B)(ii) through (vi), or any other reason for additional compliance time. EPA is also requesting comment on whether the Agency should require a WCPP (as outlined in the Unit IV.B.2. in the primary alternative regulatory action) or prescriptive controls, including respirators and dermal PPE, for any of the conditions of use EPA is proposing to prohibit.

EPA is also proposing to prohibit the manufacturing, processing, distribution in commerce, and use of CTC for the industrial and commercial use of CTC in specialty uses by the DoD. EPA received monitoring data for the industrial and commercial use of CTC in specialty uses by the DoD, which was used in the 2020 Risk Evaluation for Carbon Tetrachloride. The Agency understands that DoD has successfully phased out the use of CTC for this condition of use and is therefore proposing that the prohibition for specialty uses by the DoD would take effect 365 days after the publication date of the final rule. EPA is requesting comments on whether a shorter timeframe for prohibition would be practicable.

After the risk evaluation was published, DoD did further analysis and provided additional information clarifying their ongoing use of CTC and risk management measures implemented. DoD provided information on their use of CTC as a laboratory chemical in chemical weapons

destruction, indicating that CTC is used in small amounts in a confined, laboratory-like setting with advanced engineering controls. Therefore, EPA is proposing not to prohibit this use and instead to regulate this use under the condition of use of industrial and commercial use of CTC as a laboratory chemical. Unit IV.A.2. provides details on the proposed prescriptive controls for DoD's use of CTC as a laboratory chemical in chemical weapons destruction.

Additionally, EPA recognizes that there may be instances where an ongoing use of CTC that has implications for national security or critical infrastructure as it relates to other Federal agencies (e.g., DOD, NASA) is identified after the CTC rule is finalized, but the final rule prohibits that use. For instances like that, EPA requests comments on an appropriate, predictable, process that could expedite reconsideration for uses that Federal agencies or their contractors become aware of after the final rule is issued using the tools available under TSCA, aligning with the requirements of TSCA section 6(g). One example of an approach could be the establishment by rulemaking of a Federal agency category of use that would require implementation of the WCPP and periodic reporting to EPA on details of the use as well as progress in discontinuing the use or finding a suitable alternative. To utilize the category of use a Federal agency would petition EPA, supported by documentation describing the specific use (including documentation of the specific need, service life of any relevant equipment, and specific identification of any applicable regulatory requirements or certifications, as well as the location and quantity of the chemical being used); the implications of cessation of this use for national security or critical infrastructure (including how the specific use would prevent injuries/fatalities or otherwise provide life-supporting functions); exposure control plan; and, for Federal agency uses where similar adoption by the commercial sector may be likely, concrete steps taken to identify, test, and qualify substitutes for the uses (including details on the substitutes tested and the specific certifications that would require updating; and estimates of the

time required to identify, test, and qualify substitutes with supporting documentation). EPA requests comment on whether these are the appropriate types of information for use in evaluating this type of category of use, and whether there are other considerations that should apply. EPA would make a decision on the petition within 30 days and publish the decision in the *Federal Register* shortly after. Additionally, during the year following the petition, EPA would take public comment on the approved petition and no later than 180 days after submitting the petition to EPA, the requesting agency would submit monitoring data indicating compliance with the WCPP at each relevant location as well as documentation of efforts to identify or qualify substitutes. In the absence of that confirmatory data, the utilization of the generic Federal agency category of use would expire within one year of the date of receipt by EPA of the petition. EPA could undertake a TSCA section 6(g) rulemaking for those instances where the Federal agency could not demonstrate compliance with the WCPP. This is just one example of a potential process. EPA requests comments on a transparent process that could expedite reconsideration for uses that Federal agencies or their contractors become aware of after the final rule is issued.

4. Other requirements.

a. Recordkeeping.

EPA is proposing that manufacturers, processors, distributors, and industrial and commercial users of CTC maintain ordinary business records, such as invoices and bills-of-lading, that demonstrate compliance with the prohibitions, restrictions, and other provisions of this proposed regulation; and maintain such records for a period of 5 years from the date the record is generated. EPA is proposing that this requirement begin at the effective date of the final rule, which is expected to be set as the date 60 days after date of publication of the final rule in the *Federal Register*. Recordkeeping requirements would ensure that owners or operators can demonstrate compliance with the regulations if necessary.

b. Downstream Notification.

For conditions of use that are not otherwise prohibited under this proposed regulation, EPA is proposing that manufacturers (including importers), processors, and distributors of CTC provide downstream notification of the prohibitions through Safety Data Sheets (SDSs) by adding to sections 1(c) and 15 of the SDS the following language:

After [DATE 180 DAYS AFTER DATE OF PUBLICATION OF THE FINAL RULE IN THE *FEDERAL REGISTER*], this chemical is and may only be distributed in commerce or processed for the following purposes: Processing as a reactant/intermediate; Repackaging for use as a laboratory chemical; Recycling; Incorporation into formulation, mixture or reaction products in agricultural products manufacturing and other basic organic and inorganic chemical manufacturing; Industrial and commercial use as an industrial processing aid in the manufacture of agricultural products; Industrial and commercial use in the elimination of nitrogen trichloride in the production of chlorine and caustic soda; Industrial and commercial use as a laboratory chemical; Industrial and commercial specialty uses by the U.S. Department of Defense until [DATE 365 DAYS AFTER DATE OF PUBLICATION OF THE FINAL RULE IN THE *FEDERAL REGISTER*]; and Disposal.

The intention of downstream notification is to spread awareness throughout the supply chain of the restrictions on use of CTC under TSCA as well as provide information to end users about allowable TSCA uses of CTC.

In order to provide adequate time to undertake the changes to the SDS and ensure that all users in the supply chain receive the revised SDS, EPA is proposing a 6-month period for manufacturers, processors, and distributors to implement the proposed SDS changes following publication of the final rule.

EPA requests comments on the timeframes for recordkeeping and downstream notification requirements described in this unit.

B. Primary Alternative Regulatory Action

As indicated by TSCA section 6(c)(2)(A)(iv)(II) and (III), EPA must consider and publish a statement based on reasonably available information with respect to the reasonably ascertainable economic consequences of the rule, including consideration of the costs and

benefits and the cost effectiveness of the proposed regulatory action and one or more primary alternative regulatory actions considered by the Agency.

The primary alternative regulatory action described in this unit and considered by EPA combines requirements for a WCPP and prescriptive workplace controls to address the unreasonable risk from CTC driven by the various conditions of use. The primary alternative regulatory action would allow a WCPP, including requirements to meet an ECEL and DDCC, for those conditions of use that would be prohibited under the proposed regulatory action, and prescriptive controls for those conditions of use where an ECEL and DDCC are the proposed regulatory action and where PPE may address the unreasonable risk. EPA requests comment on this primary alternative regulatory action and whether any elements of the primary alternative regulatory action described in this unit should be considered in combination with elements of the proposed regulatory action as EPA develops the final regulatory action. Examples of possible combinations in approaches may include, but are not limited to: adoption of the primary alternative regulatory action for certain conditions of use and the proposed regulatory action for other conditions of use; allowing regulated entities to opt out of requirements described in the proposed regulatory action by complying with requirements described in the primary alternative regulatory action; or allowing regulated entities to opt out of requirements described in the primary alternative regulatory action by complying with requirements described in the proposed regulatory action.

1. *Prescriptive workplace controls.*

The primary alternative regulatory action would require prescriptive workplace controls, specifically respirators and dermal PPE, for manufacturing (including import) of CTC and for the following other conditions of use, which account for essentially all of the production volume of CTC manufactured annually, where the proposed regulatory action is a WCPP:

- Processing as a reactant in the production of HCFCs, HFCs, HFOs, and PCE;
- Processing: Incorporation into formulation, mixtures, or reaction products for agricultural products manufacturing and other basic organic and inorganic chemical manufacturing;
- Processing: Repackaging for use as a laboratory chemical;
- Processing: Recycling;
- Industrial and commercial use as an industrial processing aid in the manufacture of agricultural products;
- Industrial and commercial use in the elimination of nitrogen trichloride in the production of chlorine and caustic soda; and
- Disposal.

In the risk evaluation, EPA identified respirators and gloves that would reduce inhalation and dermal exposures to CTC. Under the primary alternative regulatory action, EPA considered requiring dermal PPE as described in Unit IV.A.1.f.ii. This approach differs from the proposed regulatory action because it would not require the use of elimination, substitution, engineering controls, and administrative controls, in accordance with the hierarchy of controls, to the extent feasible as a means of controlling dermal exposures to comply with DDCC requirements. Rather, this approach would require dermal PPE in combination with comprehensive training for tasks where dermal exposure may occur from direct handling of CTC or from contact with surfaces that may be contaminated with CTC (i.e., equipment or materials on which CTC may be present). EPA recognizes that resorting to the use of dermal PPE does not consider other, more protective controls in the hierarchy, as a WCPP does. By using other controls in the hierarchy, owners and operators may be more easily able to prevent direct dermal contact.

For inhalation exposures in the risk evaluation, EPA identified assigned protection factors

(APF) for respirators for each condition of use that would mitigate the unreasonable risk. EPA expects that workplaces engaged in the conditions of use described in Unit III.B.1. may be able to implement prescriptive controls as part of an industrial hygiene program. Under the primary alternative regulatory action, EPA considered requiring that owners or operators implement all aspects of a respiratory protection program (e.g., training, fitting, medical surveillance, etc.). This approach differs from the proposed regulatory action because it does not require the use of elimination, substitution, engineering controls, and administrative controls, in accordance with the hierarchy of controls, to the extent feasible as a means of controlling inhalation exposures to comply with an ECEL, or require monitoring to determine the airborne concentration in the workplace. As discussed in Unit V.A.1., EPA understands that there are several uncertainties regarding the applicability of respirators, such as the inability to use respirators by some workers due to respiratory concerns, issues with fit-testing, and interference with work efficiency. In addition, the APFs for the respirators are based on monitoring data that included 12-hour and 8-hour shifts as well as monitoring data from the DoD provided during the risk evaluation (Ref. 1). EPA recognizes that workers and ONUs are not typically exposed to CTC for their entire work shifts; rather, exposures to CTC tend to occur intermittently and the level of respiratory APF needed may vary throughout each work shift (Ref. 26). In addition, EPA understands that workplaces have unique processes and equipment in place and that varying levels of respiratory APFs may be needed for different workplaces. Due to these uncertainties, EPA is proposing prescriptive workplace controls as the primary alternative regulatory action. However, the Agency also understands that requiring specific respirators may be more cost-effective and easier to implement for regulated entities since it would not require monitoring for an ECEL. Based on the 2020 Risk Evaluation for Carbon Tetrachloride, EPA determined that the use of respirators with an APF of 50 could control CTC air concentration to levels that eliminate the unreasonable

risk from inhalation exposures based on high-end exposures during a 12-hour work shift driven by the following conditions of use: domestic manufacture; processing as a reactant in the production of HCFCs, HFCs, HFOs, and PCE; incorporation into formulation, mixture, or reaction products for agricultural products manufacturing and other basic organic and inorganic chemical manufacturing; and industrial and commercial use in the elimination of nitrogen trichloride in the production of chlorine and caustic soda. EPA also determined that the use of respirators with an APF of 25 could control CTC air concentration to levels that eliminate the unreasonable risk from inhalation exposures based on high-end exposures during an 8-hour work shift driven by the following conditions of use: import; repackaging of CTC for use as a laboratory chemical; recycling; industrial and commercial use of CTC as an industrial processing aid in the manufacture of agricultural products; and disposal. The alternative regulatory action would require that owners or operators require the use of respirators with an APF 25 or 50, as described in this paragraph, as well as dermal PPE, for any person reasonably likely to be exposed to CTC from the conditions of use described in this unit (Unit IV.B.1.). EPA recognizes that the length of work shifts and the inhalation exposures to CTC throughout a specific work shift may vary across facilities and that monitoring may be helpful to identify the respirators required to eliminate unreasonable risk driven by inhalation exposures. Therefore, the Agency is soliciting comments on information to support the consideration of other APFs that are also protective of the highest possible lengths of exposures and on whether or how monitoring should be considered for the alternative regulatory action.

EPA understands that many workplaces already have engineering controls or administrative controls in place that reduce exposures to CTC, in particular highly standardized and industrialized workplaces or where CTC is used in a closed system. However, EPA does not have reasonably available information on engineering controls and administrative controls that

would mitigate unreasonable risk across a wide variety of workplaces for most conditions of use. EPA is requesting comment on specific controls that mitigate the unreasonable risk from CTC and that could be included as part of a prescriptive workplace controls requirement, which could be considered as EPA develops the final regulatory action. Specifically, EPA is soliciting comment on engineering controls and administrative controls that reduce inhalation exposures to at or below the ECEL of 0.03 ppm as an 8-hr TWA or prevent dermal exposure from direct handling of CTC or from contact with surfaces that may be contaminated with CTC and any associated cost related to these controls. Examples of potential controls and workplace practices include a closed system transfer, purging liquid lines with nitrogen, and limiting frequency and duration of exposure to CTC. EPA is also soliciting comment on combinations of engineering controls, administrative controls, and PPE that would reduce inhalation exposures to at or below the ECEL of 0.03 ppm as an 8-hr TWA or prevent direct dermal contact for all regulated entities and any associated cost related to these controls.

2. Workplace Chemical Protection Program (WCPP).

As discussed in Unit IV.A.3., EPA understands that the conditions of use the Agency is proposing to prohibit have been phased out. However, if EPA receives information indicating the continued use of CTC for these conditions of use, the Agency may consider regulating these uses rather than prohibiting them. Therefore, the primary alternative regulatory action considered by EPA would require the implementation of a WCPP, including an ECEL and DDCC requirements, for the following processing, industrial, and commercial uses of CTC:

- Processing: Incorporation into formulation, mixtures, or reaction products in petrochemicals-derived manufacturing;
- Industrial and commercial use as an industrial processing aid in the manufacture of petrochemicals-derived products;

- Industrial and commercial use in the manufacture of other basic chemicals (including manufacturing of chlorinated compounds used in solvents, adhesives, asphalt, and paints and coatings), except for use in the elimination of nitrogen trichloride in the production of chlorine and caustic soda;

- Industrial and commercial use in metal recovery;
- Industrial and commercial use as an additive; and
- Industrial and commercial use in specialty uses by the DoD.

EPA understands that, if these uses are ongoing, they would occur in highly industrialized settings and controlled and closed processes, suggesting a WCPP could be implemented. Unit IV.A.1. provides details on the WCPP that EPA would require to be implemented for these uses.

For the industrial and commercial use of CTC as a laboratory chemical, the primary alternative regulatory action considered by EPA would require the implementation of only the DDCC requirements of the WCPP in combination with the use of fume hoods in workplace laboratory settings (requiring fume hoods would make mandatory the current existing good laboratory practices) and advanced engineering controls specifically for DoD's use of CTC as a laboratory chemical in chemical weapons destruction (requiring advanced engineering controls would make mandatory the existing practices at DoD facilities). EPA is soliciting comment on non-prescriptive DDCC requirements as compared to the prescriptive workplace controls of dermal PPE EPA is proposing in Unit IV.A.2.

3. Other requirements.

The primary alternative regulatory action will also require recordkeeping and downstream notification similar to the proposed regulatory action as described in Unit IV.A.4.

4. Compliance timeframes.

The timeframes for the controls outlined as part of the primary alternative regulatory action, including ECEL, DDCC, and prescriptive controls, would remain the same as the timeframes outlined in the proposed regulatory action in Unit IV.A. In addition, the timeframes for recordkeeping and downstream notification requirements described in this unit also do not differ from the timeframes for the recordkeeping and downstream notification requirements in the proposed regulatory action described in Unit IV.A.

V. Rationale for the Proposed Regulatory and Primary Alternative Regulatory Actions

This unit describes how the considerations described in Unit III.B.4 were applied when selecting among the TSCA section 6(a) requirements to arrive at the proposed and primary alternative regulatory actions described in Unit IV.A and IV.B.

A. Consideration of Risk Management Requirements Available under TSCA Section 6(a)

1. Workplace Chemical Protection Program.

One option EPA considered for occupational conditions of use was establishing a WCPP, which would include a combination of restrictions to address unreasonable risk driven by inhalation and dermal exposures in the workplace. A WCPP for CTC would encompass restrictions on certain occupational conditions of use and could include provisions for an ECEL, DDCC, and ancillary requirements to support implementation of these restrictions.

A WCPP was considered for certain conditions of use for which there are compelling reasons not to prohibit the activity and for which EPA has found that a regulatory action would address the unreasonable risk. For example, CTC is a major feedstock in the generation of lower GWP HFOs, which is important to the Agency's efforts to address climate-damaging HFCs. Another example is the use of CTC as an industrial processing aid in the manufacture of agricultural products, where industry has described its efforts to explore alternatives, but lack of success in finding a suitable replacement for CTC (Ref. 5). Similarly, for the use of CTC in the

elimination of nitrogen trichloride in the production of chlorine and caustic soda, where industry has indicated that alternatives are not as efficient and/or have not been demonstrated to be effective in decomposing nitrogen trichloride (Ref. 27). Therefore, for these uses, EPA considered regulatory requirements other than prohibition, such as a WCPP, that would reduce exposures in occupational settings so that the unreasonable risk is no longer present.

a. Existing Chemical Exposure Limit.

One option considered by EPA was establishing an ECEL and related required implementation measures, such as monitoring, as a component of a WCPP. The EPA ECEL requirement for CTC would be non-prescriptive, in the sense that regulated entities would not be required to use specific equipment or engineering controls, or any other type of control, to achieve the exposure concentration limit. Rather, it would be a performance-based exposure limit that would enable owner or operators to determine how to most effectively meet the exposure limits based on conditions at their workplace following the hierarchy of controls.

Exposures remaining at or below the ECEL would eliminate any unreasonable risk of injury to health driven by inhalation exposures for occupational conditions of use.

In the case of CTC, EPA has calculated the ECEL for CTC to be 0.03 ppm (0.2 mg/m³) for inhalation exposures as an 8-hour TWA in workplace settings, based on the cancer human equivalent concentration for liver toxicity from chronic inhalation exposures. This is the concentration at which an adult human, including a member of a susceptible subpopulation, would be unlikely to suffer adverse effects if exposed for a working lifetime (Ref. 9). The differences between the ECEL and the OSHA PEL are discussed in more detail in Unit II.C.1.b. EPA chose the cancer liver toxicity endpoint as the basis for this exposure limit, and this exposure limit will be protective of both acute and chronic non-cancer inhalation endpoints over the course of a working day and lifetime.

In deciding whether setting an ECEL would appropriately address unreasonable risk, EPA considered factors including the prevalence of use of the chemical substance, prevalence or lack of alternatives, efficacy, and factors related to work activities that may make it difficult to comply with an ECEL, particularly at the low levels EPA has identified. Examples include work activities in conditions of use that require a high range of motion or for some other reason create challenges for the implementation of respiratory PPE, and the type of PPE that may be needed to meet the ECEL in the absence of, or in addition to, other feasible exposure controls, based on analysis in the risk evaluation describing expected exposures with and without use of PPE.

EPA also considered the feasibility of exposure reduction sufficient to address the unreasonable risk even in facilities currently complying with OSHA PELs. EPA acknowledges the regulated community's expected familiarity with OSHA PELs generally, as well as facilities' past and ongoing actions to implement the CTC PEL and corresponding methods of compliance outlined in OSHA standards. Since the level of EPA's exposure limits is two orders of magnitude lower than the OSHA PEL (the differences between the ECEL and the OSHA PEL are discussed in more detail in Unit II.C.4; more information on other OELs is in Unit II.C.5.), the ECEL requirement creates some uncertainty as to the ability of facilities engaging in most conditions of use to meet the ECEL and associated action level without relying on the use of PPE, and, therefore, whether exposures could be reduced in a manner aligned with the hierarchy of controls.

EPA understands that this uncertainty extends to the applicability of respirators as well. Although respirators could reduce exposures to levels that are protective of cancer and non-cancer risks, not all workers may be able to wear respirators. Individuals with impaired lung function due to asthma, emphysema, or chronic obstructive pulmonary disease, for example, may be physically unable to wear a respirator. OSHA requires that a determination regarding the

ability to use a respirator be made by a physician or other licensed health-care professional, and annual fit testing is required for tight-fitting, full-face piece respirators to provide the required protection. Individuals with facial hair, such as beards or sideburns that interfere with a proper face-to-respirator seal, cannot wear tight fitting respirators. In addition, respirators may also present communication problems, vision problems, worker fatigue, and reduced work efficiency (63 FR 1152, January 8, 1998). According to OSHA, “improperly selected respirators may afford no protection at all (for example, use of a dust mask against airborne vapors), may be so uncomfortable as to be intolerable to the wearer, or may hinder vision, communication, hearing, or movement and thus pose a risk to the wearer’s safety or health.” (63 FR 1189 through 1190, January 8, 1998).

b. Direct Dermal Contact Control (DDCC) Requirements.

Another restriction considered by EPA to include in a WCPP for CTC to address unreasonable risk driven by dermal exposures was requiring direct dermal contact controls (DDCC). DDCC requirements under WCPP would be a process-based set of provisions to address unreasonable risk driven by dermal exposure by preventing direct dermal contact in the workplace by separating, distancing, physically removing, or isolating potentially exposed persons from direct handling of CTC or from contact with equipment or materials on which CTC may exist under routine conditions (exceptions may be needed in the event of incidental exposure or equipment malfunction). Similar to the ECEL, DDCC is non-prescriptive, in the sense that it does not require a specific control to prevent direct dermal contact; rather, it would enable regulated entities to determine how to most effectively prevent direct dermal contact based on what works best for their workplace, in accordance with the hierarchy of controls.

In deciding whether DDCC requirements under a WCPP would appropriately address the unreasonable risk driven by dermal exposures, EPA considered factors including the prevalence

of use of the chemical substance; availability of technically and economically feasible alternatives; efficacy; and factors related to work activities that may make it difficult to prevent direct dermal contact. Examples include work activities that require a high dexterity or precise use of hands and fingers or for some other reason create challenges for the implementation of dermal PPE, and the type of PPE that would be needed to prevent direct dermal contact, based on analysis in the risk evaluation describing expected exposures with and without use of PPE. EPA also considered whether exposures could be reduced in a manner aligned with the hierarchy of controls.

c. CTC Workplace Chemical Protection Program.

Taking into account these considerations, EPA is proposing that certain conditions of use would be allowed to continue if regulated entities could ensure exposures remain at or below the ECEL, direct dermal contact is prevented, and other requirements are met in the CTC WCPP. In contrast to considerations that would weigh against the likelihood of a facility within a condition of use to successfully implement WCPP, there are certain considerations that indicate a condition of use is a good fit for effective risk management via WCPP. Based on reasonably available information, including monitoring data, and information related to considerations described previously in this unit, EPA's confidence that requirements to meet an ECEL can be implemented is highest in the highly standardized and industrialized settings, such as where CTC is used in a closed system (Ref. 10). Additionally, the 2020 Risk Evaluation for Carbon Tetrachloride supports EPA's conclusion that only small reductions in exposure are needed for WCPP ECEL compliance for the conditions of use. Also, for dermal exposures, reasonably available information indicates that controls may already be in place at some workplaces to prevent or reduce direct dermal contact with CTC, including enclosed transfer liquid lines with a nitrogen purging mechanism, closed loop samplers, and impervious glove liners in addition to

chemically resistant gloves (Refs. 26 and 28).

For example, one condition of use where a WCPP may be implemented is the processing of CTC as a reactant in the production of HFOs, which are in lower global warming potential products, including refrigerants, aerosol propellants, and foam-blowing agents, potentially replacing many of the higher global warming potential products containing HFCs, which are subject to a phasedown in production and consumption of HFCs under the AIM Act and the Kigali Amendment to the Montreal Protocol. Among other things, the AIM Act authorizes EPA to address listed HFCs in three main ways: phasing down HFC production and consumption through an allowance allocation program, facilitating sector-based transitions to next-generation technologies, and issuing certain regulations for purposes of maximizing reclamation and minimizing releases of HFCs from equipment and ensuring the safety of technicians and consumers. EPA anticipates that many entities currently using HFCs with higher global warming potential will transition to alternatives with lower GWP as requirements under the AIM Act take effect. By allowing for the continued, controlled use of CTC in the production of lower-GWP HFOs, efforts to shift to chemicals with lower GWP would not be impeded by this rulemaking. In addition, CTC may be used in closed reactors to make feedstocks, including refrigerants, aerosol propellants, and foam-blowing agents (e.g., HCFCs and HFCs), used to produce HFOs (Ref. 29).

Additionally, the 2020 Risk Evaluation for Carbon Tetrachloride indicates that readily achievable reductions in exposure are needed for WCPP compliance for all the conditions of use driving the unreasonable risk from inhalation exposures. Based on analysis in the 2020 Risk Evaluation for Carbon Tetrachloride describing expected exposures with and without use of PPE, EPA identified an air-supplied respirator of APF 10, 25, and 50, depending on the condition of use, as the minimum respiratory PPE that is sufficient to mitigate the unreasonable risk. This

suggests that, for the conditions of use that would be subject to a WCPP, the reductions in exposure required to achieve a level that would not present unreasonable risk may be achievable, which, together with other considerations previously described, including monitoring data submitted via public comment by the Halogenated Solvents Industry Alliance (HSIA) during the 2020 Risk Evaluation for Carbon Tetrachloride indicating exposures near or below the ECEL, adds to EPA's confidence that facilities engaging in the use of CTC could meet the WCPP requirements (EPA-HQ-OPPT-2016-0733-0101).

Pursuant to TSCA section 6(c)(2)(A)(i), EPA is considering reasonably available information regarding the adverse effects of CTC on human health and the magnitude of exposure of human beings to CTC. EPA recognizes that people at workplaces that manufacture, process, use, or dispose of CTC may also live in the fenceline communities surrounding these facilities and consequently may be potentially exposed to CTC through ambient air outside of working hours. In addition, the Agency understands that certain engineering controls can reduce exposures to people inside the workplace but may lead to increased ventilation of CTC outside of the workplace, thereby increasing risks to people in fenceline communities of adverse health effects from exposures to CTC in ambient air. Therefore, pursuant to TSCA section 6(c)(2)(B), EPA is considering the potential adverse effects on health of people in fenceline communities posed by emissions of CTC to ambient air described in Unit VI as a factor when proposing to prohibit increased releases of CTC to outdoor air associated with the implementation of the WCPP/ECEL. This proposed requirement is intended to avoid unintended increases in exposures to people from CTC emissions to ambient air. The proposed rule would require owners and operators to attest in their WCPP/ECEL exposure control plan that engineering controls selected do not increase emissions of CTC to ambient air outside of the workplace and document in their exposure control plan whether additional equipment was installed to capture emissions of CTC

to ambient air.

2. Prescriptive controls.

Another option EPA considered was requiring specific, prescribed controls – such as engineering controls, administrative controls, and PPE – to reduce exposures to CTC in occupational settings. Prescriptive controls could include respirators and dermal PPE. The Agency identified that PPE could reduce exposures in support of risk management efforts for CTC. However, for most conditions of use, except for the use of CTC in a laboratory setting, resorting to the use of PPE does not consider other, more protective controls in the hierarchy, including elimination, substitution, engineering, and administrative controls. EPA also understands that workplaces have unique processes and equipment in place and that varying levels of respiratory APFs may be needed for different workplaces. Therefore, there is uncertainty in prescribing specific respiratory APFs and selecting an APF based on the monitoring required as part of an ECEL is likely more protective because there is more certainty in the level of exposure protection required as a result of regular monitoring requirements. In addition, the Agency recognizes that many of the largely industrialized and standardized facilities that use CTC monitor workers to determine the APFs needed to protect workers, and that the APFs identified to address the unreasonable risk in the primary alternative regulatory action may differ from the APFs needed at many of these facilities due to the variation in processes and equipment in place. As a result of monitoring, many workplaces may also identify that respirators are not needed for large portions of the day, particularly when CTC is not in use. EPA recognizes that requiring specific APFs to be used over the entire work shifts, rather than tasks throughout the workday, is not the norm for most facilities, given how respirators could interfere with physiological and psychological aspects of task performance and might reduce productivity or necessitate offering higher wages to workers who must wear respirators for long

periods of time.

Nevertheless, based on the 2020 Risk Evaluation for Carbon Tetrachloride, EPA considered the industrial and commercial use in laboratory chemicals as a strong candidate for prescriptive controls. Inhalation exposures from the industrial and commercial use of CTC as a laboratory chemical did not drive the unreasonable risk determination for CTC due to risk estimates that were predicated on expected safety practices of using CTC in small amounts under a fume hood, which reduces the potential for inhalation exposures. To codify assumptions made in the 2020 Risk Evaluation for Carbon Tetrachloride regarding the use of fume hoods in laboratory settings, EPA is proposing to require fume hoods in laboratory settings that use CTC. This proposed requirement would protect workers in laboratory settings by ensuring that good laboratory practices that reduce the potential for inhalation exposures are consistently applied and enforceable. Additionally, the 2020 Risk Evaluation for Carbon Tetrachloride determined that dermal exposures from the industrial and commercial use of CTC as a laboratory chemical drive the unreasonable risk determination for CTC. The 2020 Risk Evaluation for Carbon Tetrachloride identifies several uncertainties regarding the use of chemically resistant gloves and the dermal model. For example, the risk evaluation does not consider actual frequency, type and effectiveness of glove use in specific workplaces. In addition, the risk evaluation does not describe the “specific activity training” associated with the dermal protection factor model, beyond that it covers procedure for glove removal and disposal. EPA understands that impermeable gloves in combination with comprehensive training for particular tasks specific to CTC use can reduce the potential for dermal exposures in occupational settings. EPA is requesting comment on whether preventing dermal contact with CTC through dermal PPE and comprehensive training would adequately address the unreasonable risk from dermal exposures for the industrial and commercial use in laboratory chemicals.

3. Prohibition.

EPA considered a prohibition as a regulatory option and is proposing it for certain conditions of use where information indicates uses have been phased out (Unit IV.A.3). The lack of information indicating ongoing use for some CTC uses has led EPA to propose prohibitions, rather than a WCPP, for those conditions of use.

4. Primary alternative regulatory action.

EPA acknowledges that for the conditions of use that it is proposing to prohibit, the types of facilities that would use CTC if these uses were ongoing would likely be able to implement a WCPP, as these conditions of use occur in highly controlled and industrial settings. Therefore, for EPA's primary alternative regulatory action, described in Unit IV.B., EPA is requesting comment on whether any of the uses the Agency is proposing to prohibit are ongoing and is considering a WCPP – including requirements to ensure exposures remain below an ECEL and DDCC requirements – as an alternative regulatory action for some conditions of use of CTC.

As discussed in this unit, in the Risk Evaluation, EPA identified that PPE could reduce exposures in support of risk management efforts for CTC and is therefore proposing to consider prescriptive controls, specifically respirators and dermal PPE, as part of the alternative regulatory option for those conditions of use where the proposed regulatory option is a WCPP. Resorting to the use of PPE, however, does not provide assurance that the owner or operator considered other, more protective controls in the hierarchy, including elimination, substitution, engineering, and administrative controls. In addition, this option does not take into account distinctions in processes and equipment in all facilities, which may result in varying levels and types of respiratory and dermal PPE needed.

While the use of dermal PPE is typical for the use of CTC as a laboratory chemical, EPA recognizes the potential for there to be other forms of controls to prevent direct dermal contact in

a laboratory setting. Therefore, as part of the alternative regulatory action, EPA considered DDCC requirements for the industrial and commercial use of CTC as a laboratory chemical.

5. Risk management requirements considered but not proposed.

An option that EPA considered but is not feasible for CTC is setting a concentration limit. Because the vast majority of CTC is processed as a reactant, a concentration limit is not practicable. Limiting product container size is also an ineffective option for reducing unreasonable risk from CTC, as it is mostly transported in large tank and rail cars (Ref. 26).

6. Additional considerations.

After considering the different regulatory options under TSCA section 6(a), lack of alternatives (described in Unit V.B.), compliance dates, and other requirements under TSCA section 6(c), EPA developed the proposed regulatory action described in Unit IV.A. to address the unreasonable risk from CTC. To ensure successful implementation of this proposed regulatory action, EPA considered other requirements to support compliance with the proposed regulations, such as requiring monitoring and recordkeeping to demonstrate compliance with the WCPP, or downstream notification regarding the prohibition on manufacturing, processing, and distribution in commerce of CTC. These proposed requirements are described in Unit IV.A.4.

Under TSCA section 6(g)(1), EPA may grant an exemption from a requirement of a TSCA section 6(a) rule for a specific condition of use of a chemical substance or mixture if the Administrator finds that certain criteria are met (for example, if compliance with the requirement would significantly disrupt the national economy, national security, or critical infrastructure). Based on reasonably available information, EPA has found that a TSCA section 6(g) exemption is not warranted at this time. Therefore, EPA is not proposing to grant exemptions from the rule requirements under TSCA section 6(g). As discussed in Unit III.A. the Agency is requesting comment on whether to grant a TSCA section 6(g) exemption for CTC.

As required under TSCA section 6(d), any rule under TSCA section 6(a) must specify mandatory compliance dates, which shall be as soon as practicable with a reasonable transition period, but no later than five years after the date of promulgation of the rule (except in the case of a use exempted under TSCA section 6(g) or for full implementation of ban or phaseout requirements). These compliance dates are detailed in Units IV.A. and IV.B. As discussed in Units IV.A. and IV.B., the Agency is requesting comment on whether shorter or longer compliance timeframes should be considered.

B. Consideration of Alternatives in Deciding Whether to Prohibit or Substantially Restrict CTC

Under TSCA section 6(c)(2)(C), in deciding whether to prohibit or restrict in a manner that substantially prevents a specific condition of use of a chemical substance or mixture, and in setting an appropriate transition period for such action, EPA must consider, to the extent practicable, whether technically and economically feasible alternatives that benefit human health or the environment will be reasonably available as a substitute when the proposed prohibition or other restriction takes effect.

EPA is proposing to prohibit those conditions of use where information indicates uses of CTC are phasing out or have already been phased out: the industrial and commercial use of CTC as a processing aid in the manufacture of petrochemicals-derived products; industrial and commercial use of CTC in the manufacture of other basic chemicals (including chlorinated compounds used in solvents, adhesives, asphalt, and paints and coatings) except for use in the elimination of nitrogen trichloride in the production of chlorine and caustic soda (for which EPA is proposing a WCPP); industrial and commercial use of CTC as an additive; industrial and commercial use of CTC in metal recovery; and industrial and commercial use of CTC in specialty uses by the DoD. Since these uses seem to have been phased out, it is reasonable to assume industry has found alternatives. The transition to these alternatives has taken place since

CTC was restricted under the CAA in 1990 and therefore, while EPA has not identified specific alternatives, the Agency has concluded that technically and economically feasible alternatives are reasonably available for CTC; however, the Agency was unable to examine the health and environmental effects of other potential alternatives or substitute methods.

For other conditions of use of CTC for which EPA is proposing restrictions rather than prohibition, EPA held several outreach meetings with current users of CTC and carried out thorough research to determine if technically and economically feasible alternatives and substitute methods are available. For the processing of CTC as a reactant in the production of HFOs, the Agency understands that there are routes of production with feedstocks that do not use CTC. However, industry has explained that these routes are not as cost-effective or efficient as CTC and would require replacement or significant modification of existing production technology (Ref. 30). In addition, current processes that use CTC to manufacture HCFCs and HFCs, including HFC-245fa, HFC-365mfc, and HFC-236fa, do not seem to have substitutes readily available, particularly because these facilities have CTC-specific infrastructure in place and replacing the infrastructure at these facilities to use an alternative feedstock would require large investments (Ref. 30). In terms of PCE production, CTC does not appear to be a major feedstock in the production of PCE; rather, CTC may be a minor input when recycled to make additional PCE (Ref. 31). The recycling of CTC for production of PCE prevents additional disposal and wasting of CTC. With regard to the use of CTC as an industrial processing aid in the manufacture of agricultural products, EPA was informed that, despite past research and development efforts, a suitable replacement for CTC that would not react with the process gases in the manufacture of agricultural products has not been identified (Ref. 5). For the use of CTC in the elimination of nitrogen trichloride (NTC) in the production of chlorine and caustic soda, industry has indicated that the alternatives are not as efficient because they require more of an

alternative chemical, require more energy usage, and/or have not been demonstrated to be effective in decomposing NTC (Ref. 27). For example, one alternative is refluxing cold liquid chlorine; more liquid chlorine than CTC would be required per pound of NTC absorbed, and NTC removal with CTC allows for storage capacity of the purge stream, while chlorine does not (Ref. 27). EPA has also not identified technically and economically feasible alternatives for the specific uses of CTC in a laboratory setting.

The Agency is requesting comment on the availability of technically and economically feasible alternatives that are beneficial to health or the environment compared to CTC.

VI. TSCA Section 6(c)(2) Considerations

A. Health Effects of Carbon Tetrachloride and the Magnitude of Human Exposure to Carbon Tetrachloride

The human health hazards to CTC include carcinogenicity, liver toxicity, neurotoxicity, kidney toxicity, reproductive and developmental toxicity, irritation and sensitization, and genetic toxicity. Acute inhalation exposures to CTC at relatively high concentrations induce immediate and temporary depression of the central nervous-system, with effects consisting of escape-impairing symptoms such as dizziness. For chronic non-cancer inhalation exposure scenarios to CTC, liver toxicity is identified as the most sensitive effect due to fatty changes to the liver indicative of cellular damage. Under EPA's Guidelines for Carcinogen Risk Assessment, CTC is classified as "Likely to be Carcinogenic in Humans." CTC has been shown to cause pheochromocytomas (tumors of the adrenal glands) in male and female mice by oral and inhalation exposures, and a strong association between neuroblastoma and CTC in a single well-conducted epidemiological study in the same organ raises concern for potential carcinogenic effects in human. In addition, a general correlation has been observed in animal studies with CTC between hepatocellular cytotoxicity and regenerative hyperplasia and the induction of liver

tumors (Ref. 1).

Populations exposed to CTC include workers ages 17 and older of either gender, including pregnant women and individuals who do not use CTC but may be indirectly exposed due to their proximity to the user who is directly handling CTC (ONUs). EPA estimates that, annually, there are approximately between 852 and 9,554 workers and between 500 and 4,144 ONUs at between 30 and 71 facilities either manufacturing, processing, or using CTC for industrial and commercial conditions of use (Ref. 4).

In addition to these estimates of workers and occupational non-users directly exposed to CTC, EPA recognizes there is exposure to the general population from air and water pathways for CTC. As mentioned in Unit II.D., EPA has separately conducted a screening approach to assess whether there may be potential risks to the general population from these exposure pathways. The screening approach was developed in order to allow EPA to determine—with confidence—situations which present no unreasonable risk to fenceline communities or where further investigation would be needed to develop a more-refined estimate of risk. The fenceline technical support memos for the ambient air pathway and the water pathway provide the Agency with a quantitative assessment of exposure. For CTC, the results from applying this screening approach did not allow EPA to rule out unreasonable risk to fenceline communities. After doing an initial screen (the single year ambient air screening analysis) that did not rule out unreasonable risk, EPA conducted additional analysis (the multi-year ambient air analysis) from which it derived risk estimates that are mostly within the cancer benchmarks used by EPA and other regulatory agencies of 1 in 10,000 to 1 in 1,000,000. The single year ambient air screening analysis and the multi-year ambient air analysis allow EPA to mathematically calculate a cancer risk in fenceline communities. While EPA feels confident about there being no significant risk where calculated risks do not exceed 1×10^{-6} (as is the case for two conditions of use) there are

still limitations and uncertainties where the calculated risk exceeds the 1 in 1,000,000 cancer risk benchmark value as is the case for five conditions of use, which are described further in this unit. This unit summarizes the results of the fenceline analysis of the water pathway and also for the ambient air pathway for CTC, which expands the original single year ambient air screening approach to include a multi-year assessment in light of peer review comments on the initial methodology.

As described in Unit II.D., EPA's fenceline analysis methodology was presented to the SACC peer review panel in March 2022, and EPA considered SACC feedback (including the SACC recommendation to EPA to consider multiple years of release data to estimate exposures and associated risks) when applying the fenceline analysis to CTC. EPA also plans to consider SACC feedback and make decisions regarding how to build upon the screening approach so that EPA can more accurately assess and quantify general population exposures in upcoming risk evaluations, such as for the 1,4-dioxane supplement and for the forthcoming 20 High Priority Substances. For CTC, EPA recognizes that a key input into the fenceline assessment of the ambient air pathway was data on releases from a single year of Toxics Release Inventory (TRI) release data (2019 TRI reporting year) and that the use of more than one year of data could result in different conclusions. Accordingly, in this unit, EPA presents the results of its analysis based on CTC releases reported to TRI over a single reporting year as well as over multiple years (Ref. 32).

EPA's fenceline analysis for the air pathway for CTC indicates that EPA cannot rule out unreasonable risk to fenceline communities with confidence, described further in this unit. Estimates of cancer risk to fenceline communities were calculated and compared to 1×10^{-6} as a benchmark value for cancer risk in fenceline communities. Cancer benchmark values used by EPA and other regulatory agencies in interpreting the significance of cancer risk range from 1 in

1,000,000 to 1 in 10,000 (i.e., 1×10^{-6} to 1×10^{-4}) depending on the subpopulation exposed (Ref. 3). Benchmark values help inform decisions regarding the significance of risk and the Agency considers a number of other factors when determining whether risks are significant, such as the endpoint under consideration, the reversibility of effect, and exposure-related considerations (e.g., duration, magnitude, or frequency of exposure, or population exposed).

The ambient air fenceline analysis organizes facilities and associated risks by occupational exposure scenario (OES) and generally crosswalks each OES with the associated condition of use of CTC (Ref. 32). Due to limited information on activities and use of CTC reported under TRI, there is uncertainty if the facilities associated with a specific OES were correctly cross-walked to the appropriate condition of use, or whether some OESs indicating increased cancer risk from ambient air exposures to CTC in the air fenceline analysis should be associated with more than one condition of use of CTC.

The ambient air fenceline analysis was divided into four steps: (a) a single-year ambient air analysis, (b) a single-year land use analysis, (c) a multi-year ambient air analysis, and (d) a multi-year land use analysis. EPA conducted an ambient air analysis for a single year and multiple years to determine whether EPA-generated risk estimates exceeded benchmarks for cancer risk for real and generic facilities at multiple distances. The Agency then conducted a land use analysis as part of both the single-year and multi-year analyses to determine if EPA can reasonably expect an exposure to fenceline communities to occur within the modeled distances for facilities where there was an indication of risk above one in a million. This review consisted of a visual analysis using aerial imagery and interpreting land/use zoning practices around the facility to identify where residential, industrial/commercial businesses, or other public spaces are present within those radial distances indicating risk (as opposed to uninhabited areas), as well as whether the radial distances lie outside the boundaries of the facility.

1. CTC Fenceline Analysis of the Ambient Air Pathway

a. Single year ambient air full-screening results for CTC.

EPA's single-year (using 2019 TRI data) fenceline analysis for the ambient air pathway was based on methods presented to the SACC to identify expected exposure and estimate associated cancer risk to people who live in fenceline communities within select distances evaluated from 5 to 10,000 meters from the respective releasing facility. Where there was an indication of risk above one in a million in the single year fenceline analysis from a facility, EPA conducted a land use analysis to determine if the Agency can reasonably expect an exposure to fenceline communities to occur within the modeled distances from the respective releasing facility. The land use analysis for the single-year ambient air analysis is described in Unit VI.A.b. Risk estimates exceeded one in a million for cancer risk for 31 of the 47 real or generic, or modeled, facilities evaluated, at multiple distances (between 5 and 2,500 meters from a releasing facility), representing five OES. One OES had one generic facility evaluated which showed risk above one in a million, but no land use analysis could be performed. The remaining four OES included real facilities for which a land use analysis was conducted.

b. Single-year land use analysis for CTC.

The land use analysis for the single-year analysis identified 21 real facilities where cancer risk estimates exceeded one in a million and there is an expected exposure to fenceline communities.

c. Multi-year ambient air analysis.

Following SACC feedback, EPA evaluated 6 years of facility specific CTC release data as reported to TRI (2015 through 2020 TRI data as well as the arithmetic average of that data). The multi-year analysis evaluated 60 real facilities. Cancer risk estimates exceeded one in a million for cancer for 25 of those 60 facilities at 100 meters from the releasing facility. Out of

these 25 facilities, 6 facilities solely producing CTC as a byproduct were excluded (because, as described earlier, the 2020 Risk Evaluation for Carbon Tetrachloride did not include the production of CTC as a byproduct as a condition of use), resulting in 19 facilities. Based on the multi-year analysis, 4 of the 25 facilities either have cancer risk estimates above one in a million at distances farther out when compared to the single-year analysis or are facilities that were not captured in the single-year analysis (e.g., did not report in 2019 TRI). When excluding facilities producing CTC as a byproduct, the multi-year analysis found 3 of 19 facilities have cancer risk estimates above one in a million at distances farther out when compared to the single-year analysis or are facilities that were not captured in the single-year analysis. Although the multi-year analysis did identify several additional facilities with cancer risk estimates above one in a million for cancer that were not captured by the single-year fenceline analysis data set, the multi-year analysis did not change the number of conditions of use with cancer risk estimates above one in a million at the distances evaluated.

Overall, the ambient air analysis for the multi-year fenceline analysis identified 19 facilities with risk estimates above one in a million, with only one facility with risk estimates above one in ten thousand, at 100 meters representing 5 conditions of use. The potential risks identified for those conditions of use without consideration of the land use analysis to determine whether there is exposure to fenceline communities are:

- Manufacturing (8 out of 8 facilities evaluated, with the highest risk estimate of 4×10^{-5});
- Processing as a reactant in the production of HCFCs, HFCs, HFOs, and PCE (5 of 5 facilities evaluated, with the highest risk estimate of 7×10^{-5});
- Processing: Incorporation into formulation, mixtures, or reaction products (petrochemicals-derived manufacturing; agricultural products manufacturing; other basic organic and inorganic chemical manufacturing) (1 of 1 facility evaluated, with the highest risk estimate

of 8×10^{-5});

- Industrial and commercial use as an industrial processing aid in the manufacture of petrochemicals-derived products and agricultural products (4 of 8 facilities evaluated, with the highest risk estimate of 2×10^{-4}); and
- Disposal (1 of 15 facilities evaluated, with the highest risk estimate of 3×10^{-6}).

d. *Multi-year land use analysis.*

The land use analysis for the multi-year analysis was limited to 4 additional facilities identified in the multi-year ambient air analysis which had cancer risk estimates that exceeded one in a million at distances farther out than the single-year analysis or were new facilities not captured by the single-year analysis. Therefore, the multi-year land use analysis was conducted for these 4 additional facilities and found only 1 facility had cancer risk estimates that exceeded one in a million and an expected exposure to fenceline communities, although that one facility was identified as a facility producing CTC as a byproduct.

e. *Fenceline analysis of the ambient air pathway conclusions.*

Under the proposed regulatory action described in Unit IV.A., all of the conditions of use with an indication of potential risk to fenceline communities would be required to establish a WCPP. [However, it is important to note that EPA understands that two uses evaluated in the risk evaluation, along with the manufacturing and processing for these uses, have ceased and these uses are therefore not expected to be contributing sources to the ambient air releases in the fenceline analysis. These two uses are the industrial and commercial use as a processing aid in the manufacture of petrochemical-derived products and the industrial and commercial use in the manufacture of most other basic chemicals, including chlorinated compounds used in solvents, adhesives, asphalt, and paints and coatings (except for use in the elimination of nitrogen trichloride in the production of chlorine and caustic soda) and are proposed for prohibition].

Under the proposed WCPP requirements, facilities would need to monitor CTC air concentrations by taking personal breathing zone air samples of potentially exposed persons, which would allow facilities to better understand and manage the total releases of CTC within the facility and potentially stack and fugitive emissions. Furthermore, EPA is proposing to prohibit increased emissions associated with WCPP requirements, and in the WCPP exposure control plan facilities would need to evaluate controls to determine how to reduce releases and exposures to potentially exposed persons in the workplace and attest that engineering controls selected do not increase emissions of CTC to ambient air outside of the workplace and whether additional equipment was installed to capture emissions of CTC to ambient air. EPA anticipates that this analysis would help facilities to determine the most effective ways to reduce releases, including possible engineering controls or elimination/substitution of CTC, and therefore may also reduce the overall risk to fenceline communities.

Although both the single year fenceline analysis, based on methods presented to the SACC, and the multi-year fenceline analysis conducted for CTC, which expands upon the fenceline analysis in response to SACC feedback, indicated potential exposure and associated risks to select receptors within the general population at particular facilities, there are some uncertainties associated with the fenceline analysis. The TRI dataset used for the single- and the multi-year fenceline analysis and land use analysis does not include actual release point locations, which can affect the estimated concentrations of the chemical at varying distances modeled. To identify the release location for each facility, EPA used a local-coordinate system based on latitude/longitude coordinates reported in TRI. The latitude/longitude coordinates may represent the mailing address location of the office building associated with a very large facility or some other area of the facility rather than the actual release location (e.g., a specific process stack). This discrepancy between the coordinates reported in TRI and the actual release point

could result in an exposure concentration that does not represent the actual distance where fenceline communities may be exposed.

For the multi-year analysis, there were a few additional uncertainties. The multi-year analysis evaluated a conservative exposure scenario that consists of a facility that operates year-round (365 days per year, 24 hours per day, 7 days per week) in a South Coastal meteorologic region and a rural topography setting (Ref. 32). Therefore, the modeled exposures to receptors may be overestimated if there are fewer exposure days per year or hours per day. Another uncertainty for the multi-year analysis is the distribution and volume of releases to stack and fugitive emissions. Further, there were certain assumptions and uncertainties related to the model used for the multi-year analysis, for example, the multi-year analysis used high-end and central tendency meteorological data contained within the model, which may differ from the meteorological data utilized in the single year fenceline analysis. Another uncertainty is that the emission scenario assumed may or may not represent actual operating conditions of a given facility. Finally, there is uncertainty in the stack parameters used and whether they represent actual stack parameters or conditions of the modeled facilities, including stack height, diameter, temperature, and other factors.

EPA also recognizes, as was described in the 2020 Risk Evaluation for Carbon Tetrachloride, that CTC is highly persistent in the atmosphere with an estimated tropospheric half-life exceeding 330 years. Thus, CTC has notable global background concentrations due to its long half-life, despite having limited air releases in the US, as noted in both the EPA's Air Toxic Screening Assessment modeling technical support document and in a recent EPA publication comparing the national air toxics modeling to regional monitoring data (Refs. 33 and 34). The risk estimates from the fenceline analysis do not account for the background concentrations from historical emissions, which are persistent in the atmosphere.

EPA believes that the exposures from which these risk estimates were derived come from five conditions of use. For these five conditions of use identified in the multi-year ambient air analysis, the proposed rule would require strict workplace exposure controls via implementation of a WCPP as described in Unit IV.A.1. In the instances where efforts to reduce exposures in the workplace to levels below the ECEL could lead to adoption of engineering controls that ventilate more CTC outside, EPA believes this potential additional exposure would be limited as a result of the existing National Emission Standards for Hazardous Air Pollutants (NESHAPs) for CTC for these conditions of use under the CAA. Applicable NESHAPs include: 40 CFR part 63, Subpart VVVVVV, Chemical Manufacturing Area Sources, and 40 CFR part 63, Subparts F, G, H, and I, Organic HAP from the Synthetic Organic Chemical Manufacturing Industry and Other Processes Subject to the Negotiated Regulation for Equipment Leaks. In addition, as part of the proposed controls outlined in Unit IV, EPA is proposing to prohibit increased releases of CTC to outdoor air associated with the implementation of the WCPP/ECEL to avoid unintended increases in exposures to people from CTC emissions to ambient air by requiring owners and operators to attest in their WCPP/ECEL exposure control plan that engineering controls selected do not increase emissions of CTC to ambient air outside of the workplace and document in their exposure control plan whether additional equipment was installed to capture or otherwise prevent increased emissions of CTC to ambient air. EPA is requesting comment on the types and costs of technologies firms would adopt to comply with the prohibition on increased releases of CTC to outdoor air associated with engineering controls used in the implementation of the WCPP/ECEL. In addition, EPA requests comment on whether and to what extent these technologies would reduce CTC emissions at facilities that adopt them below emissions levels that existed prior to implementation of the WCPP/ECEL.

Because EPA believes that the proposed controls outlined in Unit IV on the five conditions of use will reduce the exposure values used in the calculation of these fenceline risk estimates, EPA does not intend at this time to revisit the air pathway for CTC as part of a supplemental risk evaluation. EPA is seeking comment on its conclusions, and the expectation that this proposed action in combination with the emissions standards resulting from existing NESHAP requirements would reduce risk sufficiently to the general population and fenceline communities, and whether, consistent with TSCA section 9(b), any other statutory authorities administered by EPA should be used to take additional regulatory action identified as necessary to protect against such risk. EPA is also soliciting comment on whether EPA should require ambient air monitoring at fenceline locations or facility emissions source monitoring to demonstrate compliance with the proposed requirement that engineering controls implemented as part of a WCPP/ECEL under this rule would not result in the ventilation of more CTC outside. The Agency recognizes that owners and operators may have difficulty distinguishing between emission increases due to implementation of the WCPP/ECEL and emissions increases resulting from other factors such as increased manufacturing, processing, or use of CTC, although monitoring at both upwind and downwind locations could help them do so. In addition, EPA understands the difficulty in distinguishing between background levels of CTC and emissions from facilities. Therefore, EPA is soliciting comment on the need for and associated costs of ambient air monitoring at fenceline locations or facility emissions source monitoring, as well as information on the frequency and nature of air monitoring EPA should consider including as requirements in the final rule (such as a detection limit for CTC). EPA is also soliciting comment on whether, if EPA does not finalize the proposed prohibition on increased releases of CTC to ambient air outside of the workplace associated with implementation of the WCPP/ECEL, EPA

should require monitoring to alert EPA to any increased emissions to ambient air associated with WCPP/ECEL implementation so that the Agency may take appropriate action.

2. CTC Fenceline Analysis of the Water Pathway

EPA's fenceline analysis for the water pathway for CTC, based on methods presented to the SACC, assesses exposure via drinking water, incidental oral ingestion of ambient water, and incidental dermal exposure to ambient water for communities in proximity to waterbodies receiving direct or indirect releases of CTC from facilities that use CTC ("fenceline communities") (Ref. 35). EPA's screening level analysis did not find potential risk to fenceline communities from the water pathway. Further, EPA has a Safe Drinking Water Act National Primary Drinking Water Regulation for CTC that applies to public water systems to protect public health on a national level.

B. Environmental Effects of Carbon Tetrachloride and the Magnitude of Exposure of the Environment to Carbon Tetrachloride

EPA did not identify risks of injury to the environment that drive the unreasonable risk determination for CTC (Refs. 1 and 3). In the 2020 Risk Evaluation for Carbon Tetrachloride, EPA identified and evaluated CTC environmental hazard data for fish, aquatic invertebrates, amphibians, and algae across acute and chronic exposure durations.

Exposures to terrestrial organisms from the suspended soils and biosolids pathway was qualitatively evaluated. Due to its physical-chemical properties, EPA expects that CTC does not bioaccumulate in fish or sediments; and CTC could be mobile in soil and migrate to water or volatilize to air (Ref. 1).

EPA concluded in the 2020 Risk Evaluation for Carbon Tetrachloride that CTC poses a hazard to environmental aquatic receptors. Amphibians were the most sensitive taxa for acute and chronic exposures. Acute exposures of CTC to fish, freshwater aquatic invertebrates, and

sediment invertebrates resulted in hazard values as low as 10.4 mg/L, 11.1 mg/L, and 2 mg/L, respectively. For chronic exposures, CTC has a hazard value for amphibians of 0.03 mg/L based on teratogenesis and lethality in frog embryos and larvae. Furthermore, chronic exposures of CTC to fish, freshwater aquatic invertebrates, and sediment invertebrates resulted in hazard values as low as 1.97 mg/L, 1.1 mg/L, and 0.2 mg/L, respectively. In algal studies, CTC has hazard values ranging from 0.07 to 23.59 mg/L (Ref. 1).

In addition to the environmental effects assessed in the 2020 Risk Evaluation for Carbon Tetrachloride, EPA recognizes that CTC is an ozone-depleting substance with a 100-year GWP of 1730 (Ref. 36). As a result of its ozone-depleting effects, the Montreal Protocol and Title VI of the CAA led to a phase-out of CTC manufacturing in the United States for most non-feedstock domestic uses. EPA did not evaluate the effect of this rule on ozone depletion. In addition, while the Agency understands that the use of CTC is expected to increase to produce low GWP HFOs, replacing many of the HFCs with higher GWP, EPA did not evaluate whether emissions of CTC would increase because of this rule and the overall impact on the GWP emissions. In other words, EPA did not evaluate if the possible increase of CTC emissions with a GWP of 1730 would offset emissions of the HFCs replaced by the lower GWP HFOs manufactured with CTC.

C. Benefits of Carbon Tetrachloride for Various Uses

CTC is primarily used as a feedstock in the production of HCFCs, HFCs, and HFOs. Other conditions of use include regulated use as a process agent in the manufacture of petrochemicals-derived and agricultural products and other chlorinated compounds such as chlorinated paraffins, chlorinated rubber and others that may be used downstream in the formulation of solvents for adhesives, asphalt, paints and coatings. Requirements under the Montreal Protocol and Title VI of the CAA led to a phaseout of CTC production in the United States for most non-feedstock domestic uses in 1996 and the CPSC banned the use of CTC in

consumer products (excluding unavoidable residues not exceeding 10 ppm atmospheric concentration) in 1970.

According to data collected in EPA's 2020 CDR, between 100 and 250 million pounds of CTC were produced or imported in the U.S. in CDR Reporting Year 2019. Eight sites were reported as domestic manufacturers of CTC in 2020 CDR. According to private databases, between 2017 and 2021 there were up to forty possible import/repackaging sites dealing with small volumes of CTC (Ref. 4). Most HFCs do not require CTC for their manufacture. However, CTC is used as a feedstock to produce HFC-245fa and HFC-365mfc. As stated in the 2020 Risk Evaluation for Carbon Tetrachloride, the production of HFC-245fa and HFC-365mfc accounted for 71% and 23%, respectively, of total CTC consumption in 2016 (Ref. 37). More recently, industry has expressed particular reliance on CTC for HFOs, such as HFO-1234yf, which are replacing some of the HFCs currently being used (Ref. 38).

CTC is a major feedstock for generation of lower-GWP alternative fluorocarbon products in the United States (Ref. 26). EPA anticipates that many entities currently using HFCs with higher global warming potential will transition to alternatives with lower global warming potential as requirements under the AIM Act take effect. The manufacturing of CTC is predicted to increase as a result of the transition from HFCs to lower-GWP HFOs that use CTC as a feedstock, such as HFO-1234yf used in motor vehicle AC and HFO-1234ze used in some types of aerosols and foam-blowing agents.

D. Reasonably Ascertainable Economic Consequences of the Proposed Rule

1. Likely effect of the rule on the national economy, small business, technological innovation, the environment, and public health.

With respect to the anticipated effects of this rule on the national economy, the economic impact of a regulation on the national economy generally only becomes measurable if the

economic impact of the regulation reaches 0.25 percent to 0.5 percent of Gross Domestic Product (GDP) (Ref. 39). Given the current GDP of \$23.17 trillion, this is equivalent to a cost of \$58 billion to \$116 billion which is considerably higher than the estimated cost of this rule. EPA considered the number of businesses, facilities, and workers that would be affected and the costs and benefits to those businesses and workers and society at large and did not find that there would be a measurable effect on the national economy. In addition, EPA considered the employment impacts of this proposal. For businesses subject to the WCPP, including the ECEL and DDCC requirements, and prescriptive workplace control requirements, EPA estimates the marginal cost of labor will increase. This may lead to small negative employment effects. Costs of prohibition are not quantified, and there may be employment effects proportionate to the extent to which CTC is still being used in the prohibited conditions of use.

EPA has determined that the rule will not have a significant impact on a substantial number of small entities. EPA estimates that the rule would affect at least four small entities, and that the cost would only exceed 1% of annual revenues for one of these small entities.

EPA expects that the proposed rule will not hinder technological innovation. Innovative applications of CTC in recent years have occurred in the production of HFOs. The regulatory options with requirements for certain conditions of use, including processing as a reactant in the production of refrigerants (such as HFOs), are not expected to inhibit innovation since they permit the continued use of CTC with appropriate controls. With respect to those conditions of use where prohibition is the requirement in the proposed regulatory action, EPA did not find evidence of ongoing use of CTC and thus there are no expected effects on innovation.

The effects of this rule on public health are estimated to be positive, due to the avoided incidence of adverse health effects attributable to CTC exposure, including adrenal and liver cancer.

2. Costs and benefits of the proposed regulatory action and of the 1 or more primary alternative regulatory actions considered by the Administrator.

EPA is proposing to prohibit the manufacturing, processing, distribution in commerce, and use of CTC for the following industrial and commercial uses: industrial and commercial use of CTC as a processing aid in the manufacture of petrochemicals-derived products; industrial and commercial use of CTC in manufacture of other basic chemicals (including chlorinated compounds used in solvents, adhesives, asphalt, and paints and coatings) except for use in the elimination of nitrogen trichloride in the production of chlorine and caustic soda; industrial and commercial use of CTC in metal recovery; industrial and commercial use of CTC as an additive; and industrial and commercial use of CTC in specialty uses by the DoD. EPA is also proposing to explicitly prohibit processing into formulation, mixture or reaction products in petrochemical-derived manufacturing, which is the upstream processing condition of use for one of the prohibited industrial and commercial uses. EPA did not estimate the costs of prohibiting CTC in certain conditions of use because reasonably available information indicates that those conditions of use have been phased out. There will therefore be unquantified costs only to the extent to which CTC is still being used in the prohibited conditions of use.

EPA is also proposing a WCPP, including an ECEL of 0.03 ppm in combination with DDCC requirements for: domestic manufacture; import; processing as a reactant in the production of HCFCs, HFCs, HFOs, and PCE; repackaging of CTC for use as a laboratory chemical; recycling; incorporation into a formulation, mixture or reaction product in agricultural products manufacturing and other basic organic and inorganic chemical manufacturing; industrial and commercial use of CTC as an industrial processing aid in the manufacture of agricultural products; industrial and commercial use in the elimination of NTC in the production of chlorine and caustic soda; and disposal. Industry would bear monitoring, PPE, and notification

and recordkeeping burdens and costs associated with the ECEL. While companies may comply with the rule using engineering controls, when estimating costs and benefits the Economic Analysis assumes firms will provide PPE to employees when monitoring thresholds are exceeded. EPA estimated monitoring results based on a log normal distribution estimated from the median and 95th percentile 8-hour time-weighted average exposure outcomes presented in the 2020 Risk Evaluation for Carbon Tetrachloride. PPE, recordkeeping, and monitoring costs after initial monitoring vary by industry and by projected initial monitoring result. Industry is expected to incur planning, recordkeeping and PPE costs associated with DDCC requirements. Industry would incur costs associated with developing an exposure control plan, performing inspections, documenting efforts to reduce exposure and occurrences of exposure, respiratory protection and dermal PPE, and training on the use of respiratory protection and dermal PPE.

EPA is also proposing to require dermal PPE in combination with comprehensive training for tasks pertaining to the use of CTC in a laboratory setting for each person potentially exposed to direct dermal contact with CTC in the work area through direct handling of the substance or from contact with surfaces that may be contaminated with CTC. In addition, EPA is proposing to require the use of fume hoods in workplace laboratory settings to codify existing good laboratory practices. EPA assumes that industry would not incur equipment costs associated with the fume hood requirement for laboratory settings because fume hoods are already considered to be good laboratory practices. Industry is expected to incur costs associated with the dermal PPE requirement.

Assuming the high-end estimates for number of affected entities and workers and compared to the baseline trend, the total cost of the proposed regulatory action is \$18.8 million dollars annualized over 20-years at a 3% discount rate and \$18.5 million dollars at a 7% discount rate. However, to improve these estimates, EPA is requesting comment on the types and costs of

administrative and engineering controls that facilities could use to control exposures in the workplace. EPA is also requesting comment on the baseline use of each identified control. In addition, EPA is requesting comment regarding the effectiveness of any existing administrative and engineering in controlling and/or reducing exposures. Also, EPA requests comment on whether these administrative and engineering controls would increase or reduce annual costs as compared to the annualized costs per facility estimated in the proposed regulatory action. For example, Executive Summary table ES-4 of the Economic Analysis includes an average annual estimated cost per facility of the proposed regulatory action in the “manufacturing” condition of use of approximately \$605,000 based on an estimate of 300 workers per site. The average annual estimated cost per facility for the “processing as a reactant” condition of use is approximately \$232,000 based on an estimate of 113 workers per site. These estimated costs, which are annualized over a 20-year period at a 3% discount rate, are composed of facility- and employee-based expenditures based largely on monitoring requirements and use of PPE. It is possible these ongoing costs could be affected by upfront expenditures on engineering and administrative controls, and EPA seeks comment on this topic.

Under the primary alternative option, EPA would require prescriptive controls of a Supplied Air Respirator (SAR) at either APF 25 or APF 50. A respirator with an APF of 50 would be required for the following conditions of use: domestic manufacture; processing as a reactant in the production of HCFCs, HFCs, HFOs, and PCE; incorporation into formulation, mixture, or reaction products for agricultural products manufacturing and other basic organic and inorganic chemical manufacturing; and industrial and commercial use in the elimination of nitrogen trichloride in the production of chlorine and caustic soda. A respirator with an APF of 25 would be required for the following conditions of use: import; repackaging of CTC for use as a laboratory chemical; recycling; industrial and commercial use of CTC as an industrial

processing aid in the manufacture of agricultural products; and disposal.

A WCPP, including an ECEL and DDCC requirements, would be required for the following conditions of use in the primary alternative regulatory action: processing of CTC for incorporation into formulation, mixture or reaction products in petrochemical-derived manufacturing; industrial and commercial use of CTC as an industrial processing aid in the manufacture of petrochemicals-derived products; industrial and commercial use of CTC in the manufacture of other basic chemicals (including manufacturing of chlorinated compounds used in solvents, adhesives, asphalt, and paints and coatings) except for use in the elimination of nitrogen trichloride in the production of chlorine and caustic soda); industrial and commercial use of CTC in metal recovery; industrial and commercial use of CTC as an additive; and in industrial and commercial use of CTC in specialty uses by the DoD.

For the industrial and commercial use of CTC as a laboratory chemical, the primary alternative regulatory action considered by EPA would require the implementation of DDCC requirements in workplace laboratory settings and require the use of fume hoods in workplace laboratory settings to codify existing good laboratory practices.

Assuming the high-end estimates for number of affected entities and workers, the total cost of the primary alternative regulatory action is \$2.3 million dollars annualized over 20-years at both a 3% and 7% discount rate. Costs are higher for the proposed action compared to the primary alternative action. Under the WCPP, facilities will bear monitoring and recordkeeping costs in addition to respirators and dermal PPE. However, facilities only need to provide a respirator to employees with a sufficiently high projected monitoring outcome. In the primary alternative action, facilities will not incur monitoring or WCPP recordkeeping costs, but will need to provide a respirator to all employees.

EPA's Economic Analysis for the rule quantified the benefits from avoided cases of

adrenal and liver cancers. Cancer benefits are calculated based on inhalation exposure estimates from the Final Risk Evaluation. Therefore, benefits are only calculated for the ECEL, which could require respiratory protection, and prescriptive workplace control options. The estimated monetized benefit of the proposed regulatory action ranges from approximately \$0.09 to \$0.1 million per year annualized over 20-years at a 3% discount rate and from \$0.04 to \$0.07 million per year at a 7% discount rate. The estimated monetized benefit of the primary alternative regulatory action is \$.09 to \$.1 million per year annualized over 20-years at a 3% discount rate and \$.04 to \$.07 million per year at a 7% discount rate. There are also unquantified benefits due to other avoided adverse health effects associated with CTC exposure, including liver, reproductive, renal, developmental, and CNS toxicity end points.

Net benefits were calculated by subtracting the costs from the quantified benefits. Based on the high-end estimates for number of affected entities and workers, the net benefit of the proposed regulatory action is -\$18.7 million dollars annualized over 20-years at a 3% discount rate and ranges from -\$18.5 to -\$18.4 million dollars at a 7% discount rate. Based on the high-end estimates for number of affected entities and workers, the net benefit of the primary alternative option ranges from -\$2.3 to -\$2.2 million dollars annualized over 20-years at a 3% discount rate and is -\$2.3 million dollars at a 7% discount rate. The range in the net benefits estimate at each discount rate reflects uncertainty in cancer risk reductions given the shorter exposure durations being considered and the life stage at which the changes in exposure occur.

A sensitivity analysis was conducted based on the low estimates of the number of affected entities in the 2020 Risk Evaluation for Carbon Tetrachloride. Based on these estimates, the total cost of the proposed regulatory action is \$2 million dollars annualized over 20-years at both a 3% and a 7% discount rate. The total cost of the primary alternative option is \$0.3 million dollars annualized over 20-years at both a 3% and 7% discount rate. The total benefit of the

proposed regulatory action is estimated to range from \$.01 million dollars to \$.02 million dollars annualized over 20-years at a 3% period discount rate, and ranges from \$.005 million dollars to \$.009 million dollars annualized over 20-years at a 7 percent discount rate. The total benefit of the primary alternative regulatory action is estimated to range from \$.01 million dollars to \$.02 million dollars annualized over 20-years at a 3% period discount rate and from \$.005 million dollars to \$.009 million dollars annualized over 20-years at a 7 percent discount rate. The net benefit of the proposed regulatory action under this sensitivity analysis is -\$2 million dollars annualized over 20-years at both a 3% and a 7% discount rate. The net benefit of the primary alternative option is -\$0.3 million dollars annualized over 20-years at both a 3% and 7% discount rate.

3. Cost effectiveness of the proposed regulatory action and of the 1 or more primary alternative regulatory actions considered by the Administrator.

For the COUs that EPA determined drive the unreasonable risk of injury to health from CTC, both the proposed regulatory action and the primary alternative action reduce unreasonable risk to the extent necessary such that unreasonable risk is no longer presented. In achieving this result, however, the estimated costs of the proposed regulatory action and the primary alternative regulatory action differ as described in Units I.E and VI.D.2. The costs of achieving the desired outcome via the proposed regulatory action or the primary alternative regulatory action can be compared to evaluate cost-effectiveness. The measure of cost-effectiveness considered is the annualized cost of each regulatory option per microrisk reduction in cancer cases estimated to occur as a result of each regulatory option, where a microrisk refers to a one in one million reduction in the risk of a cancer case. The cost-effectiveness of the proposed regulatory action ranges from \$698 to \$1,024 dollars per microrisk reduction at a 3% discount rate, and from \$687 to \$1,008 dollars per microrisk reduction at a 7% discount rate. The cost-effectiveness of the

primary alternative regulatory action ranges from \$83 to \$122 dollars per microrisk reduction at both a 3% and 7% discount rate. Since the regulated universe in both the proposed and primary alternative regulatory actions is identical, the cost-effectiveness of the regulatory actions varies based on the individual requirements comprising each proposed regulatory action. Section 3.9 of the Economic Analysis provides a summary of the unquantified costs and uncertainties in the cost estimates that may impact the respective cost-effectiveness of each proposed regulatory action.

4. Request for comments regarding the reasonably ascertainable economic consequences of the proposed rule.

EPA requests comment on its analyses of the number of affected firms, facilities, and occupational users and non-users. EPA requests comment on whether CTC is still being used in any of the conditions of use EPA is proposing to prohibit. Finally, EPA requests comment on the costs firms would incur as a result of the proposed rule, as well as information that the Agency could use to improve these estimates.

VII. TSCA Section 9 Analysis and Section 26 Considerations

A. TSCA Section 9(a) Analysis

TSCA section 9(a) provides that, if the Administrator determines, in the Administrator's discretion, that an unreasonable risk may be prevented or reduced to a sufficient extent by an action taken under a Federal law not administered by EPA, the Administrator must submit a report to the agency administering that other law that describes the risk and the activities that present such risk. TSCA section 9(a) describes additional procedures and requirements to be followed by EPA and the other Federal agency following submission of any such report. As discussed in this unit, for this proposed rule, the Administrator proposes to exercise the Administrator's discretion not to determine that unreasonable risk from CTC under the

conditions of use may be prevented or reduced to a sufficient extent by an action taken under a Federal law not administered by EPA.

In addition, TSCA section 9(d) instructs the Administrator to consult and coordinate TSCA activities with other Federal agencies for the purpose of achieving the maximum enforcement of TSCA while imposing the least burden of duplicative requirements. EPA routinely consults with other relevant Federal agencies, and for this proposed rule, EPA has and continues to coordinate with appropriate Federal executive departments and agencies, including OSHA and NIOSH, to, among other things, identify their respective authorities, jurisdictions, and existing laws with regard to risk evaluation and risk management of CTC, which are summarized in this unit, and described in Units II.B. and C. The following information relating to TSCA section 9(a) analysis reflects consultation and coordination efforts with OSHA and NIOSH.

OSHA requires that employers provide safe and healthful working conditions by setting and enforcing standards and by providing training, outreach, education, and assistance. Gaps exist between OSHA's authority to set workplace standards under the OSH Act and EPA's obligations under TSCA section 6 to eliminate unreasonable risk presented by chemical substances under the conditions of use. Health standards issued under section 6(b)(5) of the OSH Act must reduce significant risk only "to the extent feasible." 29 U.S.C. 655(b)(5). As noted previously, to set PELs for chemical exposure, OSHA must first establish that the new standards are economically and technologically feasible (79 FR 61384, Oct. 10, 2014). OSHA also does not have direct authority over State and local employees, and it has no authority over the working conditions of State and local employees in States that have no OSHA-approved State Plan under 29 U.S.C. 667.

The 2016 amendments to TSCA altered both the manner of identifying unreasonable risk

and EPA's authority to address unreasonable risk, such that risk management is increasingly distinct from provisions of the OSH Act. EPA risk evaluations under TSCA section 6(b) must determine, without consideration of costs or other nonrisk factors, whether an unreasonable risk of injury to health or the environment is presented, including an unreasonable risk to a relevant potentially exposed or susceptible subpopulation. In a TSCA section 6 risk management rule, following such an unreasonable risk determination, EPA must apply risk management requirements to the extent necessary so that the chemical no longer presents unreasonable risk and only consider costs and benefits of the regulatory action to the extent practicable, 15 U.S.C. 2605(a), (c)(2). EPA's substantive burden under TSCA section 6(a) is to apply requirements to the extent necessary so that the chemical substance no longer presents the unreasonable risk that was determined in accordance with TSCA section 6(b)(4)(A) without consideration of cost or other nonrisk factors.

EPA therefore concludes that TSCA is the most appropriate regulatory authority able to prevent or reduce unreasonable risk of CTC to a sufficient extent across the conditions of use, exposures, and populations of concern. This unreasonable risk can be addressed in a more coordinated, efficient, and effective manner under TSCA than under different laws implemented by different agencies. Moreover, the timeframe and any exposure reduction as a result of updating OSHA regulations cannot be estimated, while TSCA imposes a much more accelerated statutory timeframe for proposing and finalizing requirements to address unreasonable risk. Further, as discussed in detail in Unit II.C., there are key differences between the finding requirements of TSCA and those of the OSH Act. For these reasons, in the Administrator's discretion, the Administrator has analyzed this issue and does not determine that unreasonable risk presented by CTC may be prevented or reduced to a sufficient extent by an action taken under a Federal law not administered by EPA.

B. TSCA Section 9(b) Analysis

If EPA determines that actions under other Federal laws administered in whole or in part by EPA could eliminate or sufficiently reduce a risk to health or the environment, TSCA section 9(b) instructs EPA to use these other authorities to protect against that risk unless the Administrator determines, in the Administrator's discretion, that it is in the public interest to protect against such risk under TSCA. In making such a public interest finding, TSCA section 9(b)(2) states: "the Administrator shall consider, based on information reasonably available to the Administrator, all relevant aspects of the risk . . . and a comparison of the estimated costs and efficiencies of the action to be taken under this title and an action to be taken under such other law to protect against such risk."

Although several EPA statutes have been used to limit CTC exposure (Ref. 6), regulations under those EPA statutes largely regulate releases to the environment, rather than the occupational exposures that drive EPA's unreasonable risk determination for CTC in its 2020 risk evaluation under TSCA. While these limits on releases to the environment may be protective in the context of their respective statutory authorities, regulation under TSCA is also appropriate for occupational exposures and in some cases can provide upstream protections that would prevent the need for release restrictions required by other EPA statutes (e.g., RCRA, CAA, CWA).

The primary exposures and unreasonable risk to workers and occupational non-users would be addressed by EPA's proposed prohibitions and restrictions under TSCA section 6(a). In contrast, the timeframe and any exposure reduction as a result of updating regulations for CTC under RCRA, CAA, or CWA, for example, cannot be estimated, nor would they address the direct human exposure to workers and occupational non-users from the conditions of use evaluated in the 2020 Risk Evaluation for Carbon Tetrachloride. The Agency recognizes that the

CAA Amendments of 1990 have reduced emissions from CTC production and use. However, of the laws administered by EPA, only TSCA provides EPA the authority to regulate the manufacture (including import), processing, distribution in commerce, commercial use, and disposal of CTC as necessary to address the unreasonable risk identified under TSCA from CTC under its conditions of use.

For these reasons, the Administrator does not determine that unreasonable risk from CTC under its conditions of use, as evaluated in the 2020 Risk Evaluation for Carbon Tetrachloride, could be eliminated or reduced to a sufficient extent by actions taken under other Federal laws administered in whole or in part by EPA.

C. TSCA Section 14 Requirements

EPA is also providing notice to manufacturers, processors, and other interested parties about potential impacts to confidential business information that may occur if this rule is finalized as proposed. Under TSCA section 14(b)(4), if EPA promulgates a rule pursuant to TSCA section 6(a) that establishes a ban or phase-out of a chemical substance, the protection from disclosure of any confidential business information regarding that chemical substance and submitted pursuant to TSCA will be “presumed to no longer apply,” subject to the limitations identified in TSCA section 14(b)(4)(B)(i) through (iii). If this rule is finalized as proposed, then pursuant to TSCA section 14(b)(4)(B)(iii), the presumption against protection from disclosure would apply only to information about the specific conditions of use that this rule would prohibit. Manufacturers or processors seeking to protect such information would be able to submit a request for nondisclosure as provided by TSCA sections 14(b)(4)(C) and 14(g)(1)(E). Any request for nondisclosure would need to be submitted within 30 days after receipt of notice from EPA under TSCA section 14(g)(2)(A). EPA anticipates providing such notice via the Central Data Exchange (CDX).

D. TSCA Section 26 Considerations

In accordance with TSCA section 26(h), EPA has used scientific information, technical procedures, measures, methods, protocols, methodologies, and models consistent with the best available science. As in the case of the unreasonable risk determination, risk management decisions for this proposed rule, as discussed in Units III.B.3. and V., were based on a risk evaluation that was subject to public comment and independent, expert peer review, and was developed in a manner consistent with the best available science and based on the weight of the scientific evidence as required by TSCA sections 26(h) and (i) and 40 CFR 702.43 and 702.45. In particular, the ECEL value incorporated into the WCPP is derived from the analysis in the 2020 Risk Evaluation for Carbon Tetrachloride; it likewise represents decisions based on the best available science and the weight of the scientific evidence (Ref. 9). The ECEL value of 0.03 ppm as an 8-hour TWA is based on the point of departure for liver cancer identified in the 2020 Risk Evaluation for Carbon Tetrachloride, which is the concentration at which an adult human would be unlikely to suffer adverse effects if exposed for a working lifetime, including susceptible subpopulations.

The extent to which the various information, procedures, measures, methods, protocols, methodologies, or models, as applicable, used in EPA's decisions have been subject to independent verification or peer review is adequate to justify their use, collectively, in the record for this rule. Additional information on the peer review and public comment process, such as the peer review plan, the peer review report, and the Agency's response to public comments, can be found at EPA's risk evaluation docket (Docket ID No. EPA-HQ-OPPT-2019-0499).

VIII. Requests for Comment

While EPA is requesting public comment on all aspects of this proposal, the Agency is soliciting feedback from the public on specific issues throughout this proposed rule. This unit

summarizes those specific requests for comments.

1. EPA is requesting public comment on the proposed regulatory action and alternative regulatory action.

2. EPA is requesting public comment regarding the need for exemptions from the rule (and under what specific circumstances) pursuant to the provisions of TSCA section 6(g).

3. EPA is requesting comment on, in lieu of proposing a 6(g) exemption in a separate regulatory action, whether any elements of the primary alternative regulatory action should be considered in combination with elements of the proposed regulatory action as EPA develops the final regulatory action.

4. EPA requests public comments regarding the number of small businesses subject to the rule, including conditions of use for which EPA did not identify any affected small businesses and the potential impacts of the rule on these small businesses.

5. EPA is requesting comment on the proposed rule's rationale.

6. EPA is soliciting comment regarding an ECEL action level that is two-thirds the ECEL and any associated provisions related to the ECEL action level when the ECEL is significantly lower than the OSHA PEL.

7. EPA is requesting comment regarding the amount of time, if any, it would take the regulated community to develop a method to measure at or below the ECEL over an entire work shift. EPA is interested in what levels of detection are possible over an entire work shift based on existing monitoring methods, justification for the timeframe of the specific steps needed to develop a more sensitive monitoring method, cost associated with a more sensitive monitoring method, and any additional detailed information related to establishing a monitoring program to reliably measure CTC at or below the ECEL.

8. EPA requests comment on whether EPA should promulgate definitions for the

conditions of use covered by the 2020 Risk Evaluation for Carbon Tetrachloride, and, if so, whether the descriptions in Unit III.B.1. are consistent with the conditions of use evaluated in the 2020 Risk Evaluation for Carbon Tetrachloride and whether they provide a sufficient level of detail such that they would improve the clarity and readability of the regulation if promulgated.

9. EPA is requesting comment on whether a shorter timeframe for prohibition of the industrial and commercial use of CTC in DoD specialty uses should be considered.

10. As a result of the AIM Act/Kigali Amendment and to improve the economic analysis, EPA is requesting comment on how much CTC production and use will increase as a result of the move to HFOs; how quickly the decline in HFCs will lead to increased production of CTC (for HFOs); how much industry currently relies on CTC for HFOs; and whether alternatives to CTC for HFOs could be developed. EPA is also requesting comment on how possible increases in CTC use for larger HFO production would affect operations. Would facilities hire more workers, shift current workers to different tasks, build more sites, or run existing at higher capacity? Also, EPA is requesting comment on whether the Agency should prohibit the use of CTC in the production of HCFCs, HFCs, and PCE instead of requiring an WCPP with an ECEL and DDCC requirements or whether the Agency should require prescriptive controls, including respirators and dermal PPE, for these uses.

11. EPA is requesting comment on whether CTC is still being used in any of the conditions of use EPA is proposing to prohibit, if additional time is needed, for example, if CTC is still being used and additional time is needed to cease use, and on whether the effective dates should be staggered by lifecycle.

12. EPA is requesting comment on whether the Agency should require a WCPP or prescriptive controls, including respirators and dermal PPE, for any of the conditions of use EPA is proposing to prohibit.

13. EPA is requesting comment on the proposed implementation timeframe for the WCPP requirements; EPA proposes that they would take effect 180 days after publication of the final rule, at which point entities would be required to conduct initial exposure monitoring and develop an exposure control plan.

14. EPA is soliciting comments regarding when and how owners and operators could conduct initial exposure monitoring to ensure that it is representative of all tasks likely to be conducted by potentially exposed persons.

15. EPA is soliciting comments regarding the proposed requirement for recurring 5-year initial exposure monitoring, which differs from OSHA's existing monitoring requirements under 29 CFR 1910.1052.

16. EPA requests comment on the timeframes for periodic and additional exposure monitoring outlined in Unit IV.A.1.b.ii.

17. EPA is requesting public comments on the proposed conditions for discontinuation of periodic exposure monitoring for the CTC ECEL as part of implementation of the WCPP.

18. EPA requests comment on the use of area source monitoring instead of personal breathing zone as a representative sample of exposures when monitoring for the ECEL.

19. EPA requests comment on available methods to measure the effectiveness of controls in preventing or reducing the potential for direct dermal contact to CTC.

20. EPA is requesting comment on available monitoring methods, such as charcoal patch testing, as feasible or effective methods to measure potential direct dermal contact with CTC.

21. EPA requests comment on how the proposed prohibition of increased releases of CTC to outdoor air associated with the implementation of the WCPP/ECEL may impact the availability, feasibility, or cost of engineering controls as a means to reduce workplace exposures to or below the proposed ECEL.

22. EPA is soliciting comment on requiring warning signs to demarcate regulated areas, such as the requirements found in OSHA's General Industry Standard for Beryllium.

23. EPA is soliciting comment on whether any of the requirements for the exposure control strategies, including EPA's proposed prohibition of rotating work schedules for potentially exposed persons, should be modified and considered in the final rule.

24. EPA requests comment on the requirements proposed for appropriate PPE selection, the effectiveness of PPE in preventing direct dermal contact with CTC in the workplace, and general absorption and permeation effects to PPE from direct dermal exposure.

25. EPA requests comment on the impact on effectiveness of rinsing and reusing certain types of PPE, either gloves or protective clothing and gear.

26. EPA is requesting comment on whether there should be a requirement to replace cartridges or canisters of respirators after a certain number of hours, such as the requirements found in OSHA's General Industry Standard for 1,3-Butadiene (29 CFR 1910.1051(h)), or a requirement for a minimum service life of non-powered air-purifying respirators such as the requirements found in OSHA's General Industry Standard for Benzene (29 CFR 1910.1028(g)(3)(D)).

27. EPA is soliciting comment on whether 9 months is a reasonable timeframe to implement a respiratory protection program or if additional time is needed.

28. EPA requests comment on the degree to which additional guidance related to use of dermal PPE might be appropriate.

29. EPA is requesting comment on how owners and operators can engage with potentially exposed persons on the development and implementation of an exposure control plan and PPE program.

30. EPA requests comment on the 15-day timeframe for notification of potentially

exposed persons of monitoring results and the possibility for a shorter timeframe, such as 5 days.

31. EPA will consider compliance timeframes that may be substantially longer or shorter than the proposed timeframes for owners or operators to conduct initial exposure monitoring for the ECEL, implement the DDCC requirements, and any procedural adjustments needed to comply with the requirements outlined as part of the WCPP, and is requesting comment on the feasibility of the proposed compliance timeframes, as well as longer or shorter timeframes.

32. EPA is soliciting comment regarding the exposure control strategies required under the WCPP and documented in the exposure control plan, including the implementation of additional engineering controls, increase frequency of exposure monitoring, implementation of respiratory and dermal protection and notification of monitoring, and associated costs with the WCPP exposure control strategies implementation.

33. EPA is requesting comment on the types and costs of administrative and engineering controls that potentially regulated facilities use or could potentially use to control exposures in the workplace. EPA is also requesting comment on the baseline use of each identified control. In addition, EPA is requesting comment regarding the effectiveness of any existing administrative and engineering in controlling and/or reducing exposures. EPA requests comment on whether any engineering and administrative controls known by potentially affected sites would have higher or lower per-facility costs than the annualized per-facility costs in the proposed regulatory action. For example, Executive Summary table ES-4 of the Economic Analysis shows that, annualized over 20 years at a 3% discount rate, the per-facility cost of the proposed regulatory action in the Manufacturing condition of use would be \$604,787 (this condition of use has an average of 300 workers per site), and the per-facility cost for the Processing as a reactant condition of use would be \$231,954 (this condition of use has an average of 113 workers per site).

34. EPA is soliciting comment on non-prescriptive DDCC requirements as compared to the prescriptive workplace controls of dermal PPE EPA is proposing in Unit IV.A.2.

35. EPA requests comment on whether it should incorporate in the rule best practices to ensure proper and adequate performance of laboratory fume hoods, such as those identified in OSHA's 29 CFR 1910.1450, Appendix A National Research Council Recommendations Concerning Chemical Hygiene in Laboratory.

36. EPA is requesting comment on whether it should incorporate in the rule specific requirements for laboratory hoods, such as design characteristics and/or a range of face velocities, or some other type of performance standard.

37. EPA is proposing to require that each owner or operator of a workplace engaged in the industrial and commercial of CTC as a laboratory chemical ensure fume hoods are in use and functioning properly and that dermal PPE is provided to all potentially exposed persons with direct dermal contact with CTC within 6 months after publication of the final rule.. While EPA is proposing requirements within 6 months of publication of the final rule, the Agency will consider compliance timeframes that may be substantially longer or shorter than the proposed timeframe and is soliciting comments on the feasibility of the proposed compliance timeframes, as well as longer or shorter timeframes.

38. EPA is proposing that the prohibition of certain industrial and commercial uses described in Unit IV.A.3 would occur 180 days after the publication date of the final rule for manufacturers, processors, distributors, and industrial and commercial uses. EPA requests comment on whether CTC is still used in any of these conditions of use and whether additional time is needed or if prohibitions should be staggered by lifecycle, for example, for products affected by proposed restrictions to clear the channels of trade.

39. EPA requests comments on the appropriateness of identified compliance timeframes

for recordkeeping and downstream notification requirements described in Unit IV.A.4.

40. Primary alternative regulatory action: EPA requests comment on the primary alternative regulatory action and whether any elements of the primary alternative regulatory action should be considered in combination with elements of the proposed regulatory action as EPA develops the final regulatory action. Examples of possible combinations in approaches may include, but are not limited to: adoption of the primary alternative regulatory action for certain conditions of use and the proposed regulatory action for other conditions of use; allowing regulated entities to opt out of requirements described in the proposed regulatory action by complying with requirements described in the primary alternative regulatory action; or allowing regulated entities to opt out of requirements described in the primary alternative regulatory action by complying with requirements described in the proposed regulatory action.

41. Primary alternative regulatory action: EPA requests comment on engineering controls, administrative controls, PPE, and any combinations of these controls that reduce inhalation exposures to at or below the ECEL or prevent dermal exposure from direct handling of CTC or from contact with surfaces that may be contaminated with CTC and any associated cost related to these controls.

42. Primary alternative regulatory action: EPA is soliciting comments on information to support the consideration of other APFs that are also protective of the highest possible lengths of exposures and on whether or how monitoring should be considered for the alternative regulatory action.

43. Primary alternative regulatory action: EPA is requesting comment on whether any of the uses the Agency is proposing to prohibit are ongoing and if EPA should consider a WCPP for those conditions of use of CTC.

44. Primary alternative regulatory action: EPA is requesting comment on non-

prescriptive DDCC requirements as compared to the prescriptive workplace controls of dermal PPE EPA is proposing in Unit IV.A.2.

45. The Agency is requesting comment on the availability of technically and economically feasible alternatives that are comparably beneficial to health or the environment for CTC.

46. EPA is requesting comment on the types and costs of technologies firms would adopt to comply with the prohibition on increased releases of CTC to outdoor air associated with engineering controls used in the implementation of the WCPP/ECEL.

47. EPA requests comment on whether and to what extent these technologies would reduce CTC emissions at facilities that adopt them to or below emissions levels that existed prior to implementation of the WCPP/ECEL.

48. EPA is seeking comment on its conclusions that its proposed action in combination with the emissions standards resulting from existing NESHAP requirements would reduce risk sufficiently to the general population and fenceline communities, and whether, consistent with TSCA section 9(b), any other statutory authorities administered by EPA should be used to take additional regulatory action identified as necessary to protect against such risk.

49. EPA is soliciting comment on whether EPA should require ambient air monitoring at fenceline locations or facility emissions source monitoring to demonstrate compliance with the proposed requirement that engineering controls that are implemented as part of a WCPP/ECEL under this rule would not result in the ventilation of more CTC outside.

50. EPA is soliciting comment on the need for and associated costs of ambient air monitoring at fenceline locations or facility emissions source monitoring, as well as information on the frequency and nature of air monitoring EPA should consider including as requirements in the final rule (such as a detection limit for CTC).

51. EPA is soliciting comment on whether, if EPA does not finalize the proposed prohibition on increased releases of CTC to ambient air outside of the workplace associated with implementation of the WCPP/ECEL, EPA should require monitoring to alert EPA to any increased emissions to ambient air associated with WCPP/ECEL implementation so that the Agency may take appropriate action.

IX. References

The following is a listing of the documents that are specifically referenced in this document. The docket includes these documents and other information considered by EPA, including documents that are referenced within the documents that are included in the docket, even if the referenced document is not physically located in the docket. For assistance in locating these other documents, please consult the technical person listed under **FOR FURTHER INFORMATION CONTACT**.

1. EPA. Risk Evaluation for Carbon Tetrachloride. November 2020. (EPA-HQ-OPPT-2019-0499-0047).

2. EPA. Correction of Dermal Acute Hazard and Risk Values in the Final Risk Evaluation for Carbon Tetrachloride. August 4, 2022. (EPA-HQ-OPPT-2019-0499).
<https://www.regulations.gov/document/EPA-HQ-OPPT-2019-0499-0064>.

3. EPA. Carbon Tetrachloride; Revision to Toxic Substances Control Act (TSCA) Risk Determination. December 2022. (EPA-HQ-OPPPT-2016-0733-0120).

4. EPA. Economic Analysis of the Proposed Regulation of Carbon Tetrachloride. June 2023.

5. EPA. Email correspondence with Syngenta on Carbon Tetrachloride Alternatives. October 2021.

6. EPA. Regulatory Actions Pertaining to Carbon Tetrachloride. 2022.

7. Department of Labor, Occupational Safety and Health Administration. Permissible Exposure Limits—Annotated Tables. <https://www.osha.gov/annotated-pels> (accessed March 2023).
8. National Institute for Occupational Safety and Health. Hierarchy of Controls. <https://www.cdc.gov/niosh/topics/hierarchy/default.html> (accessed March 2023).
9. EPA. Existing Chemical Exposure Limit (ECEL) for Occupational Use of Carbon Tetrachloride. February 2021. (EPA-HQ-OPPT-2020-0592-0007). <https://www.regulations.gov/document/EPA-HQ-OPPT-2020-0592-0007>.
10. Halogenated Solvents Industry Alliance, Inc. (HSIA). Comments submitted to EPA on the Draft Risk Assessment for Carbon Tetrachloride. January 24, 2020.
11. American Conference of Governmental Industrial Hygienists (ACGIH). Carbon Tetrachloride. 2001.
12. National Institute for Occupational Safety and Health (NIOSH). Criteria for a Recommended Standard: Occupational Exposure to Carbon Tetrachloride. 1975.
13. EPA. EPA Announces Path Forward for TSCA Chemical Risk Evaluations. June 30, 2021. <https://www.epa.gov/newsreleases/epa-announces-path-forward-tsca-chemical-risk-evaluations>.
14. EPA. Science Advisory Committee on Chemicals Meeting Minutes and Final Report “Draft TSCA Screening Level Approach for Assessing Ambient Air and Water Exposures to Fenceline Communities Version 1.0.” No. 2022-01. May 2022. (EPA-HQ-OPPT-2021-0415-0095). <https://www.regulations.gov/document/EPA-HQ-OPPT-2021-0415-0095>.
15. EPA. Federalism Consultation on Forthcoming Proposed Rulemaking for Carbon Tetrachloride under TSCA Section 6(a). February 17, 2021.
16. EPA. Tribal Consultations on Forthcoming Proposed Rulemaking for Carbon

Tetrachloride. January 6, 2021 and January 12, 2021.

17. EPA. Environmental Justice Consultations on Forthcoming Proposed Rulemaking for Carbon Tetrachloride under TSCA Section 6(a). February 2, 2021 and February 18, 2021.

18. EPA. Stakeholder Meeting List. 2023.

19. EPA. EPA's Policy on Children's Health. October 2021. <https://www.epa.gov/children/childrens-health-policy-and-plan#A1>.

20. EPA. Problem Formulation of the Risk Evaluation for Carbon Tetrachloride. June 2018. (EPA-HQ-OPPT-2016-0733). <https://www.regulations.gov/document/EPA-HQ-OPPT-2016-0733-0068>.

21. EPA. Final Scope of the Risk Evaluation for 1,2-Dichloroethane (CASRN 107-06-2). August 2020. (EPA-HQ-OPPT-2018-0427-0048). <https://www.regulations.gov/document/EPA-HQ-OPPT-2018-0427-0048>.

22. EPA. Meeting with the American Chemistry Council (ACC) on Risk Management under TSCA section 6, Carbon Tetrachloride. January 2023.

23. Occupational Safety and Health Administration. Recommended Practices for Safety and Health Programs. OSHA 3885 October 2016. <https://www.osha.gov/sites/default/files/publications/OSHA3885.pdf>.

24. Occupational Safety and Health Administration. Personal Protective Equipment. OSHA 3151-02R 2023. <https://www.osha.gov/sites/default/files/publications/osha3151.pdf>.

25. The Program Executive Office, Assembled Chemical Weapons Alternatives (PEO ACWA). U.S. Chemical Weapons Destruction 2018. May 2018. https://www.youtube.com/watch?v=MaLz0dX_c78.

26. Halogenated Solvents Industry Alliance, Inc. (HSIA). Comments submitted to EPA on the Carbon Tetrachloride Risk Evaluation and the Risk Management Process. April 28, 2021.

27. Occidental Chemical Corporation. Comments submitted to EPA on the Risk Management of Carbon Tetrachloride. February 15, 2022.
28. Chemours Company. Comments submitted to EPA on Carbon Tetrachloride (CASRN 56-23-5); Draft Revision to TSCA Risk Determination. September 30, 2022.
29. Alliance for Responsible Atmospheric Policy. Comments submitted to EPA on the Draft Revision to Toxic Substances Control Act (TSCA) Risk Determinations for Perchloroethylene (PCE); Methylene Chloride; Trichloroethylene (TCE); and Carbon Tetrachloride. September 9, 2022.
30. EPA. Meeting with Honeywell on Risk Management under TSCA section 6, Carbon Tetrachloride. July 2021.
31. EPA. Preliminary Information on Manufacturing, Processing, Distribution, Use, and Disposal: Tetrachloroethylene (Perchloroethylene). February 10, 2017. (EPA-HQ-OPPT-2016-0732). <https://www.regulations.gov/docket/EPA-HQ-OPPT-2016-0732>.
32. EPA. Carbon Tetrachloride: Fenceline Technical Support – Ambient Air Pathway. October 2022.
33. U.S. EPA. August 2022. Technical Support Document EPA's Air Toxics Screening Assessment 2018 AirToxScreen TSD. Document number EPA-452/B-22-002. https://www.epa.gov/system/files/documents/2023-02/AirToxScreen_2018%20TSD.pdf.
34. Weitekamp. C. et al. 2021. An Examination of National Cancer Risk Based on Monitored Hazardous Air Pollutants. Environmental Health Perspectives. Vol 129., No. 3. <https://ehp.niehs.nih.gov/doi/full/10.1289/EHP8044>.
35. EPA. Carbon Tetrachloride: Fenceline Technical Support – Water Pathway. October 2022.
36. Intergovernmental Panel on Climate Change (IPCC). 2014. Climate Change 2013.

The Physical Science Basis. https://www.ipcc.ch/site/assets/uploads/2018/02/WG1AR5_all_final.pdf.

37. Luceta McRoy. February 10, 2017. Factors Associated with Asthma ED Visit Rates among Medicaid-enrolled Children: A Structural Equation Modeling Approach. <https://pubmed.ncbi.nlm.nih.gov/30519630/>.

38. EPA. Meeting with Halogenated Solvents Industry Alliance (HSIA) on the Use of Carbon Tetrachloride, Trichloroethylene, and Perchloroethylene and the Risk Management Process. August 2021.

39. Office of Management and Budget. March 31, 1995. Memorandum for the Heads of Executive Departments and Agencies. Guidance for Implementing Title II of S. 1. https://www.whitehouse.gov/wp-content/uploads/legacy_drupal_files/omb/memoranda/1995-1998/m95-09.pdf.

40. EPA. Supporting Statement for an Information Collection Request (ICR) Under the Paperwork Reduction Act (PRA): Carbon Tetrachloride; Regulation under the Toxic Substances Control Act (TSCA) (Proposed Rule; RIN 2070-AK82). June 2023.

41. Kevin Ashley. 2015. Harmonization of NIOSH Sampling and Analytical Methods with Related International Voluntary Consensus Standards. J Occup Environ Hyg. 12(7): D107-15.

X. Statutory and Executive Order Reviews

Additional information about these statutes and Executive Orders can be found at <https://www.epa.gov/laws-regulations/laws-and-executive-orders>.

A. Executive Order 12866: Regulatory Planning and Review and Executive Order 14094: Modernizing Regulatory Review

This action is a “significant regulatory” action as defined in Executive Order 12866 (58

FR 51735, October 4, 1993), as amended by Executive Order 14094 (88 FR 21879, April 11, 2023). Accordingly, EPA submitted this action to the OMB for Executive Order 12866 review. Documentation of any changes made in response to the Executive Order 12866 review is available in the docket.

EPA prepared an economic analysis of the potential costs and benefits associated with this action, which is also available in the docket and summarized in Units I.E. and VI.D. (Ref. 4).

B. Paperwork Reduction Act (PRA)

The information collection activities in this proposed rule have been submitted to OMB for review and comment under the PRA, 44 U.S.C. 3501 *et seq.* The Information Collection Request (ICR) document that EPA prepared has been assigned EPA ICR No. 2744.01 (Ref. 40). You can find a copy of the ICR in the docket, and it is briefly summarized here.

The information collection requirements contained in the proposed rule include:

- The preparation and retention of an exposure control plan in accordance with proposed 40 CFR 751.707(d);
- The preparation and delivery of exposure monitoring result notifications to exposed persons in accordance with proposed 40 CFR 751.707(b)(3)(v);
- Third-party downstream notifications in accordance with proposed 40 CFR 751.711 from companies that ship CTC to companies downstream in the supply chain through the SDS to communicate the proposed prohibitions; and
- The preparation and retention of related records in accordance with proposed 40 CFR 751.713, including ordinary business records, such as invoices and bills-of-lading related to the continued distribution of CTC in commerce, as well as records documenting compliance with the proposed workplace chemical protection program requirements and proposed restrictions on the laboratory use of CTC.

Respondents/affected entities: Manufacturers (including importers), processors, distributors, and industrial and commercial users of carbon tetrachloride. See Unit I.A. and the ICR for more details.

Respondent's obligation to respond: Mandatory (15 U.S.C. 2605).

Estimated number of respondents: 71.

Frequency of response: On occasion.

Total estimated burden: 85,676 hours (per year). Burden is defined at 5 CFR 1320.3(b).

Total estimated cost: \$13,172,979 (per year), includes \$8,516,686 annualized capital or operation and maintenance costs.

An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. After display in the ***Federal Register*** when approved, the OMB control numbers for EPA regulations in 40 CFR are listed in 40 CFR part 9 and displayed on the form and instructions or collection portal, as applicable.

Submit your comments on the Agency's need for this information, the accuracy of the provided burden estimates and any suggested methods for minimizing respondent burden to the EPA using the docket identified at the beginning of this proposed rule. You may also send your ICR-related comments to OMB's Office of Information and Regulatory Affairs using the interface at <https://www.reginfo.gov/public/do/PRAMain>. Find this particular information collection by selecting "Currently under Review - Open for Public Comments" or by using the search function. OMB must receive comments no later than **[INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE *FEDERAL REGISTER*]**. EPA will respond to any ICR-related comments in the final rule.

C. Regulatory Flexibility Act (RFA)

I certify that this action will not have a significant economic impact on a substantial number of small entities under the RFA, 5 U.S.C. 601, et seq. The small entities subject to the requirements of this action are small businesses that manufacture/import, process, or distribute the chemicals subject to this proposed rule. The Agency identified four small firms in the small entity analysis that are potentially subject to the proposed rule. It is estimated that three of the four small companies would incur a rule cost-to-company revenue impact ratio of less than one percent, and one company would experience an impact of 2.3 percent. The company estimated to experience a 2.3 percent rule cost-to-revenue impact would potentially be subject to the proposed rule under the disposal condition of use, which would require a WCPP under the proposed regulatory action or prescriptive controls (PPE) under the primary alternative regulatory action. Of the other three companies, one falls under the disposal COU, one under the manufacturing/import COU, and one could not be determined based on available information. To avoid understating impacts to small entities, EPA used the highest per-facility cost presented in the EA (\$604,787). Per-facility costs were estimated by dividing the total costs by the number of affected facilities for each use. Details of this analysis are in the Economic Analysis (Ref. 4), which is in the docket for this action. Based on the low number of affected small entities and the low impact, EPA does not expect this action to have a significant impact on a substantial number of small entities. EPA requests public comments regarding on the number of small businesses subject to the rule, including use categories for which EPA did not identify any affected small businesses, and on the potential impacts of the rule on these small businesses.

D. Unfunded Mandates Reform Act (UMRA)

This action does not contain an unfunded mandate of \$100 million or more as described in UMRA, 2 U.S.C. 1531-1538, and would not significantly or uniquely affect small governments. The action would affect entities that use CTC; it is not expected to affect State,

local or Tribal governments because the use of carbon tetrachloride by government entities is minimal. The total quantified annualized social cost for the proposed rule under the proposed option is \$18,804,794 (at 3% discount rate) and \$18,503,723 (at 7% discount rate), which does not exceed the unfunded mandate threshold of \$100 million.

E. Executive Order 13132: Federalism

EPA has concluded that this action has federalism implications, as specified in Executive Order 13132 (64 FR 43255, August 10, 1999), because regulation under TSCA section 6(a) may preempt State law. As set forth in TSCA section 18(a)(1)(B), the issuance of rules under TSCA section 6(a) to address the unreasonable risk presented by a chemical substance has the potential to trigger preemption of laws, criminal penalties, or administrative action by a State or political subdivision of a State that are: 1) Applicable to the same chemical substance as the rule under TSCA section 6(a); and 2) designed to prohibit or otherwise restrict the manufacture, processing, or distribution in commerce or use of that same chemical. TSCA section 18(c)(3) applies that preemption only to the “hazards, exposures, risks, and uses or conditions of use” of such chemical included in the final TSCA section 6(a) rule.

EPA provides the following preliminary federalism summary impact statement. The Agency consulted with State and local officials early in the process of developing the proposed action to permit them to have meaningful and timely input into its development. This included a consultation meeting on December 17, 2020. EPA invited the following national organizations representing State and local elected officials to this meeting: National Governors Association; National Conference of State Legislatures, Council of State Governments, National League of Cities, U.S. Conference of Mayors, National Association of Counties, International City/County Management Association, National Association of Towns and Townships, County Executives of America, and Environmental Council of States. A summary of the meeting with these

organizations, including the views that they expressed, is available in the docket (Ref. 18). EPA provided an opportunity for these organizations to provide follow-up comments in writing but did not receive any such comments.

F. Executive Order 13175: Consultation and Coordination with Indian Tribal Governments

This action does not have Tribal implications as specified in Executive Order 13175 (65 FR 67249, November 9, 2000). This rulemaking would not have substantial direct effects on Tribal governments because CTC is not manufactured, processed, or distributed in commerce by Tribes and would not impose substantial direct compliance costs on Tribal governments. Thus, Executive Order 13175 does not apply to this action. EPA nevertheless consulted with Tribal officials during the development of this action, consistent with the EPA Policy on Consultation and Coordination with Indian Tribes. Consistent with the EPA Policy on Consultation and Coordination with Indian Tribes, EPA consulted with Tribal officials during the development of this action. The Agency held a Tribal consultation from December 7, 2020, through March 12, 2021, with meetings held on January 6 and 12, 2021. Tribal officials were given the opportunity to meaningfully interact with EPA risk managers concerning the current status of risk management. During the consultation, EPA discussed risk management under TSCA section 6(a), findings from the 2020 Risk Evaluation for Carbon Tetrachloride, types of information to inform risk management, principles for transparency during risk management, and types of information EPA is seeking from Tribes (Ref. 16). EPA briefed Tribal officials on the Agency's risk management considerations and Tribal officials raised no related issues or concerns to EPA during or in follow-up to those meetings (Ref. 16). Tribal members were encouraged to provide additional comments after the teleconferences.

G. Executive Order 13045: Protection of Children from Environmental Health Risks and Safety Risks

Executive Order 13045 (62 FR 19885, April 23, 1997) directs Federal agencies to include an evaluation of the health and safety effects of the planned regulation on children in Federal health and safety standards and explain why the regulation is preferable to potentially effective and reasonably feasible alternatives. This action is not subject to Executive Order 13045 because it is not a significant regulatory action under section 3(f)(1) of Executive Order 12866, and because EPA does not believe that the environmental health or safety risk addressed by this action will have a disproportionate effect on children. This action's health and risk assessments and impacts on both children and adults from occupational use from inhalation and dermal exposures are described in Units III.A.3, III.B.3, VI.A., and the 2020 Risk Evaluation for Carbon Tetrachloride (Ref. 1). While the Agency found risks to children and adults from occupational use, the Agency determined that risks to children were not disproportionate. However, EPA's *Policy on Children's Health* applies to this action. Information on how the Policy was applied is available under Unit III.A.3.

H. Executive Order 13211: Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution or Use

This action is not a "significant energy action" under Executive Order 13211 (66 FR 28355, May 22, 2001) because it is not likely to have a significant adverse effect on the supply, distribution or use of energy and has not been designated by the Administrator of the Office of Information and Regulatory Affairs as a significant energy action.

I. National Technology Transfer and Advancement Act (NTTAA)

Pursuant to the NTTAA section 12(d), 15 U.S.C. 272, the Agency has determined that this rulemaking involves environmental monitoring or measurement, specifically for occupational inhalation exposures to CTC. Consistent with the Agency's Performance Based Measurement System (PBMS), the Agency proposes not to require the use of specific, prescribed

analytic methods. Rather, the Agency plans to allow the use of any method that meets the prescribed performance criteria. The PBMS approach is intended to be more flexible and cost-effective for the regulated community; it is also intended to encourage innovation in analytical technology and improved data quality. EPA is not precluding the use of any method, whether it constitutes a voluntary consensus standard or not, as long as it meets the performance criteria specified.

For this rulemaking, the key consideration for the PBMS approach is the ability to accurately detect and measure airborne concentrations of carbon tetrachloride at the ECEL and the ECEL action level. Some examples of methods which meet the criteria are included in the appendix of the ECEL memo (Ref. 9). EPA recognizes that there may be voluntary consensus standards that meet the proposed criteria (Ref. 41). EPA requests comments on whether it should incorporate such voluntary consensus standards in the rule and seeks information in support of such comments regarding the availability and applicability of voluntary consensus standards that may achieve the sampling and analytical requirements of the rule in lieu of the PBMS approach.

J. Executive Orders 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations

Executive Order 12898 (59 FR 7629, February 16, 1994) directs Federal agencies, to the greatest extent practicable and permitted by law, to make environmental justice part of their mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations (people of color and/or indigenous peoples) and low-income populations.

EPA believes that the human health or environmental conditions that exist prior to this action result in or have the potential to result in disproportionate and adverse human health or environmental effects on people of color, low-income populations and/or indigenous peoples.

EPA analyzed the baseline conditions facing communities near CTC and HFO manufacturing facilities as well as those of workers in the same industry and county as CTC facilities and HFO manufacturing facilities. The environmental justice analysis of local demographics found that, across the entire population within 1- and 3-miles of CTC facilities, there are higher percentages of people who identify as Black and living below the poverty line and a similar percentage of people who identify as Hispanic compared to the national averages. CTC facilities are concentrated in Texas and Louisiana, especially near Houston and Baton Rouge. In cases where environmental justice communities are also fenceline communities, EPA expects that the proposed prohibition of increased emissions associated with WCPP requirements would prevent new health and environmental impacts due to this proposed action.

The worker analysis was performed at the county and industry level. In eight of the 12 counties with CTC facilities that reported Basic Chemical Manufacturing, workers who identify as Black were over-represented compared to their percentage of the national demographics for that industry; at the national level, 11% of workers in the Basic Chemical Manufacturing industry identify as Black. In addition, there were eight counties with CTC facilities that reported Waste Treatment and Disposal; workers in that industry in those counties were more likely to earn less than the national average for that industry across several demographic groups, as outlined in the Economic Analysis.

EPA believes that it is not practicable to assess whether this action is likely to result in disproportionate and adverse effects on people of color, low-income populations, and/or indigenous peoples. EPA was unable to quantify the distributional effects of the regulatory action under consideration and compare them to baseline conditions. Current uncertainties and lack of data regarding exposure reductions proposed in this action limit EPA's ability to assess risk reductions compared to baseline conditions. One limitation to assessing whether the action is

likely to result in disproportionate and adverse effects on people of color, low-income populations, and/or indigenous peoples is a lack of data on the sociodemographic characteristics of workers in CTC facilities. Another key limitation that prevents evaluation of the distributional effects of the rule is a lack of knowledge of the actions regulated entities will take in response to the rule.

EPA additionally identified and addressed environmental justice concerns by conducting outreach to advocates of communities that might be subject to disproportionate exposure to CTC, such as minority populations, low-income populations, and indigenous peoples. On February 2 and 18, 2021, EPA held public meetings as part of this consultation. These meetings were held pursuant to and in compliance with Executive Order 12898 and Executive Order 14008, entitled “Tackling the Climate Crisis at Home and Abroad” (86 FR 7619, February 1, 2021). EPA received one written comment following these public meetings, in addition to oral comments provided during the meetings (Ref. 17). Commenters supported strong regulation of CTC to protect lower-income communities and workers. In addition, commenters recommended EPA conduct analysis of additional exposure pathways, including air and water.

The information supporting the review under Executive Order 12898 is contained in Units I.E., II.D., III.A.1., VI.A., and in the Economic Analysis (Ref. 4). EPA’s presentations and fact sheets for the environmental justice consultations related to this rulemaking, are available at <https://www.epa.gov/assessing-and-managing-chemicals-under-tsca/materials-june-and-july-2021-environmental-justice>. These materials and a summary of the consultation are also available in the public docket for this rulemaking (Ref. 17).

List of Subjects in 40 CFR Part 751

Environmental protection, Chemicals, Export notification, Hazardous substances, Import certification, Reporting and recordkeeping

Dated: [Click or tap to enter eSignature date.](#)

Michael S. Regan,

Administrator.

Therefore, for the reasons stated in the preamble, EPA proposes to amend 40 CFR Chapter I as follows:

PART 751 - REGULATION OF CERTAIN CHEMICAL SUBSTANCES AND MIXTURES UNDER SECTION 6 OF THE TOXIC SUBSTANCES CONTROL ACT

1. The authority citation for part 751 continues to read as follows:

Authority: 15 U.S.C. 2605, 15 U.S.C 2625(l)(4).

2. Amend § 751.5 by adding in alphabetical order definitions for “authorized person,” “direct dermal contact”, “ECEL”, “exposure group”, “owner or operator”, “potentially exposed person”, and “regulated area” to read as follows:

§ 751.5 Definitions.

* * * * *

Authorized person means any person specifically authorized by the owner or operator to enter, and whose duties require the person to enter, a regulated area.

* * * * *

Direct dermal contact means direct handling of a chemical substance or mixture or skin contact with surfaces that may be contaminated with a chemical substance or mixture.

ECEL is an Existing Chemical Exposure Limit and means an airborne concentration generally calculated as an eight (8)-hour time-weighted average (TWA).

* * * * *

Exposure group means a group consisting of every person performing the same or substantially similar operations in each work shift, in each job classification, in each work area where inhalation exposure to chemical substances or mixtures is reasonably likely to occur and be similar.

Owner or operator means any person who owns, leases, operates, controls, or supervises

a workplace covered by this subpart.

* * * * *

Potentially exposed person means any person who may be occupationally exposed to a chemical substance or mixture in a workplace as a result of a condition of use of that chemical substance or mixture.

Regulated area means an area established by the regulated entity to demarcate areas where airborne concentrations of a specific chemical substance exceed, or there is a reasonable possibility they may exceed, the ECEL or the EPA Short-Term Exposure Limit (STEL).

3. Add new subpart H to read as follows:

Subpart H—Carbon Tetrachloride

Sec.

751.701 General.

751.703 Definitions.

751.705 Prohibitions of Manufacturing, Processing, Distribution in Commerce, and Use.

751.707 Workplace Chemical Protection Program.

751.709 Other Workplace Restrictions.

751.711 Downstream Notification.

751.713 Recordkeeping Requirements.

§ 751.701 General.

This subpart sets certain restrictions on the manufacture (including import), processing, distribution in commerce, use, or disposal of carbon tetrachloride (CASRN 56-23-5) to prevent unreasonable risk of injury to health.

§ 751.703 Definitions.

The definitions in subpart A of part 751 apply to this subpart unless otherwise specified in this section. In addition, the following definitions apply to this subpart:

ECEL action level means a concentration of airborne carbon tetrachloride of 0.02 parts per million (ppm) calculated as an eight (8)-hour time-weighted average (TWA).

§ 751.705 Prohibition of Certain Industrial and Commercial Uses and Manufacturing, Processing, and Distribution in Commerce of Carbon Tetrachloride for those Uses.

(a) Prohibitions.

(1) After [DATE 180 DAYS AFTER DATE OF PUBLICATION OF THE FINAL RULE IN THE *FEDERAL REGISTER*], all persons are prohibited from manufacturing, processing, distributing in commerce (including making available) and using carbon tetrachloride for the following conditions of use:

(i) Processing condition of use: Incorporation into formulation, mixture or reaction products in petrochemical-derived manufacturing.

(ii) Industrial and commercial conditions of use:

(A) Industrial and commercial use as an industrial processing aid in the manufacture of petrochemicals-derived products.

(B) Industrial and commercial use in the manufacture of other basic chemicals (including manufacturing of chlorinated compounds used in solvents, adhesives, asphalt, and paints and coatings), except for use in the elimination of nitrogen trichloride in the production of chlorine and caustic soda.

(C) Industrial and commercial use in metal recovery.

(D) Industrial and commercial use as an additive.

(b) Other prohibitions.

After [DATE 365 DAYS AFTER DATE OF PUBLICATION OF THE FINAL RULE IN THE *FEDERAL REGISTER*], all persons are prohibited from manufacturing, processing, distributing in commerce (including making available) and using carbon tetrachloride for industrial and commercial specialty uses by the U.S. Department of Defense except as provided in § 751.709.

§ 751.707 Workplace Chemical Protection Program (WCPP).

(a) Applicability.

The provisions of this section apply to workplaces engaged in the following conditions of use of carbon tetrachloride, except to the extent the conditions of use are prohibited by § 751.705:

(1) Domestic manufacture, except where carbon tetrachloride is manufactured solely as a byproduct.

(2) Import.

(3) Processing as a reactant in the production of hydrochlorofluorocarbons, hydrofluorocarbons, hydrofluoroolefins and perchloroethylene.

(4) Processing: Incorporation into formulation, mixture, or reaction products for agricultural products manufacturing and other basic organic and inorganic chemical manufacturing.

(5) Processing: Repackaging for use as a laboratory chemical.

(6) Processing: Recycling.

(7) Industrial and commercial use as an industrial processing aid in the manufacture of agricultural products.

(8) Industrial and commercial use in the elimination of nitrogen trichloride in the production of chlorine and caustic soda.

(9) Disposal.

(b) Existing chemical exposure limit.

(1) *Eight-hour time-weighted average (TWA) ECEL.* Beginning [9 MONTHS AFTER DATE OF PUBLICATION OF THE FINAL RULE IN THE *FEDERAL REGISTER*], or beginning 4 months after introduction of carbon tetrachloride into the workplace if carbon

tetrachloride commences after [DATE 6 MONTHS AFTER DATE OF PUBLICATION OF THE FINAL RULE IN THE *FEDERAL REGISTER*], the owner or operator must ensure that no person is exposed to an airborne concentration of carbon tetrachloride in excess of 0.03 parts of carbon tetrachloride per million parts of air (0.03 ppm) as an eight (8)-hour TWA, in accordance with the requirements of paragraph (d)(1)(i) of this section and, as applicable, paragraph (f) of this section.

(2) *ECEL action level.* The owner or operator must establish an ECEL action level of 0.02 parts of carbon tetrachloride per million parts of air (0.02 ppm) as an eight (8)-hour TWA for purposes of monitoring the ECEL.

(3) *Exposure monitoring.*

(i) *General.*

(A) Owners or operators must determine each potentially exposed person's exposure by either:

(1) Taking a personal breathing zone air sample of each potentially exposed person's exposure; or

(2) Taking personal breathing zone air samples that are representative of the 8-hour TWA of each potentially exposed person or of each potentially exposed person's exposure performing the same or substantially similar operations in each work shift, in each job classification, in each work area.

(B) Representative 8-hour TWA exposures must be determined on the basis of one or more samples representing full-shift exposure of at least one person that represents, and does not underestimate, the potential exposure of every person in each exposure group and that represents the most highly exposed person under reasonably foreseeable conditions of use.

(C) Exposure samples must be analyzed using an appropriate analytical method by a

laboratory that complies with the Good Laboratory Practice Standards in 40 CFR Part 792.

(D) Owners or operators must ensure that methods used to perform exposure monitoring produce results that are accurate, to a confidence level of 95 percent, to within plus or minus 25 percent for airborne concentrations of carbon tetrachloride at an appropriate level of detection for the ECEL and ECEL action level.

(E) Owners and operators must re-monitor within 15 working days after receipt of any exposure monitoring when results indicate non-detect or air monitoring equipment malfunction, unless an Environmental Professional as defined at 40 CFR § 312.10 or a Certified Industrial Hygienist reviews the exposure monitoring results and determines re-monitoring is not necessary.

(ii) *Initial exposure monitoring.*

(A) Each owner or operator who has a workplace or work operation covered by this section, except as provided for in paragraph (b)(3)(ii)(B) of this section, must perform initial exposure monitoring of potentially exposed persons regularly working in areas where carbon tetrachloride is present.

(B) The initial exposure monitoring required in paragraph (b)(3)(ii)(A) of this section must be completed for workplaces manufacturing, processing, or using carbon tetrachloride as of [DATE OF PUBLICATION OF THE FINAL RULE IN THE *FEDERAL REGISTER*] by [DATE 180 DAYS AFTER DATE OF PUBLICATION OF THE FINAL RULE IN THE *FEDERAL REGISTER*] or, for workplaces that begin using carbon tetrachloride after [DATE OF PUBLICATION OF FINAL RULE IN THE *FEDERAL REGISTER*], within 30 days of introduction of carbon tetrachloride into the workplace, whichever is later. Where the owner or operator used carbon tetrachloride and has monitoring within five years prior to [DATE OF PUBLICATION OF THE FINAL RULE IN THE *FEDERAL REGISTER*] and the monitoring

satisfies all other requirements of this section, the owner or operator may rely on such earlier monitoring results to satisfy the requirements of paragraph (b)(3)(ii)(A) of this section.

(iii) *Periodic exposure monitoring.*

The owner or operator must establish an exposure monitoring program for periodic monitoring of exposure to carbon tetrachloride in accordance with table 1 to this paragraph (b)(3)(iii).

Table 1 to § 751.707(b)(3)(iii) – Periodic Monitoring Requirements

Air Concentration Condition	Periodic Exposure Monitoring Requirement
If all initial exposure monitoring is below the ECEL action level (< 0.02 ppm 8-hour TWA)	Periodic exposure monitoring is required at least once every five years.
If the most recent exposure monitoring indicates that airborne exposure is above the ECEL (> 0.03 ppm 8-hour TWA)	Periodic exposure monitoring is required within 3 months of the most recent exposure monitoring.
If the most recent exposure monitoring indicates that airborne exposure is at or above the ECEL action level but at or below the ECEL (≥ 0.02 ppm 8-hour TWA, ≤ 0.03 ppm 8-hour TWA)	Periodic exposure monitoring is required within 6 months of the most recent exposure monitoring.
If the two most recent (non-initial) exposure monitoring measurements, taken at least seven days apart within a 6- month period, indicate exposure is below the ECEL action level (< 0.02 ppm 8-hour TWA)	Periodic exposure monitoring is required within 5 years of the most recent exposure monitoring.
If the owner or operator engages in a condition of use for which WCPP ECEL would be required but does not manufacture, process, use, or dispose of carbon tetrachloride in that condition of use over the entirety of time since the last required monitoring event	The owner or operator may forgo the next periodic exposure monitoring event. However, documentation of cessation of use of carbon tetrachloride is required; and periodic monitoring would be required when the owner or operator resumes the condition of use.

(iv) *Additional exposure monitoring.*

(A) The owner or operator must conduct additional exposure monitoring whenever there has been a change in the production, process, control equipment, personnel or work practices that may reasonably be expected to result in new or additional exposures above the ECEL action level or when the owner or operator has any reason to believe that new or additional exposures

above the ECEL action level have occurred.

(B) Whenever start-up, shutdown, malfunctions or other breakdowns occur that may lead to exposure to potentially exposed persons, the owner or operator must conduct additional exposure monitoring (using personal breathing zone sampling) after the cleanup, repair or remedial action.

(v) *Notification of exposure monitoring results.*

(A) The owner or operator must inform persons whose exposures are represented by the monitoring of the monitoring results within 15 working days.

(B) This notification must include the following:

(1) Exposure monitoring results;

(2) Identification and explanation of the ECEL and ECEL action level in plain language;

(3) Explanation of corresponding required respiratory protection as described in paragraph (f) of this section;

(4) Descriptions of actions taken by the owner or operator to reduce exposure to or below the ECEL;

(5) Quantity of carbon tetrachloride in use;

(6) Location of carbon tetrachloride use;

(7) Manner of carbon tetrachloride use;

(8) Identified releases of carbon tetrachloride; and

(9) Whether the airborne concentration of carbon tetrachloride exceeds the ECEL.

(C) Notice must be provided in plain language writing, in a language that the person understands, to each potentially exposed person or posted in an appropriate and accessible location outside the regulated area with an English-language version and a non-English language version representing the language of the largest group of workers who do not read English.

(4) *Regulated areas.*

(i) Beginning [DATE 9 MONTHS AFTER DATE OF PUBLICATION OF THE FINAL RULE IN THE *FEDERAL REGISTER*], or beginning 4 months after introduction of carbon tetrachloride into the workplace in carbon tetrachloride use commences after [DATE 6 MONTHS AFTER DATE OF PUBLICATION OF THE FINAL RULE IN THE *FEDERAL REGISTER*], the owner or operator must establish and maintain a regulated area wherever any person's exposure to airborne concentrations of carbon tetrachloride exceeds or can reasonably be expected to exceed the ECEL.

(ii) The owner or operator must limit access to regulated areas to authorized persons.

(iii) The owner or operator must demarcate regulated areas from the rest of the workplace in a manner that adequately establishes and alerts persons to the boundaries of the area and minimizes the number of authorized persons exposed to carbon tetrachloride within the regulated area.

(iv) The owner or operator must supply a respirator that complies with the requirements of paragraph (f) of this section and must ensure that all persons within the regulated area are using the provided respirators whenever carbon tetrachloride exposures may exceed the ECEL.

(v) An owner or operator who has implemented all feasible engineering, work practice and administrative controls as required in paragraph (d)(1)(i) of this section, and who has established a regulated area as required by paragraph (b)(4)(i) of this section where carbon tetrachloride exposure can be reliably predicted to exceed the ECEL only on certain days (for example, because of work or process schedule) must have persons use respirators in that regulated area on those days.

(vi) The owner or operator must ensure that, within a regulated area, persons do not engage in non-work activities which may increase carbon tetrachloride exposure.

(vii) The owner or operator must ensure that while persons are wearing respirators in the regulated area, they do not engage in activities which interfere with respirator seal or performance.

(c) *Direct dermal contact controls (DDCC).*

Beginning [DATE 180 DAYS AFTER DATE OF PUBLICATION OF THE FINAL RULE IN THE *FEDERAL REGISTER*] or within 30 days of introduction of carbon tetrachloride into the workplace, owners or operators must ensure that all persons are separated, distanced, physically removed, or isolated to prevent direct dermal contact with carbon tetrachloride or from contact with equipment or materials on which carbon tetrachloride may exist in accordance with the requirements of paragraph (d)(1)(ii) of this section and, as applicable, paragraph (f) of this section.

(d) *Exposure control procedures and plan.*

(1) *Methods of compliance.*

(i) *ECEL.*

(A) The owner or operator must institute elimination, substitution, engineering controls or administrative controls to reduce exposure to or below the ECEL except to the extent that the owner or operator can demonstrate that such controls are not feasible.

(B) Wherever the feasible exposure controls, including elimination, substitution, engineering controls, and administrative controls, which can be instituted are not sufficient to reduce exposure to or below the ECEL, the owner or operator must use them to reduce exposure to the lowest levels achievable by these controls and must supplement them by the use of respiratory protection that complies with the requirements of paragraph (f) of this section. Where an owner or operator cannot demonstrate exposure below the ECEL, including through the use of engineering controls or work practices, and has not demonstrated that it has supplemented

feasible exposure controls with respiratory protection that complies with the requirements of paragraph (f) of this section, this will constitute a failure to comply with the ECEL.

(C) The owner or operator must maintain the effectiveness of engineering controls and administrative controls instituted under paragraph (d)(1)(i)(A) of this section.

(D) The owner or operator must ensure that any engineering controls instituted under paragraph (d)(1)(i)(A) of this section do not increase emissions of carbon tetrachloride to ambient air outside the workplace.

(E) The owner or operator must not implement a schedule of personnel rotation as a means of compliance with the ECEL.

(F) The owner or operator must document their exposure control strategy and implementation in an exposure control plan in accordance with this paragraph (d).

(ii) *Direct dermal contact controls (DDCC).*

(A) The owner or operator must institute elimination, substitution, engineering controls, or administrative controls to prevent direct dermal contact with carbon tetrachloride except to the extent that the employer owner or operator can demonstrate that such controls are not feasible.

(B) Wherever the feasible exposure controls, including elimination, substitution, engineering controls, and administrative controls, which can be instituted are not sufficient to prevent direct dermal contact with carbon tetrachloride, the owner or operator must use them to reduce direct dermal contact to the extent achievable by these controls and must supplement them by the use of dermal protection that complies with the requirements of paragraph (f) of this section. Where an owner or operator cannot demonstrate that direct dermal contact is prevented, including through the use of engineering controls or work practices, and has not demonstrated that it has supplemented feasible exposure controls with dermal protective equipment that complies with the requirements of paragraph (f) of this section, this will constitute a failure to

comply with the DDCC requirements.

(C) The owner or operator must maintain the effectiveness of engineering controls and administrative controls instituted under paragraph (d)(1)(ii)(A) of this section.

(2) Exposure control plan requirements.

Beginning [DATE 12 MONTHS AFTER DATE OF PUBLICATION OF THE FINAL RULE IN THE *FEDERAL REGISTER*] owners and operators must include and document in an exposure control plan the following:

(i) Identification and rationale of exposure controls selected: elimination of carbon tetrachloride, substitution of carbon tetrachloride, engineering controls, and administrative controls to reduce inhalation exposures in the workplace to either at or below the ECEL or to the lowest level achievable and to prevent or reduce direct dermal contact with carbon tetrachloride in the workplace, and the rationale explaining why each exposure control was selected (e.g., the hierarchy of controls, feasibility, effectiveness, or other relevant considerations);

(ii) If elimination of carbon tetrachloride, substitution of carbon tetrachloride, engineering controls or administrative controls were not selected, document the efforts identifying why these are not feasible, not effective, or otherwise not implemented;

(iii) Actions taken to implement exposure controls selected, including proper installation, maintenance, training or other steps taken;

(iv) Description of any regulated area and how it is demarcated, and identification of authorized persons; and description of when the owner or operator expects exposures may be likely to exceed the ECEL;

(v) Attestation that exposure controls selected do not increase emissions of carbon tetrachloride to ambient air outside of the workplace and whether additional equipment was installed to capture or otherwise prevent increased emissions of carbon tetrachloride to ambient

air;

(vi) Regular inspections, evaluations, and updating of the exposure controls no less frequent than every five years to ensure effectiveness and confirmation that all persons are implementing them accordingly; and

(vii) Occurrence and duration of any change in the production, process, control equipment, personnel or work practices and explanation of why the owner or operator may expect such change to result in new or additional exposures above the ECEL or not and occurrence and duration of any other change that may result in new or additional exposures above the ECEL have occurred;

(viii) Occurrence and duration of any start-up, shutdown, or malfunction of the facility that causes air concentrations to be above the ECEL or any direct dermal contact with carbon tetrachloride to occur during use of the substance and subsequent corrective actions taken during start-up, shutdown, or malfunctions to mitigate exposures to carbon tetrachloride; and

(ix) Availability of the exposure control plan, exposure monitoring records, respiratory protection program documentation, dermal PPE program documentation, and any other associated records relevant to carbon tetrachloride exposure in the workplace for potentially exposed persons.

(e) *Workplace information and training.*

(1) Within six months after the date of initial monitoring or by [DATE 180 DAYS AFTER DATE OF PUBLICATION OF THE FINAL RULE IN THE *FEDERAL REGISTER*] if initial monitoring was completed prior to publication of the rule, the owner or operator must provide information and training for each person prior to or at the time of initial assignment to a job involving potential exposure to carbon tetrachloride.

(2) The owner or operator must ensure that information and training is presented in a

manner that is understandable to each person required to be trained and in multiple languages as appropriate, such as, based on languages spoken by potentially exposed persons in the workplace.

(3) The following information and training must be provided to all persons assigned to a job involving potential exposure to carbon tetrachloride:

(i) The requirements of this section, as well as how to access or obtain a copy of these requirements in the workplace; and

(ii) The quantity, location, manner of use, release, and storage of carbon tetrachloride and the specific operations in the workplace that could result in exposure to carbon tetrachloride, particularly noting where exposures may be above the ECEL or where there is potential for direct dermal contact with carbon tetrachloride;

(iii) The principles of safe use and handling of carbon tetrachloride in the workplace, including specific measures the owner or operator has implemented to reduce inhalation exposures to at or below the ECEL or prevent direct dermal contact with CTC, such as work practices and PPE used;

(iv) The health hazards associated with exposure to carbon tetrachloride in the workplace;

(v) Methods and observations that may be used to detect the presence or release of carbon tetrachloride in the workplace (such as monitoring conducted by the owner or operator, continuous monitoring devices, visual appearance or odor of carbon tetrachloride when being released, etc.).

(4) The owner or operator must retrain each potentially exposed person as necessary, but at minimum annually, to ensure that each such person maintains the requisite understanding of the principles of safe use and handling of carbon tetrachloride in the workplace.

(5) Whenever there are workplace changes, such as modifications of tasks or procedures

or the institution of new tasks or procedures, which increase exposure, and where those exposures exceed the ECEL action level or increase the potential for direct dermal contact with carbon tetrachloride, based on monitoring results or the analysis documented in the exposure control plan, the owner or operator must update the training as necessary to ensure that each potentially exposed person has the requisite proficiency.

(f) Personal protective equipment (PPE).

(1) *Applicability.* The provisions of this paragraph (f) apply to any owner or operator that is required to provide respiratory protection pursuant to paragraph (d)(1)(i)(B) of this section or dermal PPE pursuant to paragraphs (c) and (d)(1)(ii)(B) of this section.

(2) *Use and maintenance.* Personal protective equipment that is of safe design and construction for the work to be performed must be provided, used, and maintained in a sanitary, reliable, and undamaged condition. Owners and operators must select PPE that properly fits each affected person and communicate PPE selections to each affected person.

(3) *Training.* Owners and operators must provide training in accordance with 29 CFR 1910.132(f) to all persons required to use PPE prior to or at the time of initial assignment to a job involving potential exposure to carbon tetrachloride. For the purposes of this paragraph (f)(3), provisions in 29 CFR 1910.132(f) applying to an “employee” also apply equally to potentially exposed persons, and provisions applying to an “employer” also apply equally to owners or operators.

(4) *Refresher training.* Owners and operators must retrain each potentially exposed person required to use PPE annually or whenever the owner or operator has reason to believe that a previously trained person does not have the required understanding and skill to properly use PPE, or when changes in the workplace or in PPE to be used render the previous training obsolete.

(5) *Respiratory protection.*

(i) Beginning [DATE 180 DAYS AFTER DATE OF PUBLICATION OF THE FINAL RULE IN THE *FEDERAL REGISTER*], or within 3 months after receipt of any exposure monitoring that indicates exposures exceeding the ECEL, or for those instances when the initial exposure monitoring is based on exposure monitoring data conducted within five years prior to publication of the rule and satisfies all other requirements of this section [DATE 180 DAYS AFTER DATE OF PUBLICATION OF THE FINAL RULE IN THE *FEDERAL REGISTER*], the owner or operator must supply a respirator where it is selected for use, selected in accordance with this paragraph (f), to each person who enters a regulated area and must ensure that all persons within the regulated area are using the provided respirators whenever carbon tetrachloride exposures exceed or can reasonably be expected to exceed the ECEL.

(ii) Owners or operators must provide respiratory protection in accordance with 29 CFR 1910.134(a) through (l) except (d)(1)(iii) and as specified in this paragraph for persons exposed or who may be exposed to carbon tetrachloride in concentrations above the ECEL. For the purpose of this paragraph (f), the maximum use concentration (MUC) as used in 29 CFR 1910.134 must be calculated by multiplying the assigned protection factor (APF) specified for a respirator by the ECEL. For the purposes of this paragraph (f), provisions in 29 CFR 1910.134(a) through (l) (except (d)(1)(iii)) applying to an “employee” also apply equally to potentially exposed persons, and provisions applying to an “employer” also apply equally to owners or operators.

(iii) Owners or operators must select and provide to persons appropriate respirators as indicated by the most recent monitoring results as follows:

(A) If the measured exposure concentration is at or below the 0.03 ppm: no respiratory protection is required.

(B) If the measured exposure concentration is above 0.03 ppm and less than or equal to 0.3 ppm (10 times ECEL): Any NIOSH-certified air-purifying half mask or full facepiece respirator equipped with NIOSH-approved organic vapor cartridges or canisters.

(C) If the measured exposure concentration is above 0.3 ppm and less than or equal to 0.75 ppm (25 times ECEL): Any NIOSH-certified air-purifying full facepiece respirator equipped with NIOSH-approved organic vapor cartridges or canisters; any NIOSH-certified powered air-purifying respirator equipped with NIOSH-approved organic vapor cartridges; or any NIOSH-certified continuous flow supplied air respirator equipped with a hood or helmet.

(D) If the measured exposure concentration is above 0.75 ppm and less than or equal to 1.5 ppm (50 times ECEL): Any NIOSH-certified air-purifying full facepiece respirator equipped with NIOSH-approved organic vapor cartridges or canisters; or any NIOSH-certified powered air-purifying respirator equipped with a tight-fitting facepiece and a NIOSH-approved organic vapor cartridge.

(E) If the measured exposure concentration is above 1.5 ppm and less than or equal to 30 ppm (1,000 times ECEL): Any NIOSH-certified supplied air respirator equipped with a half mask or full facepiece and operated in a pressure demand or other positive pressure mode.

(F) If the measured exposure concentration is greater than 30 ppm (1,000 times ECEL) or the concentration is unknown: Any NIOSH-certified self-contained breathing apparatus equipped with a full facepiece and operated in a pressure demand or other positive pressure mode; or any NIOSH-certified supplied air respirator equipped with a full facepiece and operated in a pressure demand or other positive pressure mode in combination with an auxiliary self-contained breathing apparatus operated in a pressure demand or other positive pressure mode.

(iv) The respiratory protection requirements in this paragraph represent the minimum respiratory protection requirements, such that any respirator affording a higher degree of

protection than the required respirator may be used.

(v) When a person whose job requires the use of a respirator cannot use a negative-pressure respirator, the owner or operator must provide that person with a respirator that has less breathing resistance than the negative-pressure respirator, such as a powered air-purifying respirator or supplied-air respirator, when the person is able to use it and if it provides the person with adequate protection.

(6) *Dermal protection.*

(i) Beginning [DATE 180 DAYS AFTER THE DATE OF PUBLICATION OF THE FINAL RULE IN THE *FEDERAL REGISTER*] or within 30 days of introduction of carbon tetrachloride into the workplace, the owner or operator must supply and require the donning of dermal PPE that separates and provides a barrier to prevent direct dermal contact with carbon tetrachloride in the workplace where it is selected for use, selected in accordance with this paragraph and provided in accordance with 29 CFR 1910.132(h), to each person who is reasonably likely to be dermally exposed in the work area through direct dermal contact with carbon tetrachloride. For the purposes of this paragraph (f)(6)(i), provisions in 29 CFR 1910.132(h) applying to an “employer” also applies equally to owners or operators.

(ii) Owners or operators must select and provide dermal PPE in accordance with 29 CFR 1910.133(b) and additionally as specified in this paragraph to each person who is reasonably likely to be dermally exposed in the work area through direct dermal contact with carbon tetrachloride. For the purposes of this paragraph (f)(6)(ii), provisions in 29 CFR 1910.133(b) applying to an “employer” also apply equally to owners or operators.

(iii) Owners or operators must select and provide to persons appropriate dermal PPE based on an evaluation of the performance characteristics of the PPE relative to the task(s) to be performed, conditions present, and the duration of use. Dermal PPE must include, but is not

limited to, the following items:

(A) Impervious gloves selected based on specifications from the manufacturer or supplier.

(B) Impervious clothing (e.g., long pants, long sleeved shirt) and protective gear covering the exposed areas of the body (e.g., arms, legs, torso and face).

(iv) Owners or operators must demonstrate that each item of gloves and other clothing selected provides an impervious barrier to prevent direct dermal contact with carbon tetrachloride during normal and expected duration and conditions of exposure within the work area by evaluating the specifications from the manufacturer or supplier of the clothing, or of the material used in construction of the clothing, or individually prepared third party testing, to establish that the clothing will be impervious to carbon tetrachloride alone and in combination with other chemical substances likely to be present in the work area.

§ 751.709 Workplace Restrictions for the Industrial and Commercial Use as a Laboratory Chemical, including the use of carbon tetrachloride as a laboratory chemical by the U.S. Department of Defense.

(a) Applicability.

The provisions of this section apply to workplaces engaged in the industrial or commercial use of carbon tetrachloride as a laboratory chemical, including the U.S. Department of Defense's industrial and commercial use of carbon tetrachloride as a laboratory chemical in chemical weapons destruction.

(b) Laboratory chemical requirements.

(1) After [DATE 180 DAYS AFTER DATE OF PUBLICATION OF THE FINAL RULE IN THE *FEDERAL REGISTER*], owners or operators must ensure fume hoods are in use and functioning properly and that specific measures are taken to ensure proper and adequate

performance of such equipment to minimize exposures to persons in the work area during the industrial/commercial use of carbon tetrachloride as a laboratory chemical, except for the U.S. Department of Defense's use of carbon tetrachloride as a laboratory chemical in chemical weapons destruction.

(2) After [DATE 365 DAYS AFTER DATE OF PUBLICATION OF THE FINAL RULE IN THE *FEDERAL REGISTER*], the U.S. Department of Defense must ensure that advanced engineering controls are in use and functioning properly and that specific measures are taken to ensure proper and adequate performance of such equipment to minimize exposures to persons in the area during the industrial/commercial use of carbon tetrachloride as a laboratory chemical in chemical weapons destruction.

(3) After [DATE 180 DAYS AFTER DATE OF PUBLICATION OF THE FINAL RULE IN THE *FEDERAL REGISTER*], owners or operators must ensure that all persons reasonably likely to be dermally exposed to carbon tetrachloride in a laboratory setting, except for the U.S. Department of Defense's industrial and commercial use of carbon tetrachloride as a laboratory chemical in chemical weapons destruction, are provided with dermal PPE as outlined in § 751.707(f)(2) and (6) and training on proper use of dermal PPE as outlined in § 751.707(f)(3) and (4).

(4) After [DATE 365 DAYS AFTER DATE OF PUBLICATION OF THE FINAL RULE IN THE *FEDERAL REGISTER*], U.S. Department of Defense must ensure that all persons reasonably likely to be dermally exposed to carbon tetrachloride through the industrial and commercial use of carbon tetrachloride as a laboratory chemical in chemical weapons destruction are provided with dermal PPE as outlined in § 751.707(f)(2) and (6) and training on proper use of dermal PPE as outlined in § 751.707(f)(3) and (4).

§ 751.711 Downstream Notification.

(a) Beginning on [DATE 60 DAYS AFTER DATE OF PUBLICATION OF THE FINAL RULE IN THE *FEDERAL REGISTER*]. Each person who manufactures (including imports) carbon tetrachloride for any use must, prior to or concurrent with the shipment, notify persons to whom carbon tetrachloride is shipped, in writing, of the restrictions described in this subpart in accordance with paragraph (c) of this section.

(b) Beginning on [DATE 6 MONTHS AFTER DATE OF PUBLICATION OF THE FINAL RULE IN THE *FEDERAL REGISTER*], each person who processes or distributes in commerce carbon tetrachloride for any use must, prior to or concurrent with the shipment, notify companies to whom carbon tetrachloride is shipped, in writing, of the restrictions described in this subpart in accordance with paragraph (c) of this section.

(c) The notification required under paragraphs (a) and (b) of this section must occur by inserting the following text in Sections 1(c) and 15 of the Safety Data Sheet (SDS) provided with the carbon tetrachloride:

After [DATE 180 DAYS AFTER DATE OF PUBLICATION OF THE FINAL RULE IN THE *FEDERAL REGISTER*], this chemical is and may only be distributed in commerce or processed for the following purposes: Processing as a reactant/intermediate; Repackaging for use as a laboratory chemical; Recycling; Incorporation into formulation, mixture or reaction products in agricultural products manufacturing and other basic organic and inorganic chemical manufacturing; Industrial and commercial use as an industrial processing aid in the manufacture of agricultural products; Industrial and commercial use in the elimination of nitrogen trichloride in the production of chlorine and caustic soda; Industrial and commercial use as a laboratory chemical; Industrial and commercial specialty uses by the U.S. Department of Defense until [DATE 365 DAYS AFTER DATE OF PUBLICATION OF THE FINAL RULE IN THE *FEDERAL REGISTER*]; and Disposal.

§ 751.713 Recordkeeping Requirements.

(a) *General records.*

After [DATE 60 DAYS AFTER DATE OF PUBLICATION OF THE FINAL RULE IN THE *FEDERAL REGISTER*], all persons who manufacture, process, or distribute in commerce or engage in industrial or commercial use of carbon tetrachloride must maintain ordinary

business records, such as downstream notifications, invoices and bills-of-lading related to compliance with the prohibitions, restrictions, and other provisions of this subpart.

(b) Workplace Chemical Protection Program Compliance.

(1) ECEL exposure monitoring.

For each monitoring event, owners or operators subject to the ECEL described in § 751.707(a) must document the following:

- (i) Dates, duration, and results of each sample taken;
- (ii) All measurements that may be necessary to determine the conditions that may affect the monitoring results;
- (iii) Name, workplace address, work shift, job classification, and work area of the person monitored; or identification of all persons represented by the representative sampling monitoring, indicating which persons were actually monitored; and any type of respiratory protective device worn by the monitored person, if any;
- (iv) Use of appropriate sampling and analytical methods, such as analytical methods already approved by EPA, OSHA or NIOSH, or compliance with an analytical method verification procedure;
- (v) Compliance with the Good Laboratory Practice Standards in 40 CFR Part 792; and
- (vi) Information regarding air monitoring equipment, including: type, maintenance, calibrations, performance tests, limits of detection, and any malfunctions.

(2) ECEL compliance.

Owners or operators subject to the ECEL described in § 751.707(b)(1) must retain records of:

- (i) Exposure control plan as described in paragraph § 751.707(d);
- (ii) Facility exposure monitoring records;

- (iii) Respiratory protection used and program implementation;
- (iv) Notifications of exposure monitoring results; and
- (v) Information and training provided by the owner or operator to each person prior to or at the time of initial assignment to a job involving potential exposure to carbon tetrachloride.

(3) *DDCC compliance.*

Owners or operators subject to DDCC described in § 751.707(c) must retain records of:

- (i) Exposure control plan as described in paragraph § 751.707(d);
- (ii) Dermal personal protective equipment (PPE) used and program implementation as described in § 751.707(e), including:

(A) The name, workplace address, work shift, job classification, and work area of each person reasonably likely to directly handle carbon tetrachloride or handle equipment or materials on which carbon tetrachloride may present and the type of PPE selected to be worn by each of these persons;

(B) The basis for specific PPE selection (e.g., demonstration based on permeation testing or manufacturer specifications that each item of PPE selected provides an impervious barrier to prevent exposure during expected duration and conditions of exposure, including the likely combinations of chemical substances to which the PPE may be exposed in the work area); and

(C) Appropriately sized PPE and training on proper application, wear, and removal of PPE, and proper care/disposal of PPE;

(D) Training in accordance with § 751.707(e); and

(iii) Information and training provided by the regulated entity to each person prior to or at the time of initial assignment to a job involving potential direct dermal contact with carbon tetrachloride.

(c) *Laboratory chemical compliance.*

The applicable owners and operators subject to the laboratory chemical requirements described in § 751.709 must retain records of:

- (i) Personal protective equipment (PPE) used and program implementation; and
- (ii) Documentation identifying: implementation of a properly functioning fume hood using manufacturer's instructions for installation, use, and maintenance of the fume hood, including inspections, tests, development of maintenance procedures, the establishment of criteria for acceptable test results, and documentation of test and inspection results, except for the U.S. Department of Defense's use of carbon tetrachloride as a laboratory chemical in chemical weapons destruction.
- (iii) For the U.S. Department of Defense's use of carbon tetrachloride as a laboratory chemical in chemical weapons destruction, documentation identifying: implementation of advanced engineering controls that are in use and functioning properly and specific measures taken to ensure proper and adequate performance.
- (d) *Retention.*

Owners or operators must retain the compliance records required under this section for a period of 5 years from the date that such records were generated.