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November 18, 2014

VIA REGISTERED MAIL, RETURN RECEIPT REQUESTED

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Washington River Protection Solutions, LLC
PO Box 850 MSIN H6-04
Richland, WA 99352

Kevin Smith, Manager
Department of Energy, Officer of River Protection
PO Box 450
Richland, WA 99352

CT Corporation System
WRPS' Registered Agent
505 Union Ave SE, Suite 120
Olympia, WA 98501

Dr. Ernest Moniz, Secretary
US Department of Energy
1000 Independence Ave., SW
Washington, DC 20585

Re: Notice of Intent to Sue the Department of Energy and Washington River Protection Solutions, LLC for Violations of the Federal Resource Conservation and Recovery Act at the Hanford Nuclear Site.

Dear Dr. Moniz, Mr. Smith, and Mr. Olson,

We are writing on behalf of Hanford Challenge, the United Association of Plumbers and Steamfitters, Local Union 598, and Washington Physicians for Social Responsibility (collectively referred to as "Citizens") to inform you that Citizens intend to file a citizen suit in federal court against Washington River Protection Solutions, LLC (WRPS) and the United States Department of Energy (USDOE) pursuant to section 7002 of the Solid Waste Disposal Act, amended as the Resource Conservation and Recovery Act, 42 U.S.C. § 6972, (RCRA) claiming that WRPS's and USDOE's practices at the Hanford Nuclear Site, and more specifically, the High-Level Nuclear Waste Tank Farms (Tank Farms) located in the 200 East and 200 West areas of that Facility presently owned by USDOE, have violated and continue to violate RCRA. WRPS's and USDOE's handling, storage, and treatment of waste stored at the Tank Farms present an imminent and substantial endangerment to health or the environment actionable under RCRA § 7002(a)(1)(B).¹ This letter is intended to fulfill Citizens' responsibility to provide 90 days' notice of their intent to sue pursuant to RCRA § 7002.² At the expiration of 90 days, Citizens intend to file a RCRA claim in federal court. Please direct any response to this notice to undersigned counsel for Citizens.

¹ 42 U.S.C. § 6972(a)(1)(B)

² 42 U.S.C. § 6972(b)(2)(A).

Hanford's high-level nuclear waste tanks contain 56 million gallons of mixed high-level radioactive waste and hazardous chemicals regulated by the State of Washington under RCRA authority delegated to the State by the US Environmental Protection Agency (EPA), and under Washington State law. As more fully explained below, the practices of WRPS and USDOE at the Hanford Tank Farms have and will continue to cause an imminent and substantial endangerment to the health of individuals in and around the Tank Farms unless and until the hazards of exposure to toxic vapors emanating from the waste in the tanks are acknowledged and addressed, sampling protocols are corrected, and adequate protective measures are put in place. Indeed, the toxic vapor has already caused actual harm to workers at the Hanford site. Since March 19, 2014, at least 56 individual Hanford workers have received medical attention for symptoms related to toxic vapor exposure, with the latest reported exposure on October 2, 2014. Historically, hundreds of Hanford workers have received medical attention for symptoms resulting from toxic vapor exposure in and around Hanford's Tank Farms. Hanford workers have experienced both acute and chronic illnesses as a result of their work in and around the Tank Farms. Some workers are on permanent disability as a result of a single exposure to toxic vapors at Hanford.

Hanford Challenge is a non-profit, public interest, environmental and worker advocacy organization located at 219 First Avenue S, Suite 310 Seattle, WA 98104. Hanford Challenge is an independent 501(c)3 membership organization dedicated to creating a future for Hanford that secures human health and safety, advances accountability, and promotes a sustainable environmental legacy. Many of Hanford Challenge's members work on the Hanford Site and specifically in the Tank Farms. Others recreate on and around the Columbia River where they may also be affected by vapor exposures. All have a strong interest in ensuring the safe and effective cleanup of the nation's most toxic nuclear site for current and future generations and are therefore affected by RCRA violations described herein. A number of Hanford Challenge's worker members have experienced acute and/or chronic illnesses as a result of exposure to Hanford's toxic vapors. The intent of this action is to abate conditions that continue to occur at the Tank Farms that present an imminent and substantial endangerment to health and the environment.

The United Association of Plumbers and Steamfitters, Local 598 is a Local Union of the United Association of Journeymen and Apprentices of the Plumbing and Pipe Fitting Industry of the United States, Canada and Australia (UA). Local 598, located at 1328 Road 28, Pasco, WA 99301, has members who are regularly dispatched to work in the Hanford Tank Farms. Many of Local 598's members who have worked in the tank farms have experienced both acute and/or chronic illnesses as a result of exposure to Hanford's toxic vapors.

Washington Physicians for Social Responsibility (WPSR) is a non-profit 501(c)(3) organization located at 4500 9th Ave NE, Seattle, WA 98105. WPSR organizes the Washington State healthcare community to pursue peace and health for the human community and the global ecosystem by empowering members, citizens and policy makers to develop and model for the rest of the nation socially just and life-enhancing policies regarding nuclear issues, climate change, environmental toxins, vulnerable populations and other risks to human health. WPSR is committed to raising public awareness and understanding of lessons learned from Hanford, as a means to prevent future contamination of the environment by nuclear waste; to ensuring that

health and scientific facts are closely considered in Hanford clean-up efforts; and to supporting efforts to improve the safety of clean-up operations at the Hanford Nuclear Site.

The members of these organizations who are at risk from exposure to Hanford's toxic vapors would benefit directly from the redress of the imminent and substantial endangerment discussed in this notice.

Statutory Authority for Citizen Suits under RCRA

RCRA § 7002 provides citizens the right to bring suit under the Act.³ RCRA § 7002(a)(1)(B) allows citizens to bring suit in order to stop an "imminent and substantial endangerment to health or the environment."⁴ It provides that any person may commence an action:

Against any person [. . .] including any past or present generator, past or present transporter, or past or present owner or operator of a treatment, storage, or disposal facility, who has contributed or is contributing to the past or present handling, storage, treatment, transportation, or disposal of any solid or hazardous waste which may present an imminent and substantial endangerment to health or the environment[.]⁵

General Background

The Hanford Nuclear Site, located in southeastern Washington State, near the town of Richland, covers 586 square miles along the shores of the Columbia River.⁶ Hanford is a former nuclear weapons production facility where the Atomic Energy Commission, now the Department of Energy, for decades produced plutonium for the nation's nuclear weapons arsenal. In 1989, the U. S. Department of Energy (USDOE), Environmental Protection Agency (EPA), and Washington State Department of Ecology entered into a legally binding accord, the Tri-Party Agreement (TPA), to clean up the Hanford Site.⁷ Hanford is owned by USDOE and operated under contract by private companies. Hanford produced most of the nation's supply of plutonium, which resulted in the nation's largest quantity of deadly high-level radioactive and chemical by-products, the most toxic of which are stored in underground tanks. Many of these tanks have leaked or are leaking high-level nuclear waste into the ground.

Hanford has 177 underground storage tanks that hold a total of 56 million gallons of high-level nuclear waste and toxic chemical waste. These tanks are organized into eighteen areas, known as "Tank Farms," and managed primarily by USDOE contractor WRPS.⁸ WRPS currently holds the Tank Operations Contract (TOC), which includes "operations and construction activities necessary to store, retrieve and treat Hanford tank waste, store and dispose of treated waste, and

³ 42 U.S.C. § 6972.

⁴ 42 U.S.C. § 6972(a)(1)(B).

⁵ *Id.*

⁶ See Attachment 1, Department of Energy Map of the Hanford Site Available at <http://www.hanford.gov/page.cfm/ProjectsFacilities#HM>.

⁷ <http://www.hanford.gov/page.cfm/TriParty>

⁸ See Attachment 2, Tank Farms Map and Attachment 3, Figures 1 and 2, photos of workers in the Tank Farms.

begin to close the Tank Farm waste management areas to protect the Columbia River.”⁹ USDOE plans to remove and treat the radioactive and hazardous waste stored in Hanford’s tanks over the next several decades at Hanford’s Waste Treatment Plant – a facility still under design and construction, and, in any event, years away from operation.

The waste in the Hanford tanks is very hot from radioactive decay and some of it is volatile. The tanks contain solid and liquid hazardous waste as well as particulates, vapors, gases, and fumes that originate from that hazardous waste. Vapors are generally defined as a gaseous form of a specific substance that is normal in a solid or liquid state. A chemical, or other item, that is either solid or liquid when at normal room temperature and at normal pressure may turn into a vapor when heated sufficiently, or when the pressure is increased. Vapors are gases and the terms are often used interchangeably. Fumes comes from particles that have evaporated from a solid material. Fume or fumes refers to vapors (gases), dusts and/or smoke given off by a substance as a result of a chemical transformation such as reaction, heating, explosion or detonation. A particulate is microscopic solid or liquid matter suspended in the atmosphere. USDOE and WRPS are on notice for the imminent and substantial endangerment to health and the environment from vapors, gases, fumes and particulates originating from Hanford’s hazardous waste. Hereinafter the terms “vapor” or “vapors” is intended to include gases, fumes, and particulates.

The vapors in the tanks come from the liquid and solid waste and are temporarily trapped within the headspaces of the tanks before being emitted or leaked to the atmosphere. Newer double shell tanks actively vent headspace vapors through stacks to the outside air. Older single shell tanks have passive vents. The older tanks are more likely to vent concentrated “burps” of headspace vapors than the more continuous lower concentration flows from the newer tanks. HEPA filters reduce the number of particles contaminated by radiation that escape from the tanks. Over time, these filters may become clogged with chemical condensation products, particles, and salts, substantially limiting their ability to prevent the emission of particulates from the tanks. Many toxic vapors and particulates must still be vented or simply pass through the existing filters into the atmosphere in and around the tank farms. The HEPA filters do not control or contain toxic gases.

Toxic Vapor Exposures at Hanford’s Tank Farms

The history of vapor exposures at Hanford goes back decades and hundreds, likely thousands of workers have been exposed to toxic vapors originating from Hanford’s hazardous waste. Some workers have suffered permanent long-term disability as a result of brain damage, loss of lung

⁹ WRPS and USDOE Tank Farm Contract accessible at <http://www.hanford.gov/?page=721>.

capacity, and other substantial impairments. NIOSH¹⁰, USDOE¹¹, and various expert panels¹² have filed reports on worker exposure to toxic vapors and particulates that assert Hanford's Industrial Hygiene Program has been ineffective in protecting workers from toxic vapor exposures. The Department of Energy Savannah River National Laboratory recently released a Draft Hanford Tank Vapor Assessment Report, commissioned by WRPS (2014 TVAT Report).¹³ This report, issued on October 30, 2014, detailed numerous failings in Hanford's current programs and processes designed to protect worker health and safety relative to toxic vapor exposures. One conclusion of that report matches those of earlier reports:

The ongoing emission of tank vapors, which contain a mixture of toxic chemicals, is inconsistent with the provision of a safe and healthful workplace free from recognized hazards...Management must acknowledge the health risk associated with episodic releases of tank vapors. While the ability to measure and document exposures may currently be inadequate, workers are nonetheless being affected by vapors on the tank farms. Acceptance of this observation should be communicated to all internal and external stakeholders.¹⁴

Hundreds of employees work in and around the Hanford Tank Farms on a daily basis around the clock. Pipefitters, construction workers, electricians, millwrights, nuclear chemical operators, health physics technicians, and others comprise the bulk of workers who routinely encounter potentially toxic vapors with inadequate or non-existent protective equipment. These toxic vapors are in the headspace of the tanks and seep out during atmospheric conditions such as a temperature and pressure inversion; during any type of waste disturbing activity such as pumping waste from leaking tanks; when inserting cameras or equipment into tanks; and other times through pipes, vents, filters or anywhere pressure can build and vapors can be released. Tanks must vent to the atmosphere to prevent pressure buildup and possible explosion or tank rupture. USDOE and WRPS continue to deploy ineffective strategies to protect workers from exposure to toxic vapors (including gases, fumes and particulates) capable of causing acute and chronic health effects, including brain damage, lung diseases, and cancers. Meanwhile, tank farm workers continue to experience symptoms and illnesses resulting from exposure to toxic vapors. Over 1800 chemicals are suspected to be in the vapors contained within Hanford's tank headspaces, any number of which can and do escape through tank equipment.¹⁵ USDOE and

¹⁰ NIOSH Health Hazard Evaluation Report. HETA #2004-0145-2941. CH2M Hill Hanford Group, Inc. and USDOE, ORP, Richland WA. July 2004. <http://www.hanfordchallenge.org/wp-content/uploads/2010/06/2004-July-NIOSH-Health-Hazard-Evaluation-Report.pdf>

¹¹ Office of Independent Oversight and Performance Assurance Office of Security and Safety Performance Assurance U. S. Department of Energy Investigation of Worker Vapor Exposure and Occupational Medicine Program Allegations at the Hanford Site. April 2004. (USDOE OA Report). <http://www.hanfordchallenge.org/wp-content/uploads/2010/06/2004-May-HSS-Investigation-of-Worker-Vapor-Exposure.pdf>

¹² See Attachment 4: List of Hanford Vapor Reports.

¹³ Department of Energy Savannah River National Laboratory, Hanford Tank Vapor Assessment Report, October 30, 2014, SRNL-RP-2014-00791, Revision 0. (2014 TVAT Report). Available at http://srnl.doe.gov/documents/Hanford_TVAT_Report_2014-10-30-FINAL.pdf.

¹⁴ Id. at 15-16.

¹⁵ See J. Meacham, J. Honeyman, T. Anderson, M. Zabel, and J. Huckaby, Industrial Hygiene Chemical Vapor Technical Basis. RPP-RPT-22491 Rev 1, May 2006. CH2MHILL Hanford Group & Pacific Northwest National

WRPS are on notice of the presence of these chemicals in the tanks and their potential to cause imminent and substantial endangerment to health and the environment. USDOE maintains a list of 59 known “Chemicals of Potential Concern” for which it is supposed to regularly monitor and protect workers from exposure.¹⁶ The toxic chemicals found in the tanks, many of which are recognized carcinogens, include ammonia, nitrous oxide, mercury, hydrocarbons, alcohols, ketones, aldehydes, furans, phthalates, nitriles, amines, and nitrosamines. Many more are known to be in the tanks, and have been released into the atmosphere at rates well above occupational exposure limits.¹⁷ The recently-released 2014 TVAT Report acknowledges the list of chemicals of potential concern is incomplete and unreliable.¹⁸ Furthermore, the 2014 TVAT Report studied several exposure incidents and found that “the exposures are to acute, intense concentrations. In four of the six exposures where personnel experienced upper respiratory issues, field measurements found irritants at concentrations far exceeding the OEL [Occupational Exposure Limit].”¹⁹

Two known extremely hazardous chemicals found in Hanford’s tanks are nitrosodimethylamine (NDMA) and dimethyl mercury. These chemicals are known to cause many of the symptoms that workers have experienced and their occupational exposure limits are miniscule, indicating that there is practically no safe exposure to these toxic chemicals that emanate from Hanford’s tanks, as there is no safe exposure levels for many of the other chemicals emitted as well.²⁰ NDMA is regulated by OSHA as one of thirteen Appendix B Regulated Carcinogens.²¹ OSHA requires exposures of workers to these thirteen chemicals to be controlled through the required use of engineering controls, work practices, and personal protective equipment, including respirators.²² OSHA has no regulatory authority at Hanford and USDOE and WRPS do not follow this protocol.²³ WRPS and USDOE do not adequately sample for or protect workers from exposure to these chemicals, or the other 59 or so identified chemicals of potential concern. Furthermore, WRPS does not attempt to protect workers from the synergistic effects of exposure to this dangerous mix of toxic vapors. The 2014 TVAT observed:

1. Worker vapor exposures are continuing.
2. There is no immediate local alarm that can be sounded when an incident occurs.
3. Without continuous chemical monitoring in the stack, there is no record of source strength.

Laboratory (PNNL), Richland, WA. (2006 Tech Basis Report), at Page 33. See also Attachment 5: Table C-2. Chemicals Needing Further Evaluation from the 2006 Tech Basis Report.

¹⁶ See Attachment 6, Table 5-1. Chemicals of Potential Concern (Tech Basis Report).

¹⁷ See Attachment 7, “Hanford tank farms air monitoring results, 2005 – 2009” available at <http://s3.documentcloud.org/documents/1202697/copc-above-50-oel.pdf> and NIOSH list of known occupational carcinogens available at <http://www.cdc.gov/niosh/topics/cancer/npotocca.html>.

¹⁸ 2014 TVAT Report at 25.

¹⁹ 2014 TVAT Report at 43.

²⁰ See CDC NIOSH International Chemical Safety Cards for Dimethyl Mercury and Nitrosodimethylamine Available at <http://www.cdc.gov/niosh/ipcsneng/neng1304.html> and <http://www.cdc.gov/niosh/ipcsneng/neng0525.html>.

²¹ <http://www.cdc.gov/niosh/npng/nengapdx.html>

²² *Id.*

²³ Occupational Safety and Health Act, 29 U.S.C. 653, sec 4(b).

4. Workers do not carry escape respirators.
5. Work teams have not carried grab samplers to activate during a vapor exposure incident.
6. Some change houses have been located on a hillside at the same altitude as the elevated stacks.²⁴

Workers exposed to the tank vapors have suffered serious long-term health effects including brain damage, lung disease, nervous system disorders, and cancer. Short-term effects include nosebleeds, profuse sweating, persistent headaches, tearing eyes, burning skin and lungs, coughing, sore throats, eye problems, dizziness, nausea, memory loss, difficulty breathing and increased heart rates. Some workers are on long-term disability resulting from chemical vapor exposure at Hanford, with illnesses ranging from toxic encephalopathy, neurological damage, nerve damage, and lung disease—others are still fighting for their claims to be recognized.²⁵ A Hanford contractor, the Pacific Northwest National Laboratory (PNNL), concluded that the risk of contracting cancer from exposure to these chemical vapors could be as high as 1.6 in 10.²⁶ Although numerous studies have been conducted, there remains a lack of adequate information about the contents of the tanks. This, combined with the tanks' unpredictable behavior, leaves the workers' breathing environment uncharacterized and not susceptible to full characterization. In such circumstances, utilizing technologies that capture and treat the toxic vapors (such as chemical scrubbers) and mandatory use of personal protective equipment should be required.²⁷ USDOE concluded in a 2004 report, "Until a protection strategy is defined and supported by an effective industrial hygiene program, a conservative approach to the use of personal protective equipment is warranted."²⁸ In 2004, a toxicologist who assessed this situation also concluded:

Both human health risk assessments and the human exposure 'study' show the same results; that tank vapors are extremely hazardous to humans. This leads to the conclusion that tank workers should be protected from exposure to the tank vapors. There is no scientific reason to believe that further risk assessments and studies would yield different results, or different conclusions... Cartridge-type respirators do not supply fresh air to wearer, but filter toxins out of the air before it is breathed. However, there are no individual respirator cartridges that filter all toxins present in the tank vapors. Any one type of respirator cartridge will only filter a handful of chemicals, and then only for a relatively short period of time...Humans cannot breathe tank vapors and remain healthy.²⁹

Vapors from the hazardous waste continue to go uncharacterized and personal exposures continue to go unmonitored, leaving workers without reliable information on their particular

²⁴ 2014 TVAT Report at 32.

²⁵ A. D. Maughan, J.G. Droppo, K.J. Castleton, Pnnl, *Health Risk Assessment for Short-And Long-Term Worker Inhalation Exposure to Vapor-Phase Chemicals From The Single-Shell Tank 241-C-103*, Draft (Mar. 1997) (1997 C-103 Vapor Health Risk Assessment). Available at <http://s3.documentcloud.org/documents/1159468/1997-pnnl-draft-c-103-vapor-exposures-summary.pdf>

²⁶ *Id.*

²⁷ Knowing Endangerment, at 5.

²⁸ USDOE OA Report, at 7.

²⁹ Tim Jarvis, *Health Risks to Workers Exposed to Toxic Tank Vapors at Hanford's High-Level Waste Tanks*, 2004. Available at <http://s3.documentcloud.org/documents/1150145/2004-jarvis-report.pdf>.

potential for exposure. Recent vapor exposure incidents and the conclusions of the 2014 TVAT Report indicate that an effective program is not in place.

In its current state, the industrial hygiene (professional and technician level) resources available are not sufficiently allocated to properly characterize and assess worker vapor exposure in the tank farms. In addition, there are insufficient resources and expertise currently deployed in the industrial hygiene function to properly recommend and evaluate the effectiveness of work practices, PPE and engineering controls as well as effectively inform, advise, and train line functions and address worker concerns regarding tank farm vapors. Given the complex nature of the work occurring at Hanford, and the current lack of engineering controls to mitigate tank vapor exposures, it is critical that the industrial hygiene function be given the necessary resources to assess and control worker exposures.³⁰

During the last eight months alone, at least 56 individuals have received medical attention for symptoms relating to exposure to toxic vapors. These symptoms include nosebleeds, metallic tastes, headaches, coughing, sore throats, nausea, and increased heart rates. Other workers have developed chronic obstructive pulmonary disease, decreased lung capacity, toxic encephalopathy, and other illnesses as a result of earlier exposures to toxic vapors. Hanford's health service provider has documented many of these effects.³¹ When workers experience symptoms such as loss of consciousness or even dizziness and difficulty breathing the risk of other serious harms and incidents in the Tank Farms increases as well. After all, these workers are safeguarding Hanford's high level nuclear waste tanks. The latest publicly known incidents occurred in early October of 2014 when five Hanford workers received medical checks for possible exposure to chemical vapors from tank farms.

Four Hanford employees were working between the AW and AP Tank Farms Thursday, when an odor consistent with chemical vapors was smelled. One of the employees had symptoms, and all four were given medical evaluations. In addition, a worker who smelled an odor outside the C Tank Farm on Wednesday developed symptoms overnight. The worker reported the symptoms Thursday and received a medical evaluation.³²

This brought the total number of workers affected since March of 2014 to at least 56. King 5 News documented a number of the Tank Farm Vapor Exposure incidents this year.³³ Some examples of incidents where workers experienced serious symptoms associated with tank vapor exposure in March of 2014 alone include:

³⁰ 2014 TVAT Report at 55-56.

³¹ See Hanford Environmental Health Foundation, *Report on Toxic Effects of Headspace Chemicals*, 2004. Available at <http://www.hanfordchallenge.org/wp-content/uploads/2010/06/Toxic-Effects-of-Tank-Headspace-Chemicals.pdf>.

³² More Hanford workers checked for vapor exposure, Tri-City Herald, October 3, 2014 at http://www.tricityherald.com/2014/10/02/3183248_more-hanford-workers-checked-for.html?rh=1#storylink=cpy.

³³ See King5 News coverage of 2014 vapor exposures at <http://www.king5.com/news/investigators/Hanford-workers-affected-by-suspected-chemical-vapors-now-at-40-267577121.html>

March 19 - Two WRPS workers inhaled a release of unknown chemicals in the AY-AZ tank area. Those employees returned to work but continue to receive medical care for persistent symptoms such as coughing, difficulty breathing, headaches and nosebleeds. Both workers are suffering effects of breathing in the vapors: headache, chest pain, difficulty breathing, nose bleeds and sore throats. One employee has coughed up blood.

March 25 - Four more WRPS workers also working in the AY-AZ area inhaled vapors that made them sick.

March 25 - Two workers with expertise in investigating chemical releases went into the area to attempt to find the source when they too became ill. KING 5 has found they were not wearing protective gear such as respirators. The area was evacuated after the incident.

March 25 - Three more WRPS employees breathed in vapors approximately eight miles away in the S-SX tank area. It is not known what they inhaled, but two were transported to the hospital and one to the Hanford medical clinic.

March 26 – Three workers fell ill in yet another location at the Hanford site, at what’s called the T tank farm, about a quarter mile from the S-SX area. Sources told the reporter 17 people were working on a video inspection when they were suddenly sickened by the release of vapors. Two were transported to the hospital and have been released yet sources say they continue to suffer from symptoms such as nausea and rapid heartbeat.

March 26 – Three non-WRPS workers report symptoms of vapor exposure. All were transported to the onsite medical facility and have been cleared to return to work.

March 27 – One WRPS employee got sick from vapor exposure in the AY farm area.

Workers in the Tank Farms are not adequately protected from these toxic vapors. When workers experience symptoms such as loss of consciousness or even dizziness and difficulty breathing, the risk of other harms and incidents in the Tank Farms increases as well. Furthermore, the vapors released from Hanford’s tanks have and may continue to endanger health and the environment downwind of the tank farms which are only enclosed by chain link fences. There are public tours, guests, regulators, additional contractors and workers at other areas of the Hanford site who often go close to and downwind of the Tank Farms. As recently as October 1, a worker who smelled an odor outside the perimeter of C Tank Farm developed symptoms overnight. The worker reported the symptoms the next day and received a medical evaluation.³⁴ In 2007, a heavy equipment operator situated well outside the tank farms received a toxic

³⁴ More Hanford workers checked for vapor exposure, Tri-City Herald, October 3, 2014 at http://www.tri-cityherald.com/2014/10/02/3183248_more-hanford-workers-checked-for.html?rh=1#storylink=cpy.

chemical vapor dose resulting from a spill of radioactive tank waste that a Washington Labor and Industries Appeals Board concluded caused five different types of brain damage to the worker, resulting in the award of long-term, permanent disability.³⁵ The downwind environment and the health of other individuals also face imminent and substantial endangerment from the activities and waste management described herein.

If protective measures were established and followed, workers would face a significantly lower risk of detrimental exposure. WRPS and USDOE must act to control the release of toxic vapors emanating from Hanford's hazardous waste tanks and protect not only its employees from imminent and substantial endangerment of exposure to toxic vapors, but also the health of members of the public and co-located workers.

Regulatory Background

Cleanup activities at the Hanford Federal Facility (EPA RCRA Site ID Number WA7_89000_8967) are the joint responsibility of EPA Region 10 and the Washington State Department of Ecology, Nuclear Waste Program (Ecology).

The TPA is a corrective action order under RCRA, an interagency agreement under Section 120 of the Comprehensive Environmental Remediation and Reclamation Act (CERCLA)³⁶, and a consent order under the Washington State Hazardous Waste Management Act of 1976 (Revised Code of Washington (RCW) 70.105). USDOE is the owner/operator of the site, EPA oversees CERCLA cleanup and requirements for managing PCB-containing wastes under the Toxics Substance Control Act (TSCA) and has delegated RCRA and Clean Air Act (CAA) regulatory authority to Washington State. Ecology enforces RCRA (and the State Hazardous Waste Management Act, Ch.70.105 RCW) and is the lead agency for all Transportation, Storage and Disposal Units at Hanford.³⁷

The TPA Article VI.24 declares that pursuant to Sec. 6001 of RCRA, 42 U.S.C. 6961, USDOE is subject to and must comply with RCRA and the Washington State Hazardous Waste Management Act, RCW 70.105. The Hanford Site includes certain hazardous waste treatment, storage, and disposal units authorized to operate under Section 3005(e) of RCRA, 42 U.S.C. 6925(e), and is subject to the permit requirements of Section 3005 of RCRA. Certain wastes and constituents at the Hanford Site are hazardous wastes or hazardous constituents as defined by Section 1004(5) of RCRA, 42 U.S.C. 6903(5), and 40 CFR 261. There are also hazardous wastes or hazardous constituents at the Hanford Site within the meaning of RCW 70.105 and WAC 173-303. The Hanford Site constitutes a facility within the meaning of Sections 3004 and 3005 of RCRA, 42 U.S.C. §§ 6924 and 6925, and RCW 70.105, and USDOE is the owner of the Hanford Site.

³⁵ In Re: Diana Gegg, DOCKET NO. 0816647, Washington State Board of Industrial Insurance Appeals, April 16, 2010, available at <http://www.hanfordchallenge.org/wp-content/uploads/2014/10/2010-Diana-Gegg-decision.pdf>

³⁶ 42 U.S.C. § 9601 et seq.

³⁷ See MOU between WA Ecology and USEPA Region 10 concerning the Hanford Federal Facility Agreement and Consent Order (Tri Party Agreement) which lays out who is the lead regulatory agency. Available at <http://www.ecy.wa.gov/programs/nwp/pdf/mou2.pdf>.

Hanford tanks contain “Radioactive Mixed Waste” or “Mixed Waste” that contains both hazardous waste subject to RCRA and/or HWMA (RCRA Section 1004(5) and RCW 70.105.010(15)) and radioactive waste subject to the Atomic Energy Act of 1954, as amended. The Hanford tanks are also considered a Treatment, Storage, and Disposal Unit (TSD). TSD units are identified in Appendix B of the TPA, which lists all of the High-Level Waste Tanks.³⁸

The Washington Department of Ecology’s Nuclear Waste Program is responsible for RCRA compliance at the Tank Farms. Much of the Hanford site operates under a complicated site-wide permitting scheme known as the Site-Wide Hazardous Waste Permit #WA7890008967. Ecology is currently in the process of revising a draft of this outdated and expired permit which does not include the Tank Farms. In the meantime, Hanford operates under interim status standards (WAC 173-303-400).

Thus, the Hanford Tanks contain solid and hazardous wastes that release vapors (including particulates) which cause an imminent and substantial endangerment to health and the environment.

Relief Sought

The citizen suit provision of RCRA grants the district court jurisdiction to “restrain any person who has contributed or who is contributing to the past or present handling, storage, treatment, transportation, or disposal of any solid or hazardous waste referred to in” RCRA § 7002(a)(1)(B), 42 U.S.C. § 6972(a)(1)(B).

Citizens believe that WRPS and USDOE are jointly and severally liable for the risk of imminent and substantial endangerment to human health and the environment described in this notice letter. Citizens plan to seek injunctive and declaratory relief to ameliorate the imminent and substantial endangerment along with other such relief as is permitted by law under Section 7002(a) of RCRA, 42 U.S.C. § 6972(a).

The risk of imminent and substantial endangerment to health will remain so long as there is high level nuclear and chemical hazardous waste in Hanford’s tanks. Exposures to workers in and around the tank farms as well as those visiting the site could be reduced if Hanford were to:

- 1. Immediately institute protective measures to prevent endangerment to the health of Hanford workers from exposure to toxic vapors.**
 - a. Equip all known air emission points with flow measurement devices, and with real-time monitoring equipment that can be remotely monitored in order to speed evacuation of tank farms during a vapor release event.
 - b. Operate tanks under negative pressure to create a preferential air pathway and install chemical scrubbers to capture and treat vapors.

³⁸ See TPA Action Plan Appendix B available at <http://www.hanford.gov/files.cfm/ap-App-B.pdf>.

- c. Conduct real-time monitoring for *all* toxic chemicals identified in the headspace of the tanks, and make that data immediately available to *anyone* who is interested.
- d. Provide all tank farm workers with emergency air packs (mask, ten-minute air supply) to allow safe and immediate evacuation of workers when chemical vapors emit from tank openings.
- e. Require the use of supplied air whenever tank waste is disturbed, during tank intrusion events (such as inserting a camera or a pump) and/or when circumstances warrant such precautions, including during a vapor-release event.

2. Immediately implement systemic changes to Hanford's Industrial Hygiene program.

- a. Institute the recommendations and changes detailed in the 2014 Hanford Tank Vapor Assessment Team Report.
- b. Increase the transparency and accountability of the Industrial Hygiene (IH) program through the institution of the following measures:
 - i. Increase the number and quality of IH personnel, and professionalize the program to give it parity with the health physics program in terms of resources, status, and presence in the work site;
 - ii. Institute independent, third-party oversight over chemical vapor issues at Hanford to assure rigorous adherence to quality assurance/quality control (QA/QC) requirements and program compliance;
 - iii. Document all sample and media collections and transports for both the total transport and storage time and the storage temperatures experienced by the samples taken at Hanford's Tank Farms;
 - iv. Specifically collect and analyze particulate matter samples periodically (at least once per day) to determine their potential for the spread of contaminants from the tank farms. If HEPA filters are being used to protect equipment, then pre and post-use filters need to be checked for contamination on a prompt, regular, and ongoing basis.
 - v. Reevaluate the list of contaminants of concern.
 - vi. Sample and record real time headspace flammable gas levels. A system to detect and record headspace flammability limits should be in place, particularly for those tanks that are known to experience the most significant hydrogen releases.
 - vii. Recognize and adjust to the reality that vapor exposures are transient and episodic events by integrating IH techs into tank farm work (similar to Health Physics Technicians (HPTs)), install gas flow measurement devices on openings in the tank to enable a quick reaction to the presence of vapors, and utilize real-time monitoring for all Chemicals of Potential Concern (COPC).
- c. Allow Citizens to send their own expert(s) into the tank farm areas to observe and conduct sampling with one-hour notice. Provide a site badge, hazmat and other certifications, as well as Personal Protective Equipment (PPE), to Citizens' expert(s). Reimburse Citizens for costs related to this activity.
- d. Hire external, independent experts (subject to Citizens' input, review and approval) to annually inspect and assess the contractor's progress on meeting

goals laid out in this document and in the Savannah River National Lab report. The independent, external experts will issue their findings and recommendations publicly immediately upon completion, and the USDOE and the contractor will not edit or “fact-check” the report, but comments and responses of the contractor and/or USDOE will be attached to the report.

- e. USDOE *and* the contractor hold meetings at least twice a year with interested stakeholders to talk about progress and challenges, and to answer questions and address concerns.

3. Conduct comprehensive medical monitoring for past and present Hanford Workers.

- a. Establish a fund to support a medical monitoring program and epidemiologic studies for tank farm workers (past, present and future).
- b. The purpose of the medical monitoring program is to identify and treat disease and illness if present or to reassure those found to be healthy in order to mitigate the injury suffered by Hanford workers due to toxic vapor exposure. The provision for supporting epidemiological studies is to document the harmful health effects that have occurred because of toxic vapor exposure.
- c. The parties agree that a Request for Proposal to design and conduct the medical monitoring and epidemiological studies will be drafted and agreed to by all parties.
- d. The selection of the winning bid will be conducted by all parties. In the event that agreement cannot be reached, then the parties agree to ask the court to appoint a special master to make the selection.

4. Provide workers with complete information about exposure incidents and administer workers’ compensation claims directly by the State of Washington instead of through Hanford’s contractor, Penser North America, Inc. (Penser).

- a. Set up a third party advocate acceptable to Citizens to assist Hanford workers who may have been exposed to toxic vapors at Hanford with any and all claims under worker’s compensation or Energy Employee Occupational Injury Compensation Program Act (EEOICPA).
- b. End the third-party administration of Hanford workers’ state compensation claims (currently conducted by Penser) and have claims administered directly through the Washington State Department of Labor and Industries, Workers’ Comp Program.
- c. Assure workers are provided full information about vapor exposure incidents, the chemicals in the headspaces of nearby tanks, and full cooperation with medical and state personnel attempting to investigate and validate such claims.
- d. Give workers the right to visit any health professional in the United States for evaluation and treatment or chemical vapor exposure-related injuries or illnesses. Pay the costs of these visits and give affected workers paid time off to accommodate such visits.
- e. Adopt a precautionary approach that assumes workers’ claims are valid and the burden is on the government to show otherwise.

Citizens also intend to seek attorney fees and costs as prevailing parties are authorized to do under RCRA Section 7002(e).

Conclusion

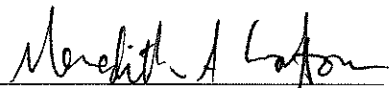
The imminent and substantial endangerment described in this Notice of Intent is ongoing. Therefore WRPS and USDOE have violated, are currently violating, and will continue to violate the Resource Conservation and Recovery Act at the Hanford Tank Farms by causing imminent and substantial endangerment to health and the environment. Accordingly, Citizens intend to file suit to abate the endangerment described above, ensure future compliance with federal and state law, recover attorneys' fees and costs of litigation, and obtain other appropriate relief.

If you have any questions regarding the allegations in this notice or believe any of the foregoing information may be in error, please contact Richard Smith or Meredith Crafton at the numbers listed below. In the absence of any questions, we would also welcome an opportunity to discuss a resolution of this matter prior to the initiation of litigation if you are prepared to remedy the violations discussed above.

Should a resolution not be reached, at the end of the 90-day period, Citizens intend to file a complaint in Federal District Court against WRPS and USDOE to include the above-described RCRA imminent and substantial endangerment claim.

Sincerely,

SMITH & LOWNEY, PLLC

By: 
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Meredith Crafton, (206) 805-0858

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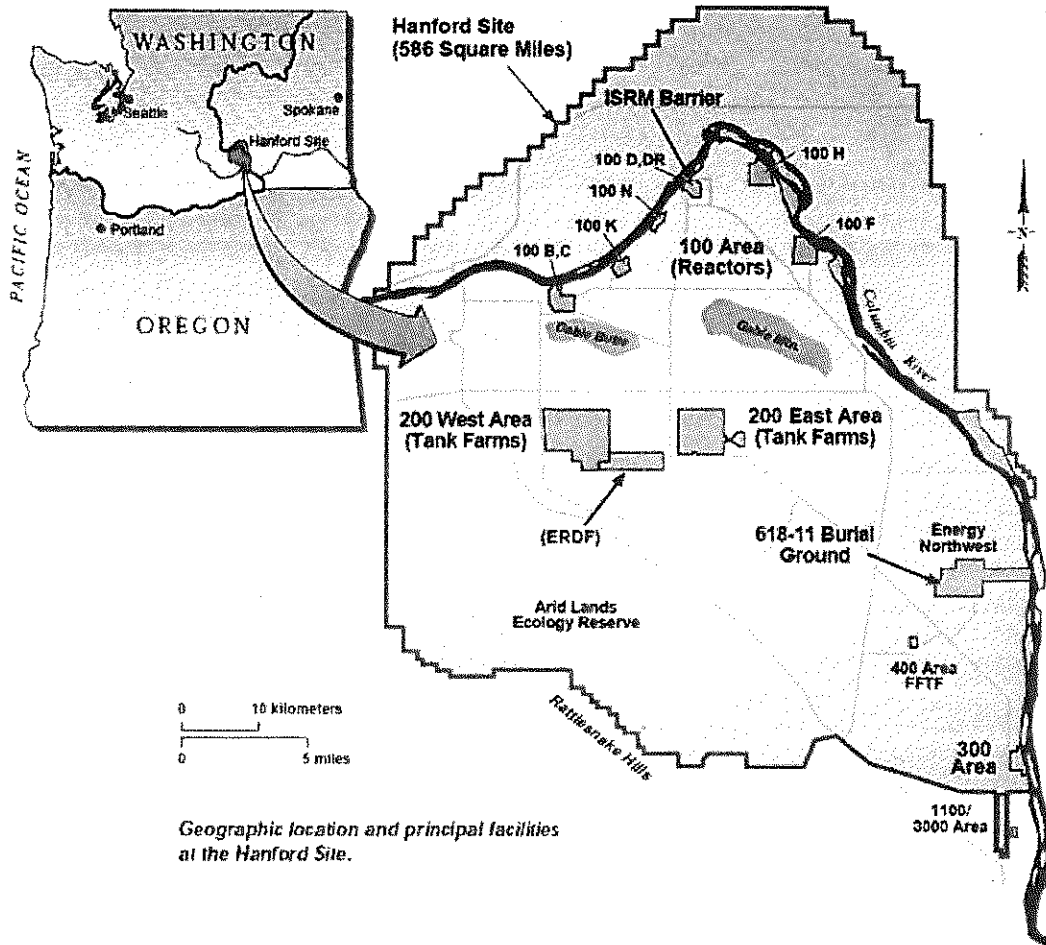
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ATTACHMENT 1

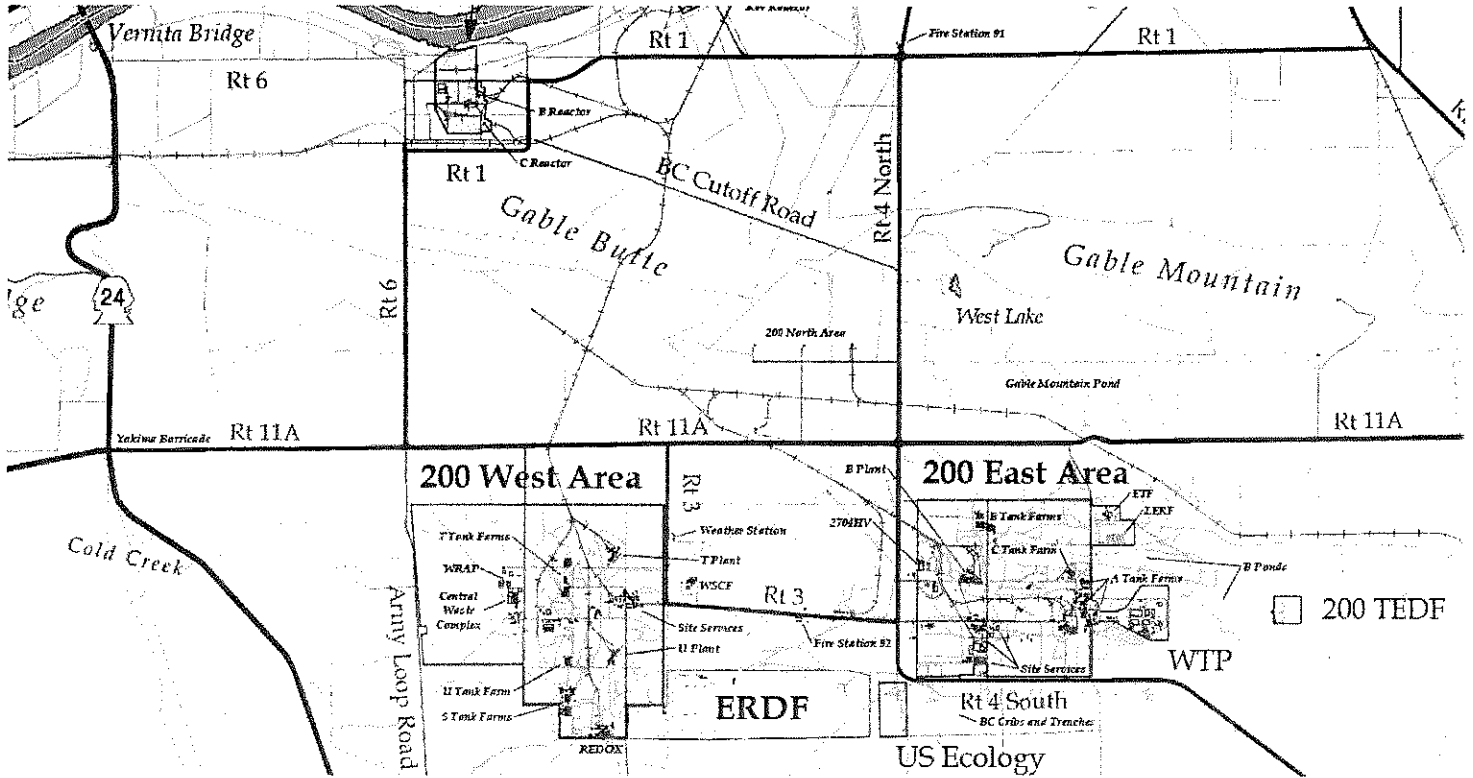
Department of Energy Maps of the Hanford Site



Department of Energy Map of the Hanford Site Available at <http://www.hanford.gov/page.cfm/ProjectsFacilities#HM>.

ATTACHMENT 2

Map of Hanford Facilities



Prepared for:
 US DEPARTMENT OF ENERGY
 RICHLAND OPERATIONS OFFICE

Created and Published by: CENTRAL MAPPING SERVICES
 FLUOR HANFORD, RICHLAND, WA

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 Coordinate System:
 WASHINGTON STATE PLANE, SOUTH ZONE, METERS
 Horizontal Datum: NAD83
 Vertical Datum: NAVD88



ATTACHMENT 3

Photos of Workers in Hanford's Tank Farms



Figure 1: Photo of Workers in Hanford's Tank Farms. Available at <http://www.hanford.gov/page.cfm/TankFarms>

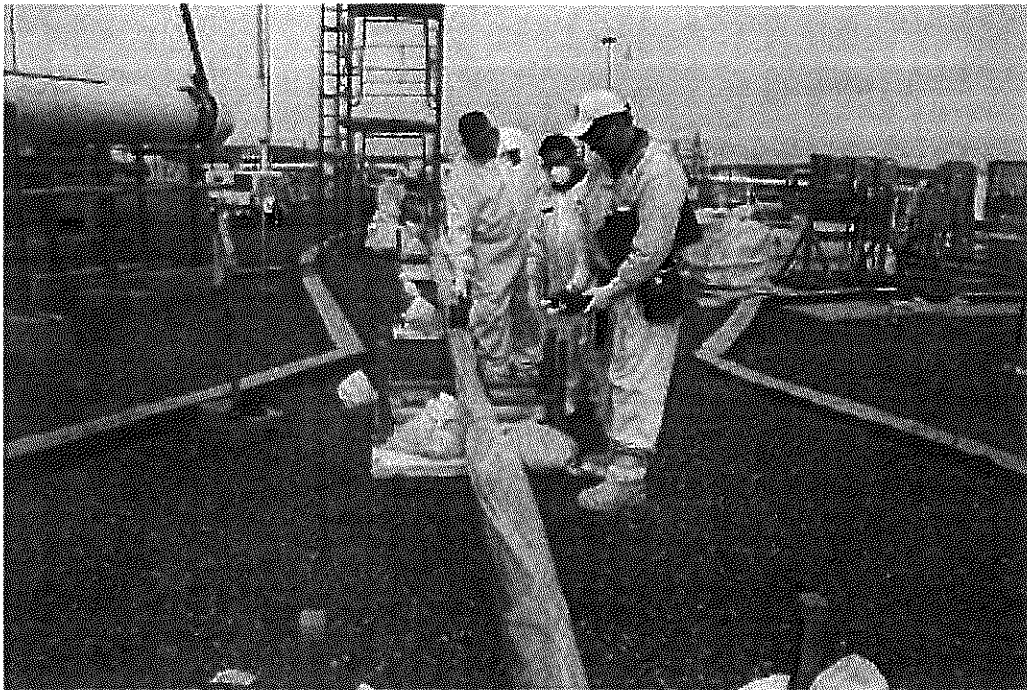


Figure 2: Photo of workers in Hanford Tank Farms. Available at: <http://ecologywa.blogspot.com/2012/04/ecology-ponders-hanford-tank-farm.html>

ATTACHMENT 4

List of Reports on Hanford Vapor Issue

Compiled by Hanford Challenge, November 2014

1. April 1992. Type B Investigation of Hanford Tank Farms Vapor Exposures. Richland Field Office, U.S. Department of Energy.
2. July 1992. Independent Technical Review of Hanford Tank Farm Operations, DOE/EM 0095.
3. February 1993. Hazards Ahead: Managing Cleanup Worker Health and Safety at the Nuclear Weapons Complex, U.S. Congress, Office of Technology Assessment, 55-56 (OTA-BP-O-85).
4. October 1993. D. Quilici, CIH, CSP, Quiltech Services, Baseline Hazard Assessment, Hanford Tank Farms, 200E/200W Areas, Westinghouse Hanford Company.
5. July 1996. Hewitt, E.R., Tank Waste Remediation System Resolution of Potentially Hazardous Vapor Issues, WHC-SD-TWR-RPT-001, Rev. 0, June 24, 1996.
6. September 1996. Huckaby JL, JA Glissmeyer, JE Meacham, and LA Stauffer. Comparison of Organic Constituents Found in the Condensed and Vapor Phases of Tanks 241-BY-108, 241-BY-110, and 241-C-102, WHC-EP-0919, Westinghouse Hanford Company, Richland, Washington.
7. September 1996. Reich, F.R., Meacham, J.E., et al. Project Plan for Resolution of the Organic Waste Tank Safety Issues at the Hanford Site. WHC-EP-0914 Rev. 0, Westinghouse Hanford Company, Richland, Washington.
8. March 1997. Health Risk Assessment for Short-and Long-term Worker Inhalation Exposure to Vapor-Phase Chemicals from the Single-shell Tank 241-C-103. A.O. Maughan, J.G. Droppo, K.J. Castleton.
9. August 1997. Carpenter, T.E., Blowing Off Safety at the Hanford Tank Farms, Toxic Negligence at Tank C-103, Government Accountability Project, available at www.hanfordchallenge.org.
10. March 1998. Brown, T. M., High Priority Tank Sampling and Analysis Report, HNF-2337 Rev. 1, Lockheed Martin for US DOE.
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13. November 2001. Exposure-Based Health Issues Project Report: Phase I of High-Level Waste Tank Operations, Retrieval, Pretreatment, and Vitrification Exposure-Based Health Issues Analysis. Pacific Northwest National Laboratory, Hanford Environmental Health Foundation. (R.D. Stenner, et al.)
14. September 2003. Knowing Endangerment: Worker Exposure to Toxic Vapors at the Hanford Tank Farms. Government Accountability Project. Nuclear Oversight Program.
15. October 2003. Hecker, S., Jaeger, R., Lavaty, K., Potter, H., Report of the Expert Panel on Vapor Concerns to CH2M Hill Hanford Group October 1, 2003.
16. October 2003. Chemical Vapor Technical Report, Dupont, Inc., Prepared for CH2M Hill Hanford Group, Inc., Contract No. 198000, available at www.hanfordchallenge.org.
17. April 2004. Investigation of Worker Vapor Exposure and Occupational Medicine Program Allegations at the Hanford Site. Office of Independent Oversight and Performance Assurance, Office of Security and Safety Performance Assurance, U.S. Department of Energy.
18. May 2004. Carpenter, T.E. and Gilbert C., Don't Breathe the Air, Bulletin of Atomic Scientists, May/June 2004.
19. June 2004. Jarvis, T.T., Ph.D., REA, Health Risks to Workers Exposed to Toxic Tank Vapors at Hanford's High-level Waste Tanks, An Overview of Issues, available at www.hanfordchallenge.org.
20. July 2004. "Evaluation of Hazardous Waste Vapor Exposures at Hanford Tank Farm Site." NIOSH Health Hazard Evaluation Report. Department of Health and Human Services. HTEA#2002-0145-2941.
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24. November 2004. Baker, D. M. Feasibility Study for Control of Vapors from Waste Storage Tanks in the 241-C, 241-AW, and 241-AN Tank Farms, RPP-RPT-23101. Rev 0, CH2M Hill Hanford Group, Inc., Richland, WA.

25. December 2004. Burgeson, I.E., Moore, N. A., Bunn, A. L. Huckaby, J. L., *Toxicological Assessment of Hanford Tank Headspace Chemicals - Determination of Chemicals of Potential Concern*. PNNL-14949 Rev 0, Pacific Northwest National Laboratory (PNNL), Richland, WA.
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27. March 2006. *Proposed Approach to Establishing Acceptable Limits of Exposure to Hydrocarbon Vapors Emitted from Underground waste Storage Tanks at the Hanford Site*. RPP-RPT-29404. (C.R. Mackerer).
28. May 2006. Meacham, J. E., Honeyman, J.O., Anderson, T. J., Zabel, M.L., Huckaby, J.L., May 2006a. *Industrial Hygiene Chemical Vapor Technical Basis*. RPP-RPT-22491 Rev I, CH2MHILL Hanford Group & Pacific Northwest National Laboratory (PNNL), Richland, WA.
29. February 2006. T.S. Poet, T.J. Mast, J.L. Huckaby, *Screening Values for Non-Carcinogenic Hanford Waste Tank Vapor Chemicals that Lack Established Occupational Exposure Limits*. PNNL-15640, Pacific Northwest National Laboratory (PNNL), Richland, WA.
30. October 2007. Anderson, T. J., Bickel, E. E., Hoffman, J.C., Voogd, J. A., *Health effects report/or 241-S-102*
31. June 2008. Breysee, P.N., Franzblau, A., Witschi, P., *The Industrial Hygiene Chemical Vapor Technical Basis Review*. Hanford Concerns Council.
32. June 2008. Jabara, J. W., Farler, D. F., *Evaluation of Worker Exposures to Tank Generated Vapors from May14, 2005 -December 31, 2007*. RPP-RPT-38056 Rev 0, CH2MHJLL Hanford Group, Richland, WA.
33. September 2010. Breysee, P.N., PhD, Board CIH, Stenzel, M.R., CIH, *Independent Review Panel Report on Chemical Vapors Industrial Hygiene Strategy*. Hanford Concerns Council, available at hanfordconcernscouncil.org.
34. October 2014, *Hanford Tank Vapor Assessment Report*, Savannah River National Laboratory, SRNL-RP-2014-00791.

ATTACHMENT 5

RPP-22491 Rev. 1

Table C-2. CNFE with Concentrations Below Analytical Reporting Limits (2 Sheets)

Chemical Identification Number	Chemical Name
106-44-5	4-Methylphenol (p-Cresol)
1319-77-3	Cresol (all isomers)
616-40-0	Hydrazine, 1,1-diethyl-
101-83-7	Cyclohexylamine, N-cyclohexyl- (Dicyclohexylamine)
1024-57-3	Heptachlor epoxide
106-94-5	Propane, 1-bromo-
107-10-8	1-Propanamine
1071-26-7	2,2-Dimethylheptane
107-31-1	Butanal, 3-hydroxy-
108-21-4	1-Methylethyl acetate
108-64-5	Ethyl 3-methylbutanoate
11096-82-5	Arochlor-1260
1116-54-7	Ethanol, 2,2'-(nitrosoimino)bis-
112-37-8	Undecanoic acid
119-33-5	4-Methyl-2-nitrophenol
12672-29-6	Arochlor-1248
12674-11-2	Arochlor-1016
129-00-0	Pyrene
13952-84-6	2-Butanamine
140-79-4	Piperazine, 1,4-dinitroso-
15104-03-7	Piperidine, 4-methyl-1-nitroso-
1526-17-6	2-Fluoro-6-nitrophenol
156-87-6	1-Propanol, 3-amino-
16536-57-5	cis-2-Bromocyclohexanol
16747-32-3	Pentane, 3-ethyl-2,2-dimethyl-
1721-93-3	Isoquinoline, 1-methyl-
1825-61-2	Methoxytrimethylsilane
1825-65-6	Butoxytrimethylsilane
18720-66-6	3-Heptanol, 6-methyl-
19549-83-8	3-Heptanone, 2,6-dimethyl-
19689-18-0	4-Decene
2110-78-3	Methyl 2-hydroxy-2-isobutyrate
21571-34-6	2-Fluoro-4-nitrophenol
22967-92-6	Methylmercury
2562-37-0	1-Nitrocyclohexene
2581-34-2	3-Methyl-4-nitrophenol
286-18-0	7-Azabicyclo[4.1.0]heptane
3034-41-1	1-Methyl-4-nitro-1H-imidazole
309-00-2	Aldrin
319-84-6	alpha-BHC
319-85-7	beta-BHC
319-86-8	delta-BHC
3404-58-8	3-Ethyl-1-hexene
34075-28-0	Butane, 2,3-dimethyl-2-nitro-
34419-76-6	1-Propanamine, N,2-dimethyl-
37324-23-5	Arochlor-1262
394-41-2	3-Fluoro-4-nitrophenol
3970-62-5	3-Pentanol, 2,2-dimethyl-
3973-27-1	p-Dioxin, 2,3-dihydro-2,5,6-trimethyl-

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Table C-2. CNFE with Concentrations Below Analytical Reporting Limits (2 Sheets)

Chemical Identification Number	Chemical Name
39884-53-2	N-nitroso-2-methyl-oxazolidine
403-19-0	2-Fluoro-4-nitrophenol
4245-37-8	2-Propenoic acid, 2-methyl-, ethenyl-
497-56-3	2-Methyl-3,5-dinitrophenol
504-20-1	2,5-Heptadien-4-one, 2,6-dimethyl-
50623-57-9	Butyl nonanoate
5103-71-9	alpha-Chlordane
5343-96-4	2-Butanol, 3-methyl-, acetate
53778-73-7	2-Butanol, 1-methoxy-
54166-32-4	2,6,6-Trimethyloctane
553-97-9	p-Benzoquinone, 2-methyl-
55556-86-0	Pyrrolidine, 2,5-dimethyl-1-nitroso-
55556-93-9	4-Piperidinol, 1-nitroso-
58-89-9	Lindane (isomeric mix)
59-50-7	4-Chloro-3-methylphenol
608-33-3	2,6-Dibromophenol
62016-37-9	2,4,6-Trimethyloctane
62108-23-0	2,5,6-Trimethyldecane
625-50-3	Acetamide, N-ethyl-
638-10-8	2-Butenoic acid, 3-methyl-, ethyl
700-38-9	5-Methyl-2-nitrophenol
7247-89-4	Piperidine, 2-methyl-1-nitroso-
73583-56-9	2,6-Dimethyl-6-nitro-2-hepten-4-one
7421-93-4	Endrin Aldehyde
75-25-2	Bromoform (Tribromomethane)
758-21-4	Silane, ethyldimethyl-
75-98-9	Propanoic acid, 2,2-dimethyl
76-44-8	Heptachlor
78-42-2	Tri(2-ethylhexyl)phosphate
79-05-0	Propanamide
79-77-6	2,6,6-Trimethylcyclohexen-1-yl-3-buten-2-one
83-32-9	Acenaphthene
91-63-4	Quinoline, 2-methyl-
922-64-5	Propanedinitrile, methylene
924-46-9	1-Propanamine, N-methyl-N-nitroso-
96-69-5	bis(3-tert-Butyl-4-hydroxy-6-methylphenyl) sulfide
98060-52-7	2,2,6-Trimethyloctane
98060-54-9	2,2,8-Trimethyldecane
99-28-5	2,6-Dibromo-4-nitrophenol
994-05-8	Butane, 2-methoxy-2-methyl-
99-66-1	Valproic acid
Not available	Phosphonic acid, dioctadecyl ester

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Table C-3. CNFE with Concentrations Below Analytical Reporting Limits (2 Sheets)

Chemical Identification Number	Chemical Name	Note
110-60-1	1,4-Butanediamine	4
123-75-1	Pyrrolidine	4
1453-58-3	1H-Pyrazole, 3-methyl-	4
16339-12-1	Methanamine, N-methoxy-N-nitroso-	4
16778-70-4	1H-1,2,4-Triazole, 1-ethyl-	4
18294-04-7	Ethanedioic acid, bis(trimethylsilyl) ester	4
1886-75-5	Propane, 2-[(1,1-dimethylethyl)sulfonyl]-2-methyl-	4
2432-55-5	Butanethioic acid, S-decyl ester	4
27750-45-4	Benzenepropanoic acid, .alpha.-[(trimethylsilyl)oxy]-, trimethylsilyl ester	4
29052-10-6	Butyric acid, ester with p-hydroxybenzotrile	4
33342-89-1	1-Propanone, 1-[4-[(trimethylsilyl)oxy]phenyl]-	4
3518-07-8M	Benz[a]acridine, 8,10-diethyl- and others	4
37148-64-4	Benzenoacetic acid, .alpha.,4-bis[(trimethylsilyl)oxy]-, trimethylsilyl ester	4
38165-93-4	Propanedioic acid, [(trimethylsilyl)oxy]-, bis(trimethylsilyl) ester	4
39251-86-0M	2-Furancarboxylic acid, hexyl ester and others	4
421-50-1	2-Propanone, 1,1,1-trifluoro-	4
4342-25-0	3,6-Dioxa-2,4,5,7-tetrasilaoctane, 2,2,4,4,5,5,7,7-octamethyl-	4
505-57-7	2-Hexenal	4
541-01-5	Heptasiloxane, hexadecamethyl-	4
55334-40-2	Benzenoacetic acid, .alpha.,4-bis[(trimethylsilyl)oxy]-, methyl ester	4
55471-01-7	Butanamide, 2,2,3,3,4,4,4-heptafluoro-N-[2-[(trimethylsilyl)oxy]-2-[4-[(trimethylsilyl)oxy]phenyl]ethyl]-	4
55494-10-5	2-Hexenedioic acid, bis(trimethylsilyl) ester, (E)	4
599-70-2	Benzene, (ethylsulfonyl)-	4
637-64-9	2-Furanmethanol, tetrahydro-, acetate	4
75268-01-8	1H-Azepin-1-amine, N-ethylidenehexahydro-	4
75-55-8	1,2-Propylenimine (2-Methyl aziridine)	4
75-77-4	Silane, chlorotrimethyl-	4
883-93-2	Benzothiazole, 2-phenyl-	4
930-22-3	Oxirane, ethenyl-	4
993-07-7	Silane, trimethyl-	4
MAYHC00-01a	2-Decyne mixture	4
MAYHC00-01b	6-Methyl-8,9-(7H)-dihydro-1,2,4-triazolo[4,3-B]-1,2,4-triazepin-8-one	4
UES010-02	Formic acid, 2,6-dimethyl-5-hepten-2-ol ester	4
UHC000-03	C1-Hydroxyquinoline	4
UHC000-04	C2-Hydroxyquinoline	4
UHC000-08M	C1-Acridine and others	4
UHC000-11	6-Amino-2,3-diphenyl(1H)pyrrolo[2,3-b]pyridine	4
USI000-04	p-Trimethylsilyloxyphenyl-bis(trimethylsilyloxy)ethane	4
101300-62-3	Silane, (4,5-dimethyl-1,4-cyclohexadiene-1,2-diyl)	2
107-16-4	Acetonitrile, hydroxy-	2
1115-07-7	Borane, diethylmethyl-	2
22058-71-5	Methylamine, N-(1-methylhexylidene)-	2
31053-55-1	Thiophene, 2-methoxy-5-methyl-	2
311-89-7	1-Butanamine, 1,1,2,2,3,3,4,4,4-nonafluoro-N,N-bis	2
430-51-3M	2-Propanone, 1-fluoro- and others	2
512-85-6	2,3-Dioxabicyclo[2.2.2]oct-5-ene, 1-methyl-4-(1-methylethyl)-	2
694-87-1	Bicyclo[4.2.0]octa-1,3,5-triene	2
710-04-3	2H-Pyran-2-one, 6-hexyltetrahydro-	2

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Table C-3. CNFE with Concentrations Below Analytical Reporting Limits (2 Sheets)

Chemical Identification Number	Chemical Name	Note
1192-51-4	2,4(3H,5H)-Furandione, 3-methyl-	5
1708-29-8	Furan, 2,5-dihydro-	5
1795-48-8	Propane, 2-isocyanato-	5
1838-59-1	Formic acid, 2-propenyl ester	5
20474-93-5	2-Butenoic acid, 2-propenyl ester	5
22431-09-0	Methanamine, N-(1-methylbutylidene)-	5
2549-67-9	Aziridine, 2-ethyl-	5
31681-26-2	2-Furanacetaldehyde, .alpha.-propyl-	5
34314-82-4	Furan, 3-(1,1-dimethylethyl)-2,3-dihydro-	5
3457-92-9	1,5-Pentanediol, dinitrate	5
3777-71-7	Furan, 2-heptyl-	5
4179-38-8	Furan, 2-octyl-	5
4229-91-8	Furan, 2-propyl-	5
56052-94-9	Oxirane, 2-ethyl-3-propyl-, cis-	5
616-45-5	2-Pyrrolidinone	5
627-27-0	3-Buten-1-ol	5
694-05-3	Pyridine, 1,2,3,6-tetrahydro-	5
717-21-5	2-Propen-1-one, 3-(2-furanyl)-1-phenyl-	5
78-76-2	Butane, 2-bromo-	5
96-41-3	Cyclopentanol	5
UAD010-01	Decadienal	5
1072-85-1	Benzene, 1-bromo-2-fluoro-	3
10061-01-5	cis-1,3-Dichloro-1-propene	1
10061-02-6	trans-1,3-Dichloro-1-propene	1

Notes: ¹ Determined to be an analytical laboratory contaminant (PNNL-15648).

² Misidentified by reporting analytical laboratory (TWS05.008).

³ Personal email communication from M Stauffer to J.L. Huckaby, September 9, 2004.

⁴ Misidentified by reporting analytical laboratory (TWS05.016).

⁵ Misidentified by reporting analytical laboratory (PNNL-15673).

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Table C-4. Low Molecular Weight Organic Vapors With Potential Characterization Problems

Chemical Identification Number	Name	Formula	Molecular Weight (g/mol)	Exposure Guideline	Exposure Guideline Source*
107-29-9	Ethanal oxime	CH ₃ CHNOH	59.068	0.1	Screening Value
109-95-5	Ethyl nitrite	CH ₃ CH ₂ ONO	75.067	0.2	Screening Value
123-39-7	N-Methylformamide	HCONHCH ₃	59.068	0.4	Screening Value
124-40-3	Dimethylamine	CH ₃ NHCH ₃	45.084	5	TLV
144-62-7	Oxalic acid	HO ₂ CO ₂ H	90.035	0.5	TLV
151-56-4	Aziridine	cyclic- CH ₂ CH ₂ NH	43.068	0.5	TLV
215229-01-9	Ethyl peroxyxynitrite	CH ₃ CH ₂ OONO	91.066	0.01	Screening Value
298-12-4	Glyoxylic acid	OHCCO ₂ H	74.036	12	Screening Value
302-01-2	Hydrazine	H ₂ NNH ₂	32.045	0.01	TLV
3031-73-0	Methyl hydroperoxide	CH ₃ OOH	48.041	0.01	Screening Value
3031-74-1	Ethyl hydroperoxide	CH ₃ CH ₂ OOH	62.068	0.01	Screening Value
42829-59-4	Methyl peroxyxynitrate	CH ₃ OONO ₂	93.039	0.03	Screening Value
463-58-1	Carbonyl sulfide	OCS	60.075	1	Screening Value
484678-32-2	Methyl peroxyxynitrite	CH ₃ OONO	77.040	0.01	Screening Value
517-25-9	Trinitromethane	CH(NO ₂) ₃	151.035	0.2	Screening Value
540-73-8	1,2-Dimethylhydrazine	(CH ₃) ₂ NHNHCH ₃	60.099	carcinogen	IARC 2A
56-40-6	Glycine	H ₂ NCH ₂ CO ₂ H	75.067	100	Screening Value
57-14-7	1,1-Dimethylhydrazine	(CH ₃) ₂ NNH ₂	60.099	0.01	TLV
598-58-3	Methyl nitrate	CH ₃ ONO ₂	77.040	1.3	Screening Value
600-40-8	1,1-Dinitroethane	CH ₃ CH(NO ₂) ₂	120.065	100	TLV
60-34-4	Methyl hydrazine	CH ₃ NHNH ₂	46.072	0.01	TLV
625-58-1	Ethyl nitrate	CH ₃ CH ₂ ONO ₂	91.067	1.3	Screening Value
625-76-3	Dinitromethane	CH ₂ (NO ₂) ₂	106.038	0.2	Screening Value
64160-40-3	Ethyl peroxyxynitrate	CH ₃ CH ₂ OONO ₂	107.066	0.03	Screening Value
64-18-6	Formic acid	HCO ₂ H	46.026	5	TLV
64-19-7	Acetic acid	CH ₃ CO ₂ H	60.053	10	PEL
74-84-0	Ethane	CH ₃ CH ₃	30.070	1000	TLV
74-85-1	Ethene	CH ₂ CH ₂	28.054	200	TLV
74-86-2	Ethyne	CHCH	26.038	2500	REL
74-89-5	Methylamine	CH ₃ NH ₂	31.057	5	TLV
74-90-8	Hydrogen cyanide	HCN	27.026	4.7	TLV
75-04-7	Ethylamine	CH ₃ CH ₂ NH ₂	45.084	5	TLV
75-12-7	Formamide	HCONH ₂	45.041	10	TLV
75-13-8	Isocyanic acid	HNCO	43.025	0.13	Screening Value
75-15-0	Carbon disulfide	CS ₂	76.139	10	TLV
75-17-2	Methanal oxime	CH ₂ NOH	45.041	0.1	Screening Value
75-52-5	Nitromethane	CH ₃ NO ₂	61.041	20	TLV
79-14-1	Glycolic acid	HOCH ₂ CO ₂ H	76.052	1.2	Screening Value
79-24-3	Nitroethane	CH ₃ CH ₂ NO ₂	75.067	100	TLV
865-40-7	Nitrosomethane	CH ₃ NO	45.041	0.2	Screening Value
925-91-7	Nitrosoethane	CH ₃ CH ₂ NO	59.068	0.2	Screening Value

Notes: * Screening Values are from PNNL-15640

IARC = International Agency for Research on Cancer

PEL = OSHA Permissible Exposure Limit

REL = NIOSH Recommended Exposure Limit.

TLV = ACGIH Threshold Limit Value

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Table C-5. CNFE with Established U.S. OELs (3 Sheets)

Chemical Identification Number	Chemical Name	OEL		Maximum Source Concentration	
		Type	(ppmv)	(ppmv)	% of OEL
100-00-5	1-Chloro-4-nitrobenzene	TLV	0.1	0.00076	0.8%
100-41-4	Ethylbenzene	PEL	100	0.14	0.1%
100-42-5	Styrene (Ethenylbenzene)	TLV	20	0.28	1%
100-51-6	Benzene-methanol	WEEL	10	0.010	0.1%
100-52-7	Benzaldehyde	WEEL	4	0.0068	0.2%
100-61-8	Benzenamine, N-methyl-	TLV	0.5	0.0036	0.7%
10102-43-9	Nitric oxide (NO)	PEL	25	1.6	7%
101-84-8	Benzene, 1,1'-oxybis-	PEL	1	0.024	2%
106-35-4	3-Heptanone	PEL	50	1.8	4%
106-46-7	1,4-Dichlorobenzene	TLV	10	0.0033	0.03%
106-68-3	3-Octanone	PEL	25	0.44	2%
106-88-7	1,2-Epoxybutane	WEEL	2	0.084	4%
106-97-8	n-Butane	TLV	800	7.7	1%
107-02-8	Acrolein (2-Propenal)	PEL	0.1	0.0060	6%
107-05-1	3-Chloropropene (Allyl chloride)	PEL	1	0.0064	0.6%
107-13-1	Acrylonitrile (2-Propenenitrile)	REL	1	0.011	1%
107-15-3	Ethylenediamine	PEL	10	0.23	2%
107-18-6	2-Propen-1-ol	TLV	0.5	0.0037	0.7%
107-31-3	Formic acid, methyl ester	PEL	100	0.024	0.02%
107-39-1	1-Pentene, 2,4,4-trimethyl-	WEEL	300	0.046	0.02%
107-87-9	2-Pentanone	REL	150	1.2	0.8%
108-03-2	1-Nitropropane	PEL	25	0.034	0.1%
108-05-4	Vinyl acetate (Ethenyl ethanoate)	TLV	10	0.00078	0.008%
108-10-1	Hexone (Methyl isobutyl ketone)	TLV	50	0.94	2%
108-20-3	Propane, 2,2'-oxybis-	TLV	25	0.097	0.4%
108-39-4	3-Methylphenol (m-Cresol)	REL	2	0.0021	0.1%
108-67-8	1,3,5-Trimethylbenzene	REL	25	0.015	0.06%
108-87-2	Methylcyclohexane	PEL	300	0.38	0.1%
108-88-3	Toluene	TLV	50	1.2	2%
108-89-4	Pyridine, 4-methyl-	WEEL	2	0.057	3%
108-90-7	Chlorobenzene	TLV	10	0.015	0.2%
108-93-0	Cyclohexanol	PEL	50	0.00049	0.001%
108-94-1	Cyclohexanone	TLV	25	0.085	0.3%
108-95-2	Phenol	PEL	5	0.27	5%
108-99-6	Pyridine, 3-methyl-	WEEL	2	0.036	2%
109-06-8	Pyridine, 2-methyl-	WEEL	2	0.062	3%
109-66-0	n-Pentane	REL	120	5.7	5%
109-99-9	Tetrahydrofuran	PEL	200	4.9	2%
110-12-3	5-Methyl-2-hexanone	TLV	50	0.038	0.08%
110-43-0	2-Heptanone	TLV	50	0.60	1%
110-54-3	n-Hexane	TLV	50	2.2	4%
110-62-3	Pentanal	TLV	50	0.24	0.5%
110-82-7	Cyclohexane	TLV	100	1.1	1%
110-83-8	Cyclohexene	PEL	300	0.0027	0.001%
110-89-4	Piperidine	WEEL	1	0.0072	0.7%
111-65-9	n-Octane	REL	75	0.35	0.5%
111-76-2	2-Butoxyethanol	TLV	25	0.061	0.2%
111-84-2	n-Nonane	TLV	200	0.30	0.1%

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Table C-5. CNFE with Established U.S. OELs (3 Sheets)

Chemical Identification Number	Chemical Name	OEL		Maximum Source Concentration	
		Type	(ppmv)	(ppmv)	% of OEL
111-87-5	1-Octanol	WEEL	50	0.061	0.1%
115-10-6	Methane, oxybis-	WEEL	1000	2.0	0.2%
120-82-1	1,2,4-Trichlorobenzene	TLV	5	0.016	0.3%
122-39-4	Benzamine, N-phenyl	TLV	1.45	0.030	2%
123-19-3	4-Heptanone	TLV	50	0.44	0.9%
123-38-6	Propionaldehyde	TLV	20	0.26	1%
123-51-3	3-Methyl-1-butanol	PEL	100	0.027	0.03%
123-73-9	trans-2-Butenal	TLV Ceiling	0.3	0.0031	1%
123-86-4	Acetic acid, butyl ester	PEL	150	3.4	2%
126-98-7	2-Propenenitrile, 2-methyl-	TLV	1	0.037	4%
127-19-5	Acetamide, N,N-dimethyl-	PEL	10	0.013	0.1%
1330-20-7	Xylene (all isomers)	PEL	100	0.33	0.3%
1333-74-0	Hydrogen	n.a. ¹	n.a.	n.a.	n.a.
138-86-3	Cyclohexene, 1-methyl-4-(1-methylethenyl)-	WEEL	30	0.022	0.07%
141-78-6	Acetic acid ethyl ester	PEL	400	12	3%
141-79-7	3-Penten-2-one, 4-methyl-	REL	10	0.020	0.2%
142-82-5	n-Heptane	REL	85	0.98	1%
149-57-5	Hexanoic acid, 2-ethyl-	TLV	0.848	0.00031	0.04%
156-59-2	cis-1,2-Dichloroethene	TLV	200	0.0098	0.005%
1717-00-6	Ethane, 1,1-dichloro-1-fluoro-	WEEL	500	0.18	0.04%
287-92-3	Cyclopentane	TLV	600	0.21	0.03%
4170-30-3	2-Butenal	TLV	0.3	0.023	8%
463-82-1	Propane, 2,2-dimethyl-	TLV	600	0.054	0.009%
541-85-5	5-Methyl-3-heptanone	TLV	25	0.043	0.2%
542-56-3	2-Methyl-1-propyl nitrite	TLV	1	0.025	3%
563-80-4	2-Butanone, 3-methyl-	TLV	200	1.8	0.9%
57-55-6	1,2-Propanediol	WEEL	50	0.15	0.3%
592-45-0	1,4-Hexadiene	WEEL	10	0.042	0.4%
6032-29-7	2-Pentanol	PEL	100	0.14	0.1%
627-13-4	Nitric acid, propyl ester	PEL	25	1.2	5%
637-92-3	Propane, 2-ethoxy-2-methyl-	TLV	5	0.00024	0.005%
64-17-5	Ethanol	PEL	1000	21	2%
67-63-0	2-Propanol	PEL	400	2.0	0.5%
67-64-1	Acetone	REL	250	19	8%
71-23-8	1-Propanol	PEL	200	5	3%
71-55-6	1,1,1-Trichloroethane	PEL	350	0.011	0.003%
7440-37-1	Argon	n.a. ¹	n.a.	n.a.	n.a.
74-83-9	Bromomethane	TLV	1	0.014	1%
74-87-3	Chloromethane	TLV	50	0.10	0.2%
74-98-6	Propane	PEL	998	4.7	0.5%
74-99-7	1-Propyne	PEL	1000	0.34	0.03%
75-00-3	Chloroethane	TLV	100	0.039	0.04%
75-28-5	2-Methylpropane	REL	800	0.65	0.08%
75-34-3	1,1-Dichloroethane	PEL	100	0.011	0.01%
75-35-4	1,1-Dichloroethene	TLV	5	0.021	0.4%
75-43-4	Methane, dichlorofluoro-	TLV	10	0.054	0.5%
75-45-6	Chlorodifluoromethane (Freon 22)	TLV	1000	1.7	0.2%
75-65-0	2-Propanol, 2-methyl-	PEL	100	0.13	0.1%
75-68-3	Ethane, 1-chloro-1,1-difluoro-	WEEL	1000	0.73	0.07%

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Table C-5. CNFE with Established U.S. OELs (3 Sheets)

Chemical Identification Number	Chemical Name	OEL		Maximum Source Concentration	
		Type	(ppmv)	(ppmv)	% of OEL
75-69-4	Trichlorofluoromethane (Freon 11)	PEL	1000	3.7	0.4%
75-71-8	Dichlorodifluoromethane (Freon 12)	PEL	1000	0.020	0.002%
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	PEL	1000	0.21	0.02%
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane	PEL	1000	0.012	0.001%
78-78-4	Butane, 2-methyl-	TLV	600	2.5	0.4%
78-79-5	1,3-Butadiene, 2-methyl-	WEEL	50	0.052	0.1%
78-82-0	2-Methylpropanenitrile	REL	8	0.019	0.2%
78-83-1	2-Methyl-1-propanol	TLV	50	0.018	0.04%
78-84-2	Propanal, 2-methyl-	WEEL	25	0.004	0.01%
78-87-5	1,2-Dichloropropane	PEL	75	0.0099	0.01%
78-92-2	2-Butanol	TLV	100	0.21	0.2%
78-93-3	2-Butanone	PEL	200	13	7%
79-00-5	1,1,2-Trichloroethane	TLV	10	0.034	0.3%
79-09-4	Propanoic acid	TLV	10	0.0051	0.05%
79-20-9	Acetic acid, methyl ester	PEL	200	0.043	0.02%
79-34-5	1,1,2,2-Tetrachloroethane	TLV	1	0.021	2%
84-74-2	Dibutylphthalate	PEL	0.4	0.00048	0.1%
872-50-4	2-Pyrrolidinone, 1-methyl-	WEEL	10	0.024	0.2%
88-72-2	1-Methyl-2-nitrobenzene	TLV	2	0.0014	0.07%
91-20-3	Naphthalene	PEL	10	0.014	0.1%
95-48-7	2-Methylphenol (o-Cresol)	REL	2	0.012	0.6%
95-50-1	1,2-Dichlorobenzene	TLV	25	0.0081	0.03%
95-63-6	1,2,4-Trimethylbenzene	TLV	25	0.015	0.06%
96-22-0	3-Pentanone	TLV	200	0.062	0.03%
97-99-4	2-Furanmethanol, tetrahydro-	WEEL	2	0.016	0.8%
98-82-8	Cumene (Isopropylbenzene)	PEL	50	0.088	0.2%
98-83-9	Benzene, (1-methylethenyl)-	TLV	50	0.031	0.06%
98-86-2	Acetophenone	TLV	10	0.44	4%
98-95-3	Nitrobenzene	PEL	1	0.0027	0.3%
99-08-1	Benzene, 1-methyl-3-nitro-	TLV	2	0.00019	0.01%
99-82-1	Cyclohexane, 1-methyl-4-(1-methylethyl)-	WEEL	30	0.047	0.2%
99-99-0	Benzene, 1-methyl-4-nitro-	TLV	2	0.00033	0.02%

Note: ¹ Hydrogen and argon are both simple asphyxiants and do not have OELs.

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Table C-6. Hydrocarbons (14 Sheets)

Chemical Identification Number	Chemical Name
1002-17-1	Decane, 2,9-dimethyl-
1002-43-3	Undecane, 3-methyl-
1002-68-2	3-Undecene, (E)-
1008-80-6	Naphthalene, decahydro-2,3-dimethyl-
101-81-5	Benzene, 1,1'-methylenebis-
103-65-1	Benzene, propyl-
10374-74-0	7-Tetradecene
106-42-3	1,4-Dimethylbenzene
1068-19-5	4,4-Dimethylheptane
1069-53-0	Hexane, 2,3,5-trimethyl-
106-98-9	1-Butene
107-00-6	1-Butyne
107-01-7	2-Butene
1071-81-4	Hexane, 2,2,5,5-tetramethyl-
1072-05-5	Heptane, 2,6-dimethyl-
1074-17-5	Benzene, 1-methyl-2-propyl-
107-83-5	2-Methylpentane
108-08-7	Pentane, 2,4-dimethyl-
1083-56-3	Benzene, 1,1'-(1,4-butanediyl)bis-
108-38-3	1,3-Dimethylbenzene
109-67-1	1-Pentene
109-68-2	2-Pentene
1113-56-0	1,3-Pentadiene, 2,3-dimethyl-
111-66-0	1-Octene
111-67-1	2-Octene
1116-90-1	1,4-Hexadiene, 4-methyl-
1118-58-7	1,3-Pentadiene, 2-methyl-
1120-21-4	n-Undecane
1120-36-1	1-Tetradecene
112-40-3	n-Dodecane
112-41-4	1-Dodecene
112-88-9	1-Octadecene
112-95-8	Eicosane
115-07-1	1-Propene
115-11-7	1-Propene, 2-methyl-
1191-96-4	Cyclopropane, ethyl-
1192-18-3	cis-1,2-Dimethylcyclopentane
124-11-8	1-Nonene
124-18-5	n-Decane
13049-35-9	1,1'-Biphenyl, 2,2'-diethyl-
13151-04-7	1-Heptene, 5-methyl-
13151-06-9	1-Octene, 7-methyl-
13151-29-6	1-Decene, 4-methyl-
13151-34-3	Decane, 3-methyl-
13151-35-4	Decane, 5-methyl-
13151-74-1	Decane 3-cyclohexyl-, 3-cyclohexyl-
13151-75-2	Decane 4-cyclohexyl-, 4-cyclohexyl-
13151-99-0	Cyclooctane, 1,4-dimethyl-, cis-
13286-73-2	Tridecane, 3-ethyl-

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Table C-6. Hydrocarbons (14 Sheets)

Chemical Identification Number	Chemical Name
13287-21-3	Tridecane, 6-methyl-
13287-23-5	Heptadecane, 8-methyl-
13287-24-6	Nonadecane, 9-methyl-
1331-43-7	Cyclohexane, diethyl-
13360-61-7	1-Pentadecene
13475-75-7	Pentadecane, 8-hexyl-
13475-78-0	Heptane, 5-ethyl-2-methyl-
13475-82-6	Heptane, 2,2,4,6,6-pentamethyl-
135-98-8	Benzene, (1-methylpropyl)-
13828-31-4	Cyclohexene, 1-methyl-3-(1-methylethyl)-
14255-23-3	2-Hexene, 2,4-dimethyl-
1453-24-3	Cyclohexene, 1-ethyl-
14676-29-0	Heptane, 3-ethyl-2-methyl-
14686-13-6	2-Heptene, (E)-
14686-14-7	3-Heptene, (E)-
14720-74-2	Heptane, 2,2,4-trimethyl-
1472-09-9	Cyclopropane, octyl-
14850-23-8	4-Octene, (E)-
14905-56-7	Tetradecane, 2,6,10-trimethyl-
14919-01-8	3-Octene, (E)-
15232-85-6	Cyclohexene, 1-pentyl-
1560-88-9	Octadecane, 2-methyl-
1560-92-5	Hexadecane, 2-methyl-
1560-93-6	Pentadecane, 2-methyl-
1560-96-9	Tridecane, 2-methyl-
1560-97-0	Dodecane, 2-methyl-
1574-41-0	1,3-Pentadiene, (Z)-
15869-80-4	Heptane, 3-ethyl-
15869-86-0	Octane, 4-ethyl-
15869-89-3	Octane, 2,5-dimethyl-
15869-92-8	Octane, 3,4-dimethyl-
15869-93-9	Octane, 3,5-dimethyl-
15869-94-0	3,6-Dimethyloctane
15890-40-1	cis-1,2-trans-3-Trimethylcyclopentane
15918-07-7	4-Nonene, 5-methyl-
16106-59-5	1-Hexene, 4,5-dimethyl-
1618-22-0	Naphthalene, decahydro-2,6-dimethyl-
1630-94-0	Cyclopropane, 1,1-dimethyl-
1632-16-2	2-Ethyl-1-hexene
1632-70-8	Undecane, 5-methyl-
1638-26-2	1,1-Dimethylcyclopentane
1640-89-7	Cyclopentane, ethyl-
16538-89-9	Cyclooctane, (1-methylpropyl)
16538-93-5	Cyclooctane, butyl-
16580-24-8	Cyclohexane, 1-methyl-3-(1-methylethyl)-
16580-26-0	1-Methyl-1-(1-methylethyl)cyclohexane
16745-94-1	1-Hexene, 3,4-dimethyl-
16746-85-3	1-Hexene, 4-ethyl-
16747-25-4	Hexane, 2,2,3-trimethyl-
16747-26-5	Hexane, 2,2,4-trimethyl-
16747-28-7	Hexane, 2,3,3-trimethyl-

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Table C-6. Hydrocarbons (14 Sheets)

Chemical Identification Number	Chemical Name
1678-81-5	cis, trans,cis-1,2,3-trimethylcyclohexane
1678-91-7	Cyclohexane, ethyl-
1678-92-8	Cyclohexane, propyl-
1678-93-9	Cyclohexane, butyl-
1678-97-3	Cyclohexane, 1,2,3-trimethyl-
1678-98-4	Cyclohexane, (2-methylpropyl)-
17301-22-3	Undecane, 2,5-dimethyl-
17301-23-4	Undecane, 2,6-dimethyl-
17301-24-5	Undecane, 2,7-dimethyl-
17301-25-6	Undecane, 2,8-dimethyl-
17301-26-7	Undecane, 2,9-dimethyl-
17301-27-8	Undecane, 2,10-dimethyl-
17301-28-9	Undecane, 3,6-dimethyl-
17301-29-0	Undecane, 3,7-dimethyl-
17301-30-3	Undecane, 3,8-dimethyl-
17301-31-4	Undecane, 3,9-dimethyl-
17301-32-5	Undecane, 4,7-dimethyl-
17301-33-6	Undecane, 4,8-dimethyl-
17301-94-9	Nonane, 4-methyl-
17302-23-7	Nonane, 4,5-dimethyl-
17302-28-2	Nonane, 2,6-dimethyl-
17302-32-8	Nonane, 3,7-dimethyl-
17302-33-9	Undecane, 6-methyl-
17302-37-3	2,2-Dimethyldecane
17312-50-4	Decane, 2,5-dimethyl-
17312-54-8	3,7-Dimethyldecane
17312-55-9	Decane, 3,8-dimethyl-
17312-57-1	Dodecane, 3-methyl-
17312-58-2	Undecane, 3-ethyl-
17312-60-6	Undecane, 6-ethyl-
17312-62-8	Decane, 5-propyl-
17312-63-9	Nonane, 5-butyl-
17312-64-0	Undecane, 2,2-dimethyl-
17312-68-4	Undecane, 4,4-dimethyl-
17312-73-1	Undecane, 5,5-dimethyl-
17312-74-2	Decane, 5-ethyl-5-methyl-
17312-76-4	Undecane, 6,6-dimethyl-
17312-77-5	Undecane, 2,3-dimethyl-
17312-78-6	Undecane, 3,4-dimethyl-
17312-80-0	Undecane, 2,4-dimethyl-
17312-81-1	Undecane, 3,5-dimethyl-
17312-82-2	Undecane, 4,6-dimethyl-
17312-83-3	Undecane, 5,7-dimethyl-
17453-93-9	Dodecane, 5-methyl-
17453-94-0	Undecane, 5-ethyl-
1750-51-2	Naphthalene, decahydro-1,6-dimethyl-
1759-58-6	trans-1,3-Dimethylcyclopentane
1795-15-9	Cyclohexane, octyl-
1795-16-0	Cyclohexane, decyl-
1795-21-7	Cyclopentane, decyl-

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Table C-6. Hydrocarbons (14 Sheets)

Chemical Identification Number	Chemical Name
1795-27-3	Cyclohexane, 1,3,5-trimethyl-, (1.alpha.,3.alpha.,
18344-37-1	Heptadecane, 2,6,10,14-tetramethyl-
1839-63-0	Cyclohexane, 1,3,5-trimethyl-
18435-22-8	Tetradecane, 3-methyl-
18435-45-5	1-Nonadecene
18476-57-8	2,6-Octadiene, 4,5-dimethyl-
18669-52-8	1,4-Hexadiene, 2,3-dimethyl-
1921-70-6	Pentadecane, 2,6,10,14-tetramethyl-
19341-98-1	Cyclobutane, 1,2-diethyl-, trans-
19398-37-9	3-Decene
19549-87-2	1-Heptene, 2,4-dimethyl-
19689-19-1	5-Decene
20063-97-2	2-Decene, (E)-
20184-89-8	3-Nonyne
20184-91-2	4-Nonyne
20278-85-7	Heptane, 2,3,5-trimethyl-
2030-84-4	4-Dodecene
2049-95-8	Benzene, (1,1-dimethylpropyl)-
2051-30-1	Octane, 2,6-dimethyl-
2090-38-2	Cyclohexane, 1,2,4,5-tetramethyl-
20959-33-5	Heptadecane, 7-methyl-
21164-95-4	Hexadecane, 7,9-dimethyl-
2132-84-5	Benzene, (1-methylhexyl)-
21328-57-4	Cyclooctane, 1,5-dimethyl-
21964-48-7	1,12-Tridecadiene
219783-06-9	1,3,4-Trimethyl-1-(1-methylethyl)cyclohexane
2213-23-2	Heptane, 2,4-dimethyl-
2216-30-0	Heptane, 2,5-dimethyl-
2216-33-3	Octane, 3-methyl-
2216-34-4	Octane, 4-methyl-
2223-52-1	Cyclohexane, 1,1,4,4-tetramethyl-
22808-06-6	3-Hexene, 2,2,5,5-tetramethyl-
23609-46-3	1,2-Diethylcyclooctene
2384-85-2	3-Decyne
2402-06-4	Cyclopropane, 1,2-dimethyl-, trans-
2415-72-7	Cyclopropane, propyl-
24251-86-3	Dodecane, 5,8-diethyl-
2437-56-1	1-Tridecene
2452-99-5	Cyclopentane, 1,2-dimethyl-
2453-00-1	1,3-Dimethylcyclopentane
24949-38-0	6-Tridecene
24949-42-6	6-Tridecene, 7-methyl-
25117-24-2	Tetradecane, 4-methyl-
25117-31-1	Tridecane, 5-methyl-
25117-32-2	Tetradecane, 5-methyl-
2511-91-3	Cyclopropane, pentyl-
2532-58-3	Cyclopentane, 1,3-dimethyl-, cis-
2613-66-3	Cyclopentane, 1-ethyl-3-methyl-, cis-
26730-12-1	Tridecane, 4-methyl-
26730-14-3	Tridecane, 7-methyl-

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Table C-6. Hydrocarbons (14 Sheets)

Chemical Identification Number	Chemical Name
2719-61-1	Benzene, (1-methylundecyl)-
2719-62-2	Benzene, (1-pentylheptyl)-
2719-63-3	Benzene, (1-butyloctyl)-
2719-64-4	Benzene, (1-propylnonyl)-
279-23-2	Bicyclo[2.2.1]heptane
2801-84-5	Decane, 2,4-dimethyl-
280-65-9	Bicyclo[3.3.1]nonane
2815-57-8	Cyclopentane, 1,2,3-trimethyl-
2815-58-9	Cyclopentane, 1,2,4-trimethyl-
2847-72-5	Decane, 4-methyl-
286-08-8	Bicyclo[4.1.0]heptane
287-23-0	Cyclobutane
2882-96-4	Pentadecane, 3-methyl-
2883-05-8	Octane, 2-cyclohexyl-
28981-49-9	Cyclododecane, ethyl-
29053-04-1	Cyclopentane, 1-methyl-3-(2-methylpropyl)-
29212-09-7	2-Methyl-2,3-hexadiene
292-64-8	Cyclooctane
294-62-2	Cyclododecane
295-17-0	Cyclotetradecane
295-65-8	Cyclohexadecane
2958-75-0	1-Methyldecahydronaphthalene
2958-76-1	Naphthalene, decahydro-2-methyl-
29799-19-7	Cyclohexane, 1-(1,5-dimethylhexyl)-4-methyl-
2980-69-0	Undecane, 4-methyl-
300-57-2	Benzene, 2-propenyl-
3054-63-5	Dodecane, 4,9-dipropyl-
3073-66-3	Cyclohexane, 1,1,3-trimethyl-
3074-71-3	Heptane, 2,3-dimethyl-
31081-17-1	Nonane, 2-methyl-5-propyl-
31081-18-2	Nonane, 3-methyl-5-propyl-
31295-56-4	Dodecane, 2,6,11-trimethyl-
3178-29-8	Heptane, 4-propyl-
3221-61-2	Octane, 2-methyl-
32281-85-9	Cyclopentane, 1,3-dimethyl-2-(1-methylethyl)-
32669-86-6	Cyclohexane, cyclopropyl-
3290-53-7	Benzene, (2-methyl-2-propenyl)-
3404-75-9	2-Heptene, 3-methyl-
34303-81-6	3-Hexadecene, (Z)-
3452-09-3	1-Nonyne
3522-94-9	Hexane, 2,2,5-trimethyl-
3524-73-0	1-Hexene, 5-methyl-
35507-09-6	7-Hexadecene, (Z)-
3604-14-6	Naphthalene, decahydro-1,2-dimethyl-
3638-35-5	Cyclopropane, (1-methylethyl)-
37050-03-6	3,4-Nonadiene
3769-23-1	1-Hexene, 4-methyl-
3788-32-7	Cyclopentane, (2-methylpropyl)-
38851-69-3	cis-1-Butyl-2-methylcyclopropane
38851-70-6	Cyclopropane, 1-butyl-2-methyl-, trans-

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Table C-6. Hydrocarbons (14 Sheets)

Chemical Identification Number	Chemical Name
3891-98-3	Dodecane, 2,6,10-trimethyl-
3892-00-0	Pentadecane, 2,6,10-trimethyl-
4032-86-4	Heptane, 3,3-dimethyl-
4032-93-3	Heptane, 2,3,6-trimethyl-
4050-45-7	2-Hexene, (E)-
41446-60-0	7-Tetradecene, (Z)-
41446-61-1	6-Tetradecene, (Z)-
41446-66-6	5-Tetradecene, (E)-
41446-67-7	3-Tetradecene, (Z)-
41446-68-8	3-Tetradecene, (E)-
41977-32-6	Cyclopropane, 1,2-dibutyl-
41977-33-7	Cyclopropane, 1-pentyl-2-propyl-
41977-34-8	Cyclopropane, 1-butyl-1-methyl-2-propyl-
41977-43-9	Cyclopropane, 1,1,2-trimethyl-3-(2-methylpropyl)-
41977-48-4	Bicyclo[4.1.0]heptane, 3-methyl-7-pentyl-
4259-00-1	1,1,2-Trimethylcyclopentane
4291-79-6	Cyclohexane, 1-methyl-2-propyl-
4291-80-9	Cyclohexane, 1-methyl-3-propyl-
4292-75-5	Cyclohexane, hexyl-
4292-92-6	Cyclohexane, pentyl-
4316-65-8	1-Hexene, 3,5,5-trimethyl-
4390-04-9	Nonane, 2,2,4,4,6,8,8-heptomethyl-
4413-16-5M	Benzene, (1-cyclohexylethyl)- and others
4461-48-7M	2-Pentene, 4-methyl- and others
4485-13-6	3-Heptene, 4-propyl-
4516-69-2	Cyclopentane, 1,1,3-trimethyl-
4536-87-2	Benzene, (1-ethylnonyl)-
4536-88-3	Benzene, (1-methyldecyl)-
4537-15-9	Benzene, (1-butylheptyl)-
4551-51-3	1H-Indene, octahydro-, cis-
463-49-0	Propadiene
464-06-2	Butane, 2,2,3-trimethyl-
4683-94-7	trans-2-Methyldecahydronaphthalene
4737-43-3	Cyclopentane, (1-methylbutyl)-
4795-86-2	2,2,6-Trimethylbicyclo[3.1.1]heptane
4806-61-5	Cyclobutane, ethyl-
4810-09-7	1-Heptene, 3-methyl-
4850-28-6	Cyclopentane, 1,2,4-trimethyl-, (1.alpha.,2.alpha.
4866-55-1	Cyclopropane, 1,2-dimethyl-3-methylene-, cis-
489-20-3	Cyclopentane, 1,2-dimethyl-3-(1-methylethyl)-
4923-77-7	Cyclohexane, 1-ethyl-2-methyl-, cis-
4926-78-7	Cyclohexane, 1-ethyl-4-methyl-, cis-
493-02-7	Naphthalene, decahydro-, trans-
4941-53-1	5-Undecene
49622-16-4	2-Undecene, 2,5-dimethyl-
5026-76-6	1-Heptene, 6-methyl-
504-60-9	1,3-Pentadiene
50746-53-7	Cyclopentane, 1-methyl-2-(2-propenyl)-, trans-
50871-03-9	1-Decene, 3,4-dimethyl-
50876-31-8	Cyclohexane, 1,1,3,5-tetramethyl-, trans-
50876-32-9	Cyclohexane, 1,1,3,5-tetramethyl-, cis-

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Chemical Identification Number	Chemical Name
50915-91-8	Cyclopropene, 1-butyl-2-ethyl-
50991-08-7	1,1'-Bicyclohexyl, 2-methyl-, cis-
50991-09-8	1,1'-Bicyclohexyl, 2-methyl-, trans-
51284-29-8	Cyclohexane, (1,2-dimethylpropyl)-
513-35-9	2-Butene, 2-methyl-
513-81-5	1,3-Butadiene, 2,3-dimethyl-
5171-86-8	Hexane, 3,3,4,4-tetraethyl-
526-73-8	1,2,3-Trimethylbenzene
527-84-4	1-Isopropyl-2-methylbenzene
52896-87-4	Heptane, 4-(1-methylethyl)-
52896-90-9	Heptane, 3-ethyl-5-methyl-
53366-38-4	Cyclopentane, (2-methylbutyl)-
535-77-3	Benzene, 1-methyl-3-(1-methylethyl)-
5364-83-0	Cyclohexane, 1-propenyl-
538-68-1	Benzene, pentyl-
53907-60-1	Cyclopentane, 1,1,3,4-tetramethyl-, cis-
540-84-1	2,2,4-Trimethylpentane
54105-66-7M	Cyclohexane, undecyl- and others
54244-79-0	1-Decene, 5-methyl-
54299-96-6	1,2-Dimethylcyclooctene
54411-00-6	Cyclohexane, 1-methyl-4-(1-methylbutyl)-
54411-01-7	Cyclohexane, 1-methyl-2-pentyl-
54411-02-8	Cyclohexane, 1-methyl-3-pentyl-
544-76-3	Hexadecane
54549-80-3	Cyclopentane, 2-ethyl-1,1-dimethyl-
5458-16-2	Pentane, 2-cyclopropyl-
54823-94-8	Cyclohexane, 1-(cyclohexylmethyl)-2-methyl-, trans
54823-98-2	Cyclohexane, 1-(cyclohexylmethyl)-4-methyl-, trans
54824-04-3	Cyclohexane, 1-(cyclohexylmethyl)-2-methyl-, cis-
54832-83-6	1H-Indene, octahydro-2,2,4,4,7,7-hexamethyl-, tran
54833-48-6	Heptadecane, 2,6,10,15-tetramethyl-
54845-26-0	3-Heptene, 2,2,3,5,5,6,6-heptamethyl-
54934-90-6	Cyclohexane, 1,1'-(1-methylethylidene)bis-
54934-93-9	Cyclohexane, 1-(cyclohexylmethyl)-2-ethyl-, cis-
54934-95-1	Cyclohexane, 1-(cyclohexylmethyl)-4-ethyl-, cis-
54965-05-8	Cyclohexane, 1,1,3-trimethyl-2-(3-methylpentyl)-
55030-62-1	Tridecane, 4,8-dimethyl-
55045-07-3	Dodecane, 2-methyl-8-propyl-
55045-08-4	Dodecane, 2-methyl-6-propyl-
55045-11-9	Tridecane, 5-propyl-
55045-12-0	Tetradecane, 4,11-dimethyl-
55045-13-1	Tetradecane, 6,9-dimethyl-
55045-14-2	Tetradecane, 4-ethyl-
55170-92-8	2-Undecene, 4,5-dimethyl-, (E)-
55282-34-3	Cyclohexane, 1,3,5-trimethyl-2-octadecyl-
55373-86-9	Docosane, 7-hexyl-
55702-61-9	2-Hexene, 4,4,5-trimethyl-
558-37-2	1-Butene, 3,3-dimethyl-
55937-92-3	Bicyclo[4.1.0]heptane, 2-methyl-7-pentyl-
560-21-4	2,3,3-Trimethylpentane

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Table C-6. Hydrocarbons (14 Sheets)

Chemical Identification Number	Chemical Name
562-49-2	Pentane, 3,3-dimethyl-
56292-65-0	Dodecane, 2,5-dimethyl-
56292-66-1	Tridecane, 2,5-dimethyl-
56292-69-4	Tetradecane, 2,5-dimethyl-
563-16-6	3,3-Dimethylhexane
563-45-1	1-Butene, 3-methyl-
563-46-2	1-Butene, 2-methyl-
563-78-0	1-Butene, 2,3-dimethyl-
563-79-1	2-Butene, 2,3-dimethyl-
564-02-3	2,2,3-Trimethylpentane
565-59-3	Pentane, 2,3-dimethyl-
565-75-3	Pentane, 2,3,4-trimethyl-
56728-10-0	1-Hexene, 3,4,5-trimethyl-
56851-45-7	2-Dodecene, 4-methyl-
571-61-9M	Naphthalene, 1,5-dimethyl- and others
575-37-1	Naphthalene, 1,7-dimethyl-
57905-86-9	Cyclobutane, 1,1,2,3,3-pentamethyl-
581-40-8	Naphthalene, 2,3-dimethyl-
583-48-2	3,4-Dimethylhexane
583-48-2M	Hexane, 3,4-dimethyl- and others
583-57-3	Cyclohexane, 1,2-dimethyl-
58462-32-1	trans,trans-3-Ethyldecahydronaphthalene
584-94-1	Hexane, 2,3-dimethyl-
5876-87-9	1,11-Dodecadiene
589-34-4	3-Methyl-Hexane
589-43-5	Hexane, 2,4-dimethyl-
589-53-7	Heptane, 4-methyl-
589-81-1	Heptane, 3-methyl-
589-90-2	Cyclohexane, 1,4-dimethyl-
590-18-1	2-Butene, (Z)-
590-35-2	Pentane, 2,2-dimethyl-
590-66-9	Cyclohexane, 1,1-dimethyl-
590-73-8	2,2-Dimethylhexane
5911-04-6	Nonane, 3-methyl-
591-76-4	Hexane, 2-methyl-
591-95-7	1,2-Pentadiene
592-13-2	Hexane, 2,5-dimethyl-
592-27-8	Heptane, 2-methyl-
592-41-6	1-Hexene
592-42-7	1,5-Hexadiene
592-43-8	2-Hexene
592-48-3	1,3-Hexadiene
592-76-7	1-Heptene
592-77-8	2-Heptene
592-78-9	3-Heptene
592-98-3	3-Octene
593-45-3	Octadecane
594-11-6	Cyclopropane, methyl-
594-82-1	Butane, 2,2,3,3-tetramethyl-
59681-06-0	2,6,10,14,18,22-Tetracosahexaene, 2,6,10,19,23-pen
598-61-8	Cyclobutane, methyl-

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Table C-6. Hydrocarbons (14 Sheets)

Chemical Identification Number	Chemical Name
5989-27-5	Cyclohexene, 1-methyl-4-(1-methylethenyl)
6031-02-3	Benzene, (1-methylpentyl)-
6044-71-9	Dodecane, 6-methyl-
60643-93-8	3-Hexene, 2,3,4,5-tetramethyl-, (Z)-
6069-98-3	Cyclohexane, 1-methyl-4-(1-methylethyl)-, cis-
609-26-7	Pentane, 3-ethyl-2-methyl-
6094-02-6	1-Hexene, 2-methyl-
611-14-3	Benzene, 1-ethyl-2-methyl-
61141-57-9	Cyclohexene, 1-ethyl-6-ethylidene-
61141-72-8	Dodecane, 4,6-dimethyl-
61141-79-5	Cyclohexane, 1,2-diethyl-1-methyl-
61141-80-8	Cyclohexane, 1,2-diethyl-3-methyl-
61142-20-9	Cyclohexane, (4-methylpentyl)-
61142-23-2	Cyclohexane, (2,2-dimethylcyclopentyl)-
61142-24-3	Cyclohexane, 1,2,4,5-tetraethyl-, (1.alpha.,2.alph
61142-37-8	Cyclohexane, (1,2-dimethylbutyl)-
61142-38-9	Cyclohexane, (3-methylpentyl)-
61142-40-3	4-Undecene, 4-methyl-
61142-41-4	Cyclooctane, ethenyl-
61142-47-0	2-Pentene, 2-methoxy-
61142-65-2	Cyclopentane, 3-hexyl-1,1-dimethyl-
61142-66-3	Cyclopentene, 5-hexyl-3,3-dimethyl-
61142-68-5	Cyclopentane, 1-hexyl-3-methyl-
61142-70-9	Cyclohexane, 2,4-diethyl-1-methyl-
6117-97-1	Dodecane, 4-methyl-
617-78-7	3-Ethylpentane
61886-62-2	3-Hexadecyne
620-00-8	3-Ethyl-2-hexene
620-14-4	3-Methylethylbenzene
62016-14-2	Octane, 2,5,6-trimethyl-
62016-18-6	Octane, 5-ethyl-2-methyl-
62016-19-7	Octane, 6-ethyl-2-methyl-
62016-30-2	Octane, 2,3,3-trimethyl-
62016-34-6	Octane, 2,3,7-trimethyl-
62108-21-8	Decane, 6-ethyl-2-methyl-
62108-22-9	Decane, 2,5,9-trimethyl-
62108-25-2	Decane, 2,6,7-trimethyl-
62108-26-3	Decane, 2,6,8-trimethyl-
62108-27-4	Decane, 2,4,6-trimethyl-
62108-31-0	Heptane, 4-ethyl-2,2,6,6-tetramethyl-
62108-32-1	Heptane, 2,2,3,4,6,6-hexamethyl-
62183-55-5	Octane, 3-ethyl-2,7-dimethyl-
62185-21-1	3,4,5,6-Tetramethyloctane
62185-53-9	Nonane, 5-(2-methylpropyl)-
62199-50-2	Cyclopentane, 1-butyl-2-propyl-
62199-51-3	Cyclopentane, 1-pentyl-2-propyl-
62237-97-2	Decane, 2,2,6-trimethyl-
62238-01-1	Decane, 2,2,8-trimethyl-
62238-08-8	Cyclopropane, 1-ethyl-2-pentyl-
62238-11-3	Decane, 2,3,5-trimethyl-

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Chemical Identification Number	Chemical Name
62238-12-4	Decane, 2,3,6-trimethyl-
62238-13-5	Decane, 2,3,7-trimethyl-
62238-14-6	Decane, 2,3,8-trimethyl-
62238-33-9	Cyclohexane, 1-ethyl-2-propyl-
622-96-8	Benzene, 1-ethyl-4-methyl-
62338-08-3	3-Hexene, 3-ethyl-2,5-dimethyl-
62338-09-4	Decane, 2,2,3-trimethyl-
62338-40-3M	Cyclohexane, decylidene- and others
62338-45-8	Bicyclo[2.2.2]octane, 1,2,3,6-tetramethyl-
62338-47-0	4-Decene, 3-methyl-, (E)-
62338-52-7M	Cyclobutane, 3-hexyl-1,1,2-trimethyl- and others
6236-88-0	Cyclohexane, 1-ethyl-4-methyl-, trans-
62376-15-2	Cycloundecane, 1,1,2-trimethyl-
624-64-6	2-Butene, (E)-
625-65-0	2-Pentene, 2,4-dimethyl-
627-20-3	2-Pentene, (Z)-
629-50-5	n-Tridecane
629-59-4	n-Tetradecane
629-62-9	Pentadecane
629-73-2	1-Hexadecene
629-78-7	Heptadecane
629-89-0	1-Octadecyne
629-92-5	Nonadecane
629-94-7	Heneicosane
630-01-3	Hexacosane
630-02-4	Octacosane
6304-50-3	Dodecane, 2,2,4,9,11,11-hexamethyl-
6305-52-8	Naphthalene, 2-butyldecahydro-
637-50-3	Benzene, 1-propenyl-
638-04-0	Cyclohexane, 1,3-dimethyl-, cis-
63830-68-2	4-Nonene, 2,3,3-trimethyl-, (Z)-
638-36-8	Hexadecane, 2,6,10,14-tetramethyl-
6418-41-3	Tridecane, 3-methyl-
6418-43-5	Hexadecane, 3-methyl-
6418-44-6	Heptadecane, 3-methyl-
6434-78-2	2-Nonene, (E)-
643-58-3	1,1'-Biphenyl, 2-methyl-
645-10-3	1,7-Dimethyl-4-(1-methylethyl)cyclodecane
646-04-8	2-Pentene, (E)-
66552-62-3	Naphthalene, decahydro-1,5-dimethyl-
66553-50-2	Cyclopentane, 1-methyl-2-(4-methylpentyl)-, trans-
66660-41-1	cis,trans-3-Ethyldecahydronaphthalene
66660-42-2	cis, cis-3-Ethylbicyclo[4.4.0]decane
66660-43-3	trans, cis-3-Ethylbicyclo[4.4.0]decane
66826-95-7	Cyclohexane, 1-(cyclohexylmethyl)-4-methyl-
674-76-0	2-Pentene, 4-methyl-, (E)-
6765-39-5	1-Heptadecene
67730-63-6	4,6-Decadiene, 3,8-dimethyl-, (E,E)-
6783-92-2	Cyclohexane, 1,1,2,3-tetramethyl-
67975-92-2	1-Cyclohexyl-1-hexene
690-08-4M	2-Pentene, 4,4-dimethyl-, (E)- and others

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Chemical Identification Number	Chemical Name
691-37-2	1-Pentene, 4-methyl-
692-47-7M	3-Hexene, 2,2,5,5-tetramethyl-, (Z)- and others
693-61-8	E-2-Undecene
693-62-9	4-Undecene, (E)-
696-29-7	Cyclohexane, (1-methylethyl)-
6975-98-0	Decane, 2-methyl-
7045-71-8	Undecane, 2-methyl-
7058-01-7	Cyclohexane, (1-methylpropyl)-
7094-26-0	Cyclohexane, 1,1,2-trimethyl-
7116-86-1	1-Hexene, 5,5-dimethyl-
71186-27-1	trans-2-ethyl-1,1,3-trimethylcyclohexane
7154-80-5	Heptane, 3,3,5-trimethyl-
72014-90-5M	1,4-Pentadiene, 2,3,4-trimethyl- and others
7206-14-6	3-Dodecene, (E)-
7206-15-7	4-Dodecene, (E)-
7206-17-9	6-Dodecene, (E)-
7206-28-2	5-Dodecene, (Z)-
7225-64-1	Heptadecane, 9-octyl-
7239-23-8	3-Dodecene, (Z)-
72993-32-9	Cyclopentane, 1-butyl-2-ethyl-
7300-03-0	3-Methyl-3-heptene
7367-38-6	4-Nonene, 5-butyl-
7385-78-6	1-Pentene, 3,4-dimethyl-
74054-92-5	1,1,6,6-Tetramethylspiro[4,4]nonane
7433-56-9	5-Decene, (E)-
74421-09-3	Cyclopentane, 1,1,3-trimethyl-3-(2-methyl-2-propenyl)-
74630-08-3	1-Octene, 3-ethyl-
74630-30-1	2-Decene, 4-methyl-, (Z)-
74630-39-0	1-Undecene, 4-methyl-
74630-40-3	1-Undecene, 8-methyl-
74630-42-5	1-Undecene, 7-methyl-
74630-44-7	2-Undecene, 8-methyl-, (Z)-
74630-48-1	3-Undecene, 2-methyl-, (Z)-
74630-61-8	2-Undecene, 6-methyl-, (E)-
74630-62-9	5-Undecene, 7-methyl-, (Z)-
74630-66-3	5-Undecene, 7-methyl-, (E)-
74630-69-6	4-Undecene, 5-methyl-, (Z)-
74645-98-0	Dodecane, 2,7,10-trimethyl-
74663-66-4	Cyclohexane, 1,5-diethyl-2,3-dimethyl-
74663-86-8	Cyclopropane, 1-ethyl-2-heptyl-
74663-91-5	Cyclopropane, 1-heptyl-2-methyl-
74685-30-6	5-Eicosene, (E)-
74752-97-9	1,3-Hexadiene, 3-ethyl-2-methyl-, (Z)-
74764-46-8M	3-Heptene, 3-ethyl and others
74810-41-6	Cyclohexane, (2-ethyl-1-methylbutylidene)-
74810-42-7	Cyclohexane, (2-ethyl-1-methyl-1-butenyl)-
74-82-8	Methane
75163-97-2	Octadecane, 2,6-dimethyl-
75-19-4	Cyclopropane
75-83-2	Butane, 2,2-dimethyl-
758-86-1	1,4-Pentadiene, 2,3-dimethyl-

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Table C-6. Hydrocarbons (14 Sheets)

Chemical Identification Number	Chemical Name
762-62-9	1-Pentene, 4,4-dimethyl-
763-29-1	1-Pentene, 2-methyl-
7642-09-3	3-Hexene, (Z)-
7642-15-1	Z-4-Octene
764-96-5	5-Undecene, (Z)-
764-97-6	5-Undecene, (E)-
7667-60-9	Cyclohexane, 1,2,4-trimethyl-, (1.alpha.,2.beta.,4
7683-64-9	2,6,10,14,18,22-Tetracosahexaene, 2,6,10,15,19,23-
7688-21-3	2-Hexene, (Z)-
777-22-0	Benzene, (1-methylheptyl)-
79-29-8	Butane, 2,3-dimethyl-
816-79-5	2-Pentene, 3-ethyl-
81983-71-3	Cyclohexane, 1,1-dimethyl-2-propyl-
82085-14-1	2,4-Dimethyl-3-hexene
821-74-9	4,5-Nonadiene
821-95-4	1-Undecene
821-96-5	2-Undecene, (Z)-
821-98-7	Z-4 Undecene
822-50-4	Cyclopentane, 1,2-dimethyl-, trans-
86-73-7	9H-Fluorene
871-83-0	Nonane, 2-methyl-
872-05-9	1-Decene
872-56-0	Cyclobutane, (1-methylethyl)-
90-12-0	1-Methylnaphthalene
91-17-8	Naphthalene, decahydro-
91-57-6	Naphthalene, 2-methyl-
91695-32-8	2-Undecene, 4-methyl-
921-47-1	2,3,4-Trimethylhexane
922-28-1	3,4-Dimethylheptane
92-51-3	1,1'-Bicyclohexyl
926-82-9	Heptane, 3,5-dimethyl-
930-18-7	Cyclopropane, 1,2-dimethyl-, cis-
930-57-4	Cyclopropane, butyl-
95-47-6	1,2-Dimethylbenzene
96-14-0	Pentane, 3-methyl-
96-37-7	Cyclopentane, methyl-
98-06-6	Benzene, (1,1-dimethylethyl)-
998-35-6	Nonane, 5-propyl-
CYCY00-01	cis-1,2-Diethylcyclobutane
MAEUAE0-01a	1,3-Pentadiene, (E)- mixture
MAEUCY0-01a	2,4-Hexadiene, 3-methyl- mixture
MARUAK0-01a	Benzene, butyl mixture
MARUPH0-01a	9H-Fluorene, 3-methyl- mixture
MAYUAE0-01a	1-Pentyne mixture
MCYCY00-01b	Cyclobutane, 1,2-diethyl-, cis- mixture
MCYNT00-01b	Cyclohexane, 2-butyl- mixture
MUAEUAR-03a	Methyl fluorene mixture
MUAEUAY-02b	C5-Alkyne mixture
U00005-01	Branched C5 hydrocarbon
U00013-01	C13 Aliphatic hydrocarbon
UAE003-01	C3-Alkene/Cycloalkane

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Table C-6. Hydrocarbons (14 Sheets)

Chemical Identification Number	Chemical Name
UAE003-01a	C3-Alkene (or C3 cycloalkane) mixture
UAE004-01	C4-Alkene
UAE004-02	C4-Alkene/Cycloalkane
UAE005-01	C5-Alkene
UAE005-02	C5-Alkene/Cycloalkane
UAE005-02b	C5-Cycloalkane (or C5 alkene) mixture
UAE006-01	C6-Alkene
UAE007-01	C7-Alkene
UAE007-03	C7-Alkene/Cycloalkane
UAE007-03a	C7-Alkene (or C7-cycloalkane) mixture
UAE008-01	C8-Alkene
UAE008-02	C8-Alkene/Cycloalkane
UAE008-02b	C8-Cycloalkane (or C8-alkene) mixture
UAE009-01	C9-Alkene
UAE009-02	C9-Alkene/Cycloalkane
UAE009-02b	C9-Cycloalkane (or C9-alkene) mixture
UAE010-01	C10-Alkene
UAE010-02	C10-Alkene/Cycloalkane
UAE010-02a	C10-Alkene (or C10-cycloalkane) mixture
UAE011-01	C11-alkene
UAE011-02	c4-heptadiene
UAE011-03	C11-Alkene/Cycloalkane
UAE011-03a	C11-Alkene (or C11-cycloalkane) mixture
UAE011-04	C11-Diene/Cycloalkane
UAE011-04b	C11-Cycloalkane (or C11 diene) mixture
UAE011-05	4-Decene, 7-methyl-
UAE012-01	C12-Alkene
UAE012-02	C12-Alkene/Cycloalkane
UAE012-02a	C12-Alkene (or C12-cycloalkane) mixture
UAE012-03	2-undecene, 7-methyl-, cis=trans
UAE012-04	3-Undecene, 8-methyl
UAE012-05	4-undecene, 6-methyl
UAE012-06	3-Undecene, 5-methyl-
UAE013-01	c13-alkene
UAE013-02	C13-Alkene/Cycloalkane
UAE013-02a	C13-Alkene (or C13-cycloalkane) mixture
UAE013-03	C13-Diene/Cycloalkane
UAE013-03b	C13-Cycloalkane (of C13 diene) mixture
UAE014-01	C14-Alkene
UAE014-02	C14-Alkene/Cycloalkane
UAE014-02b	C14-Cycloalkane (or C14-alkene) mixture
UAE015-01	C15-Alkene/Cycloalkane
UAE015-01a	C15-Alkene (or C15-Cycloalkane) mixture
UAE015-02	C15-Alkene
UAK004-01	C4-Alkane
UAK006-01	C6-Alkane
UAK006-02M	C6-Alkane (coeluent)
UAK007-01	C7-Alkane
UAK008-01	C8-Alkane
UAK009-01	C9-Alkane
UAK010-01	C10-Alkane
UAK011-01	C11-Alkane

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Table C-6. Hydrocarbons (14 Sheets)

Chemical Identification Number	Chemical Name
UAK012-01	C12-Alkane
UAK014-01	C14-alkane
UAK014-02	Decane, 2,3,5,8-tetramethyl
UAK015-01	C15-alkane
UAK016-01	C16-alkane
UAK017-01	C17-Alkane
UAK018-01	C18-Alkane
UAK020-01	Unknown C20-Alkane
UAR000-02	C4-Dihydronaphthalene
UAR000-03	Dimethyl-naphthalene
UAR000-11	C2-Benzene
UAR000-12	C4 substituted benzene
UAR000-15	Benzene, ethyl-methyl-, isomer
UAR000-16	Benzene, -trimethyl-, isomer
UAY013-01	C5-Octyne
UCY006-01	C3-Cyclopropane
UCY007-01	C2-Cyclopentane
UCY008-01	C2-Cyclohexane
UCY008-02	C3-Cyclopentane
UCY009-01	C3-Cyclohexane
UCY009-02	C3-Cyclohexene
UCY009-04	C4-Cyclopentane
UCY010-01	C4-Cyclohexane
UCY010-02	C5-cyclopentane
UCY011-01	C5-Cyclohexane
UCY011-02	C6-Alkenyl-cyclopentane
UCY011-03	C6-Cyclopentane
UCY011-04	1-ethyl-2,2,6-trimethylcyclohexane
UCY011-05	Methyldecahydronaphthalene
UCY011-06	C5-Cyclohexene
UCY012-02	C6-Cyclohexane
UCY012-03	C7-Cyclopentane
UCY012-04	2-Propyl-1,1,3-trimethylcyclohexane
UCY012-05	C2-Decahydro-naphthalene
UCY012-08	Cyclopropane, 1-(2-butyl)-1-(2-methylbutyl)-
UCY013-01	C7-Cyclohexane
UCY013-02	C8-Cyclopentane
UCY013-03	Cyclohexane, 1,2-dimethyl-3-pentyl-
UCY013-04	C3-Decahydronaphthalene
UCY014-01	C8-Cyclohexane
UCY014-02	C8-Cyclohexene
UCY014-03	C9-Cyclopentane
UCY014-04	Unknown C4 Alkyl Decahydronaphthalene
UCY015-01	C9-Cyclohexane

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Table C-7. CNFE with Screening Values (11 Sheets)

Chemical Identification Number	Chemical Name	Screening Value (ppmv)	Maximum Conc (ppmv)	Need In-Depth Analysis?
1002-16-0	Nitric acid, pentyl ester	0.25	0.16	No
1002-84-2	Pentadecanoic acid	1.0	0.23	No
1004-29-1	2-Butyltetrahydrofuran	0.50	0.037	No
100-47-0	Benzonitrile	1.0	0.016	No
100-71-0	Pyridine, 2-ethyl-	0.050	0.0023	No
100-73-2	2H-Pyran-2-carboxaldehyde, 3,4-dihydro-	1.9	0.0016	No
1009-61-6	Ethanone, 1,1'-(1,4-phenylene)bis-	0.10	0.0004	No
100-97-0	1,3,5,7-Tetraazatricyclo[3.3.1.1 ^{3,7}]decane	0.052	0.0051	No
10203-30-2	3-Dodecanol	0.015	0.0010	No
10264-17-2	Butanamide, N-hexyl-	0.10	0.0001	No
103-23-1	Hexanedioic acid, bis(2-ethylhexyl) ester	0.15	0.0039	No
10374-14-8	Cyclobutanone, 2-ethyl-	0.067	0.0050	No
104-50-7	2(3H)-Furanone, 5-butylidihydro-	5.0	0.00087	No
104-61-0	2(3H)-Furanone, dihydro-5-pentyl-	0.50	0.0025	No
104-67-6	2(3H)-Furanone, 5-heptyldihydro-	15	0.00069	No
10486-19-8	Tridecanal	0.50	0.00023	No
104-90-5	Pyridine, 5-ethyl-2-methyl-	0.020	0.0026	No
105-21-5	2(3H)-Furanone, dihydro-5-propyl-	5.0	0.0019	No
105-42-0	2-Hexanone, 4-methyl-	0.050	1.1	Yes
105-66-8	Propyl butanoate	15.00	0.042	No
10599-75-4	N-(Pentylidene)methanamine	0.05	0.022	No
10599-77-6	1-Butanamine, N-pentylidene-	0.010	0.00063	No
1066-40-6	Silanol, trimethyl-	5.0	0.056	No
106-72-9	5-Heptenal, 2,6-dimethyl-	25	0.067	No
1072-44-2	1-Methylaziridine	0.020	0.065	Yes
1073-11-6	2(3H)-Furanone, 5-ethenylidihydro-5-methyl-	0.50	0.00044	No
107-75-5	Octanal, 7-hydroxy-3,7-dimethyl-	0.50	0.00013	No
107-89-1	3-Hydroxybutanal	0.20	0.019	No
107-92-6	Butyric Acid (Butanoic acid)	1.0	0.85	No
108-29-2	2(3H)-Furanone, dihydro-5-methyl-	75	0.0098	No
108-30-5	2,5-Furandione, dihydro-	0.0025	0.0020	No
108-47-4	Pyridine, 2,4-dimethyl-	0.020	0.10	Yes
108-48-5	Pyridine, 2,6-dimethyl-	0.020	0.0025	No
109-08-0	Pyrazine, methyl-	1.0	0.0055	No
109-21-7	Butanoic acid, butyl ester	1.5	0.40	No
109-69-3	Butane, 1-chloro-	0.75	0.15	No
109-75-1	3-Butenenitrile	0.020	0.021	Yes
109-93-3	Ethene, 1,1'-oxybis-	2.0	0.031	No
109-97-7	1H-Pyrrole	0.030	0.011	No
110-00-9	Furan	0.010	3.2	Yes
110-13-4	2,5-Hexanedione	0.0050	0.0015	No
110-27-0	Tetradecanoic acid, 1-methylethyl ester	0.0035	0.17	Yes
110-36-1	Tetradecanoic acid, butyl ester	0.0035	0.20	Yes
110-71-4	Ethane, 1,2-dimethoxy-	100	0.0025	No
110-74-7	Propyl formate	1.00	0.054	No
110-93-0	5-Hepten-2-one, 6-methyl-	0.15	0.0012	No
111-06-8	Hexadecanoic acid, butyl ester	0.0035	0.00019	No
111-13-7	2-Octanone	0.50	0.32	No

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Table C-7. CNFE with Screening Values (11 Sheets)

Chemical Identification Number	Chemical Name	Screening Value (ppmv)	Maximum Conc (ppmv)	Need In-Depth Analysis?
1112-39-6	Silane, dimethoxydimethyl-	5.0	0.011	No
111-27-3	1-Hexanol	1.0	0.073	No
1115-11-3	2-Butenal, 2-methyl-	0.0030	0.013	Yes
111-70-6	1-Heptanol	0.50	0.40	No
111-71-7	Heptanal	0.50	0.12	No
1117-59-5	Pentanoic acid, hexyl ester	1.5	0.0021	No
1120-06-5	2-Decanol	0.015	0.00068	No
1120-07-6	Nonanamide	5.0	0.0011	No
1120-64-5	Oxazole, 4,5-dihydro-2-methyl-	0.50	0.016	No
1121-05-7	2-Cyclopenten-1-one, 2,3-dimethyl-	0.050	0.0013	No
1121-07-9	2,5-Pyrrolidinedione, 1-methyl-	10	0.0055	No
112-12-9	2-Undecanone	0.50	0.37	No
1121-33-1	Cyclopentanone, 2,4-dimethyl-	0.20	0.0052	No
112-30-1	1-Decanol	0.15	0.0011	No
112-31-2	Decanal	0.50	0.042	No
1123-28-0	1-Hydroxycyclohexanecarboxylic acid	0.30	0.018	No
112-42-5	1-Undecanol	0.015	0.00069	No
112-44-7	Undecanal	0.50	0.00053	No
112-53-8	1-Dodecanol	0.015	0.00096	No
112-54-9	Dodecanal	0.50	0.00067	No
112-72-1	1-Tetradecanol	0.015	0.0010	No
112-80-1	9-Octadecenoic acid (Z)-	1.0	0.0055	No
112-92-5	1-Octadecanol	0.015	0.96	Yes
1184-60-7	1-Propene, 2-fluoro-	0.010	0.53	Yes
1191-95-3	Cyclobutanone	0.067	0.048	No
1191-99-7	Furan, 2,3-dihydro-	0.50	0.025	Yes
1192-33-2	Cyclobutanone, 3,3-dimethyl-	0.067	0.0011	No
1196-92-5	Phenol, 4-(aminomethyl)-2-methoxy-	0.050	0.0031	No
121-00-6	Phenol, 2-(1,1-dimethylethyl)-4-methoxy-	0.050	0.00050	No
123-05-7	Hexanal, 2-ethyl-	0.50	0.033	No
123-15-9	Pentanal, 2-methyl-	0.50	0.051	No
123-25-1	Butanedioic acid, diethyl ester	1.5	0.67	No
123-32-0	Pyrazine, 2,5-dimethyl-	1.0	0.00038	No
123-56-8	2,5-Pyrrolidinedione	10	0.0025	No
123-79-5	Hexanedioic acid, dioctyl ester	0.15	0.099	No
123-95-5	Octadecanoic acid, butyl ester	0.0035	0.0019	No
123-96-6	2-Octanol	0.50	0.070	No
124-12-9	Octanenitrile	0.080	0.49	Yes
124-13-0	Octanal	0.50	0.46	No
124-19-6	Nonanal	5.0	1.0	No
124-28-7	1-Octadecanamine, N,N-dimethyl-	0.10	0.00030	No
13040-03-4	Bicyclo[3.1.1]hept-3-en-2-ol, 4,6,6-trimethyl	0.50	0.00088	No
136-77-6	1,3-Benzenediol, 4-hexyl-	0.20	0.00063	No
137-32-6	1-Butanol, 2-methyl-	1.0	0.041	No
13861-97-7	2(3H)-Furanone, dihydro-4,4-dimethyl-	0.50	0.0012	No
13925-00-3	Pyrazine, ethyl-	0.10	0.0065	No
14128-61-1	5-Methyl-5-phenyl-2-hexanone	0.50	0.0072	No
14129-48-7	4-Octen-3-one	0.15	0.0036	No
141-62-8	Tetrasiloxane, decamethyl-	3.0	0.0027	No

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Table C-7. CNFE with Screening Values (11 Sheets)

Chemical Identification Number	Chemical Name	Screening Value (ppmv)	Maximum Conc (ppmv)	Need In-Depth Analysis?
142-30-3	3-Hexyne-2,5-diol, 2,5-dimethyl-	0.10	0.00036	No
142-60-9	Propanoic acid, octyl ester	1.5	0.0036	No
142-62-1	Caprioc Acid (Hexanoic acid)	1.0	0.00077	No
142-78-9	Dodecanamide, N-(2-hydroxyethyl)-	5.0	0.00072	No
142-91-6	Hexadecanoic acid, 1-methylethyl ester	0.0035	0.033	Yes
142-96-1	Butane, 1,1'-oxybis-	1.0	0.39	No
143-07-7	Dodecanoic acid	1.0	0.034	No
143-08-8	1-Nonanol	0.070	0.0037	No
143-28-2	9-Octadecen-1-ol, (Z)-	1.0	0.00042	No
14476-37-0	4-Undecanone	0.50	0.011	No
1454-84-8	1-Nonadecanol	0.015	0.00071	No
1454-85-9	1-Heptadecanol	0.015	0.0020	No
1462-84-6	Pyridine, 2,3,6-trimethyl-	0.020	0.00012	No
1467-79-4	Cyanamide, dimethyl-	8.0	0.042	No
1482-15-1	1-Pentyn-3-ol, 3,4-dimethyl-	1.0	0.00054	No
1506-02-1	Ethanone, 1-(5,6,7,8-tetrahydro-3,5,5,6,8,8-hexamethyl-)	0.10	0.00009	No
151-18-8	Propanenitrile, 3-amino-	0.060	0.00075	No
1534-26-5	3-Tridecanone	0.50	0.61	Yes
1534-27-6	3-Dodecanone	0.50	1.1	Yes
1565-81-7	3-Decanol	0.015	0.0026	No
1568-20-3	1H-Pyrazole, 4,5-dihydro-5-methyl-	0.020	0.018	No
1569-50-2	3-Penten-2-ol	0.020	0.0016	No
15726-15-5	4-Heptanone, 3-methyl-	0.50	0.0035	No
15877-57-3	Pentanal, 3-methyl-	0.17	0.042	No
15932-80-6	Cyclohexanone, 5-methyl-2-(1-methylethylidene)-	0.20	0.043	No
1604-34-8	2-Undecanone, 6,10-dimethyl-	0.50	0.040	No
1615-70-9	2,4-Pentadienenitrile	0.020	0.041	Yes
1626-09-1	2,7-Octanedione	0.050	0.0070	No
1647-11-6	2-Methylene butanenitrile	0.02	0.043	Yes
16519-68-9	Cyclohexanone, 2,6-diethyl-	0.20	0.00058	No
1653-30-1	2-Undecanol	0.015	0.00046	No
1653-31-2	2-Tridecanol	0.015	0.00056	No
16624-06-9	Cyclooctanemethanol, .alpha.,.alpha.-dimethyl-	0.015	0.0023	No
1669-44-9	3-Octen-2-one	0.15	0.047	No
16778-26-0	2(3H)-Benzofuranone, 3a,4,5,6-tetrahydro-3a,6,6-tr	0.50	0.090	No
1679-08-9	1-Propanethiol, 2,2-dimethyl-	7.3	0.066	No
1703-52-2	Furan, 2-ethyl-5-methyl-	0.010	0.010	Yes
1712-64-7	Nitric acid, 1-methylethyl ester	1.0	0.091	No
1713-33-3	7-Oxabicyclo[4.1.0]heptane, 1-methyl-	0.050	0.0021	No
17351-34-7	14-Pentadecenoic acid	1.0	0.0039	No
17429-02-6	Cyclohexanone, 4-hydroxy-4-methyl-	0.20	0.00035	No
1757-42-2	Cyclopentanone, 3-methyl-	0.20	0.022	No
1759-53-1	Cyclopropanecarboxylic acid	0.10	0.054	No
17622-46-7	2-Cyclohexen-1-one, 4-ethyl-3,4-dimethyl-	0.020	0.00048	No
1779-19-7	1,3,6-Trioxocane	0.20	0.0016	No
17851-53-5	1,2-Benzenedicarboxylic acid, butyl 2-methylpropyl	0.0055	0.00085	No
1840-42-2	Methane, fluorotrinitro-	10	0.015	No
18433-98-2	Pyrazine, 2,5-dimethyl-3-(3-methylbutyl)-	0.020	0.0013	No
18521-07-8	3-Octen-2-ol, 2-methyl-, (Z)-	1.0	0.058	No

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Table C-7. CNFE with Screening Values (11 Sheets)

Chemical Identification Number	Chemical Name	Screening Value (ppmv)	Maximum Conc (ppmv)	Need In-Depth Analysis?
18829-55-5	2-Heptenal, (E)-	0.0030	0.0016	No
18829-56-6	2-Nonenal, (E)-	0.0030	0.0029	No
1888-57-9	3-Hexanone, 2,5-dimethyl-	0.50	0.0057	No
19269-28-4	Hexanal, 3-methyl-	1.0	0.14	No
1927-69-1	2H-Pyran, 2-(1,1-dimethylethoxy)tetrahydro-	0.19	0.023	No
1932-92-9	2-Propyn-1-ol, propanoate	1.5	0.0012	No
1937-62-8	9-Octadecenoic acid, methyl ester, (E)-	0.0035	0.00064	No
19549-80-5	2-Heptanone, 4,6-dimethyl-	0.50	0.00096	No
19550-03-9	2-Hexanol, 2,3-dimethyl-	0.50	0.00012	No
19550-46-0	1,3-Dimethylcyclopentanol	0.50	0.025	No
19550-73-3	Cyclopentanone, 3,4-dimethyl-, trans-	0.20	0.00012	No
1975-78-6	Decanenitrile	0.080	0.16	Yes
19780-10-0	5-Dodecanone	0.50	0.024	No
19780-59-7	2-Heptanol, 3-ethyl-2-methyl-	0.50	0.00097	No
19780-63-3	2-Pentanol, 3-ethyl-2-methyl-	0.25	0.00017	No
19781-07-8	2,7-Octanediol, 2,7-dimethyl-	0.50	0.0027	No
19781-27-2	3-Octanol, 6-ethyl-	0.50	0.0013	No
20192-66-9	1,3-Benzodioxol-2-one, hexahydro-, trans-	0.020	0.00037	No
2040-07-5	Ethanone, 1-(2,4,5-trimethylphenyl)-	0.10	0.0023	No
2050-78-4	Nitric acid, decyl ester	0.25	0.00095	No
20633-11-8	Nitric acid, hexyl ester	0.25	0.10	No
20633-12-9	Nitric acid, heptyl ester	0.25	0.10	No
20633-13-0	Nitric acid, nonyl ester	0.25	0.00017	No
20691-89-8	4-Piperidinmethanol, 1-methyl-	0.010	0.0075	No
20698-91-3	Benzeneacetic acid, alpha-hydroxy-, methyl ester	0.0035	0.0011	No
20743-95-7	Benzene, 1-butoxy-4-methoxy-	0.010	0.00050	No
20754-04-5	4-Octanone, 3-methyl-	0.50	0.0029	No
2091-29-4	9-Hexadecenoic acid	1.0	0.33	No
21078-65-9	1-Decanol, 2-ethyl-	0.015	0.00012	No
2136-70-1	Ethanol, 2-(tetradecyloxy)-	0.20	0.18	No
22026-12-6	6-Tridecanone	0.50	0.099	No
2216-87-7	3-Undecanone	0.50	0.11	No
22319-25-1	3-Hepten-2-one, 4-methyl-	0.15	0.0071	No
22319-29-5	4-Hepten-3-one, 5-ethyl-2,4-dimethyl-	0.15	0.031	No
2243-27-8	Nonanenitrile	0.080	0.16	Yes
2244-07-7	Undecanenitrile	0.080	0.00029	No
2345-27-9	2-Tetradecanone	0.50	0.011	No
23462-75-1	2H-Pyran-3(4H)-one, dihydro-	1.0	0.0010	No
2371-19-9	2-Heptanone, 3-methyl-	0.50	0.0086	No
2407-94-5	Cyclohexanol, 1,1'-dioxybis-	0.50	0.00019	No
2408-37-9	Cyclohexanone, 2,2,6-trimethyl-	0.20	0.030	No
2425-77-6	2-Hexyl-1-decanol	0.20	0.025	No
24405-16-1	2H-Pyran-2-one, tetrahydro-5,6-dimethyl-, trans-	1.0	0.21	No
2456-28-2	Decane, 1,1'-oxybis-	1.0	0.073	No
2490-48-4	1-Hexadecanol, 2-methyl-	0.0015	0.00039	No
25013-16-5	Phenol, (1,1-dimethylethyl)-4-methoxy-	0.050	0.00037	No
2508-29-4	1-Pentanol, 5-amino-	0.050	0.00065	No
2548-87-0	2-Octenal, (E)-	0.0030	0.0016	No
25564-22-1	2-Pentyl-2-cyclopenten-1-one	0.05	0.040	No

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Table C-7. CNFE with Screening Values (11 Sheets)

Chemical Identification Number	Chemical Name	Screening Value (ppmv)	Maximum Conc (ppmv)	Need In-Depth Analysis?
2610-95-9	2H-Pyran-2-one, tetrahydro-6,6-dimethyl-	1.0	0.00052	No
26215-90-7	4-Tridecanone	0.50	0.019	No
26248-42-0	Tridecanol	0.0015	0.0011	No
2639-63-6	Butanoic acid, hexyl ester	1.5	0.00013	No
26465-81-6	1H-Inden-1-one, 2,3-dihydro-3,3-dimethyl-	0.010	0.00042	No
26496-20-8	4-Tetradecanone	0.50	0.0014	No
26537-19-9	Benzoic acid, 4-(1,1-dimethylethyl)-, methyl ester	0.00055	0.00052	No
27392-16-1	Cyclohexanecarboxylic acid, 2-(1,1-dimethylethyl)-	0.00066	0.00024	No
27675-36-1	1-Propene, 1-nitro-, (Z)-	0.25	0.0021	No
2799-17-9	2-Propanol, 1-amino-	0.20	0.19	No
28019-94-5	1H-Pyrazole, 4,5-dihydro-4,5-dimethyl-	0.020	0.0055	No
28290-01-9	Cyclobutanone, 2,3,3-trimethyl-	0.067	0.0021	No
28473-21-4	1-Nonanol	0.070	0.0032	No
2865-82-9	2(3H)-Furanone, 5-ethylidihydro-5-methyl-	0.50	0.0014	No
288-16-4	Isothiazole	0.010	0.00079	No
288-47-1	Thiazole	0.10	0.0024	No
288-88-0	1H-1,2,4-Triazole	1.0	0.0087	No
289-95-2	Pyrimidine	3.0	0.029	No
29006-00-6	2-Hexanone, 6-methoxy-	2.0	0.00011	No
2902-96-7	2-Nitro-1-propanol	0.10	0.43	Yes
290-37-9	Pyrazine	2.0	0.12	No
2919-23-5	Cyclobutanol	0.50	0.0055	No
2922-51-2	2-Heptadecanone	0.50	0.00009	No
29354-98-1	Hexadecanol	0.0015	0.00009	No
29366-35-6	4-Dodecanone, 11-methyl-	0.50	0.0029	No
29887-79-4	Cycloheptane, 1,3-dimethoxy-, trans-	0.20	0.00028	No
3054-92-0	3-Pentanol, 2,3,4-trimethyl-	0.25	0.0017	No
30692-16-1	5-Tridecanone	0.50	0.0034	No
30951-17-8	1-Naphthalenol, decahydro-4a-methyl-8-methylene-2-(1-methylethyl)	0.50	0.00071	No
32064-72-5	2-Nonen-4-one	0.15	0.010	No
33083-83-9	5-Undecanone	0.50	0.016	No
334-48-5	Decanoic acid	1.0	0.00039	No
33933-82-3	2-Decanone, 5,9-dimethyl-	0.50	0.0029	No
34379-54-9	Furan, 2,3-dihydro-4-(1-methylpropyl)-	0.50	0.00098	Yes
3438-46-8	Pyrimidine, 4-methyl-	0.30	0.0091	No
34386-42-0	Benzenemethanol, 4-(1,1-dimethylethyl)-.alpha.-methyl-	0.010	0.0031	No
3457-90-7	1,3-Propanediol, dinitrate	0.00050	0.018	Yes
3457-91-8	1,4-Butanediol, dinitrate	0.00050	0.26	Yes
35194-30-0	9-Decen-2-one	0.15	0.00048	No
35468-97-4	1-Hepten-1-ol, acetate	1.5	0.0034	No
35996-97-5	Pentadecanoic acid, butyl ester	0.0035	0.00062	No
3622-84-2	Benzenesulfonamide, N-butyl-	0.015	0.16	Yes
3664-60-6	7-Octen-2-one	0.15	0.0012	No
36653-82-4	1-Hexadecanol	0.015	1.1	Yes
3682-42-6	Pentanoic acid, 3-methyl-2-oxo-, methyl ester	1.5	0.0036	No
3760-54-1	1-Pyrrolidinecarboxaldehyde	0.10	0.00014	No
3760-63-2	1-Butanone, 4-(dimethylamino)-1-phenyl-	0.010	0.0019	No
3761-94-2	Cycloheptanol, 1-methyl-	0.50	0.00017	No
3777-69-3	Furan, 2-pentyl-	0.010	0.0025	Yes

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Table C-7. CNFE with Screening Values (11 Sheets)

Chemical Identification Number	Chemical Name	Screening Value (ppmv)	Maximum Conc (ppmv)	Need In-Depth Analysis?
3789-85-3	Benzoic acid, 2-[(trimethylsilyl)oxy]-, trimethyls	0.25	0.017	No
3796-70-1	5,9-Undecadien-2-one, 6,10-dimethyl-, (E)-	0.15	0.00008	No
38447-22-2	Hexanedioic acid, bis(1-methylpropyl) ester	0.15	0.00017	No
3879-26-3	5,9-Undecadien-2-one, 6,10-dimethyl-, (Z)-	0.15	0.00077	No
3913-02-8	1-Octanol, 2-butyl-	0.50	0.042	No
3913-81-3	2-Decenal, (E)-	0.0030	0.00062	No
39161-19-8	3-Penten-1-ol	0.020	0.0069	No
39168-02-0	Furan, tetrahydro-2,4-dimethyl-, trans-	0.50	0.0032	No
3944-36-3	2-Propanol, 1-(1-methylethoxy)-	0.20	0.0063	No
39515-51-0	Benzaldehyde, 3-phenoxy-	0.0023	0.00023	No
39899-08-6	3-Hepten-2-one, 3-methyl-	0.15	0.026	No
40649-36-3	4-Propylcyclohexanone	0.20	0.034	No
40702-26-9	3-Cyclohexene-1-carboxaldehyde, 1,3,4-trimethyl-	0.0030	0.00074	No
4088-60-2	2-Buten-1-ol, (Z)-	0.070	0.037	No
41239-48-9	Furan, 2,5-diethyltetrahydro-	0.50	0.019	No
41744-75-6	1-Heptadecanol, 16-methyl-	0.0015	0.00033	No
4176-04-9	Bicyclo[4.1.0]heptan-3-one, 4,7,7-trimethyl	0.020	0.086	Yes
420-56-4	Silane, fluorotrimethyl-	0.050	0.00049	No
42565-49-1	10-Undecen-4-one, 2,2,6,6-tetramethyl-	0.15	0.0014	No
42604-04-6	Cycloheptane, methoxy-	0.20	0.019	No
4272-06-4	4-Undecanol	0.015	0.00030	No
42786-06-1	4H-1,2,4-Triazol-3-amine, 4-ethyl-	1.0	0.0019	No
4312-99-6	1-Octen-3-one	0.15	0.0060	No
4337-65-9	Hexanedioic acid, mono(2-ethylhexyl) ester	0.15	0.0026	No
4457-62-9	Furan, tetrahydro-2,5-dipropyl-	0.50	0.00097	No
4485-09-0	4-Nonanone	0.50	0.12	No
4562-27-0	4(1H)-Pyrimidinone	0.10	0.0016	No
4573-09-5	Cyclopentanone, 2,2,5-trimethyl-	0.20	0.0026	No
460-13-9	Propane, 1-fluoro-	0.75	0.057	No
4631-98-5	Cyclohexanol, 4-(1,1,3,3-tetramethylbutyl)-	0.50	0.00045	No
470-65-5	Cyclohexanol, 4-methyl-1-(1-methylethyl)-	0.50	0.00018	No
4786-20-3	2-Butenenitrile	0.020	0.0057	No
4799-62-6	1-Pentanol, 5-methoxy-	1.0	0.0021	No
4826-62-4	2-Dodecenal	0.0030	0.00049	No
486-25-9	9H-Fluoren-9-one	0.010	0.0021	No
4911-70-0	2-Pentanol, 2,3-dimethyl-	0.25	0.0012	No
502-56-7	5-Nonanone	0.0050	0.0024	No
502-69-2	2-Pentadecanone, 6,10,14-trimethyl-	0.50	0.00047	No
503-30-0	Trimethylene oxide	2.5	0.56	No
5057-99-8	1,2-Cyclopentanediol, trans-	0.10	0.0018	No
50639-02-6	5-Undecanone, 2-methyl-	0.50	0.20	No
507-55-1	1,3-Dichloro-1,1,2,2,3-pentafluoropropane	1.67	1.0	No
5115-98-0	3-Piperidinecarboxamide, N-methyl-	1.0	0.0015	No
51411-24-6	6,10-Dodecadien-1-ol, 3,7,11-trimethyl-	1.0	0.26	No
5145-01-7	2(3H)-Furanone, dihydro-3,5-dimethyl-	0.50	0.14	No
51595-87-0	2-Heptanone, 6-(2-furanyl)-6-methyl-	0.010	0.00052	Yes
5166-53-0	3-Hexen-2-one, 5-methyl-	0.15	0.0034	No
51756-19-5	1-Nonen-3-one, 2-methyl-	0.15	0.00087	No
51953-17-4	4(3H)-Pyrimidinone	0.10	0.0051	No

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Table C-7. CNFE with Screening Values (11 Sheets)

Chemical Identification Number	Chemical Name	Screening Value (ppmv)	Maximum Conc (ppmv)	Need In-Depth Analysis?
5204-80-8	4-Pentenal, 2-ethyl-	5.0	0.014	No
5205-34-5	5-Decanol	0.015	0.0035	No
52588-78-0	3,4-Undecadiene-2,10-dione, 6,6-dimethyl-	0.015	0.00022	No
53229-39-3	Oxirane, (1-methylbutyl)-	0.020	0.00046	No
53398-83-7	Butanoic acid, 2-hexenyl ester, (E)-	1.5	0.0053	No
534-22-5	Furan, 2-methyl-	0.010	1.0	Yes
53535-33-4	Heptanol	0.50	0.059	No
53833-32-2	Oxazole, 4,5-dimethyl-2-propyl-	0.50	0.0075	No
53907-75-8	Oxirane, 2-methyl-2-pentyl-	0.020	0.0028	No
54004-41-0	1-Pentanol, 4-methyl-2-propyl-	0.25	0.0055	No
541-05-9	Cyclotrisiloxane, hexamethyl-	4.4	0.63	No
541-35-5	Butanamide	0.10	0.020	No
541-73-1	Benzene, 1,3-dichloro-	0.25	0.010	No
542-44-9	Hexadecanoic acid, 2,3-dihydroxypropyl ester	0.0035	0.00027	No
542-54-1	4-Methylpentanenitrile	0.08	0.024	No
542-55-2	Formic acid, 2-methylpropyl ester	1.0	0.066	No
543-29-3	Nitric acid, 2-methylpropyl ester	0.25	0.070	No
543-49-7	2-Heptanol	0.50	0.052	No
543-87-3	1-Butanol, 3-methyl-, nitrate	0.25	0.15	No
544-16-1	Nitrous acid, butyl ester	0.40	0.49	Yes
544-63-8	Tetradecanoic acid	1.0	0.39	No
5454-28-4	Heptanoic acid, butyl ester	0.15	0.0011	No
54658-01-4	Hexane, 3-methoxy-	0.050	0.045	No
54774-28-6	2-Furanmethanol, tetrahydro-5-methyl-, trans-	0.020	0.00065	No
54845-28-2	2-Hexenoic acid, 2-hexenyl ester, (E,E)-	0.15	0.035	No
5500-21-0	Cyclopropanecarbonitrile	0.060	0.0073	No
55429-85-1	Benzeneethanamine, N-[(pentafluorophenyl)methylene	1.0	0.0039	No
556-67-2	Cyclotetrasiloxane, octamethyl	3.0	0.41	No
55956-20-2	2-Oxazolidinone, 5-methyl-3-(2-propenyl)-	0.50	0.011	No
56052-85-8	2-Pentene, 5-(pentyl-oxo)-, (E)-	1.0	0.0034	No
56554-96-2	2-Octadecenal	0.0030	0.0020	No
565-61-7	2-Pentanone, 3-methyl-	0.50	0.036	No
565-67-3	3-Pentanol, 2-methyl-	0.25	0.073	No
565-68-4	1-Pentyn-3-ol, 4-methyl-	1.0	0.0098	No
565-69-5	3-Pentanone, 2-methyl-	0.50	0.013	No
565-80-0	3-Pentanone, 2,4-dimethyl-	0.50	0.061	No
5675-51-4	1,12-Dodecanediol	0.0015	0.00011	No
57-10-3	Hexadecanoic acid	1.0	0.37	No
57-11-4	Octadecanoic acid	1.0	0.00032	No
5715-25-3	2-Cyclohexen-1-one, 4,5-dimethyl-	0.020	0.0044	No
5746-58-7	Tetradecanoic acid, 12-methyl-, (S)-	1.0	0.00088	No
5756-43-4	Hexane, 1-ethoxy-	0.050	0.019	No
57706-88-4	3-Octanol, 3,7-dimethyl-, (+,-)-	0.50	0.0012	No
5775-96-2	1H-Pyrazole, 4,5-dihydro-1,5-dimethyl-	0.20	0.0071	No
578-54-1	Benzenamine, 2-ethyl-	0.0050	0.0015	No
583-58-4	Pyridine, 3,4-dimethyl-	0.020	0.0015	No
58467-28-0	2,5-Pyrrolidinedione, 3-ethyl-3-hydroxy-	10	0.0011	No
5857-36-3	3-Pentanone, 2,2,4-trimethyl-	0.50	0.012	No
585-74-0	Ethanone, 1-(3-methylphenyl)-	0.10	0.00033	No

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Table C-7. CNFE with Screening Values (11 Sheets)

Chemical Identification Number	Chemical Name	Screening Value (ppmv)	Maximum Conc (ppmv)	Need In-Depth Analysis?
589-63-9	4-Octanone	0.50	0.47	No
589-82-2	3-Heptanol	0.50	0.065	No
589-93-5	Pyridine, 2,5-dimethyl-	0.020	0.019	No
590-01-2	Propanoic acid, butyl ester	1.5	0.20	No
590-36-3	2-Pentanol, 2-methyl-	0.25	0.051	No
590-50-1	2-Pentanone, 4,4-dimethyl-	0.50	0.11	No
590-86-3	Butanal, 3-methyl-	0.50	0.085	No
5910-87-2	2,4-Nonadienal, (E,E)-	0.0030	0.00087	No
5910-89-4	Pyrazine, 2,3-dimethyl-	0.50	0.0089	No
591-22-0	Pyridine, 3,5-dimethyl-	0.020	0.0021	No
591-23-1	Cyclohexanol, 3-methyl-	0.50	0.00059	No
591-24-2	Cyclohexanone, 3-methyl-	0.20	0.029	No
591-87-7	Acetic acid, 2-propenyl ester	5.0	1.0	No
592-84-7	Formic acid, butyl ester	1.0	0.72	No
593-08-8	2-Tridecanone	0.50	0.24	No
594-70-7	Propane, 2-methyl-2-nitro-	0.10	0.23	Yes
598-32-3	3-Buten-2-ol	5.0	0.026	No
59-89-2	N-Nitrosomorpholine	0.0050	0.0097	Yes
59983-39-0	1-Pyrrolidinamine, 2-(methoxymethyl)-, (S)-	0.10	0.00031	No
600-14-6	2,3-Pentanedione	0.20	0.016	No
600-24-8	Butane, 2-nitro-	0.10	0.0012	No
60-35-5	Acetamide	0.0100	0.0032	Yes
6064-27-3	C6-Dodecanone	0.50	0.090	No
608-25-3	1,3-Benzenediol, 2-methyl-	10	0.00099	No
6137-06-0	2-Heptanone, 4-methyl-	0.50	0.017	No
6137-12-8	3-Hexanone, 4-ethyl-	0.50	0.00059	No
6137-26-4	4-Dodecanone	0.50	0.026	No
613-93-4	Benzamide, N-methyl-	0.0050	0.00033	No
617-29-8	3-Hexanol, 2-methyl-	0.060	0.018	No
6175-49-1	2-Dodecanone	0.50	0.018	No
617-94-7	Benzenemethanol, .alpha.,.alpha.-dimethyl-	0.10	2.2	Yes
623-37-0	3-Hexanol	0.060	0.0081	No
623-56-3	3-Hexanone, 5-methyl-	0.50	0.0017	No
623-87-0	1,3-Dinitrate-1,2,3-propanetriol	0.00050	0.010	Yes
624-16-8	4-Decanone	0.50	0.0026	No
624-42-0	3-Heptanone, 6-methyl-	0.25	0.0052	No
624-43-1	1,2,3-Propanetriol, 1-nitrate	0.00050	0.026	Yes
624-91-9	Nitrous acid, methyl ester	0.20	0.32	Yes
624-95-3	1-Butanol, 3,3-dimethyl-	1.0	0.018	No
625-25-2	2-Heptanol, 2-methyl-	0.50	0.00069	No
625-74-1	Propane, 2-methyl-1-nitro-	0.10	0.0020	No
625-84-3	1H-Pyrrole, 2,5-dimethyl-	0.010	0.0027	No
625-86-5	Furan, 2,5-dimethyl-	0.010	0.0093	Yes
627-05-4	Butane, 1-nitro-	0.25	0.39	Yes
627-59-8	2-Hexanol, 5-methyl-	0.50	0.00051	No
6281-96-5	Formamide, N-(2-methylpropyl)-	0.10	0.0058	No
628-28-4	Butane, 1-methoxy-	0.050	0.43	Yes
628-44-4	2-Octanol, 2-methyl-	0.50	0.0056	No
628-61-5	Octane, 2-chloro-	0.010	0.00071	No

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Table C-7. CNFE with Screening Values (11 Sheets)

Chemical Identification Number	Chemical Name	Screening Value (ppmv)	Maximum Conc (ppmv)	Need In-Depth Analysis?
628-80-8	Pentane, 1-methoxy-	0.20	0.0077	No
629-08-3	Heptanenitrile	0.080	0.64	Yes
629-23-2	3-Tetradecanone	0.50	0.14	No
6295-06-3	Acetic acid, oxo-, butyl ester	1.5	0.00025	No
629-54-9	Hexadecanamide	5.0	0.00026	No
629-60-7	Tridecanenitrile	0.080	0.052	No
629-70-9	1-Hexadecanol, acetate	1.5	0.0043	No
629-76-5	1-Pentadecanol	0.015	0.0021	No
629-80-1	Hexadecanal	0.50	0.00044	No
630-18-2	Propanenitrile, 2,2-dimethyl-	0.080	0.021	No
630-19-3	Propanal, 2,2-dimethyl-	0.25	0.020	No
637-88-7	1,4-Cyclohexanedione	0.067	0.0034	No
645-56-7	Phenol, 4-propyl-	0.050	0.00051	No
645-62-5	2-Hexenal, 2-ethyl-	0.0030	0.028	Yes
66-25-1	Hexanal	5.0	1.3	No
6711-26-8	Cyclohexanone, 2,5-dimethyl-2-(1-methylethenyl)-	0.020	0.00040	No
6728-26-3	2-Hexenal, (E)-	0.0030	0.00030	No
6728-31-0	4-Heptenal, (Z)-	5.0	0.0020	No
6789-80-6	3-Hexenal, (Z)-	5.0	0.0047	No
6836-38-0	6-Dodecanol	0.015	0.0017	No
68443-63-0	Hexanoic acid, 2-ethyl-, butyl ester	0.15	0.0012	No
68820-35-9	4-Undecenal, (E)-	5.0	0.0024	No
6898-69-7	N-(Butylidene)methanamine	0.05	0.029	No
6898-74-4	1-Butanamine, N-ethylidene-	0.010	0.0079	No
693-54-9	2-Decanone	0.50	0.086	No
693-98-1	1H-Imidazole, 2-methyl-	0.10	0.00043	No
695-06-7	2(3H)-Furanone, 5-ethylidihydro-	5.0	0.017	No
69687-91-8	2-Hexenoic acid, 4-methylphenyl ester	0.15	0.0014	No
69770-96-3	Cyclopentanone, 2-methyl-4-(2-methylpropyl)-	0.20	0.068	No
699-22-9	1H-Pyrrole, 1-pentyl-	0.10	0.016	No
705-15-7	1-(2-Hydroxy-5-methoxyphenyl)ethanone	0.10	0.013	No
706-14-9	2(3H)-Furanone, 5-hexyldihydro-	5.0	0.00079	No
7112-02-9	Octanamide, N-(2-hydroxyethyl)-	0.50	0.0034	No
71-41-0	1-Pentanol	0.20	0.12	No
719-22-2	2,5-Cyclohexadiene-1,4-dione, 2,6-bis(1,1-dimethyl	0.010	0.0029	No
7250-80-8	Benzenesulfonamide, N-hexyl-	0.0015	0.00043	No
7379-12-6	2-Methyl-3-hexanone	0.50	0.064	No
74367-34-3	Propanoic acid, 2-methyl-, 3-hydroxy-2,4,4-trimeth	0.15	0.00052	No
74381-40-1	Propanoic acid, 2-methyl-, 1-(1,1-dimethylethyl)-2	0.10	0.45	Yes
74646-36-9	1-Dodecyn-4-ol	1.0	0.0051	No
74646-37-0	1-Tridecyn-4-ol	1.0	0.00065	No
74793-02-5	2,2'-Bioxepane	0.050	0.045	No
75011-90-4	1H-Pyrazole, 4,5-dihydro-5-propyl-	0.020	0.0045	No
753-89-9	Propane, 1-chloro-2,2-dimethyl-	0.75	0.0037	No
75-84-3	1-Propanol, 2,2-dimethyl-	0.50	0.036	No
75-85-4	2-Butanol, 2-methyl-	10	0.018	No
75-97-8	2-Butanone, 3,3-dimethyl-	2.0	0.034	No
76-09-5	2,3-Butanediol, 2,3-dimethyl-	0.10	0.0017	No
763-93-9	3-Hexen-2-one	0.15	0.011	No

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Table C-7. CNFE with Screening Values (11 Sheets)

Chemical Identification Number	Chemical Name	Screening Value (ppmv)	Maximum Conc (ppmv)	Need In-Depth Analysis?
766-15-4	1,3-Dioxane, 4,4-dimethyl-	0.020	0.0017	No
7726-08-1	Decanamide, N-(2-hydroxyethyl)-	5.0	0.00057	No
774-40-3	Benzeneacetic acid, .alpha.-hydroxy-, ethyl ester	0.0035	0.0017	No
78-46-6	Phosphonic acid, butyl-, dibutyl ester	0.0020	0.070	Yes
78-85-3	2-Propenal, 2-methyl-	0.20	0.026	No
79-16-3	Acetamide, N-methyl-	0.10	0.00037	No
79-31-2	2-Methylpropionic acid	1.00	0.010	No
80-39-7	Benzenesulfonamide, N-ethyl-4-methyl-	0.0015	0.0014	No
814-78-8	3-Buten-2-one, 3-methyl-	0.0020	0.021	Yes
819-97-6	Butanoic acid, 1-methylpropyl ester	1.5	0.00016	No
820-29-1	5-Decanone	0.50	0.0061	No
821-41-0	5-Hexen-1-ol	0.020	0.016	No
821-55-6	2-Nonanone	0.50	1.6	Yes
83321-16-8	3-Cyclopenten-1-one, 2,3,4-trimethyl-	0.15	0.00081	No
84-64-0	1,2-Benzenedicarboxylic acid, butyl cyclohexyl est	0.055	0.0059	No
85-69-8	1,2-Benzenedicarboxylic acid, butyl 2-ethylhexyl e	0.0055	0.00060	No
871-71-6	Formamide, N-butyl-	0.10	0.013	No
873-94-9	Cyclohexanone, 3,3,5-trimethyl-	0.20	0.034	No
89-82-7	Cyclohexanone, 5-methyl-2-(1-methylethylidene)	0.20	0.37	Yes
91894-15-4	4-Methoxy-6-methyl-6,7-dihydro-4H-furo[3,2-c]pyran	1.00	0.078	No
922-63-4	2-Methylenebutanal	0.20	0.012	No
922-65-6	1,4-Pentadien-3-ol	0.020	0.0073	No
925-54-2	2-Methylhexanal	1.00	0.053	No
925-78-0	3-Nonanone	0.50	0.14	No
926-42-1	1-Propanol, 2,2-dimethyl-, nitrate	0.25	0.078	No
928-45-0	Nitric acid, butyl ester	0.25	0.36	Yes
928-68-7	2-Heptanone, 6-methyl-	0.50	2.1	Yes
928-80-3	3-Decanone	0.50	0.0049	No
930-02-9	1-Ethenyloxyoctadecane	0.50	0.044	No
930-36-9	1H-Pyrazole, 1-methyl-	0.020	0.0018	No
93-55-0	1-Propanone, 1-phenyl-	0.10	0.047	No
948-65-2	1H-Indole, 2-phenyl-	0.10	0.00065	No
95-16-9	Benzothiazole	1.0	0.0099	No
96-17-3	Butanal, 2-methyl-	0.50	0.021	No
96-47-9	2-Methyltetrahydrofuran	0.50	0.039	No
96-48-0	2(3H)-Furanone, dihydro-	75	0.91	No
97-87-0	Propanoic acid, 2-methyl-, butyl ester	1.5	0.0040	No
97-95-0	1-Butanol, 2-ethyl-	1.0	0.012	No
98-54-4	Phenol, 4-(1,1-dimethylethyl)-	0.050	0.0013	No
MADUAK0-01b	Benzaldehyde, 4-hydroxy- mixture	0.0046	0.0013	No
MADUAR0-01a	Undecanal, 2-methyl- mixture	0.50	0.0048	No
MARSI00-01a	Trisiloxane, octamethyl- mixture	3.0	0.0068	No
MARUPH0-01b	di-t-Butyl-ethylphenol mixture	0.050	0.00041	No
MKEUAE0-01b	Acetophenone, 2'-hydroxy-5' methoxy- mixture	0.10	0.013	No
MOHOH00-01a	Benzenemethanol, alpha, methyl- mixture	0.010	0.0047	No
MUPHUSI-01a	Nonylphenol isomer mixture	0.050	0.00010	No
OHUES0-01	1-Heptadecanyl acetate	1.50	0.00008	No
UAD012-01	(7E,9E)-Dodecadienal	5.0	0.067	No
UCA014-01	C14-Alkanoic Acid	1.0	0.11	No

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Table C-7. CNFE with Screening Values (11 Sheets)

Chemical Identification Number	Chemical Name	Screening Value (ppmv)	Maximum Conc (ppmv)	Need In-Depth Analysis?
UCA016-01	C16-Alkanoic acid	1.0	1.1	Yes
UES010-01	C6 Ester of butanoic acid	0.15	0.00013	No
UES013-01	1-ethylpropyl octanoate	0.0035	0.00007	No
UET005-01	Unknown C5 ether	2.0	0.014	No
UHC000-05	C3-Pyridine	0.050	0.0015	No
UHC000-06	C4-2-Pyrrolidinone	1.0	0.00059	No
UHC000-07	C4-Piperidine	0.010	0.00069	No
UHC000-09	Methyl pyridine	0.020	0.52	Yes
UHC000-10	C2-Pyrrolidine	0.40	0.29	No
UHC000-13	C2-Pyridine	0.050	0.19	Yes
UIN000-01	Sulfur oxides (SO _x)	0.020	0.37	Yes
UKE006-02	C6-Alkenone	0.15	0.0021	No
UKE006-03	4-Hydroxy-4-methylpentanone	0.050	0.0034	No
UKE006-04	C6-Alkanone	0.050	0.021	No
UKE007-01	C7-Alkanone	0.50	0.071	No
UKE008-01	C8-Alkanone	0.50	1.2	Yes
UKE009-02	C9-Alkenone	0.15	0.13	No
UKE009-03	C9-Alkanone	0.50	1.1	Yes
UKE010-01	C10-Alkanone	0.50	0.027	No
UKE010-02	3-t-Pentylcyclopentanone	0.067	0.0016	No
UKE011-02	C11-Alkanone	0.50	0.013	No
UKE012-02	C12-Alkanone	0.50	0.41	No
UKE013-02	C13-Alkanone	0.50	1.1	Yes
UKE014-01	C14-Alkanone	0.50	0.050	No
UKE014-03	2-Hexanone, 3-cyclohexyliden-4-ethyl	0.050	0.029	No
UKE015-01	2-Pentanone, 4-cyclohexyliden-3,3-diethyl	0.15	0.017	No
UNA003-01	Unknown C3-Nitrate	0.25	0.019	No
UNI000-02M	2-Butanenitrile and others	0.080	0.040	No
UNI007-01	C7-Alkyl nitrile	0.080	0.011	No
UNI008-01	C8-Alkyl nitrile	0.080	0.018	No
UOH010-01	1-Cyclopentyl-2,2-dimethyl-1-propanol	0.50	0.017	No
UPH000-01	Octyl phenol isomer	0.050	0.00011	No
USI000-05	Trimethylsilylester of methoxy benzoic acid	0.25	0.0015	No

Note: Conc = Concentration

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Table C-8. Chemicals Given In-Depth Analysis (2 Sheets)

Chemical Identification Number	Chemical Name	AOEL (ppmv)	Max Conc (ppmv)	COPC?
105-42-0	2-Hexanone, 4-methyl-	0.50	1.1	Yes
1072-44-2	1-Methylaziridine	0.050	0.065	No
108-47-4	Pyridine, 2,4-dimethyl-	0.50	0.10	Yes
109-75-1	3-Butenenitrile	1.0	0.021	No
110-00-9	Furan	0.0010	3.2	No
110-27-0	Tetradecanoic acid, 1-methylethyl ester	not needed	0.17	No
110-36-1	Tetradecanoic acid, butyl ester	not needed	0.20	No
1115-11-3	2-Butenal, 2-methyl-	0.030	0.013	No
112-92-5	1-Octadecanol	not needed	0.96	No
1184-60-7	1-Propene, 2-fluoro-	0.10	0.53	Yes
1191-99-7	Furan, 2,3-dihydro-	0.0010	0.025	No
124-12-9	Octanenitrile	6.0	0.49	No
142-91-6	Hexadecanoic acid, 1-methylethyl ester	not needed	0.033	No
1534-26-5	3-Tridecanone	17	0.61	No
1534-27-6	3-Dodecanone	17	1.1	No
1615-70-9	2,4-Pentadienenitrile	0.30	0.041	Yes
1647-11-6	2-Methylene butanenitrile	0.30	0.043	Yes
1703-52-2	Furan, 2-ethyl-5-methyl-	0.0010	0.010	No
1975-78-6	Decanenitrile	6.0	0.16	No
2243-27-8	Nonanenitrile	6.0	0.16	No
2902-96-7	2-Nitro-1-propanol	8.0	0.43	No
34379-54-9	Furan, 2,3-dihydro-4-(1-methylpropyl)-	0.0010	0.00098	No
3457-90-7	1,3-Propanediol, dinitrate	0.050	0.018	No
3457-91-8	1,4-Butanediol, dinitrate	0.050	0.26	No
3622-84-2	Benzenesulfonamide, N-butyl-	contaminant	0.16	No
36653-82-4	1-Hexadecanol	not needed	1.1	No
3777-69-3	Furan, 2-pentyl-	0.0010	0.0025	No
4176-04-9	Bicyclo[4.1.0]heptan-3-one, 4,7,7-trimethyl	0.70	0.086	Yes
51595-87-0	2-Heptanone, 6-(2-furanyl)-6-methyl-	0.0010	0.00052	No
534-22-5	Furan, 2-methyl-	0.0010	1.0	No
544-16-1	Nitrous acid, butyl ester	0.10	0.49	Yes
594-70-7	Propane, 2-methyl-2-nitro-	0.30	0.23	Yes
59-89-2	N-Nitrosomorpholine	Intertox	0.010	Yes
60-35-5	Acetamide	not needed	0.0032	No
617-94-7	Benzenemethanol, .alpha.,.alpha.-dimethyl-	contaminant	2.2	No
623-87-0	1,3-Dinitrate-1,2,3-propanetriol	0.050	0.010	No
624-43-1	1,2,3-Propanetriol, 1-nitrate	8.0	0.026	No
624-91-9	Nitrous acid, methyl ester	0.10	0.32	Yes
625-86-5	Furan, 2,5-dimethyl-	0.0010	0.0093	No
627-05-4	Butane, 1-nitro-	2.5	0.39	Yes
628-28-4	Butane, 1-methoxy-	17	0.43	No
629-08-3	Heptanenitrile	6.0	0.64	Yes
645-62-5	2-Hexenal, 2-ethyl-	0.10	0.028	Yes
74381-40-1	Propanoic acid, 2-methyl-, 1-(1,1-dimethylethyl)-2-methyl-1,3-propanediyl ester	contaminant	0.45	No
78-46-6	Phosphonic acid, butyl-, dibutyl ester	0.0070	0.070	No
814-78-8	3-Buten-2-one, 3-methyl-	0.020	0.021	No
821-55-6	2-Nonanone	17	1.6	No

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Table C-8. Chemicals Given In-Depth Analysis (2 Sheets)

Chemical Identification Number	Chemical Name	AOEL (ppmv)	Max Conc (ppmv)	COPC?
89-82-7	Cyclohexanone, 5-methyl-2-(1-methylethylidene)	2.5	0.37	Yes
928-45-0	Nitric acid, butyl ester	8.0	0.36	No
928-68-7	2-Heptanone, 6-methyl-	8.0	2.1	Yes
UCA016-01	C16-Alkanoic acid	Ambiguous	1.1	No
UHC000-09	Methyl pyridine	Ambiguous	0.52	No
UHC000-13	C2-Pyridine	Ambiguous	0.19	No
UIN000-01	Sulfur oxides (SO _x)		0.37	No
UKE008-01	C8-Alkanone	Ambiguous	1.2	No
UKE009-03	C9-Alkanone	Ambiguous	1.1	No
UKE013-02	C13-Alkanone	Ambiguous	1.1	No

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Table C-9. Chemicals Removed from the COPC List

Chemical Identification Number	Chemical Name	Basis for Removal	Removal Date	Notes
100-40-3	4-Ethenylcyclohexene	Misidentified	6-Jul-05	1, 2
10102-44-0	Nitrogen dioxide	Non-tank source	6-Jul-05	2, 3
104-76-7	2-Ethyl-1-hexanol	Below 10% of AOEL	26-Jan-06	4, 5
106-93-4	1,2-Dibromoethane	Analytical contaminant	26-Jan-06	5, 6
107-06-2	1,2-Dichloroethane	Analytical contaminant	26-Jan-06	5, 6
11097-69-1	Aroclor-1254	Chlorinated biphenyls	6-Jul-05	2
117-81-7	bis(2-Ethylhexyl)phthalate	Below 10% of TLV	26-Jan-06	5, 7
123-91-1	1,4-Dioxane	Below 10% of TLV	26-Jan-06	5, 7
124-38-9	Carbon dioxide	Removed by IH	6-Jul-05	2, 3
127-18-4	Tetrachloroethylene	Below 10% of TLV	26-Jan-06	5, 7
128-37-0	2,6-bis(1,1-Dimethylethyl)-4-methylphenol [BHT]	Sampling contaminant	15-Feb-06	8, 10
134-32-7	1-Naphthylamine	Low concentration	15-Feb-06	8, 9
53469-21-9	Aroclor-1242	Chlorinated biphenyls	6-Jul-05	2
56-23-5	Carbon tetrachloride	Below 10% of TLV	26-Jan-06	5, 7
57-14-7	1,1-Dimethylhydrazine	Misidentified	6-Jul-05	1, 2
589-38-8	3-Hexanone	Below 10% of AOEL	26-Jan-06	4, 5
60-34-4	Methyl hydrazine	Misidentified	6-Jul-05	1, 2
630-08-0	Carbon monoxide	Non-tank source	6-Jul-05	2, 3
67-66-3	Chloroform	Below 10% of TLV	26-Jan-06	5, 7
72-55-9	Dichlorodiphenyldichloroethylene (DDE)	Low concentration	15-Feb-06	8, 9
75-01-4	Chloroethene	Analytical contaminant	26-Jan-06	5, 7
75-02-5	Fluoroethene	Misidentified	6-Jul-05	1, 2
75-09-2	Dichloromethane	Below 10% of PEL	15-Feb-06	7, 8
75-15-0	Carbon disulfide	Below 10% of TLV	26-Jan-06	5
75-21-8	Ethylene oxide	Misidentified	6-Jul-05	1, 2
75-50-3	N,N-Dimethylmethanamine	Misidentified	6-Jul-05	1, 2
79-01-6	Trichloroethylene	Below 10% of TLV	26-Jan-06	5, 7
79-10-7	Acrylic acid	Misidentified	6-Jul-05	1, 2
79-46-9	2-Nitropropane	Below 10% of TLV	26-Jan-06	5, 7

Notes: ¹ TWS05.008² Interoffice Memo 7F800-05-JOH-006³ Interoffice Memo 7B600-MLZ-05-005⁴ PNNL-15736⁵ EASRG meeting minutes 1/26/2006 (Appendix E)⁶ PNNL-15648⁷ EASRG meeting minutes 12/7/2005 (Appendix E)⁸ EASRG meeting minutes 2/15/2006 (Appendix E)⁹ PNNL-15632¹⁰ PNNL-15640

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Table C-10. Chemicals of Potential Concern

Chemical Identification Number	Chemical Name	Tank Farms OEL		Date Added to COPC List
		Value	Source	
92-52-4	1,1'-Biphenyl	0.2 ppmv	ACGIH TLV	7-Oct-04
106-99-0	1,3-Butadiene	1 ppmv	OSHA PEL	7-Oct-04
623-87-0	1,3-Dinitrate-1,2,3-propantriol	0.05 ppmv	AOEL	26-Jan-06
3457-91-8	1,4-Butanediol dinitrate	0.05 ppmv	AOEL	26-Jan-06
71-36-3	1-Butanol	20 ppmv	ACGIH TLV	7-Oct-04
108-47-4	2,4-Dimethylpyridine	0.5 ppmv	AOEL	26-Jan-06
1615-70-9	2,4-Pentadienenitrile	0.3 ppmv	AOEL	15-Feb-06
645-62-5	2-Ethylhex-2-enal	0.1 ppmv	AOEL	15-Feb-06
1184-60-7	2-Fluoropropene	0.1 ppmv	AOEL	26-Jan-06
591-78-6	2-Hexanone	5 ppmv	ACGIH TLV	7-Oct-04
1115-11-3	2-Methylbut-2-enal	0.03 ppmv	AOEL	26-Jan-06
1647-11-6	2-Methylene butanenitrile	0.3 ppmv	AOEL	15-Feb-06
594-70-7	2-Nitro-2-methylpropane	0.3 ppmv	AOEL	15-Feb-06
78-94-4	3-Buten-2-one	0.2 ppmv	ACGIH ceiling	6-Jul-05
814-78-8	3-Methyl-3-buten-2-one	0.02 ppmv	AOEL	26-Jan-06
105-42-0	4-Methyl-2-hexanone	0.5 ppmv	AOEL	26-Jan-06
928-68-7	6-Methyl-2-heptanone	8 ppmv	AOEL	26-Jan-06
75-07-0	Acetaldehyde	25 ppmv	ACGIH ceiling	7-Oct-04
75-05-8	Acetonitrile	20 ppmv	ACGIH TLV	7-Oct-04
7664-41-7	Ammonia	25 ppmv	ACGIH TLV	7-Oct-04
71-43-2	Benzene	0.5 ppmv	ACGIH TLV	7-Oct-04
123-72-8	Butanal	25 ppmv	AOEL	7-Oct-04
109-74-0	Butanenitrile	8 ppmv	AOEL	7-Oct-04
928-45-0	Butyl nitrate	8 ppmv	AOEL	26-Jan-06
544-16-1	Butyl nitrite	0.1 ppmv	AOEL	26-Jan-06
	Chlorinated biphenyls	0.03 mg/m ³	AOEL	6-Jul-05
78-46-6	Dibutyl butylphosphonate	0.007 ppmv	AOEL	26-Jan-06
84-66-2	Diethyl phthalate	5 mg/m ³	ACGIH TLV	7-Oct-04
593-74-8	Dimethylmercury	0.01 mg/m ³	ACGIH TLV	7-Oct-04
75-04-7	Ethylamine	5 ppmv	ACGIH TLV	14-May-06
50-00-0	Formaldehyde	0.3 ppmv	ACGIH ceiling	7-Oct-04
110-00-9	Furan	0.001 ppmv	AOEL	26-Jan-06
---	Substituted furans	0.001 ppmv	AOEL	26-Jan-06
1191-99-7	2,3-Dihydrofuran	0.001 ppmv	AOEL	26-Jan-06
51595-87-0	2-(2-Methyl-6-oxoheptyl)furan	0.001 ppmv	AOEL	26-Jan-06
625-86-5	2,5-Dimethylfuran	0.001 ppmv	AOEL	26-Jan-06
1703-52-2	2-Ethyl-5-methylfuran	0.001 ppmv	AOEL	26-Jan-06
534-22-5	2-Methylfuran	0.001 ppmv	AOEL	26-Jan-06
3777-69-3	2-Pentylfuran	0.001 ppmv	AOEL	26-Jan-06
34379-54-9	4-(1-Methylpropyl)-2,3-dihydrofuran	0.001 ppmv	AOEL	26-Jan-06
629-08-3	Heptanenitrile	6 ppmv	AOEL	26-Jan-06
628-73-9	Hexanenitrile	6 ppmv	AOEL	7-Oct-04
---	Hydrocarbons	200 mg/m ³	AOEL	7-Dec-05
7439-97-6	Mercury	0.003 ppmv	ACGIH TLV	7-Oct-04
67-56-1	Methanol	200 ppmv	ACGIH TLV	7-Oct-04
624-83-9	Methyl isocyanate	0.02 ppmv	ACGIH TLV	7-Oct-04
624-91-9	Methyl nitrite	0.1 ppmv	AOEL	26-Jan-06
10024-97-2	Nitrous oxide (N ₂ O)	50 ppmv	ACGIH TLV	7-Oct-04
62-75-9	N-Nitrosodimethylamine	0.0003 ppmv	AOEL	7-Oct-04
10595-95-6	N-Nitrosomethylethylamine	0.0003 ppmv	AOEL	7-Oct-04
59-89-2	N-Nitrosomorpholine	0.0006 ppmv	AOEL	26-Jan-06
110-59-8	Pentanenitrile	6 ppmv	AOEL	7-Oct-04
107-12-0	Propanenitrile	6 ppmv	AOEL	7-Oct-04
110-86-1	Pyridine	1 ppmv	ACGIH TLV	6-Jul-05
126-73-8	Tributyl phosphate	0.2 ppmv	ACGIH TLV	7-Oct-04

ATTACHMENT 6

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Table 5-1. Chemicals of Potential Concern

	Chemical	Chemical Identification Number	Tank Farms OEL	
			Value	Source
1	1,1'-Biphenyl	92-52-4	0.2 ppmv	ACGIH TLV
2	1,3-Butadiene	106-99-0	1 ppmv	OSHA PEL
3	1,3-Dinitrate-1,2,3-propantriol	623-87-0	0.05 ppmv	AOEL
4	1,4-Butanediol dinitrate	3457-91-8	0.05 ppmv	AOEL
5	1-Butanol	71-36-3	20 ppmv	ACGIH TLV
6	2,4-Dimethylpyridine	108-47-4	0.5 ppmv	AOEL
7	2,4-Pentadienenitrile	1615-70-9	0.3 ppmv	AOEL
8	2-Ethylhex-2-enal	645-62-5	0.1 ppmv	AOEL
9	2-Fluoropropene	1184-60-7	0.1 ppmv	AOEL
10	2-Hexanone	591-78-6	5 ppmv	ACGIH TLV
11	2-Methylbut-2-enal	1115-11-3	0.03 ppmv	AOEL
12	2-Methylene butanenitrile	1647-11-6	0.3 ppmv	AOEL
13	2-Nitro-2-methylpropane	594-70-7	0.3 ppmv	AOEL
14	3-Buten-2-one	78-94-4	0.2 ppmv	ACGIH ceiling
15	3-Methyl-3-buten-2-one	814-78-8	0.02 ppmv	AOEL
16	4-Methyl-2-hexanone	105-42-0	0.5 ppmv	AOEL
17	6-Methyl-2-heptanone	928-68-7	8 ppmv	AOEL
18	Acetaldehyde	75-07-0	25 ppmv	ACGIH ceiling
19	Acetonitrile	75-05-8	20 ppmv	ACGIH TLV
20	Ammonia	7664-41-7	25 ppmv	ACGIH TLV
21	Benzene	71-43-2	0.5 ppmv	ACGIH TLV
22	Butanal	123-72-8	25 ppmv	AOEL
23	Butanenitrile	109-74-0	8 ppmv	AOEL
24	Butyl nitrate	928-45-0	8 ppmv	AOEL
25	Butyl nitrite	544-16-1	0.1 ppmv	AOEL
26	Chlorinated biphenyls	---	0.03 mg/m ³	AOEL
27	Dibutyl butylphosphonate	78-46-6	0.007 ppmv	AOEL
28	Diethyl phthalate	84-66-2	5 mg/m ³	ACGIH TLV
29	Dimethylmercury	593-74-8	0.01 mg/m ³	ACGIH TLV
30	Ethylamine	75-04-7	5 ppmv	ACGIH TLV
31	Formaldehyde	50-00-0	0.3 ppmv	ACGIH Ceiling
32	Furan	110-00-9	0.001 ppmv	AOEL
33	Substituted furans	---	0.001 ppmv	AOEL
34	Heptanenitrile	629-08-3	6 ppmv	AOEL
35	Hexanenitrile	628-73-9	6 ppmv	AOEL
36	Hydrocarbons	---	200 mg/m ³	AOEL
37	Mercury	7439-97-6	0.025 mg/m ³	ACGIH TLV
38	Methanol	67-56-1	200 ppmv	ACGIH TLV
39	Methyl isocyanate	624-83-9	0.02 ppmv	ACGIH TLV
40	Methyl nitrite	624-91-9	0.1 ppmv	AOEL
41	Nitrous oxide (N ₂ O)	10024-97-2	50 ppmv	ACGIH TLV
42	N-Nitrosodimethylamine	62-75-9	0.0003 ppmv	AOEL
43	N-Nitrosomethylethylamine	10595-95-6	0.0003 ppmv	AOEL
44	N-Nitrosomorpholine	59-89-2	0.0006 ppmv	AOEL
45	Pentanenitrile	110-59-8	6 ppmv	AOEL
46	Propanenitrile	107-12-0	6 ppmv	AOEL
47	Pyridine	110-86-1	1 ppmv	ACGIH TLV
48	Tributyl phosphate	126-73-8	0.2 ppmv	ACGIH TLV

ATTACHMENT 7

Tank or Tank Farm where source air samples showed chemicals of potential concern above 50% of the occupational exposure limit.
 All the chemicals detected can potentially have chronic health effects.

Survey Date	Farm	Location	Agent	CAS	Air Conc	Air Conc UOM	% OEL	OEL	OEL UOM
4/7/2009	702-AZ	Stack	N-Nitrosodimethylamine	62-75-9	0.469	ppb	156.3	0.3	ppb
4/9/2009	702-AZ	Stack	N-Nitrosodimethylamine	62-75-9	0.556	ppb	185.3	0.3	ppb
8/18/2005	A FARM	A105	Ammonia	7664-41-7	52.26	ppm	209	25	ppm
8/18/2005	A FARM	A105	Mercury	7439-97-6	0.016	mg/m3	66	0.025	mg/m3
8/11/2005	A FARM	A103	N-Nitrosodimethylamine	62-75-9	0.763	ppb	254.4	0.3	ppb
8/18/2005	A FARM	A106	N-Nitrosodimethylamine	62-75-9	0.23	ppb	76.8	0.3	ppb
8/18/2005	A FARM	A104	Nitrous Oxide	10024-97-2	30	ppm	60	50	ppm
8/18/2005	A FARM	A105	Nitrous Oxide	10024-97-2	120	ppm	240	50	ppm
8/18/2005	A FARM	A106	Nitrous Oxide	10024-97-2	33	ppm	66	50	ppm
7/21/2005	AN FARM	Primary Exhauster	Ammonia	7664-41-7	104.079	ppm	416.3	25	ppm
3/27/2006	AN FARM	Primary Exhauster	Ammonia	7664-41-7	133.608	ppm	534.4	25	ppm
8/23/2006	AN FARM	Primary Exhauster	Ammonia	7664-41-7	46.548	ppm	186.2	25	ppm
10/18/2006	AN FARM	Primary Exhauster	Ammonia	7664-41-7	115.539	ppm	462.2	25	ppm
3/30/2007	AN FARM	Primary Exhauster	Ammonia	7664-41-7	28.03	ppm	112.1	25	ppm
8/23/2006	AN FARM	Primary Exhauster	Mercury	7439-97-6	0.021	mg/m3	85.3	0.025	mg/m3
7/21/2005	AN FARM	Primary Exhauster	N-Nitrosodimethylamine	62-75-9	41.599	ppb	13866.3	0.3	ppb
3/27/2006	AN FARM	Primary Exhauster	N-Nitrosodimethylamine	62-75-9	12.725	ppb	4241.8	0.3	ppb
8/23/2006	AN FARM	Primary Exhauster	N-Nitrosodimethylamine	62-75-9	14.64	ppb	4880.1	0.3	ppb
3/30/2007	AN FARM	Primary Exhauster	N-Nitrosodimethylamine	62-75-9	8.106	ppb	2702	0.3	ppb
7/21/2005	AN FARM	Primary Exhauster	N-Nitrosomethylethylamine	10595-95-6	0.731	ppb	243.8	0.3	ppb
3/27/2006	AN FARM	Primary Exhauster	N-Nitrosomethylethylamine	10595-95-6	0.462	ppb	153.9	0.3	ppb
8/23/2006	AN FARM	Primary Exhauster	N-Nitrosomethylethylamine	10595-95-6	0.294	ppb	98.1	0.3	ppb
3/30/2007	AN FARM	Primary Exhauster	N-Nitrosomethylethylamine	10595-95-6	0.256	ppb	85.4	0.3	ppb
7/21/2005	AN FARM	Primary Exhauster	n-Nitrosomorpholine	59-89-2	0.393	ppb	65.4	0.6	ppb
3/30/2007	AN FARM	Primary Exhauster	n-Nitrosomorpholine	59-89-2	0.333	ppb	55.5	0.6	ppb
8/23/2006	AN FARM	Primary Exhauster	Nitrous Oxide	10024-97-2	26.14	ppm	52.3	50	ppm
8/23/2006	AN FARM	Primary Exhauster	Nitrous Oxide	10024-97-2	27.64	ppm	55.3	50	ppm

Survey Date	Farm	Location	Agent	CAS	Air Conc	Air Conc UOM	% OEL	OEL	OEL UOM
6/23/2005	AP FARM	Primary Exhauster	Ammonia	7664-41-7	90.354	ppm	361.4	25	ppm
5/2/2006	AP FARM	Primary Exhauster	Ammonia	7664-41-7	119.255	ppm	477	25	ppm
9/6/2006	AP FARM	Primary Exhauster	Ammonia	7664-41-7	92.719	ppm	370.9	25	ppm
4/26/2005	AP FARM	Primary Exhauster	N-Nitrosodimethylamine	62-75-9	11.193	ppb	373.1	0.3	ppb
6/23/2005	AP FARM	Primary Exhauster	N-Nitrosodimethylamine	62-75-9	0.304	ppb	101.3	0.3	ppb
5/2/2006	AP FARM	Primary Exhauster	N-Nitrosodimethylamine	62-75-9	4.024	ppb	134.2	0.3	ppb
9/6/2006	AP FARM	Primary Exhauster	N-Nitrosodimethylamine	62-75-9	8.334	ppb	278.1	0.3	ppb
1/11/2007	AP FARM	Primary Exhauster	N-Nitrosodimethylamine	62-75-9	1.002	ppb	334	0.3	ppb
2/13/2007	AP FARM	Inside Farm	N-Nitrosodimethylamine	62-75-9	0.305	ppb	101.6	0.3	ppb
2/15/2007	AP FARM	Primary Exhauster	N-Nitrosodimethylamine	62-75-9	0.742	ppb	247.4	0.3	ppb
9/6/2006	AP FARM	Primary Exhauster	N-Nitrosomethylethylamine	10595-95-6	0.227	ppb	75.5	0.3	ppb
9/6/2006	AP FARM	Primary Exhauster	Nitrous Oxide	10024-97-2	25.17	ppm	50.3	50	ppm
3/24/2008	AP FARM	AP108	Nitrous Oxide	10024-97-2	250	ppm	500	50	ppm
7/6/2005	AW FARM	PRIMARY EXHAUSTER	Ammonia	7664-41-7	48.238	ppm	193	25	ppm
4/4/2006	AW FARM	PRIMARY EXHAUSTER	Ammonia	7664-41-7	160.965	ppm	643.9	25	ppm
8/27/2006	AW FARM	PRIMARY EXHAUSTER	Ammonia	7664-41-7	91.32	ppm	365.3	25	ppm
12/2/2006	AW FARM	PRIMARY EXHAUSTER	Ammonia	7664-41-7	122.875	ppm	491.5	25	ppm
12/2/2006	AW FARM	PRIMARY EXHAUSTER	Mercury	7439-97-6	0.032	mg/m3	126.7	0.025	mg/m3
7/7/2005	AW FARM	PRIMARY EXHAUSTER	N-Nitrosodimethylamine	62-75-9	0.151	ppb	50.2	0.3	ppb
4/4/2006	AW FARM	PRIMARY EXHAUSTER	N-Nitrosodimethylamine	62-75-9	0.158	ppb	52.7	0.3	ppb
12/2/2006	AW FARM	PRIMARY EXHAUSTER	N-Nitrosodimethylamine	62-75-9	0.16	ppb	53.4	0.3	ppb
4/7/2009	AY FARM	AY102	Ammonia	7664-41-7	32.43	ppm	129.7	25	ppm
4/7/2009	AY FARM	AY102	Furan	110-00-9	2.74	ppb	274	1	ppb
4/9/2009	AY FARM	AY102	Furan	110-00-9	2.013	ppb	201.3	1	ppb
4/7/2009	AY FARM	AY102	N-Nitrosodimethylamine	62-75-9	0.697	ppb	232.5	0.3	ppb
4/9/2009	AY FARM	AY102	N-Nitrosodimethylamine	62-75-9	0.426	ppb	142.1	0.3	ppb
4/7/2009	AZ FARM	AZ101	Ammonia	7664-41-7	32.901	ppm	131.6	25	ppm

Tank or Tank Farm where source air samples showed chemicals of potential concern above 50% of the occupational exposure limit.
 All the chemicals detected can potentially have chronic health effects.

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Tank or Tank Farm where source air samples showed chemicals of potential concern above 50% of the occupational exposure limit. All the chemicals detected can potentially have chronic health effects.										
Survey Date	Farm	Location	Agent	CAS	Air Conc	Air Conc UOM	% OEL	OEL	OEL UOM	
4/7/2009	AZ FARM	AZ101	Mercury	7439-97-6	0.068	mg/m3	274	0.025	mg/m3	
4/9/2009	AZ FARM	AZ101	Mercury	7439-97-6	0.118	mg/m3	473.2	0.025	mg/m3	
3/3/2008	BX FARM	BX104	Ammonia	7664-41-7	77.624	ppm	310.5	25	ppm	
3/3/2008	BX FARM	BX110	Ammonia	7664-41-7	26.37	ppm	105.5	25	ppm	
2/29/2008	BX FARM	BX104	Furan	110-00-9	8.542	ppb	854.2	1	ppb	
3/3/2008	BX FARM	BX104	Mercury	7439-97-6	0.028	mg/m3	111.7	0.025	mg/m3	
3/3/2008	BX FARM	BX106	Mercury	7439-97-6	0.02	mg/m3	80.8	0.025	mg/m3	
2/26/2008	BX FARM	BX103	N-Nitrosodimethylamine	62-75-9	0.2	ppb	66.5	0.3	ppb	
4/8/2008	BY FARM	BY108	1,3-Butadiene	106-99-0	3.383	ppm	338.3	1	ppm	
6/29/2009	BY FARM	BY104	N-Nitrosodimethylamine	62-75-9	0.675	ppb	224.9	0.3	ppb	
10/25/2005	C FARM	C103	2-Propenyl acetate	591-87-7	400	ppb	800	50	ppm	
10/25/2005	C FARM	C103	2-Propenyl acetate	591-87-7	320	ppb	640	50	ppm	
10/25/2005	C FARM	C103	2-Propenyl acetate	591-87-7	460	ppb	920	50	ppm	
10/25/2005	C FARM	C103	2-Propenyl acetate	591-87-7	420	ppb	840	50	ppm	
10/25/2005	C FARM	C103	3-Buten-2-one	78-94-4	0.23	ppm	115	0.2	ppm	
10/25/2005	C FARM	C103	3-Buten-2-one	78-94-4	0.16	ppm	80	0.2	ppm	
10/25/2005	C FARM	C103	3-Buten-2-one	78-94-4	0.13	ppm	65	0.2	ppm	
10/25/2005	C FARM	C103	3-Buten-2-one	78-94-4	0.12	ppm	60	0.2	ppm	
3/3/2006	C FARM	C107	Ammonia	7664-41-7	18.232	ppm	72.9	25	ppm	
4/11/2006	C FARM	C103	Ammonia	7664-41-7	24.158	ppm	96.6	25	ppm	
4/20/2006	C FARM	C104	Ammonia	7664-41-7	14.227	ppm	56.9	25	ppm	
12/22/2006	C FARM	C108	Ammonia	7664-41-7	25.476	ppm	101.9	25	ppm	
12/22/2006	C FARM	C108	Ammonia	7664-41-7	34.694	ppm	138.8	25	ppm	
1/25/2007	C FARM	C108	Ammonia	7664-41-7	46.701	ppm	186.8	25	ppm	
1/25/2007	C FARM	C108	Ammonia	7664-41-7	48.319	ppm	193.3	25	ppm	
2/2/2009	C FARM	C110	Ammonia	7664-41-7	127.618	ppm	510.5	25	ppm	
2/2/2009	C FARM	C110	Ammonia	7664-41-7	119.594	ppm	478.4	25	ppm	

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Survey Date	Farm	Location	Agent	CAS	Air Conc	Air Conc UOM	% OEL	OEL	OEL UOM
2/12/2009	C FARM	C110	Ammonia	7664-41-7	123.257	ppm	493	25	ppm
2/2/2009	C FARM	C110	Furan	110-00-9	31.455	ppb	3145.5	1	ppb
2/2/2009	C FARM	C110	Furan	110-00-9	25.687	ppb	2568.7	1	ppb
5/12/2006	C FARM	C201	Mercury	7439-97-6	0.014	mg/m3	57.3	0.025	mg/m3
5/15/2006	C FARM	C202	Mercury	7439-97-6	0.086	mg/m3	342.7	0.025	mg/m3
8/15/2007	C FARM	C202	Mercury	7439-97-6	0.035	mg/m3	140.5	0.025	mg/m3
2/12/2009	C FARM	C110	Mercury	7439-97-6	0.056	mg/m3	223.8	0.025	mg/m3
11/6/2005	C FARM	C103	n-Nitrosodiethylamine	55-18-5	0.092	ppb	91.8	0.1	ppb
4/27/2006	C FARM	C104	N-Nitrosodimethylamine	62-75-9	0.234	ppb	77.9	0.3	ppb
5/12/2008	C FARM	C104	N-Nitrosodimethylamine	62-75-9	1.288	ppb	429.4	0.3	ppb
10/25/2005	C FARM	C103	Nitrous Oxide	10024-97-2	63	ppm	126	50	ppm
10/25/2005	C FARM	C103	Nitrous Oxide	10024-97-2	55	ppm	110	50	ppm
10/25/2005	C FARM	C103	Nitrous Oxide	10024-97-2	85	ppm	170	50	ppm
10/25/2005	C FARM	C103	Nitrous Oxide	10024-97-2	82	ppm	164	50	ppm
3/3/2006	C FARM	C107	Nitrous Oxide	10024-97-2	61.5	ppm	123	50	ppm
4/11/2006	C FARM	C103	Nitrous Oxide	10024-97-2	87.2	ppm	174.4	50	ppm
4/11/2006	C FARM	C103	Nitrous Oxide	10024-97-2	106.3	ppm	212.6	50	ppm
10/12/2005	S FARM	S101	Ammonia	7664-41-7	464.016	ppm	1856.1	25	ppm
10/12/2005	S FARM	S102	Ammonia	7664-41-7	398.94	ppm	1595.8	25	ppm
10/12/2005	S FARM	S103	Ammonia	7664-41-7	46.329	ppm	185.3	25	ppm
10/20/2005	S FARM	S106	Ammonia	7664-41-7	13.496	ppm	54	25	ppm
8/17/2006	S FARM	S101	Ammonia	7664-41-7	47.726	ppm	190.9	25	ppm
8/23/2006	S FARM	S102	Ammonia	7664-41-7	36.266	ppm	145.1	25	ppm
1/18/2007	S FARM	S102	Ammonia	7664-41-7	19.327	ppm	77.3	25	ppm
3/7/2007	S FARM	S102	Ammonia	7664-41-7	41.414	ppm	165.7	25	ppm
3/7/2007	S FARM	S102	Ammonia	7664-41-7	21.464	ppm	85.9	25	ppm
10/12/2005	S FARM	S101	N-Nitrosodimethylamine	62-75-9	1.1	ppb	366.7	0.3	ppb

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Tank or Tank Farm where source air samples showed chemicals of potential concern above 50% of the occupational exposure limit. All the chemicals detected can potentially have chronic health effects.										
Survey Date	Farm	Location	Agent	CAS	Air Conc	Air Conc UOM	% OEL	OEL	OEL UOM	
10/12/2005	S FARM	S102	N-Nitrosodimethylamine	62-75-9	0.77	ppb	256.7	0.3	ppb	
10/12/2005	S FARM	S103	N-Nitrosodimethylamine	62-75-9	1.139	ppb	379.8	0.3	ppb	
10/20/2005	S FARM	S106	N-Nitrosodimethylamine	62-75-9	0.749	ppb	249.8	0.3	ppb	
8/9/2006	S FARM	S110	N-Nitrosodimethylamine	62-75-9	2.959	ppb	986.5	0.3	ppb	
8/15/2006	S FARM	S107	N-Nitrosodimethylamine	62-75-9	1.81	ppb	603.4	0.3	ppb	
8/15/2006	S FARM	S108	N-Nitrosodimethylamine	62-75-9	1.033	ppb	344.3	0.3	ppb	
8/15/2006	S FARM	S109	N-Nitrosodimethylamine	62-75-9	1.497	ppb	499	0.3	ppb	
8/15/2006	S FARM	S106	N-Nitrosodimethylamine	62-75-9	0.571	ppb	190.2	0.3	ppb	
8/17/2006	S FARM	S101	N-Nitrosodimethylamine	62-75-9	1.389	ppb	463	0.3	ppb	
8/23/2006	S FARM	S102	N-Nitrosodimethylamine	62-75-9	0.282	ppb	93.9	0.3	ppb	
1/18/2007	S FARM	S102	N-Nitrosodimethylamine	62-75-9	0.913	ppb	304.4	0.3	ppb	
3/7/2007	S FARM	S102	N-Nitrosodimethylamine	62-75-9	2.64	ppb	880.1	0.3	ppb	
3/7/2007	S FARM	S102	N-Nitrosodimethylamine	62-75-9	1.876	ppb	625.2	0.3	ppb	
6/23/2005	S FARM	S102	Nitrous Oxide	10024-97-2	47	ppm	94	50	ppm	
6/23/2005	S FARM	S102	Nitrous Oxide	10024-97-2	36	ppm	72	50	ppm	
8/11/2005	S FARM	S102	Nitrous Oxide	10024-97-2	29	ppm	58	50	ppm	
8/11/2005	S FARM	S102	Nitrous Oxide	10024-97-2	29	ppm	58	50	ppm	
10/12/2005	S FARM	S101	Nitrous Oxide	10024-97-2	62	ppm	124	50	ppm	
10/12/2005	S FARM	S102	Nitrous Oxide	10024-97-2	86	ppm	172	50	ppm	
8/9/2006	S FARM	S110	Nitrous Oxide	10024-97-2	34.2	ppm	68.4	50	ppm	
8/17/2006	S FARM	S101	Nitrous Oxide	10024-97-2	45.7	ppm	91.4	50	ppm	
8/23/2006	S FARM	S102	Nitrous Oxide	10024-97-2	34.6	ppm	69.2	50	ppm	
8/4/2006	SX FARM	SX105	Ammonia	7664-41-7	51.401	ppm	205.6	25	ppm	
8/5/2006	SX FARM	SX104	Ammonia	7664-41-7	46.67	ppm	186.7	25	ppm	
8/7/2006	SX FARM	SX103	Ammonia	7664-41-7	77.081	ppm	308.3	25	ppm	
8/5/2006	SX FARM	SX104	N-Nitrosodimethylamine	62-75-9	0.537	ppb	179	0.3	ppb	
8/7/2006	SX FARM	SX102	N-Nitrosodimethylamine	62-75-9	2.319	ppb	773	0.3	ppb	

Tank or Tank Farm where source air samples showed chemicals of potential concern above 50% of the occupational exposure limit. All the chemicals detected can potentially have chronic health effects.										
Survey Date	Farm	Location	Agent	CAS	Air Conc	Air Conc UOM	% OEL	OEL	OEL UOM	
8/7/2006	SX FARM	SX103	N-Nitrosodimethylamine	62-75-9	3.856	ppb	1285.2	0.3	ppb	
8/9/2006	SX FARM	SX105	N-Nitrosodimethylamine	62-75-9	0.746	ppb	248.7	0.3	ppb	
7/26/2006	SX FARM	SX115	Nitrous Oxide	10024-97-2	37.69	ppm	75.4	50	ppm	
8/7/2006	SX FARM	SX103	Nitrous Oxide	10024-97-2	53.1	ppm	106.2	50	ppm	
5/9/2006	SY FARM	PRIMARY EXHAUSTER	Ammonia	7664-41-7	13.323	ppm	53.3	25	ppm	
5/23/2006	SY FARM	PRIMARY EXHAUSTER	Ammonia	7664-41-7	30.259	ppm	121	25	ppm	
3/4/2007	SY FARM	PRIMARY EXHAUSTER	Ammonia	7664-41-7	39.301	ppm	157.2	25	ppm	
4/28/2005	SY FARM	PRIMARY EXHAUSTER	N-Nitrosodimethylamine	62-75-9	2.18	ppb	726.7	0.3	ppb	
5/9/2006	SY FARM	PRIMARY EXHAUSTER	N-Nitrosodimethylamine	62-75-9	1.423	ppb	474.4	0.3	ppb	
5/23/2006	SY FARM	PRIMARY EXHAUSTER	N-Nitrosodimethylamine	62-75-9	0.926	ppb	308.5	0.3	ppb	
8/23/2006	SY FARM	PRIMARY EXHAUSTER	N-Nitrosodimethylamine	62-75-9	0.536	ppb	178.8	0.3	ppb	
3/4/2007	SY FARM	PRIMARY EXHAUSTER	N-Nitrosodimethylamine	62-75-9	0.537	ppb	178.9	0.3	ppb	
3/15/2007	T FARM	T112	N-Nitrosodimethylamine	62-75-9	0.328	ppb	109.4	0.3	ppb	
6/7/2007	TX FARM	TX109	Ammonia	7664-41-7	21.672	ppm	86.7	25	ppm	
6/11/2007	TX FARM	TX107	N-Nitrosodimethylamine	62-75-9	0.438	ppb	146.1	0.3	ppb	
6/11/2007	TX FARM	TX118	N-Nitrosodimethylamine	62-75-9	0.197	ppb	65.8	0.3	ppb	
6/21/2007	TX FARM	TX109	N-Nitrosodimethylamine	62-75-9	6.493	ppb	2164.3	0.3	ppb	
4/4/2007	U FARM	U109	Ammonia	7664-41-7	21.857	ppm	87.4	25	ppm	
4/12/2007	U FARM	U109	N-Nitrosodimethylamine	62-75-9	8.547	ppb	2849.1	0.3	ppb	