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REGULATORY RECLASSIFICATION OF PFAS COULD BE A BRAC-BREAKER*

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I. Introduction

The Base Realignment and Closure (BRAC) process represents a powerful mechanism for leaders in both the executive and legislative branches of government to shape the military instrument of national power.[1] By their nature, BRAC decisions enable strategic military goals and have critical impacts on military operations and capabilities.[2] These decisions are also politically sensitive and highly contentious in part because of the perception that closing or realigning military installations

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1 *See* CHRISTOPHER T. MANN, CONG. RSCH. SERV., R45705, BASE CLOSURE AND REALIGNMENT (BRAC): BACKGROUND AND ISSUES FOR CONGRESS 1-2 (2019).

2 *See, e.g.,* Adam Smith & Christopher Preble, *Another BRAC Now*, 12 STRATEGIC. STUD. Q. 3, 5-6 (2018); Frederico Bartels, *A New Defense Strategy Requires a New Round of BRAC*, 13 STRATEGIC. STUD. Q. 73, 88 (2019); Kevin L. Parker, *Thinking Differently About Air Bases: Evolving with the Evolving Strategic Environment*, 33 AIR & SPACE POWER J. 52, 52 (2019).

will bring economic devastation to nearby communities.[3] Over several iterations, the BRAC process has evolved into the primary method for the DoD to right-size its domestic infrastructure, avoiding enormous maintenance costs at outdated facilities so that it can focus resources on its next potential wartime conflict.[4] But there are two parts of this bargain: in exchange for being able to reduce its maintenance costs and shed unnecessary infrastructure, the BRAC process expects the DoD to transfer this property into private ownership as quickly as possible.[5] The BRAC authorities even provide the DoD with the unique ability to transfer excess property to non-federal recipients at no cost, with the expectation that the property will be quickly redeveloped and jobs will be created.[6] One simply cannot think about BRAC without also thinking about the DoD's mandate to support the rapid economic development of transferred properties.

With varying degrees of success, the DoD has long sought to balance this mandate for rapid economic development against its legal obligation to address environmental contamination on properties that are slated for transfer under BRAC.[7] Unfortunately, an emerging environmental issue threatens to dramatically upset this balance by not only disrupting pending and future BRAC transfers, but also forcing the DoD to revisit prior BRAC transfers. Chemicals known as PFAS are now known to contaminate a growing list of 687 current and former installations.[8] The DoD is "still in the early phases of investigating PFAS" releases that span six decades.[9] Official cost estimates of remediating this contamination currently "exceed" $2 billion,[10] but these estimates are almost meaningless. They are based on conservative fiscal assumptions that only quantify cleanup costs when they become both "probable and reasonably estimable."[11] In

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[3] *See* Richard A. Wegman & Harold G. Bailey, Jr., *The Challenge of Cleaning Up Military Wastes When U.S. Bases are Closed*, 21 ECOLOGY L. Q. 865, 868-69 (1994); Bartels, *supra* note 2, at 76.
[4] *See* MANN, *supra* note 1, at 1-5.
[5] *See* MANN, *supra* note 1, at 5.
[6] MANN, *supra* note 1, at 7.
[7] *See* Wegman & Bailey, *supra* note 3, at 911-23; U.S. GOV'T ACCOUNTABILITY OFF., GAO-17-151, MILITARY BASE REALIGNMENTS AND CLOSURES: DOD HAS IMPROVED ENVIRONMENTAL CLEANUP REPORTING BUT SHOULD OBTAIN AND SHARE MORE INFORMATION 23 (2017) [hereinafter GAO-17-151].
[8] U.S. GOV'T ACCOUNTABILITY OFF., GAO-21-421, FIREFIGHTING FOAM CHEMICALS: DOD IS INVESTIGATING PFAS AND RESPONDING TO CONTAMINATION, BUT SHOULD REPORT MORE COST INFORMATION 12-13 (2021) [hereinafter GAO-21-421].
[9] *Id.* at 21 tbl.1, n."c".
[10] *Defense Environmental Restoration: Hearing Before House Appropriations Subcomm. on Def.,* 117th Cong. 6 (2022) (statement of Richard Kidd, Deputy Assistant Sec'y of Def. for Env't & Energy Resilience) [hereinafter Kidd 2022].
[11] GAO-21-421, *supra* note 8, at 21-22.

reality, DoD's potential liability is much greater than these estimates suggest.[12] In none of the 687 cases has DoD yet quantified the cost of long-term cleanup actions; rather, DoD has only quantified the cost of initial site assessments and, in 78 cases, the cost of studying the feasibility of various cleanup options.[13] The DoD's efforts to understand the true extent of PFAS contamination are further complicated by the fact that the majority of its former installations long ago transferred into non-federal ownership as part of the BRAC process, and have been subsequently redeveloped into a wide variety of private land uses.[14] Department of Defense officials have testified that "it will be years before we fully define the problem and decades before it is completely cleaned up."[15]

Meanwhile, as the DoD struggles to answer basic questions about the size and extent of its PFAS contamination problem, the EPA is poised to fundamentally alter the existing regulatory framework upon which DoD's plans and modest cost estimates are based. These proposed regulatory changes would classify some or all PFAS chemicals as "hazardous substances" under applicable federal law.[16] Congressional testimony by DoD officials has strongly suggested that such a designation is unnecessary because the DoD already has the legal authority to remediate PFAS contamination at its current and former bases.[17] However, many communities and state regulators are dissatisfied with the scope and pace of the DoD's PFAS response to date. Although PFAS contamination presents several interrelated challenges that the DoD will need to work through in the coming decades, this article focuses specifically on the potential for regulatory reclassification of PFAS to expand the DoD's liability to clean up contaminated properties while simultaneously disrupting past, pending, and future BRAC property transfers.

In the face of great factual and regulatory uncertainty, this article aims to help the DoD's environmental and real property managers prepare for the implications of EPA's proposed regulatory changes. Department of

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[12] GAO-21-421, *supra* note 8, at 20.
[13] GAO-21-421, *supra* note 8, at 15 fig.4.
[14] *See* MANN, *supra* note 1, at 6 fig.1.
[15] Kidd 2022, *supra* note 10.
[16] Designation of Perfluorooctanoic Acid (PFOA) and Perfluorooctanesulfonic Acid (PFOS) as CERCLA Hazardous Substances, 87 Fed. Reg. 54415 (Sept. 6, 2022) (to be codified at 40 C.F.R. § 302.4).
[17] *Remediation and Impact of PFAS: Hearing Before House Appropriations Subcom. on Mil. Const., Veterans Aff., and Related Agencies*, 117th Cong. 2 (2021) (statement of Paul Cramer, Principal Deputy of the Assistant Sec'y of Def. for Sustainment) [hereinafter Cramer]; *Addressing the Legacy of Dep't of Def. Use of PFAS - Protecting Our Communities and Implementing Reform: Hearing Before House Armed Services Subcomm. on Readiness*, 116th Cong. 2-3 (2020) (statement of Maureen Sullivan, Deputy Assistant Sec'y of Def. for Environment) [hereinafter Sullivan].

Defense practitioners require an objective answer to the following research question: "What impact, if any, would regulatory reclassification of PFAS have on DoD's real property remediation and disposal programs?" This article explores the scientific, legal, and regulatory driving forces that will shape the DoD's future response to PFAS contamination. Using the scenario planning methodology to explore the three most likely outcomes of EPA's proposed regulatory changes, this article maintains a particular focus on the impact to past, pending, and future BRAC property transfers. It explores the unique challenges that arise from remediating former military property that has already transferred into non-federal ownership and been redeveloped into private residences, businesses, and industrial uses. It considers the possibility that the proposed regulatory changes may ultimately require the DoD to seek enormous supplemental appropriations to pay for its increased liability, especially its liability to remediate PFAS contamination at these BRAC properties that have already been redeveloped. While the human health benefits of the proposed regulatory changes may ultimately outweigh these potential direct and indirect costs, it is nonetheless worthwhile for DoD managers to understand the full implications of what EPA has proposed.

II. Background: Driving Forces

There are numerous driving forces behind the DoD's emerging PFAS contamination problem. The following section seeks to explain the growing body of scientific research alongside the multifaceted statutory and regulatory frameworks that determine the DoD's responsibilities in both remediating contamination and transferring excess BRAC property to non-federal owners. As discussed below, these driving forces are interrelated, complex, and still evolving.

A. Overview of Proposed Regulatory Change

In recent years, a surge of momentum has formed behind an effort to designate some or all PFAS chemicals as hazardous substances under federal environmental law. For instance, the House of Representatives has passed several bills that would require the EPA to make this designation, although none ultimately have become law.[18] Simultaneously, for the past

[18] DAVID M BEARDEN ET AL., CONG. RSCH. SERV., R45986, FEDERAL ROLE IN RESPONDING TO POTENTIAL RISKS OF PER- AND POLYFLUOROALKYL SUBSTANCES *(PFAS)* 34-51 (2019).

three years, the EPA has sought public input as it considered more discretionary regulatory pathways to make the hazardous substance designation.[19] The 2020 campaign of President Biden explicitly favored a hazardous substance designation.[20] Consistent with this policy position, in October 2021, the EPA publicized a PFAS strategic roadmap document that outlines various "commitments" that it makes to addressing PFAS in the coming two years.[21] This roadmap includes the EPA's "commitment" to designate two specific PFAS chemicals (known as PFOA and PFOS, which will be discussed below) as hazardous substances through a formal rulemaking process.[22] The EPA took the first step toward fulfilling this commitment by issuing a proposed rule in September 2022, with a final rule expected in summer 2023.[23] In addition to designating two specific types of PFAS as hazardous, the EPA also plans to issue advance rulemaking notice of its intent to designate other types of PFAS as hazardous.[24] Presumably, these other types of PFAS could become designated as hazardous at some future date. Designation as a hazardous substance under this regulatory pathway requires EPA to conclude that "when released into the environment, [PFAS] may present a substantial danger to public health or welfare or the environment."[25] It is important to note that none of these designations will be legally effective until the respective rulemaking processes have been finalized and survive any potential legal challenges.[26]

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[19] *Id.* at 6.

[20] John Gardella, *PFAS Under Biden Administration – Change Is Coming*, 10 NAT'L. L. REV. 1, 1-4 (2020).

[21] U.S ENV'T PROT. AGENCY, PFAS STRATEGIC ROADMAP: EPA'S COMMITMENTS TO ACTION 2021-2024 (2021) [hereinafter EPA STRATEGIC ROADMAP].

[22] *Id.* at 17.

[23] *Id.;* Designation of Perfluorooctanoic Acid (PFOA) and Perfluorooctanesulfonic Acid (PFOS) as CERCLA Hazardous Substances, 87 Fed. Reg. 54415 (Sept. 6, 2022) (to be codified at 40 C.F.R. § 302.4).

[24] EPA STRATEGIC ROADMAP, *supra* note 21, at 17.

[25] Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Pub. L. No. 96-510, §102(a), 94 Stat. 2767 (1980) (codified as amended at 42 U.S.C. §§ 9601-9675).

[26] For instance, courts have found that diphacinone did not qualify as a hazardous substance under CERCLA even though it was argued that EPA planned to list it in the future. *See* Hassayampa Steering Comm. v. Arizona, No. 89-16715, 1991 U.S. App. LEXIS 19727, at *4-5 (9th Cir. Aug. 16, 1991).

B. Overview of PFAS

1. History and Applications

The history of PFAS shares similarities with many other synthetic chemicals that were introduced into widespread use before a full scientific understanding of their environmental and human health effects had been attained. The first PFAS chemicals were invented in the 1930s, and quickly became renowned for repelling water and oil, resisting adhesion, and reducing friction.[27] In turn, these characteristics led to PFAS being used for a wide variety of commercial and industrial purposes.[28] For instance, in the 1940s, PFAS were introduced in non-stick coatings, such as popular cooking products.[29] In the 1950s, these uses expanded to include numerous stain- and water-resistant products, including carpets, food containers, and waterproof fabrics and leathers.[30] The widespread adoption of products containing PFAS has not relented, and today such products can be found in retail stores and restaurants across America.

Until 1967, the U.S. military had not played a significant role in the history or development of PFAS. But in that year, while engaged in combat operations in the Gulf of Tonkin during the Vietnam War, the aircraft carrier USS *Forrestal* was devastated by a petroleum-based fire that killed 134 sailors and injured 161 more.[31] This tragic event prompted DoD to seek more effective firefighting technologies.[32] Soon thereafter, firefighting foams containing PFAS were developed through a partnership between DoD and the 3M Corporation.[33] These foams have come to be known as aqueous film forming foams (AFFF).[34] It is the unique heat-resistant qualities of PFAS that make AFFFs especially effective at both extinguishing petroleum-based fires and preventing them from reigniting.[35] As opposed to some other uses of PFAS, the deployment of

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[27] INTERSTATE TECH. & REG. COUNCIL, HISTORY AND USE OF PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS) 1 (2020).
[28] *Id.* at 2.
[29] *Id.*
[30] *Id.*
[31] GAO-21-421, *supra* note 8, at 1.
[32] GAO-21-421, *supra* note 8, at 1.
[33] GAO-21-421, *supra* note 8, at 1; Mike Hughlett, *Firefighting Foam Trials Present Next BigPFAS Challenge for 3M,* STAR TRIBUNE (Oct. 1, 2022, 8:00 AM), https://www.startribune.com/3m-faces-next-pfas-hurdle-bellwether-cases-regarding-firefighting-foam/600211948.
[34] U.S. DEP'T OF DEF., DEPARTMENT OF DEFENSE REMEDIATION PLAN FOR CLEANUP OF WATER IMPACTED WITH PERFLUOROOCTANE SULFONATE OR PERFLUOROOCTANOIC ACID 1 (2020) (hereinafter DOD REMEDIATION PLAN).
[35] GAO-21-421, *supra* note 8, at 1.

AFFF often provides PFAS with a direct entry point into the environment because the foams come into contact with both soil and groundwater.[36] Fifty years after their military introduction, AFFFs (and thereby PFAS) have now been used extensively, both in training and emergency operations, across all military services for decades.[37] In fact, the DoD continues to use AFFFs to this day, viewing them as mission-critical lifesaving tools because of their firefighting effectiveness.[38] The DoD has recently curtailed the use of AFFF in training, but continues using AFFF for emergency fire suppression while simultaneously seeking to develop alternatives.[39]

In addition to DoD's widespread use of PFAS through AFFF, there are other noteworthy military uses of PFAS that bear further examination. For instance, PFAS have been used in fire-resistant aviation hydraulic fluids, which can be released during routine maintenance activities as well as mechanical malfunctions and accidents.[40] Similarly, PFAS have been found in numerous types of industrial equipment used by the military, including automotive, aerospace, and aviation systems.[41]

To date, the DoD's investigations have focused almost exclusively on past releases of PFAS through AFFF. However, a recent report from the DoD Inspector General found that the DoD may be ignoring other important sources of PFAS releases.[42] The report cites one such example at Camp Grayling, Michigan, where there were no known historical releases of AFFF in the area.[43] Nonetheless, Camp Grayling tested for high levels of PFAS contamination in its groundwater.[44] Investigation ultimately identified a suspected source location that indicated the release occurred near a station that was used for washing equipment, including military vehicles.[45] The report suggests that examples like Camp Grayling could prove to be far more widespread than currently known, especially because DoD's investigation of PFAS contamination has, to date, been

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[36] U.S. DEP'T OF DEF., OFF. OF INSPECTOR GEN., NO. DODIG-2021-105, EVALUATION OF THE DEPARTMENT OF DEFENSE'S ACTIONS TO CONTROL CONTAMINANT EFFECTS FROM PERFLUOROALKYL AND POLYFLUOROALKYL SUBSTANCES AT DEPARTMENT OF DEFENSE INSTALLATIONS 2 (2021) (hereinafter DOD IG REPORT).
[37] GAO-21-421, *supra* note 8, at 1, 29.
[38] U.S. DEP'T OF DEF., PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS) TASK FORCE, PROGRESS REPORT 3 (2020).
[39] *Id*.
[40] DOD IG REPORT, *supra* note 36, at 30.
[41] *See* INTERSTATE TECH. & REG. COUNCIL, *supra* note 27, at 1.
[42] DOD IG REPORT, *supra* note 36, at 28.
[43] DOD IG REPORT, *supra* note 36, at 31.
[44] DOD IG REPORT, *supra* note 36, at 31.
[45] DOD IG REPORT, *supra* note 36, at 31.

narrowly focused on AFFF releases.[46] As a result, the DoD may be significantly undercounting the actual number of PFAS releases and affected installations.

2. Environmental and Human Health Concerns

Although there are many different types of PFAS chemicals, it is their common characteristics that make these chemicals problematic for the environment, wildlife, and humans. EPA estimates that the PFAS family of chemicals includes more than 1,200 unique compounds that share similar chemical structures.[47] With so many variations, it is not surprising that the scientific understanding of many of these chemicals is still developing.[48] Some of the most manufactured and, to date, most studied of these chemicals are known as perfluorooctanoate (PFOA) and perfluorooctane sulfonate (PFOS).[49] Studies of PFAS have concluded that, to varying degrees, these chemicals tend to bio-accumulate in organisms and demonstrate long-term persistence in the environment.[50] It is this lack of degradation over time that has earned PFAS the nickname "forever chemicals."[51]

According to EPA, human exposure to certain types of PFAS (most notably PFOA and PFOS) can lead to negative health effects.[52] In tests of laboratory animals, PFOA and PFOS were found to cause tumors, damage reproductive systems, inhibit developmental processes, impair liver and kidney functions, and cause various other immunological effects.[53] Human epidemiological studies indicate similar but more limited findings.[54] EPA has not, to date, designated any types of PFAS chemicals as known or suspected carcinogens, though it is closely monitoring ongoing scientific studies.[55]

The risk that PFAS poses to humans depends significantly upon possible exposure pathways. While drinking water presents one of the most common exposure pathways for humans, it is not the only one.

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[46] DOD IG REPORT, *supra* note 36, at 31.
[47] U.S. ENV'T PROT. AGENCY, EPA'S PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS) ACTION PLAN 12 (2019) [hereinafter PFAS ACTION PLAN].
[48] *See id.* at 13.
[49] BEARDEN ET AL., *supra* note 18, at 3-4.
[50] BEARDEN ET AL., *supra* note 18, at 4.
[51] BEARDEN ET AL., *supra* note 18, at 4.
[52] PFAS ACTION PLAN, *supra* note 47, at 13.
[53] PFAS ACTION PLAN, *supra* note 47, at 13.
[54] PFAS ACTION PLAN, *supra* note 47, at 13.
[55] PFAS ACTION PLAN, *supra* note 47, at 32-33.

Scientific research on this subject is still ongoing, but other common exposure pathways appear to be human ingestion of PFAS-contaminated food, inhalation of PFAS-contaminated dust and air, and dermal contact with PFAS-contaminated substances.[56] Also, PFAS have been detected in plant root structures, agricultural crops, and also higher up the food chain, in meat and dairy products.[57] At a minimum, these studies suggest that remediation actions focused exclusively on treating human drinking water are unlikely to address all potential human exposure pathways.

3. PFAS Migration and Remediation

The current scientific understanding of PFAS migration processes and available remediation technologies are serious concerns for environmental managers. Recent studies indicate that it can take several decades for PFAS to migrate from contaminated soil into groundwater.[58] Studies of AFFF releases have also concluded that PFAS soil contamination is often orders of magnitude higher than the resulting concentration of PFAS that migrates into groundwater.[59] In addition, because of the complex and inter-connected qualities of natural groundwater systems, PFAS migration into groundwater can make it extremely difficult for scientists to determine original contamination points, and discrete groundwater plumes can be detected as far as six miles away from the point at which PFAS were originally discharged.[60] These findings suggest that narrowly focused groundwater treatment strategies may be inadequate to achieve lasting results because treatment of the symptom (groundwater contamination) does not address the root cause (soil contamination). In fact, the presently known state of PFAS contamination could conceivably become more dire as previously unmigrated PFAS begins to migrate into water sources in the coming decades. In light of these incredibly long lag times, high concentrations in soil, and difficulty in determining original PFAS contamination points, the remediation of PFAS has been described as

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[56] Elsie M. Sunderland et al., *A Review of the Pathways of Human Exposure to Poly- and Perfluoroalkyl Substances (PFASs) and Present Understanding of Health Effects*, 29 J. EXPOSURE SCI. & ENV'T EPIDEMIOLOGY 131, 133-36 (2018).
[57] *Id.* at 136.
[58] Bo Guo et al., *A Mathematical Model for the Release, Transport, and Retention of Per- and Polyfluoroalkyl Substances (PFAS) in the Vadose Zone*, WATER RES. RSCH., Feb. 2020, at 1, 10.
[59] *Id.*
[60] Adam Baas et al., *The Use of PFAS at Industrial and Military Facilities: Technical, Regulatory, and Legal Issues*, 49 ENV'T L. REP. NEWS & ANALYSIS 10109, 10117 (2019).

particularly challenging.[61] Scientists note that PFAS soil treatment strategies are still in the very early stages of development, which will require significant amounts of additional time, research, and field validation in the future.[62]

4. Initial Regulatory Response

Despite growing public concern and a mounting body of scientific evidence indicating that PFAS cause negative human health effects, to date EPA has not issued enforceable limits on PFAS in drinking water.[63] The closest EPA has come to nationwide regulation was its issuance in May 2016 of a non-enforceable drinking water health advisory issued pursuant to the Safe Drinking Water Act (SDWA).[64] This advisory recommended PFOA and PFOS drinking water limits of 70 parts per trillion (PPT).[65] Recently, in June 2022, EPA issued an updated drinking water advisory that recommends dramatically reduced PFOA limits of 0.004 PPT and PFOS limits of 0.02 PPT.[66] These levels are far lower than previous levels. It is also noteworthy that this advisory expanded the types of subject PFAS chemicals to include not just PFOA and PFOS, but also types of PFAS chemicals known as GenX chemicals and perfluorobutane sulfonic acid (PFBS).[67]As will be discussed below, the DoD has historically given tremendous weight to these (non-enforceable) numbers: they have been the dispositive threshold that the DoD uses to determine whether remediation actions are needed at installations contaminated by PFAS.[68]

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[61] Reza Mahinroosta & Lalantha Senevirathna, *A Review of the Emerging Treatment Technologies for PFAS Contaminated Soils*, 255 J. ENV'T MGMT. 109896, 109896 (2020).
[62] Ramona Darlington et al., *The Challenges of PFAS Remediation*, MIL. ENG'R, Jan.-Feb. 2018, at 58, 59-60.
[63] BEARDEN ET AL., *supra* note 18, at 5.
[64] BEARDEN ET AL., *supra* note 18, at 15. It is worth noting that, pursuant to the SDWA, EPA has issued administrative orders against three current or former DoD installations due to high levels of PFOA and PFOS contamination in human drinking water. U.S. GOV'T ACCOUNTABILITY OFF., GAO-18-78, DRINKING WATER: DOD HAS ACTED ON SOME EMERGING CONTAMINANTS BUT SHOULD IMPROVE INTERNAL REPORTING ON REGULATORY COMPLIANCE 20 tbl.3 (2017). These orders were based on specific factual scenarios and do not set nationwide precedent.
[65] BEARDEN ET AL., *supra* note 18, at 15.
[66] U.S. ENV'T PROT. AGENCY, OFF. OF WATER, ADVISORY 822-F-22-002, TECHNICAL FACT SHEET: DRINKING WATER HEALTH ADVISORIES FOR FOUR PFAS (PFOA, PFOS, GENX CHEMICALS, AND PFBS) 4 (2022) [hereinafter EPA 2022 DRINKING WATER HEALTH ADVISORY].
[67] *Id.* at 1.
[68] DOD REMEDIATION PLAN, *supra* note 34, at 4; GAO-21-421, *supra* note 8, at 16.

C. Overview of CERCLA

The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended, is the seminal legal authority that governs DoD's responsibility to remediate environmental contamination.[69] Further, CERCLA overlaps and interacts with other environmental statutes as well, most notably the Resource Conservation and Recovery Act (RCRA).[70] However, the DoD "prefers to follow" CERCLA as its primary framework for environmental remediation, aiming to satisfy compliance obligations with overlapping statutes through the CERCLA framework.[71] Befitting a complicated but exceptionally important statute like CERCLA, the text of the law and its regulations are also interpreted by a large body of caselaw that has arisen from numerous lawsuits involving CERCLA.[72] As will be discussed below, CERCLA contains numerous authorities, obligations, definitions, and distinctions that are of critical importance in understanding the applicable regulatory treatment of PFAS.[73] In addition, some sections of CERCLA that are specific to federal agencies control relevant aspects of the DoD's real property management functions, including the transfer and disposal of excess real property under BRAC.[74]

1. Section 104: Voluntary Response Authority

Section 104 of CERCLA grants the president broad voluntary authority to respond to environmental contamination across the country. In turn, this authority has been delegated chiefly to the EPA, but also to the DoD in cases where contamination results from a release at a military facility or from a military vessel.[75] Although the EPA has an important

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[69] *Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and Federal Facilities*, U.S. ENV'T PROT. AGENCY (Mar. 28, 2022), https://www.epa.gov/enforcement/comprehensive-environmental-response-compensation-and-liability-act-cercla-and-federal.

[70] 42 U.S.C. §§ 6901-6992.

[71] U.S. DEP'T OF DEF., 4715.20, DEFENSE ENVIRONMENTAL RESTORATION PROGRAM (DERP) MANAGEMENT encl.3, para. 4(a)(1)(b)(2) (9 Mar. 2012) (C1, 31 Aug. 2018).

[72] PETER L. GRAY, THE SUPERFUND MANUAL: A PRACTITIONER'S GUIDE TO CERCLA LITIGATION 1 (2017).

[73] *See generally id.* at 1-30.

[74] John F. Seymour, *Transfer of Federal Lands: Compliance with Section 120(H) of the Comprehensive Environmental Response, Compensation, and Liability Act*, 27 COLUM. J. ENV'T L. 173, 177 (2002).

[75] GRAY, *supra* note 72, at 2. Executive Order 12580 delegates to the secretary of defense response authority under CERCLA section 104 "where either the release is on or the sole

role to play in certain response actions under CERCLA section 104, this presidential delegation of authority means that the DoD, rather than the EPA, has been the lead agency in responding to PFAS contamination on current and former military installations.[76] As discussed below, however, this voluntary response authority is also limited by significant distinctions that CERCLA draws between different categories of substances.

The primary limitation on the DoD's voluntary response authority arises from CERCLA's vastly different treatment of "hazardous substances" and "pollutants or contaminants."[77] These terms are not interchangeable. The EPA maintains a finite list of hazardous substances that have been so designated either through statute or a regulatory process.[78] To date, no PFAS have been designated as hazardous substances.[79] In opposition to the relatively clear-cut list of hazardous substances, CERCLA defines a "pollutant or contaminant" far more loosely to mean "any element, substance, compound, or mixture, including disease-causing agents, which after release into the environment . . . may reasonably be anticipated to cause death, disease, behavioral abnormalities, cancer, genetic mutation, physiological malfunctions . . . or physical deformations."[80] Importantly, however, the mere presence of a "pollutant or contaminant" is not sufficient to justify the use of section 104 response authority.[81] Instead, the release of such pollutant or contaminant must also "present an imminent and substantial danger to the public health or welfare."[82]

This inflexible "imminent and substantial danger" requirement that CERCLA section 104 imposes on pollutants or contaminants stands in stark contrast to its treatment of hazardous substances, the mere presence of which justifies voluntary response actions.[83] Accordingly, the DoD can be understood to possess voluntary response authority whenever it releases a hazardous substance.[84] But it does not possess voluntary response authority whenever it releases a pollutant or contaminant; this authority is

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source of the release is from any facility or vessel under the jurisdiction, custody, or control" of the Department of Defense. Exec. Order No. 12,580 ¶ 2(e)(1), 3 C.F.R. 193 (1988).

[76] *See* BEARDEN ET AL., *supra* note 18, at 20.

[77] *See* GRAY, *supra* note 72, at 9-10.

[78] 40 C.F.R. § 302.4 (2022).

[79] U.S. ENV'T PROT. AGENCY, PFAS ACTION PLAN: PROGRAM UPDATE 9 (2020).

[80] 42 U.S.C. § 9601(33) (2012). It is worth noting that releases of petroleum products are categorically excluded from section 104. GRAY, *supra* note 72, at 10.

[81] GRAY, *supra* note 72, at 10.

[82] 42 U.S.C. § 9604(a)(1) (2012).

[83] GRAY, *supra* note 72, at 9-10.

[84] *See* GRAY, *supra* note 72, at 9-10.

limited to situations where the release "present[s] an imminent and substantial danger to the public health or welfare."[85] It is worth noting that voluntary response authority is always permissive in nature.[86] Other sections of CERCLA may compel action, but the DoD has no affirmative obligation under section 104 to undertake any cleanup actions, even when the contamination may satisfy the imminent endangerment requirement.[87]

Although it is not required, the DoD gives tremendous weight to EPA's non-enforceable PFAS drinking water advisory standards that were mentioned in the previous section.[88] More specifically, using the CERCLA section 104 voluntary response authority framework, the DoD has historically determined that PFOA and PFOS (but not other types of PFAS) are pollutants or contaminants that present an imminent and substantial danger to the public health or welfare when they are present in human drinking water above the 70 PPT threshold.[89] As will be discussed later, all significant DoD actions under CERCLA section 104 have, to date, been contingent on these conditions. Stated differently, the DoD has not considered PFOA or PFOS contamination to satisfy the imminent endangerment requirement under section 104 in cases where: (1) PFOA or PFOS contaminate only soil, (2) PFOA or PFOS contaminate groundwater sources that are not used for human drinking water,[90] and/or (3) PFOA or PFOS contaminate drinking water below the (previous) 70 PPT threshold.[91] The DoD has viewed these scenarios as outside the limits of its authority under CERCLA section 104 because of the lacking imminent endangerment.[92] It remains to be seen whether the DoD will consider the EPA's June 2022 PFAS drinking water advisory limits in the same fashion as the prior health advisories.[93] If so, then future use of the DoD's

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[85] GRAY, *supra* note 72, at 10.
[86] *See* BEARDEN ET AL., *supra* note 18, at 25.
[87] BEARDEN ET AL., *supra* note 18, at 25 (discussing a Senate-passed bill (S. 1790), which ultimately failed to become law, but that would have amended DoD's authorities to compel response whenever DoD releases a hazardous substance, pollutant, or contaminant).
[88] DOD REMEDIATION PLAN, *supra* note 34, at 4.
[89] DOD REMEDIATION PLAN, *supra* note 34, at 4; GAO-21-421, *supra* note 8, at 18.
[90] GAO-21-421, *supra* note 8, at 18. DoD has generally not addressed drinking water when levels were below EPA's previous recommended advisory threshold of 70 PPT in human drinking water. *Defense Environmental Restoration: Hearing Before the House Appropriations Subcomm. on Def.,* 117th Cong. 6 (2021) (statement of Mark Correll, Deputy Assistant Sec'y of the Air Force for Env't, Safety and Infrastructure) [hereinafter Correll].
[91] DOD REMEDIATION PLAN, *supra* note 34, at 4; Letter from Suzanne Bilbrey, Director, USAF Env't. Dir., to State of N.M. Ground Water Quality Bureau 2 (Jan. 10, 2019) [hereinafter Bilbrey NOV Response Letter].
[92] Bilbrey NOV Response Letter, *supra* note 91, at 2.
[93] *See* EPA 2022 DRINKING WATER HEALTH ADVISORY, *supra* note 66, at 1.

voluntary response authority will be satisfied whenever DoD's activities can be attributed to human drinking water contamination that exceeds 0.004 PPT for PFOA, 0.02 PPT for PFOS, 10 PPT for GenX Chemicals, and 2,000 PPT for PFBS.[94]

Once the statutory prerequisites for voluntary response authority have been satisfied, the DoD does not then have unlimited discretion to carry out cleanup actions however it sees fit. Rather, any cleanup actions must conform with standards set forth in EPA-promulgated regulations known as the National Contingency Plan (NCP).[95] More details about the NCP are contained below in the discussion of CERCLA section 121. The NCP contains a mechanism to prioritize the most hazardous sites in the United States, known as the National Priorities List (NPL), which is administered by EPA.[96] There are more than 1,300 individual sites listed on the NPL, of which approximately 140 are managed by the DoD.[97] The inclusion of a DoD installation on the NPL carries great significance because it gives EPA decision-making authority over the selection of remedial actions at such facilities, although the responsibility to carry out these actions remains with the DoD.[98] It is worth noting that, to date, no DoD installations have been added to the NPL based on PFAS contamination alone, because the system that the EPA uses to determine inclusion on the NPL focuses on hazardous substances.[99] Even in cases where a contaminated DoD facility is not listed on the NPL, however, the DoD is nonetheless required to consult with the affected state government before selecting remedial actions.[100] In addition, DoD cleanup actions at non-NPL facilities generally must achieve state cleanup standards.[101]

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[94] *See* EPA 2022 DRINKING WATER HEALTH ADVISORY, *supra* note 66, at 1.
[95] GRAY, *supra* note 72, at 13.
[96] DAVID M. BEARDEN, CONG. RSCH. SERV., R41039, COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT: A SUMMARY OF SUPERFUND CLEANUP AUTHORITIES AND RELATED PROVISIONS OF THE ACT 7 (2012).
[97] *Superfund: National Priorities List (NPL),* U.S. ENV'T PROT. AGENCY (Mar. 11, 2022), https://www.epa.gov/superfund/superfund-national-priorities-list-npl; *National Priorities List (NPL) Sites – by State*, U.S. ENV'T PROT. AGENCY (July 13, 2022), https://www.epa.gov/superfund/national-priorities-list-npl-sites-state.
[98] *See* 42 U.S.C. § 9620(e)(4)(A).
[99] *See* BEARDEN, *supra* note 96, at 6; Carly Johnson, *How the Safe Drinking Water Act and the Comprehensive Environmental Response, Compensation, and Liability Act Fail Emerging Contaminants: A Per- and Polyfluoroalkyl Substances (PFAS) Case Study*, 42 MITCHELL HAMLINE L. J. PUB. POL'Y & PRAC. 91, 108 (2020).
[100] BEARDEN, *supra* note 96, at 30-31.
[101] BEARDEN, *supra* note 96, at 30-31; *see* Letter from Stephen G. Termaath, Chief, BRAC Prog. Mgmt. Div., to State of Mich. Water Res. Div. 3-4 (Dec. 7, 2018) [hereinafter Termaath NOV Response Letter].

2. Section 106: Involuntary Abatement

Under CERCLA, the EPA (for releases on land), the U.S. Coast Guard (for releases in rivers and coastal waters), and states are empowered to serve as their own principal regulators.[102] This regulatory enforcement power is perhaps greater under CERCLA than any other environmental statute.[103] Regulators are authorized to issue administrative abatement orders, which are backed by hefty fines that can accumulate daily, in cases where the release of a hazardous substance (not pollutant or contaminant) poses "an imminent and substantial endangerment to the public health or welfare *or the environment*."[104] In practice, this regulatory authority is normally exercised after the polluter(s) have been requested to voluntarily undertake necessary response actions.[105] In cases where such voluntary compliance is achieved, regulators will enter into voluntary settlement agreements, known as consent orders, with the polluter(s).[106] In cases where polluter(s) do not voluntarily agree to undertake cleanup actions, the regulators can use their involuntary abatement authority under section 106 to compel abatement actions.[107]

Following initial confusion on the subject, amendments to CERCLA specifically made clear that federal agencies and military services are subject to CERCLA's involuntary abatement provisions to the same extent as private entities.[108] Therefore, as part of their enforcement powers, states, EPA, and U.S. Coast Guard (USCG) are authorized to collect information from, and inspect, DoD facilities.[109] In addition, with the concurrence of the U.S. attorney general, federal regulators can issue administrative abatement orders to the DoD and enter into settlement agreements for abatement actions involving hazardous substances.[110]

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[102] BEARDEN, *supra* note 96, at 22.
[103] LEE M. THOMAS & COURTNEY M. PRICE, GUIDANCE MEMORANDUM ON THE USE AND ISSUANCE OF ADMINISTRATIVE ORDERS UNDER SECTION 106 1 (1986) [hereinafter EPA MEMORANDUM].
[104] 42 U.S.C. § 9606(a) (emphasis added).
[105] EPA MEMORANDUM, *supra* note 103, at 2-3.
[106] EPA MEMORANDUM, *supra* note 103, at 2-4.
[107] EPA MEMORANDUM, *supra* note 103, at 2-4.
[108] *Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and Federal Facilities*, U.S. ENV'T PROT. AGENCY (Mar. 28, 2022), https://www.epa.gov/enforcement/comprehensive-environmental-response-compensation-and-liability-act-cercla-and-federal.
[109] *See id.*
[110] *See id.*

3. Section 107: Liability

Section 107 is arguably the most important section of CERCLA because it sets forth the financial obligation of "potentially responsible parties" (PRPs) to pay the costs associated with any cleanup actions that are required under CERCLA.[111] When financial liability attaches under CERCLA, it is the broadest possible liability allowed under the law.[112] This liability has been clarified by applicable caselaw to be "strict," "retroactive," and "joint and several."[113] According to the legal concept of strict liability, PRPs can be held liable even in cases where they did not behave negligently or contravene applicable restrictions.[114] Retroactive liability can be understood to make PRPs liable for releases that occurred prior to CERCLA's enactment in 1980.[115] Finally, joint and several liability can make any one of multiple PRPs independently liable for the full cost of remediating a given site, even if that PRP was only responsible for a fraction of the contamination.[116] The expansiveness of section 107 liability is virtually unprecedented in American law.

Because this incredibly broad financial liability attaches to any person or entity that is identified to be a PRP, classification as a PRP carries great legal significance. With limited exceptions, CERCLA defines PRPs to broadly include both current and former "owner[s] and operator[s] of [any] vessel or a facility . . . at which . . . hazardous substances were disposed of."[117] Surprisingly, however, the manufacture of hazardous substances does not, in itself, give rise to liability as a PRP.[118] This limitation means that the users of products containing hazardous substances generally cannot seek contribution from the manufacturer of such products under section 107.

It is noteworthy that CERCLA section 107 allows for great flexibility in who can assert liability against PRPs. The EPA is authorized to directly recover cleanup costs from PRPs as well as enter into voluntary settlement agreements, which can be enticing to PRPs because settlement can save extensive litigation costs.[119] In addition, states, Indian tribes, and the PRPs

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[111] BEARDEN, *supra* note 96, at 12.
[112] BEARDEN, *supra* note 96, at 13.
[113] BEARDEN, *supra* note 96, at 13.
[114] BEARDEN, *supra* note 96, at 13.
[115] BEARDEN, *supra* note 96, at 13.
[116] BEARDEN, *supra* note 96, at 13 (noting, however, that in such cases, the PRP being saddled with disproportionate liability can seek contribution from other PRPs through separate actions).
[117] 42 U.S.C. § 9607(a); BEARDEN, *supra* note 96, at 13.
[118] *See* 42 U.S.C. § 9607(a); BEARDEN ET AL., *supra* note 18, at 23.
[119] BEARDEN, *supra* note 96, at 23.

themselves can seek to recover cleanup costs from other PRPs.[120] Finally, the subsequent owner(s) of property that is later discovered to be contaminated can also impose cleanup liability on their PRP predecessors.[121] The clear intent of CERCLA's design was to give immediate cleanup the highest priority and urgency while simultaneously giving regulators and subsequent property owners tremendous leverage—even if it has the potential to be unfair—in forcing PRPs to fund the cleanup.[122]

The critical distinction between hazardous substances and pollutants or contaminants in CERCLA once again carries great significance, as it is a dispositive factor in determining liability under section 107. Liability under section 107 hinges on whether the release in question was of a hazardous substance.[123] If so, then the owner at the time of the release is a PRP, and therefore subject to (potentially) full cleanup cost liability under section 107.[124] Importantly, however, section 107 liability does not attach to releases of pollutants or contaminants.[125] In addition, section 107 liability attaches to all releases of hazardous substances regardless of whether there is any imminent endangerment to public health or the environment.[126]

4. Section 120(h): Real Property Transfer Requirements

Prior to transferring excess real property to non-federal owners, CERCLA generally requires the DoD to remediate any hazardous substances (not pollutants or contaminants) necessary to protect human health and the environment.[127] This statutory requirement is echoed in DoD policy.[128] Although CERCLA does not specify criteria for determining which remediations are necessary, the EPA sometimes reviews DoD determinations about necessary remediations prior to the transfer of large military facilities.[129] Long-term remedial actions can take

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[120] BEARDEN, *supra* note 96, at 23.
[121] *See* Bethlehem Iron Works, Inc. v. Lewis Industries, Inc., 891 F. Supp. 221 (E.D. Pa. 1995).
[122] *See* BEARDEN, *supra* note 96, at 25-27.
[123] 42 U.S.C. § 9607(a)(2).
[124] BEARDEN, *supra* note 96, at 12-13.
[125] *See* 42 U.S.C. § 9607(a) (discussing only hazardous substances).
[126] *See id.*
[127] *See* Seymour, *supra* note 74, at 193-94.
[128] *See* U.S. DEP'T OF DEF., INSTR. 4165.72, REAL PROPERTY DISPOSAL encl. 2, para. E2.1.4(a) (21 Dec. 2007) (C2 31 Aug. 2018).
[129] Seymour, *supra* note 74, at 194 n.67.

decades depending on numerous factors specific to each contaminated parcel, including: the nature and extent of contamination, available cleanup technologies, and the amount of funding that has been appropriated by Congress.[130] Because of unexpectedly long delays to the transfer of excess properties after CERCLA's enactment, Congress later amended the law to create two primary tools designed to alleviate these transfer delays.[131] The first allows for the DoD to "parcelize" contaminated properties so that the clean portions can be transferred while cleanup activities continue on the remaining portions.[132] The second allows for the transfer of some properties prior to the completion of all cleanup activities if, and only if, certain restrictive conditions are met.[133] In practice, the conditions imposed on these so-called "early transfers" can be highly cumbersome, which significantly limits DoD's use of the authority.[134] In addition, early transfers cannot occur in cases where cleanup actions are needed to protect public health.[135]

Section 120(h) also provides explicit clarity about the continuing liability of the United States in cases where hazardous substances (not pollutants or contaminants) are discovered after transfer has occurred. This continuing liability is consistent with the broad concept of strict, retroactive, joint and several liability under section 107. Section 120(h) requires each deed of conveyance to a non-federal owner to include a covenant warranting that remediation of hazardous substances (not pollutants or contaminants) "found to be necessary after the date of . . . transfer [will] be conducted by the United States."[136] Deeds are also required to provide the United States with continuing rights of access to all former federal property for the limited purpose of conducting cleanup actions found to be necessary after transfer.[137]

Despite the clear continuing liability language in section 120(h), as well as the covenant language that is required to be inserted into individual deeds of conveyance, some DoD policy documents use more limited language to describe the DoD's obligation to clean up the contamination of hazardous substances discovered after transfer. For instance, the DoD's

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[130] BEARDEN, *supra* note 96, at 33; Seymour, *supra* note 74, at 207.
[131] BEARDEN, *supra* note 96, at 32-33.
[132] BEARDEN, *supra* note 96, at 32-33.
[133] BEARDEN, *supra* note 96, at 32-33. This authority is commonly referred to as "early transfer" authority even though the statute does not use this term.
[134] *See* DAVID M. BEARDEN, CONG. RSCH. SERV., RS22065, MILITARY BASE CLOSURES: ROLE AND COSTS OF ENVIRONMENTAL CLEANUP 2 (2006).
[135] BEARDEN, *supra* note 96, at 33.
[136] 42 U.S.C. § 9620(h)(3)(A)(ii)(II); BEARDEN, *supra* note 96, at 32; Seymour, *supra* note 74, at 204-06.
[137] Seymour, *supra* note 74, at 206-07.

Defense Environmental Restoration Program (DERP) Management policy states that the DoD "may" conduct post-transfer cleanup actions if it is determined that "[a]pplicable statutory or regulatory requirements have changed and must be applied to the property."[138] This more discretionary "may" also appears in U.S. Navy policy.[139]

Although there is no direct precedent on point, there is little doubt that designation of a new hazardous substance that had not been so designated at the time of transfer would nonetheless still trigger CERCLA's broad conception of liability.[140] Neither section 120(h) nor any other part of CERCLA contains language indicating that the list of hazardous substances that may require post-transfer cleanup is frozen in time on the date of transfer; on the contrary, section 107 liability is stubbornly retroactive.[141] In the decades prior to CERCLA's enactment, for instance, federal law designated no hazardous substances, and the United States made no continuing liability covenants in its deeds. Nonetheless, section 107 has been interpreted to make the United States unambiguously liable for the cleanup of these subsequently designated hazardous substances.[142] Therefore, the DoD's curious characterization of continuing liability as being discretionary does not appear to be consistent with the text of CERCLA or its caselaw.[143]

5. Section 121: Cleanup Standards

For a statute that has the potential to impose such great financial liability and disrupt the transfer of excess federal property under BRAC, it is perhaps surprising that CERCLA does not require uniform cleanup standards. In fact, both the types of cleanup actions required and the stringency of such actions can vary widely from site to site, even for similar levels of the same contaminants.[144] As mentioned previously,

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[138] U.S. DEP'T OF DEF., 4715.20, DEFENSE ENVIRONMENTAL RESTORATION PROGRAM MANAGEMENT encl. 3, para. 10(c)(3)(a)(4) (9 Mar. 2012) (C1 31 Aug. 2018).
[139] U.S. DEP'T OF NAVY, ENVIRONMENTAL RESTORATION PROGRAM MANUAL para. 14-2 (2018).
[140] *See* Michael Heard Snow, *Too Little, Too Late: Congress's Attempt to Regulate Forever Chemicals Through Military Appropriations*, 45 WM. & MARY ENV'T. L. & POL'Y REV. 277, 307-08 (2020).
[141] BEARDEN, *supra* note 96, at 13.
[142] *See* BEARDEN, *supra* note 96, at 13.
[143] *See* Patrick J. Paul, *PFAS Gaining Legislative and Regulatory Traction*, NAT. RES. & ENV'T., Spring 2020, at 55-56; John L. Ropiequet, *Environmental Law Litigation Under CERCLA*, 47 AMER. JURIS. TRIALS § 11 (2021).
[144] BEARDEN, *supra* note 96, at 10.

cleanup actions generally must be consistent with the EPA-promulgated NCP. However, neither the statute nor the NCP require a specific cleanup level associated with individual hazardous substances, pollutants, or contaminants.[145] Instead, these authorities require simply that cleanup actions comply with "applicable or relevant and appropriate . . . requirement[s]" (ARARs) that will assure protection of human health and the environment.[146] These ARARs provide regulators and PRPs with a surprising amount of elasticity in determining which cleanup actions (if any) are necessary at a given site.[147] For instance, they normally incorporate state laws and regulations as well as any overarching federal environmental laws and regulations.[148] Because CERCLA does not impose its own standards, the ARAR concept can be viewed as a loosely defined "umbrella" requirement that incorporates by reference a virtually unlimited range of other state and federal authorities.[149]

The single most significant driver of ARAR selection—and therefore the ultimate cleanup remedy selection—is the anticipated future land use of a contaminated property.[150] In practice, it is a property's anticipated land use that most strongly influences both the degree of cleanup necessary and the types of cleanup actions that could achieve such cleanup levels.[151] For instance, regulators generally require far more stringent and costly cleanup actions when the anticipated future use of a property is residential because of the associated risks to residents who, by nature of living and recreating on the property, have greater exposure.[152] In contrast, commercial and industrial uses frequently require less stringent (and less costly) cleanup actions, in part because land use controls (such as deed restrictions) can be used to prohibit activities that are deemed unsafe, such as residential uses and drinking water extraction.[153] On this point, the EPA has issued guidance for how regulators can consider the anticipated future land use in determining whether various remedies will achieve the desired cleanup standards at specific sites.[154] This guidance advises regulators to

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[145] *See* BEARDEN, *supra* note 96, at 10.
[146] 42 U.S.C. § 9621(d)(2)(A).
[147] BEARDEN, *supra* note 96, at 10.
[148] BEARDEN, *supra* note 96, at 10.
[149] BEARDEN, *supra* note 96, at 10.
[150] BEARDEN, *supra* note 134, at 2.
[151] BEARDEN, *supra* note 134, at 2.
[152] BEARDEN, *supra* note 134, at 2.
[153] BEARDEN, *supra* note 134, at 2.
[154] Memorandum from Elliott P. Laws, Assistant Administrator, Solid, Waste, and Emergency Response, U.S. Env't Prot. Agency to Regional Directors 4-8 (May 25, 1995).

discuss potential land uses with local officials, city planning departments, and the public as early as possible in the CERCLA process.[155]

The anticipated land use at the time that an excess property is transferred out of federal ownership carries long-term significance. As discussed above regarding section 120(h), the DoD has continuing liability in cases where hazardous substances (not pollutants or contaminants) are discovered after transfer has occurred. However, in such cases, the DoD's obligation is limited to only those standards (ARARs) that are applicable to the land use that was anticipated at the time of transfer.[156] For example, if the transferee of a former DoD property now intends to use it for residential purposes, even though the DoD was originally only required to clean the property to industrial standards, the identification of additional contamination after transfer does not then require the DoD to clean the property to residential standards.[157] In that case, the DoD would only be required to achieve industrial cleanup standards.[158] In other words, any costs required to make property suitable for a different land use than was originally required of the DoD are borne by the transferee.[159] This limitation prevents transferees from upgrading their given land use any time additional hazardous substances are discovered that require DoD response.[160]

The universe of potential ARARs that could affect the DoD's remediation of PFAS is rapidly expanding as states promulgate wide-ranging standards that are intended to fill the void of enforceable federal standards. Many states have already promulgated regulations that are equally as stringent as the EPA's pre-June 2022 advisory limit of 70 PPT for PFOA and PFOS in human drinking water.[161] Other states have promulgated more restrictive standards for human drinking water.[162] Still others have expanded the types of regulated PFAS chemicals beyond just PFOA and PFOS.[163] In light of the EPA's June 2022 health advisory, it is likely that many states will adopt the EPA recommended limits as enforceable standards. Doing so would not only expand the universe of regulated PFAS chemicals to include GenX and PFBS, but it would also

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[155] *See id.* at 4-5.
[156] BEARDEN, *supra* note 134, at 3-4.
[157] BEARDEN, *supra* note 134, at 3-4.
[158] BEARDEN, *supra* note 134, at 3-4.
[159] BEARDEN, *supra* note 134, at 4.
[160] *See* BEARDEN, *supra* note 134, at 3-4.
[161] Jennifer Black et al., *Perfluoroalkyl and Polyfluoroalkyl Substances: Using Law and Policy to Address These Environmental Health Hazards in the United States*, 31 HEALTH MATRIX: J. L.-MED. 341, 363-64 (2021).
[162] *Id.*
[163] *Id.*

impose a far more restrictive limit for PFOA (0.004 PPT) and PFOS (0.02 PPT) than existed previously.

A particularly noteworthy trend is that an increasing number of states have promulgated enforceable PFAS limits not only for human drinking water, but also for groundwater and even soil and air.[164] This expansion of regulated media appears to track the evolving scientific understanding of potential human exposure to include pathways beyond simply drinking water.[165] As the human health effects of PFAS become better understood over time, many observers believe that a flood of state PFAS regulation is inevitable.[166] All of these state-based regulations could become important drivers of DoD's cleanup obligations if they are considered to be ARARs under CERCLA.[167]

6. Funding Cleanup Actions

Although CERCLA contains authorities and imposes financial liabilities for required cleanup actions, the law does not provide a source of funds that is available to the DoD outside of its normal appropriations.[168] Many people are familiar with CERCLA because of its creation of the so-called "Superfund." While this is a source of funds that can be used to pay for cleanup actions in certain circumstances, it is generally not available to federal agencies.[169] In addition, although Congress has created a Judgment Fund that is available to pay for litigated claims against the United States, this fund is not available to federal agencies in cases where Congress has otherwise provided separate appropriations for that purpose.[170] The Department of Justice has also recently restricted the use of the Judgment Fund to exclude cases where a final sum certain dollar amount has not been determined.[171] This restriction particularly impacts CERCLA litigation because of the numerous factual unknowns that can take years or decades to resolve in such cases.[172] Because of the above, DoD's cleanup actions must generally

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[164] *Id.* at 365.
[165] *See id.*
[166] *See id.* at 367.
[167] *See id.* at 368.
[168] BEARDEN, *supra* note 96, at 1.
[169] BEARDEN, *supra* note 96, at 1.
[170] BEARDEN, *supra* note 96, at 28.
[171] Memorandum from Claire McCusker Murray, Principal Deputy Associate Attorney General, U.S. Dep't of Just., to Env't & Nat. Res. Div. 1 (Mar. 5, 2020).
[172] Sylvia Carignan & Ellen M. Gilmer, *Superfund Cleanup Deals Could Get Trickier After Federal Memo*, BLOOMBERG LAW (Sep. 17, 2020, 6:00 AM), https://news.bloomberglaw

be paid out of its own appropriated DERP accounts (for active installations) and BRAC accounts (for former installations).[173]

7. Overview of DoD Response Actions to Date

The DoD has been commended for following non-enforceable EPA guidance, but at the same time, it has also been criticized for taking a measured approach in responding to PFAS.[174] Because no PFAS have yet been designated as hazardous substances, the DoD's only effective option under CERCLA has been to use its voluntary response authority to respond to releases of PFAS that it determines satisfy section 104's imminent endangerment requirement for pollutants or contaminants. As mentioned above, DoD actions have been consistent with EPA's pre-June 2022 guidance that only views limited categories of PFAS (namely PFOA and PFOS) as pollutants or contaminants that present an imminent endangerment to public health (and this only when they exceed the threshold of 70 PPT in human drinking water).[175] In such cases, the DoD has taken immediate steps to protect public health, such as providing affected persons with "bottled water, installing drinking water treatment systems, and connecting [nearby residents to municipal water systems instead of wells]."[176] The DoD has generally not taken response actions for contamination that is either below the 70 PPT threshold or not present in human drinking water.[177]

Despite spending approximately $1.1 billion through the end of fiscal year 2020, the DoD still has an incomplete picture of the extent of PFAS contamination on its current and former installations.[178] As mentioned above, the DoD's investigations have largely focused on known or suspected releases of AFFF.[179] The most recent publicly available data indicates that the "DoD has identified 687 . . . installations with known or

.com/environment-and-energy/superfund-cleanup-deals-could-get-trickier-after-federal-memo.

[173] BEARDEN, *supra* note 96, at 31.

[174] *See*, *e.g.*, GENNA REED ET AL., UNION OF CONCERNED SCIENTISTS, A TOXIC THREAT: GOVERNMENT MUST ACT NOW ON PFAS CONTAMINATION AT MILITARY BASES 1-8 (2018).

[175] *See* DOD REMEDIATION PLAN, *supra* note 34, at 4. It remains to be seen whether DoD will consider EPA's June 2022 PFAS drinking water advisory limits in the same fashion as the prior health advisories.

[176] GAO 21-421, *supra* note 834, at 17.

[177] GAO 21-421, *supra* note 834, at 18.

[178] GAO 21-421, *supra* note 834, at 20

[179] DOD IG REPORT, *supra* note 36, at 28.

suspected releases [of AFFF]."[180] Of these, 108 are former installations that were closed under the BRAC process.[181] Department of Defense officials have testified that they cannot yet prioritize any of these former installations because an insufficient number have been adequately tested.[182] Initial site inspections are not expected to be completed until the end of 2023.[183] Consequently, the DoD's factual understanding of the extent of PFAS contamination remains in a constant state of flux, and its list of contaminated sites continues to grow almost every month. In addition, because the DoD's focus has been on AFFF rather than other potential sources of PFAS contamination, it is likely to identify additional contaminated sites in the future.[184]

The DoD's PFAS response has been privileged to enjoy the limited regulatory oversight that comes with exercising voluntary response authority under CERCLA section 104 for pollutants or contaminants. Several states and non-governmental organizations have expressed displeasure with the pace and limited scope of DoD's voluntary response actions.[185] In some cases, states have even attempted to enforce more restrictive state laws and regulations against the DoD in an effort to compel response actions that are both more accelerated and broader in scope. For example, in October 2018, the State of Michigan issued a notice of violation (NOV) to the Air Force for PFAS contamination at the former Wurtsmith Air Force Base (AFB), which Michigan viewed as a violation of state law that required immediate action.[186] The Air Force disputed the violation for the primary reason that the federal government is "immune under CERCLA from a state enforcing a requirement related to substances that are not CERCLA hazardous substances."[187] Similarly, the State of New Mexico issued a NOV to the Air Force in November 2018 based on PFAS contamination at Cannon AFB, which the state viewed as a violation of state law requiring immediate action. The Air Force once again disputed the violation, arguing that it is not subject to state regulation because PFAS are pollutants or contaminants under CERCLA rather than hazardous

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[180] GAO-21-421, *supra* note 834, at 12.
[181] GAO-21-421, *supra* note 834, at 13 fig.3.
[182] *See Remediation and Impact of PFAS: Hearing Before House Appropriations Subcom. on Mil. Const., Veterans Aff., and Related Agencies*, 117th Cong. 2 (2021) (statement of Paul Cramer, Principal Deputy Assistant Sec'y of Def. for Sustainment) [hereinafter Cramer].
[183] *Id.*
[184] DOD IG REPORT, *supra* note 36, at 28.
[185] *See, e.g.,* REED ET AL., *supra* note 174, at 1-8.
[186] Termaath NOV Response Letter, *supra* note 101, at 1-6.
[187] Termaath NOV Response Letter, *supra* note 101, at 4.

substances.[188] In March 2019, the State of New Mexico sued the Air Force in litigation that remains ongoing.[189] In an opposition brief, the Air Force highlighted that its voluntary response authority under CERCLA section 104 protects it from interference by state regulators in part because PFAS are not designated as hazardous substances under CERCLA.[190]

At the same time that the DoD has taken this hardline posture against state regulators attempting to alter its voluntary response under CERCLA section 104, the DoD has presented itself in a somewhat different light to Congress and members of the public. For instance, a DoD official recently testified before Congress that "DoD . . . is specifically authorized under CERCLA Section 104 to take cleanup action to address 'pollutants or contaminants' like PFAS. The DoD is thus taking cleanup actions, *even though* PFAS are not designated as a CERCLA hazardous substance."[191] This language is consistent with other official DoD testimony before Congress[192] as well as other public statements.[193] It conspicuously fails to mention the limited scope of PFAS releases that DoD considers to satisfy the imminent endangerment requirement that section 104 places on pollutants or contaminants, or that CERCLA does not impose such a requirement on hazardous substances. Perhaps more importantly, it also strongly suggests that a decision to designate some or all PFAS as hazardous substances may be unnecessary and unimpactful.

D. Overview of BRAC

At the end of the Cold War, Congress designed an orderly process to help it make difficult base closure decisions with a focus on military mission requirements rather than politics. The hallmark of this process is

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[188] Bilbrey NOV Response Letter, *supra* note 91, at 2.
[189] Complaint, State of N.M. v. United States, No. 1:19-cv-00178-LF-KBM, 2019 WL 1065864 (D.N.M. Mar. 5, 2019).
[190] Brief in Opposition to Plaintiff's Motion for Preliminary Injunction at 20, State of N.M. v. United States, No. 1:19-cv-00178-MV-JFR, 2019 WL 6605644 (D.N.M. Sept. 7, 2019).
[191] *Remediation and Impact of PFAS: Hearing Before House Appropriations Subcom. on Mil. Const., Veterans Aff., and Related Agencies*, 117th Cong. 3 (2021) (statement of Richard Kidd, Deputy Assistant Sec'y of Def. for Env't & Energy Resilience) (emphasis added).
[192] *Addressing the Legacy of Dep't of Def. Use of PFAS - Protecting Our Communities and Implementing Reform: Hearing Before House Armed Servs. Subcomm. on Readiness*, 116th Cong. 2-3 (2020) (statement of Maureen Sullivan, Deputy Assistant Sec'y of Def. for Env't) [hereinafter Sullivan].
[193] Paul Ney, *Keynote Address by the Honorable Paul Ney, General Counsel of the U.S. Department of Defense at the Charleston Law Review and the Riley Institute 12th Annual Law and Society Symposium*, 14 CHARLESTON L. REV. 425, 433 (2020).

that the executive and legislative branches jointly appoint an independent blue-ribbon commission of experts who are given evaluation criteria to make DoD-wide basing recommendations.[194] Following open hearings, public comment, and data validation from the Government Accountability Office (GAO), these recommendations are then transmitted to Congress, which can either accept or reject the recommendations in their entirety.[195] Importantly, the recommendations cannot be amended by members of Congress, many of whose constituents may be directly impacted by any recommended base closures.[196] In addition, Congress has restricted the DoD's ability to close installations outside of the BRAC process.[197]

With regard to the aforementioned evaluation criteria, it is worth noting that BRAC Commissions have generally not considered environmental cleanup costs or timelines as part of their selection processes.[198] Though perhaps surprising on its face, this ignorance has in fact been quite deliberate. After all, CERCLA sections 107 and 120(h) impose incredibly broad liability for cleanup costs regardless of whether any particular base is closed under BRAC.[199] In addition, it is argued that considering cleanup costs would create a "perverse incentive" to favor the retention of contaminated installations and the disposal of uncontaminated installations.[200] GAO has largely agreed with this approach, in part because of the difficulty of estimating cleanup costs prior to the completion of investigative studies and plans.[201]

Over the course of five BRAC rounds between 1988 and 2005, the DoD has been directed to close 120 major installations, complete 79 major downsize actions (known as realignments), and perform 990 minor closures and realignments.[202] With heightened sensitivity to the potential for dire economic impacts that base closure and realignment actions can have on nearby communities,[203] Congress directed the DoD to operate on an expedited timeline, completing all BRAC real property disposal actions within a six-year implementation period.[204] The DoD was also given special legislative authority to transfer BRAC properties directly to local

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[194] *See* MANN, *supra* note 1, at 2-3.
[195] MANN, *supra* note 1, at 3.
[196] MANN, *supra* note 1, at 2-3.
[197] MANN, *supra* note 1, at 14..
[198] DEF. BASE CLOSURE AND REALIGNMENT COMM'N, 2005 DEFENSE BASE CLOSURE AND REALIGNMENT COMMISSION REPORT TO THE PRESIDENT 334 (2005).
[199] *See id.*
[200] *Id.*
[201] *See id.*
[202] GAO-17-151, *supra* note 7, at 5 tbl.1.
[203] *See* Wegman & Bailey, *supra* note 3, at 868-69.
[204] *See* MANN, *supra* note 1, at 3; GAO-17-151, *supra* note 7, at 5.

communities (not coincidentally named "economic development conveyances") at no cost so that these properties could be expeditiously redeveloped.[205] Under normal property disposal authorities, the United States requires transferees to pay fair market value for property, with limited exceptions.[206] The clear intent of Congress was to turn BRAC properties into economically productive (non-federal) uses as quickly as possible.

These economic development goals were further supported by a unique indemnity provision that Congress inserted into section 330 of the National Defense Authorization Act (NDAA) for Fiscal Year 1993.[207] This law aimed to provide reassurance to developers and other transferees of former BRAC property by requiring DoD to indemnify new BRAC property owners against claims from third parties for personal injury or property damage arising from DoD's release of any hazardous substance, pollutant, or contaminant.[208] This exceedingly rare instance of congressionally authorized indemnity can be viewed as a supplement to the DoD's traditional PRP liability under CERCLA. Section 330 expressly stated that indemnification shall not be construed as affecting or modifying in any way DoD's liability under CERCLA.[209] While the text of section 330 focuses on claims from third parties, applicable caselaw has clarified that a third party does not have to actually sue a BRAC transferee for the transferee to assert liability against the DoD under section 330.[210] In one case, a state regulator's mere threat of fining a BRAC transferee was held to satisfy section 330's requirements, with the end result being that the DoD was held liable for the BRAC transferee's expenses in remediating newly discovered asbestos contamination.[211] The transferees of former BRAC property thus enjoy multiple pathways to assert cleanup liability against the DoD; these include not only the traditional pathways under CERCLA sections 107 and 120(h), but also section 330 when transferees

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[205] MANN, *supra* note 1, at 7.

[206] CHUCK MASON, CONG. RSCH. SERV., R40476, BASE REALIGNMENT AND CLOSURE (BRAC): TRANSFER AND DISPOSAL OF MILITARY PROPERTY 5 (2013).

[207] Pub. L. No. 102-484, 106 Stat. 2315, 2371 (1992); 10 U.S.C. § 2687 note (Indemnification of Transferees of Closing Defense Property).

[208] *Id.*

[209] *Id.* § 330(e).

[210] *See* Richmond Am. Homes of Col., Inc. v. United States, 75 Fed. Cl. 376, 391 (2007) (holding that the threat of fines by a state regulator against a BRAC transferee satisfied the third party claim requirement of section 330); *see also* Indian Harbor Ins. Co. v. United States, 704 F.3d 949, 956 (Fed. Cir. 2013) (holding that expenditures associated with cleanup costs that a state regulator demanded of a BRAC transferee were recoverable under section 330).

[211] *See Richmond*, 75 Fed. Cl. at 391.

incur cleanup costs as a result of claims from third parties or demands from environmental regulators.[212]

Despite lofty expectations for the DoD to rapidly implement BRAC decisions, the BRAC authorities do not provide the DoD with any relief from the CERCLA requirements discussed above. In fact, CERCLA section 120(h)'s requirement to remediate hazardous substances (not pollutants or contaminates) prior to transfer has proven to be the primary reason that the DoD has failed to transfer a large number of BRAC properties (in many cases even several decades after the initial BRAC decision).[213] Of the approximately 388,000 acres of former base property designated for transfer over the five BRAC rounds, approximately 315,000 acres (81%) have been transferred out of DoD custody and control.[214] Approximately 73,000 acres (19%) remain to be transferred because of long-term environmental remediation actions that are still underway.[215] To be clear, these transfer delays existed long before the DoD's current PFAS problem became widely known, and they are largely caused by CERCLA's requirement to remediate hazardous substances (not pollutants or contaminants). Although PFAS have likely been released on many of these 73,000 acres, it is not the remediation of PFAS that have caused their delay.

There is no doubt that that many of the 315,000 acres that have already been transferred out of DoD ownership are, to varying degrees, contaminated with PFAS. In addition, pursuant to the clear intent of Congress, many of these properties have been subsequently redeveloped into a variety of (economically productive) industrial, commercial, and even residential uses by their new owners. At the time of transfer, the DoD had no reason to suspect that PFAS may later be designated as hazardous substances that it may be required to remediate. Thus, in many of these cases, the DoD is likely to have ensured the properties are safe for less restricted land uses, such as residential and recreational. Unfortunately, to date, the DoD's public release of data about PFAS contamination has been coarse rather than granular: it identifies contaminated former installations but does not contain any estimates of the acreage or land use of the contaminated individual parcels that make up these former installations. Moreover, the DoD's released data focuses almost exclusively on water

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[212] *See id.; see also* 32 C.F.R. § 175 (2022) (Indemnification or Defense, or Providing Notice to the Department of Defense, Relating to a Third-Party Environmental Claim).

[213] MANN, *supra* note 1, at 5-6. DoD's BRAC implementation policy echoes this requirement. U.S. DEP'T OF DEF., 4165.66-M, BASE REDEVELOPMENT AND REALIGNMENT MANUAL para. C8.5 (1 Mar. 2006) (C1, 31 Aug. 2018).

[214] MANN, *supra* note 1, at 41.

[215] *See* MANN, *supra* note 1, at 41.

contamination levels, providing very little information about soil contamination.

Despite lengthy delays to fully implementing past rounds of BRAC, numerous commentators have argued that BRAC is a necessary part of the United States' national defense strategy and urgently needs to be continued through future rounds.[216] The primary justification is that BRAC, by offloading of excess infrastructure, enables the DoD to realign its budget to reflect existing military needs over the ever-increasing maintenance costs of facilities that have outlived their useful lives.[217] The DoD estimates that the prior BRAC rounds continue to save it $11.9 billion in recurring annual savings,[218] although this number is disputed.[219] Realignment actions also help facilitate joint basing, which many view as an efficient way of pooling resources to reduce redundancy across the DoD enterprise.[220] In addition, the National Defense Strategy continues to suggest that the DoD should "work to reduce excess property and infrastructure, providing Congress with options for a [BRAC round]."[221]

III. Scenario Planning Methodology

The following sections aim to apply the scientific, legal, and regulatory driving forces discussed above to the three most likely scenarios that will occur as a result of the EPA's stated commitment to designate some or all PFAS chemicals as hazardous substances.[222] Scenario 1 preserves the status quo: the EPA ultimately fails to finalize its planned rulemaking process, which means no PFAS are designated as hazardous substances. In Scenario 2, the EPA is successful in designating PFOA and PFOS as hazardous substances. In Scenario 3, the EPA ultimately designates all PFAS (not just PFOA and PFOS) as hazardous substances. Each of these three scenarios is analyzed below, with a particular focus on the potential impact to DoD's real property remediation and disposal programs under BRAC.

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[216] *See*, *e.g.*, Smith & Preble, *supra* note 2, at 5-6; Bartels, *supra* note 2, at 88; Parker, *supra* note 2, at 52.
[217] Smith & Preble, *supra* note 2, at 5; David S. Sorenson, *More Military Base Closures? Considering the Alternatives*, 35 DEF. & SEC. ANALYSIS 23, 24 (2019).
[218] Bartels, *supra* note 2, at 84 fig.2.
[219] MANN, *supra* note 1, at 7.
[220] *See* MANN, *supra* note 1, at 8.
[221] *See*, *e.g.*, JAMES MATTIS, SUMMARY OF THE 2018 NATIONAL DEFENSE STRATEGY OF THE UNITED STATES OF AMERICA: SHARPENING THE AMERICAN MILITARY'S COMPETITIVE EDGE 10 (2018).
[222] EPA STRATEGIC ROADMAP, *supra* note 21, at 17.

The analysis for each of the scenarios considers the impact to a specific former installation, Wurtsmith AFB, Michigan, which was fully decommissioned pursuant to the 1991 BRAC round.[223] In total, the installation consisted of approximately 4,600 acres nestled between the shores of Lake Huron and the Huron-Manistee National Forests.[224] Nearly half of Wurtsmith's land was conveyed to the local airport authority, which today operates a public airport on the airfield and industrial areas.[225] The airport is home to numerous small businesses focused on aircraft maintenance, manufacturing, and other industrial services.[226] Another approximately 2,000 acres were conveyed to the local township through BRAC's economic development conveyance authority.[227] These areas include the base's 758 family housing units, which have been redeveloped and sold to private owners, in addition to the base's dormitory, which has been converted into 86 condominium units for seniors.[228] Along with this significant housing supply, Wurtsmith offers numerous amenities that have either been built or adapted from the former base's infrastructure, including a 50-acre outdoor sports complex, three churches, a live theater, a public library, a community college, a public hospital, and numerous small commercial businesses.[229] Approximately 274 acres of Wurtsmith remain untransferred due to ongoing environmental remediation actions that are unrelated to PFAS.[230] It also is worth noting that the EPA proposed adding Wurtsmith to the NPL in 1994, but this addition was never finalized.[231] Before its closure, Wurtsmith had fewer than 700 civilian jobs. Today, over 1,600 people work at the former installation.[232]

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[223] *Wurtsmith Air Force Base, Michigan Redevelopment Profile,* U.S. DEP'T OF DEF. OFF. OF LOCAL DEF. CMTY COOPERATION (Oct. 2020), https://oldcc.gov/project/wurtsmith-air-force-base-michigan-redevelopment-profile [hereinafter *Wurtsmith Profile*].
[224] *Id.*
[225] *Id.*
[226] *Id.*
[227] *Id.*
[228] *Id.*
[229] *Id.*
[230] DEP'T OF AIR FORCE, CIVIL ENG'G CTR, AIR FORCE BRAC PROGRAM SNAPSHOT: FORMER WURTSMITH AFB 1 (2018) [hereinafter WURTSMITH SNAPSHOT].
[231] *Wurtsmith Air Force Base, Oscoda, MI, Cleanup Progress*, U.S. ENV'T PROT. AGENCY, https://cumulis.epa.gov/supercpad/SiteProfiles/index.cfm?fuseaction=second.schedule&id=0503675 (last visited Dec. 22, 2022).
[232] *Wurtsmith Profile*, *supra* note 223.

Unfortunately, despite the above economic successes, all is not well at Wurtsmith. In 2010, sampling near one of Wurtsmith's former fire training areas revealed high levels of PFAS contamination in the groundwater.[233] Subsequent investigation has confirmed extensive PFAS contamination that extends well beyond the borders of the former base: measured plumes of PFAS-contaminated groundwater total at least eight square miles.[234] Drinking water tests in the area have shown PFOA and PFOS contamination levels as high as 2,923 PPT, while groundwater tests indicate PFOA and PFOS contamination levels exceeding 171,000,000 PPT.[235] These levels far exceed the EPA's current (non-enforceable) threshold of 0.004 PPT (for PFOA) and 0.02 (for PFOS) in drinking water.[236] In 2018, the State of Michigan promulgated new rules that mirror the EPA's then-existing 70 PPT advisory limit for PFOA and PFOS, [237] thereby making this threshold an enforceable ARAR with which the DoD's voluntary response actions must comply. In that same year, the State of Michigan issued a NOV to the Air Force for violations of state law in an attempt to accelerate the voluntary remediation actions underway at the former base.[238] The Air Force responded in part that it would not comply with the NOV because the United States is immune from attempts by states to regulate substances that are not classified as hazardous under CERCLA.[239]

Using its voluntary response authority under CERCLA section 104, the DoD has completed the preliminary assessment and site inspection phases of the CERCLA process, and is currently preparing for the remedial investigation phase.[240] As it studies potential long-term remedial actions, the Air Force operates a facility to pump and treat PFAS-contaminated groundwater.[241] It has also paid to provide affected landowners and neighbors with bottled water and connections to municipal water systems

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[233] *Former Wurtsmith Air Force Base (Oscoda, Iosco County*), MICHIGAN PFAS ACTION RESPONSE TEAM, (Mar. 25, 2022), https://www.michigan.gov/pfasresponse/investigations/sites-aoi/iosco-county/wurtsmith.

[234] Keith Matheney, *Air Force Snubs Michigan Law on Tainted Well Fixes,* DETROIT FREE PRESS (Apr. 25, 2017, 8:57 PM), https://www.freep.com/story/news/local/michigan/2017/04/25/air-force-snubs-michigan-law-demanding-new-water-hookup-wurtsmith/100909266.

[235] U.S. DEP'T OF DEF., PFAS SNAPSHOT: WURTSMITH AIR FORCE BASE 2 (2020).

[236] *See* EPA 2022 DRINKING WATER HEALTH ADVISORY, *supra* note 66, at 4; WURTSMITH SNAPSHOT, *supra* note 230, at 1.

[237] STATE OF MICH., OVERVIEW OF MICHIGAN'S SCREENING VALUES & MCLS: PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS) 4 (2021).

[238] Termaath NOV Response Letter*, supra* note 101, at 3.

[239] Termaath NOV Response Letter*, supra* note 101, at 3.

[240] *See* WURTSMITH SNAPSHOT, *supra* note 228.

[241] *See* WURTSMITH SNAPSHOT, *supra* note 228 at 2.

to avoid any human consumption of contaminated drinking water through nearby wells.[242] The Air Force has spent more than $85 million on cleanup actions at Wurtsmith—and counting.[243]

IV. Results

Table 1. Summary of each scenario's impact on the DoD's real property remediation and disposal programs under BRAC.

	Scenario 1: No PFAS Designated as Hazardous	*Scenario 2: PFOA and PFOS Designated as Hazardous*	*Scenario 3: All PFAS Designated as Hazardous*
Impact on Pending and Future BRAC Transfers	CERCLA § 120(h) allows the DoD to continue transferring PFAS-contaminated property under BRAC.	CERCLA § 120(h) prevents the DoD from transferring PFOA- and PFOS-contaminated property until necessary remedial actions are complete or regulator approval is obtained.	CERCLA § 120(h) prevents the DoD from transferring any PFAS-contaminated property until necessary remedial actions are complete or regulator approval is obtained.
Impact on Former DoD Property	CERCLA §§ 107 & 120(h) prevent owners and regulators from asserting cleanup liability against the DoD or forcing them to undertake cleanup actions for PFAS contamination. CERCLA § 104 prevents them from voluntarily remediating PFAS contamination that fails to satisfy the imminent endangerment requirement.	CERCLA §§ 107 and 120(h) allow current owners and regulators to assert liability or force cleanup actions for PFOA or PFOS contamination. CERCLA § 104 allows the DoD to voluntarily remediate all PFOA or PFOS contamination.	CERCLA §§ 107 and 120(h) allow current owners and regulators to assert liability or force cleanup actions for all PFAS contamination. CERCLA § 104 allows the DoD to voluntarily remediate all PFAS contamination.
Impact on DoD Remediation Efforts	CERCLA § 106 prevents regulators from altering the pace or scope of the DoD's voluntary cleanup actions that are conducted under CERCLA § 104. CERCLA § 121 cleanup standards (ARARs) are only required at sites that the DoD voluntarily remediates under CERCLA § 104.	CERCLA § 106 allows regulators to alter the pace or scope of the DoD remedial actions when PFOA or PFOS contamination poses an imminent endangerment to public health, welfare, or the environment. CERCLA § 121 cleanup standards (ARARs) are required at all sites that the DoD remediates for PFOA or PFOS contamination.	CERCLA § 106 allows regulators to alter the pace or scope of DoD remedial actions when any PFAS contamination poses an imminent endangerment to public health, welfare, or the environment. CERCLA § 121 cleanup standards (ARARs) are required at all sites that DoD remediates for PFAS contamination.

[242] WURTSMITH SNAPSHOT, *supra* note 228 at 2.
[243] *Former Wurtsmith Air Force Base (BRAC 1991)*, AIR FORCE CIVIL ENGINEER CENTER, https://www.afcec.af.mil/Home/BRAC/Wurtsmith.aspx (last visited Dec. 23, 2022).

A. Scenario 1: Status Quo

1. Impact on Pending and Future BRAC Transfers

The EPA's failure to designate any PFAS as hazardous substances would result in a lack of legal or policy incentives for the DoD to change its current practices in transferring pending and future BRAC properties that may be contaminated with PFAS to non-federal owners. Pursuant to Congress's intention of using BRAC to encourage economic development, many of these properties would continue to be transferred at no cost to the recipients.[244] CERCLA section 120(h) represents the primary obstacle to the timely transfer of BRAC properties, but it applies only to hazardous substances.[245] Accordingly, the DoD would be free to continue disposing of properties that may have PFAS contamination without any requirement to remediate prior to transfer. It is true that, at least in cases where PFAS contamination has been identified and disclosed, it may be difficult for the DoD to find interested transferees, many of whom may be concerned about the implications of owning PFAS-contaminated property. However, the DoD's disclosure obligations under CERCLA section 120(h) would not be implicated by non-hazardous substances like PFAS in this scenario.[246]

2. Impact on Former DoD Property

The status quo would continue to prevent regulators and the owners of property that has already been transferred under BRAC from successfully asserting PFAS cleanup liability against the DoD under CERCLA sections 107 or 120(h).[247] For instance, the operator of the public airport at the former Wurtsmith AFB would have no legal recourse under CERCLA to compel DoD cleanup actions or to assert cleanup liability against the DoD, even though the PFAS contamination levels at the site are orders of magnitude higher than the levels that the DoD considers to satisfy the imminent public endangerment requirement of CERCLA section 104. This result is directly attributable to the wording of CERCLA sections 107 and 120(h), which only impose cleanup liability for hazardous substances.[248] The DoD may voluntarily decide to commence the cleanup actions desired by the Wurtsmith community and affected neighbors, but

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[244] *See* MANN, *supra* note 1, at 7.
[245] *See* MANN, *supra* note 1, at 5-6.
[246] *See* Seymour, *supra* note 74, at 184-92.
[247] *See* 42 U.S.C. §§ 9607(a), 9620(h).
[248] *See id.*

it will not be legally compelled to do so, and in fact, would be free to reverse course or significantly narrow the scope or timing of its response actions at a future date.[249] Applied more broadly, this principle would prevent the owners of any past, pending, or future BRAC property transfers from either compelling or seeking DoD contribution toward the cleanup of PFAS contamination on their property, even in cases of extreme concentrations.

Under the status quo scenario, it is conceivable that a BRAC transferee could assert PFAS remediation liability against the DoD pursuant to the indemnification provision of section 330 of the NDAA of 1993, which is triggered not only by hazardous substances, but also by pollutants or contaminants.[250] Importantly, however, section 330 also requires a BRAC transferee's asserted remediation costs to be based on a claim from a third party or an abatement order from a regulator, in addition to satisfying other procedural requirements.[251] Even when these conditions are satisfied, the DoD then has an opportunity to defend itself directly against the third party claimant or environmental regulator.[252] One possible defense the DoD would have to claims based on an environmental regulator's abatement order would be that the regulator's abatement authority under CERCLA section 106 requires the presence of a hazardous substance (not pollutant or contaminant) that poses "an imminent and substantial endangerment to the public health or welfare or the environment."[253] To date, there are no known examples of PFAS remediation costs being successfully asserted against the DoD in this indirect manner (through a BRAC transferee). Accordingly, the DoD's potential PFAS cleanup liability under section 330 remains an untested legal theory—at least for the moment.

3. Impact on DoD Remediation Efforts

The DoD would remain on its current path to addressing PFAS contamination at current and former installations. Despite public

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[249] *See* BEARDEN ET AL., *supra* note 18, at 25.

[250] 10 U.S.C. § 2687 note. This type of claim would require the BRAC transferee to convince a court that the types of PFAS giving rise to their claim should be considered pollutants or contaminants under CERCLA. This would not be difficult in light of DoD's determination that PFAS are pollutants or contaminants that justify its use of voluntary response authority under CERCLA section 104. *See*, *e.g.*, Cramer, *supra* note 17, at 2.

[251] *See* Richmond Am. Homes of Col., Inc. v. United States, 75 Fed. Cl. 376, 391 (2007); *see also* 32 C.F.R. § 175 (2022).

[252] 10 U.S.C. § 2687 note, § 330(c) (Indemnification of Transferees of Closing Defense Property).

[253] 42 U.S.C. § 9606(a).

assurances from DoD officials that it can remediate PFAS "*even though* PFAS are not designated as a CERCLA hazardous substance,"[254] The DoD's voluntary response authority would remain limited in important ways. Most significantly, CERCLA section 104 permits DoD remediation of pollutants or contaminants like PFAS only when they pose an imminent endangerment to public health.[255] Under this scenario, the DoD would have no immediate legal or policy reasons to change its existing practice of considering only PFOA and PFOS to satisfy the imminent public endangerment requirement, and only when these chemicals are present in human drinking water (not soil or other groundwater) above the EPA's recommended health advisory limits. Accordingly, under this scenario, the DoD would continue to categorically exclude from consideration any PFAS cleanup actions that fail to satisfy these preconditions. Furthermore, state and federal regulators would have no ability to compel the DoD to alter the pace or scope of its voluntary responses because their involuntary abatement authority is contingent on the presence of hazardous substances.[256]

4. Unknown Factors

The status quo would offer no resolution to the existing factual uncertainty over the extent of the DoD's PFAS contamination, nor would it resolve the existing regulatory uncertainty about rapidly changing state laws that may become ARARs with which DoD's voluntary remedial actions must comply. As discussed, the DoD currently has a very limited understanding of the extent of potential PFAS contamination on current and former installations, and it will take many more years before its understanding even begins to approach a stage that can be described as comprehensive.[257] In the coming years and decades, as the DoD completes the numerous site investigations that are currently underway, it will move to the next stages of the CERCLA process. These stages require the DoD to study the feasibility of various remediation options. Importantly, remedial actions at both NPL and non-NPL sites will have to achieve those state cleanup standards that are determined to be ARARs.[258] The list of

[254] Cramer, *supra* note 17, at 2 (emphasis added); *see also* Sullivan, *supra* note 17, at 2-3.
[255] GRAY, *supra* note 72, at 10.
[256] *See* 42 U.S.C. § 9606(a).
[257] *See* GAO-21-421, *supra* note 8, at 20.
[258] BEARDEN, *supra* note 96, at 10. At NPL sites, DoD would continue to be required to implement remedial actions that are selected by EPA. Non-NPL sites would continue to constitute the vast majority of DoD's CERCLA cleanup locations because EPA will not be

potential ARARs is both extremely dynamic and state specific. Although it is difficult to predict the future PFAS regulatory landscape across all states, the clear trend today is toward more restrictive PFAS standards at the state level.[259] The DoD will be required to achieve these standards at sites that the DoD considers to satisfy the imminent public endangerment requirement of CERCLA section 104.

Finally, it remains possible that some other regulatory action by the EPA, such as SDWA drinking water limits, would have an impact on the DoD cleanup actions under the status quo scenario. The EPA's roadmap specifically includes a "commitment" to creating a national drinking water regulation for PFOA and PFOS by fall 2023,[260] though it remains to be seen whether this regulation will be finalized and enforceable against the DoD. Nationwide drinking water standards would be considered ARARs under CERCLA.[261] Accordingly, the DoD would be required to achieve these standards when exercising its voluntary response authority. States could also continue enacting drinking water standards that are more restrictive than the federal standards, and these state standards could also be considered ARARs if they have general applicability and do not impose more stringent standards against the DoD than are imposed on non-federal parties.[262]

B. Scenario 2: Only PFOA and PFOS are Designated as Hazardous Substances

1. Impact on Pending and Future BRAC Transfers

If the EPA successfully finalizes its proposed rule to designate PFOA and PFOS as hazardous substances, the resulting impact to the DoD would be substantial. Nearly all pending and future BRAC transfers of PFOA- and PFOS-contaminated property would be indefinitely delayed until necessary remediation actions could be completed and regulatory approvals obtained.[263] Although the possibility of so-called "early transfers" could represent an exception to this rule by allowing transfer to precede cleanup actions, these exceptions require compliance with

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able to add additional sites based purely on PFAS contamination. *See* BEARDEN, *supra* note 96, at 10.

[259] *See* Black et al., *supra* note 161, at 367.

[260] EPA STRATEGIC ROADMAP, *supra* note 21, at 12-13.

[261] *See* BEARDEN, *supra* note 96, at 10.

[262] *See* BEARDEN, *supra* note 96, at 10.

[263] *See* Seymour, *supra* note 74, at 194-204.

challenging preconditions, and historically represent a small minority of BRAC transfers.[264] Accordingly, the vast majority of the DoD property slated for BRAC transfer that is currently known, or later discovered, to be contaminated by PFOA or PFOS would immediately become untransferable for an indefinite period of time.[265] Another factor that could lead to transfer delays is likely to come from the existing lack of effective technologies to treat PFOA and PFOS soil contamination, though it is possible that such transfers could nonetheless proceed if regulators agree that restrictive land use controls could protect public health and the environment without requiring physical cleanup actions.[266] Such land use restrictions, however, could potentially undermine the economic development potential of the excess property. Finally, because CERCLA requires the United States to disclose whether any hazardous substances (not pollutants or contaminants) have been released, disposed, or stored on a given property prior to transfer,[267] the DoD would be required to spend considerable time researching its records for evidence of such activities on all properties that are designated for transfer under BRAC.

2. Impact on Former DoD Property

Scenario 2 would impact the DoD's obligation to remediate property that has already transferred to non-federal owners under BRAC in ways that are both dramatic and unquantifiable, given the incomplete state of existing knowledge. As discussed previously, CERCLA section 120(h) requires deeds to covenant that the DoD will conduct any hazardous substance remediation "actions found to be necessary after the date of . . . transfer."[268] These covenants are consistent with CERCLA section 107, which would impose the broadest possible liability under the law—joint, several, and retroactive—on the DoD for any PFOA or PFOS releases that occurred during its ownership of the property.[269] Scenario 2, therefore, introduces new DoD liability to private, non-federal parties, which would be a direct result of EPA's designation of PFOA and PFOS as hazardous

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[264] *See* BEARDEN, *supra* note 134, at 2; U.S. GOV'T ACCOUNTABILITY OFF., GAO-02-433, MILITARY BASE CLOSURES: PROGRESS IN COMPLETING ACTIONS FROM PRIOR REALIGNMENTS AND CLOSURES 26 (2002).
[265] *See* Seymour, *supra* note 74, at 193-94.
[266] *See* BEARDEN, *supra* note 134, at 3-4.
[267] 42 U.S.C. § 9620(h).
[268] *Id.* § 9620(h)(3)(A)(ii)(II).
[269] *See* BEARDEN, *supra* note 96, at 12-13.

substances.[270] This new liability could result in dozens, hundreds, or even thousands of claims, lawsuits, and regulatory enforcement actions that would not only take up considerable DoD resources to manage, but also would ultimately compel the DoD to remediate PFOA and PFAS contamination at its former properties.

Remediation of former DoD property presents unique challenges that are avoided when the DoD remediates property that has not yet transferred into private ownership. Under BRAC, many of these former DoD properties were transferred for the explicit purpose of encouraging redevelopment and economic stimulus.[271] Accordingly, many of these former properties have been subsequently redeveloped into a variety of new land uses, such as residential, recreational, commercial, and industrial. Remediating these properties would present significant logistical challenges because of the potential for disrupting the new land uses. While groundwater treatment might be able to occur without significant issue, soil treatment technologies are still under development and have the potential to be far more disruptive.[272] The potential for disruptive soil treatment therefore increases the risk that the DoD could be required to compensate the owners of redeveloped former BRAC property for their lost profits, temporary relocation costs, and the loss of their use of the property during remediation treatment.

As under Scenario 1, regulators would be empowered to require the DoD's remedial actions under Scenario 2 to comply with a rapidly expanding universe of potential ARARs.[273] The DoD has continuing liability to the non-federal owners of former BRAC property in cases where hazardous substances (in this case PFOA and PFOS) are discovered after transfer has occurred.[274] However, the DoD's obligation is limited to only those ARARs that are applicable to the land use that was anticipated

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[270] As discussed in Scenario 1, it remains conceivable under Scenario 2 that a BRAC transferee could successfully assert liability against DoD pursuant to the indemnification provision of section 330 of the NDAA of 1993. DoD liability in this scenario would be triggered if certain types of PFAS were determined to be pollutants or contaminants under CERCLA. 10 U.S.C. § 2687 note. Even if that condition were satisfied, however, the BRAC transferee's remediation costs would also need to be based on a claim from a third party or an order from an environmental regulator, in addition to satisfying other procedural requirements under section 330. *See* Richmond Am. Homes of Col., Inc. v. United States, 75 Fed. Cl. 376, 391 (2007); 32 C.F.R. § 175 (2022). To date, there are no known examples of PFAS remediation costs being successfully asserted against DoD in this indirect manner, so it remains an untested legal theory.

[271] *See* MANN, *supra* note 1, at 7.

[272] *See* Darlington et al., *supra* note 62, at 59-60.

[273] *See* BEARDEN, *supra* note 96, at 10.

[274] *See* BEARDEN, *supra* note 96, at 33.

at the time of transfer.[275] Thus, the designation of PFOA and PFOS as hazardous substances would provide both regulators and the current owners of former BRAC property an opportunity to compel the DoD compliance with modern ARARs that never previously existed, as long as these modern ARARs are applicable to the land use that was anticipated at the time of transfer.[276]

Using the Wurtsmith AFB example, Scenario 2 would open multiple new avenues for property owners and regulators to compel the DoD to alter the pace and scope of its current voluntary activities at the former installation. For instance, the owners of the dozens of residential and recreational lands that are spread across Wurtsmith would be empowered to force the DoD to complete whatever additional remediation of PFOA and PFOS is found necessary after transfer. These remedial actions would require consultation with the State of Michigan, and would also be required to comply with any ARARs applicable to residential and recreational land uses, which are generally the most stringent standards. Alternatively, the State of Michigan could also initiate enforcement actions against the DoD or seek the DoD's financial contribution toward cleanup actions that Michigan regulators direct. These actions and contributions would once again be required to achieve compliance with any ARARs applicable to residential and recreational land uses.[277]

It is critical to understand that the DoD's obligation to return to previously transferred property for hazardous substance remediation under this scenario is not necessarily a one-time commitment. On the contrary, the DoD could be required to return to former BRAC properties each time a previous ARAR is deemed to insufficiently protect human health or the environment.[278] For instance, immediately after PFOA and PFOS are designated as hazardous substances, it is likely that the DoD will be compelled to bring the Wurtsmith properties into compliance with whatever state and federal ARARs regulate groundwater and drinking water. However, bringing the Wurtsmith properties into compliance with applicable ground and drinking water standards does not mean that the DoD is subsequently released from its CERCLA obligations. Rather, the State of Michigan and the EPA would remain free to promulgate more restrictive water standards—or perhaps create new soil standards—many years or even decades later. The DoD would have a continuing liability to return to the former Wurtsmith properties and bring them into compliance

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[275] BEARDEN, *supra* note 134, at 3-4.
[276] *See* BEARDEN, *supra* note 134, at 3-4.
[277] *See* BEARDEN, *supra* note 134, at 3-4.
[278] *See* BEARDEN, *supra* note 134, at 3-4.

with such future ARARs whenever the previous ARARs are determined to insufficiently protect human health or the environment.

Unfortunately, because the DoD soil sampling at Wurtsmith has prioritized airfield areas, it is impossible to know exactly which properties and land uses are most affected by PFOA and PFOS contamination. While it is clear that much of the soil and groundwater underneath the Wurtsmith airfield is contaminated with PFAS, it remains unclear whether other areas—such as Wurtsmith's many residential, educational, healthcare, recreational, or commercial properties—also have significant levels of soil or groundwater contamination.[279] If so, the owners of these properties and Michigan state regulators would be empowered to compel the DoD to comply with current and future ARARs applicable to those land uses.[280]

3. Impact on DoD Remediation Efforts

Designation of PFOA and PFOS as hazardous substances would fundamentally alter the DoD's current use of voluntary response authority under CERCLA section 104. The existing limits on this authority, which the DoD regularly cites in court and adversarial proceedings, would essentially vanish as a result of PFOA and PFOS's designation as hazardous substances.[281] Instead, the DoD would be capable of taking voluntary response actions for any PFOA or PFOS contamination that can be attributed to its actions, regardless of whether the contamination occurs in soil, groundwater, or drinking water, and regardless of whether the contamination poses an imminent endangerment to human health.[282] For PFAS other than PFOA and PFOS, however, the DoD is likely to continue its existing practice of viewing the imminent public endangerment requirement as a legal impediment for using its voluntary response authority under CERCLA section 104.

The role of outside regulators—and the potential cleanup standards they might impose—would expand dramatically for all types of DoD property, including past, pending, and future BRAC properties, as well as the existing inventory of DoD real property and installations. In addition, the DoD would be answerable to outside regulators for PFOA and PFOS

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[279] Existing land use controls at Wurtsmith prevent water extraction from much of the property that has been transferred under BRAC. AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY, PUBLIC HEALTH ASSESSMENT: WURTSMITH AIR FORCE BASE, OSCODA, IOSCO COUNTY, MICHIGAN, EPA FACILITY ID: MI5570024278, at 1 (2001).
[280] *See* BEARDEN, *supra* note 134, at 3-4.
[281] *See* GRAY, *supra* note 72, at 9-10.
[282] *See* GRAY, *supra* note 72, at 9-10.

contamination that migrates onto neighboring property that it has never owned, such as the private property abutting Wurtsmith AFB. Contrary to the current situation, where the DoD has been successful in contesting attempts by state regulators to alter the pace or scope of the DoD's voluntary response actions, the DoD is likely to have far less success with this approach in Scenario 2. Whenever a state regulator could demonstrate that PFOA or PFOS contamination poses an imminent endangerment to either human health *or the environment*, that regulator would be able to impose severe penalties and administrative orders to direct the DoD's immediate (involuntary) cleanup response.[283] In addition, EPA's decision-making authority over the selection of remedial actions at DoD sites that are listed on the NPL could become particularly significant because EPA would also gain the authority to add new DoD sites to the NPL based purely on their PFOA and PFOS contamination.[284] The end result of these changes is that the DoD would find itself with far less independence in overseeing its response to PFOA and PFOS contamination.

4. Unknown Factors

Finally, although Scenario 2 would represent a legal sea change, it is also extremely difficult to quantify the difference in the DoD's potential financial liability between Scenarios 1 and 2. The lack of uniform cleanup standards and the lack of existing cleanup technologies pose two significant hurdles, but the lack of basic information about the size and extent of DoD-caused PFOA and PFOS contamination represents a more fundamental hurdle to quantifying potential liability. Based on the dramatic expansion of voluntary cleanup actions available under CERCLA section 104, the expanded role of regulators who would become empowered to compel involuntary cleanup actions, and the ability of non-federal owners of BRAC property to assert liability against the DoD for cleanup actions, it seems clear the DoD is likely to engage in substantially more cleanup actions under Scenario 2 than it is under Scenario 1. However, until the DoD completes assessments and feasibility studies at sites that are known or suspected to have AFFF or other types of PFOA or PFOS releases, it is simply impossible to quantify how much of this difference would be attributable to the regulatory reclassification of PFOA and PFOS.

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[283] *See* 42 U.S.C. § 9606(a).
[284] *See* BEARDEN, *supra* note 96, at 6-7.

C. Scenario 3: All PFAS are Designated as Hazardous Substances

1. Impact on Pending and Future BRAC Transfers

The EPA's designation of all PFAS chemicals as hazardous substances would only compound the immediate and indefinite delays to transferring pending and future BRAC properties that were described in Scenario 2. These properties would need to be screened for the presence of hundreds of new hazardous substances, and if such chemicals are present, the DoD would need to complete cleanup actions and/or receive regulatory approvals prior to transfer.[285] The DoD's disclosure obligations under CERCLA would likewise require lengthened timelines as the DoD completes comprehensive searches of its records to find evidence of past storage, disposal, or release of any PFAS chemicals. In sum, the impact on pending and future BRAC transfers is very similar to Scenario 2, except the expanded list of hazardous substances presents significantly more potential delays to timely transfer under BRAC.

2. Impact on Former DoD Property

The new liability that the DoD would owe to the current owners of its former property under Scenario 2 would be significantly enlarged under Scenario 3. The right of these landowners, as well as regulators, to force (involuntary) DoD response actions would be applicable to a far greater number of new hazardous substances than under Scenario 2. In addition, the DoD's continuing obligation to remediate this expanded list of hazardous substances would increase the possibility that the DoD could be required to complete new remediation actions each time a previous ARAR is deemed to insufficiently protect human health or the environment.[286] As under Scenario 2, the remediation of former DoD property that has been subsequently redeveloped after transfer presents considerable logistical problems, especially for the remediation of PFAS-contaminated soil. These remedial actions increase the likelihood that the DoD could be required to pay landowners for lost profits, relocation costs, and other compensation during periods of intensive remediation.

Returning to the Wurtsmith example, it is important to consider that all DoD actions to date have taken place under a framework that assumes only PFOA and PFOS satisfy the imminent endangerment requirement of

[285] *See* Seymour, *supra* note 74, at 194-204.
[286] *See* BEARDEN, *supra* note 134, at 3-4.

CERCLA section 104. Accordingly, DoD investigations have focused primarily on AFFF releases near the airfield. The DoD has conducted very little investigation of any other types of releases, largely disregarding non-PFOA and non-PFOS types of PFAS contamination. Interestingly, however, publicly released sampling data near the Wurtsmith airfield indicates that dozens of other types of PFAS chemicals (not just PFOA and PFOS) are abundant in Wurtsmith's soil, groundwater, and drinking water.[287] If these other types of PFAS were designated as hazardous substances, the Wurtsmith property owners, as well as Michigan regulators, could force cleanup actions in accordance with any ARARs that apply to the land uses anticipated at the time of original transfer under BRAC.

3. Impact on DoD Remediation Efforts

Designation of all PFAS chemicals as hazardous substances would, once again, fundamentally alter the DoD's use of voluntary response authority under CERCLA section 104. Once all PFAS chemicals become designated as hazardous, the DoD would no longer need to make distinctions when using its voluntary response authority based on whether contamination poses an imminent endangerment to public health. Instead, all PFAS chemicals, as hazardous substances, would be eligible for voluntary remedial actions under CERCLA section 104 in whatever medium they are located.[288]

Another noteworthy feature of Scenario 3 is the expanded role of regulators. As under Scenario 2, these regulators would be empowered to compel the DoD to alter the pace and scope of its current voluntary cleanup actions, which have to date largely disregarded all types of PFAS other than PFOA and PFOS. Any time a regulator could show that PFAS contamination poses an imminent endangerment to public health *or the environment*, the DoD could be forced to comply with involuntary abatement orders.[289] As discussed below, however, there may be significant regulatory hurdles to implementing enforcement systems under Scenario 3.

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[287] *See* Memorandum from Catharine Varley, BRAC Environmental Coordinator, U.S. Air Force, for Record (Dec. 8, 2021).
[288] *See* GRAY, *supra* note 72, at 9-10.
[289] *See* 42 U.S.C. § 9607(a)(2).

4. Unknown Factors

There are two primary unknown factors that characterize Scenario 3. The first is regulatory: given the hundreds of different types of PFAS chemicals, it remains to be seen whether all of these chemicals would be treated as a singular category, or if each would receive its own standards.[290] Normally, state and federal ARARs are created from risk-based analyses tied to various land uses and exposure pathways. However, given the incredible diversity of PFAS, it may be challenging for regulators to conduct detailed analyses for each type of PFAS, especially analyses that could withstand scrutiny and legal challenge. Health and environmental studies of PFAS have, to date, focused predominantly on PFOA and PFOS. Far less is known about the risks of other types of PFAS.[291] In addition, it remains possible that other types of PFAS present different risks than PFOA or PFOS based on different exposure pathways in both humans and wildlife.

The second unknown factor is factual: whereas the DoD is still in the early stages of understanding the extent of PFOA and PFOS contamination, it is almost completely in the dark about the extent of contamination from other types of PFAS. As discussed, the DoD's focus has been on PFOA and PFOS releases through AFFF.[292] Not only has this approach missed PFOA and PFOS contamination from non-AFFF sources, but it has also largely ignored all other types of PFAS. Therefore, under Scenario 3, the DoD would need to invest considerable resources to even begin understanding the possible extent of its liability for the hundreds of types of PFAS chemicals that are likely spread across its current and former installations.

V. Conclusion

Based on the three scenarios discussed above, it appears likely that the EPA's designation of some or all PFAS chemicals as hazardous substances would cause a large increase in the number, scope, and intensity of remediation actions for which the DoD would be responsible.[293] This

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[290] *See* Baas, *supra* note 60, at 10120-21.
[291] *See* BEARDEN ET AL., *supra* note 18, at 4-5.
[292] DOD IG REPORT, *supra* note 36, at 28.
[293] It is theoretically possible that DoD could voluntarily undertake many of the remediation actions contemplated in Scenarios 2 and 3 if it were to reexamine its interpretation of CERCLA section 104. More specifically, if DoD expanded the scope of PFAS contamination it considers under the imminent public endangerment requirement

potential increase would come at a high cost, especially at former BRAC properties like Wurtsmith AFB, and this cost represents an unmistakable risk to the DoD's budgets and warfighting mission. Reclassification of PFAS therefore significantly increases the danger that appropriators will be forced to make difficult tradeoffs between funding important DoD mission requirements and the DoD's extensive new environmental cleanup liabilities. Given the incomplete state of existing knowledge, however, it is impossible to quantify the DoD's potential new outlays at this point.[294] There are simply too many unknown variables regarding the extent of contamination, which types of PFAS are involved, which cleanup technologies are able to remediate the contamination, which land uses are most affected, and which state and federal standards will be considered ARARs that will be applicable to these land uses.[295]

Reclassification of PFAS is also likely to disrupt the DoD's disposal of excess real property under BRAC. As discussed, all pending and future BRAC property transfers would be delayed indefinitely, thereby directly undermining Congress's expectation that the DoD conduct BRAC transfers as quickly as possible.[296] However, one must also consider that Congress could have designed BRAC to waive the DoD's compliance obligation with CERCLA section 120(h) if Congress truly prioritized rapid economic development over environmental cleanup, but it did not do so. Moreover, PFAS-contaminated property is likely to have reduced potential for economic development until the contamination has been remediated.[297] In this sense, pausing all pending and future BRAC transfers until PFAS remediation actions are complete could actually support, rather than undermine, Congress's long-term economic development goals.

One thing that can be known with complete certainty is that reclassification would reduce or eliminate the flexibility that the DoD now enjoys in how it remediates and disposes of BRAC properties. In this

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that currently constricts its use of CERCLA section 104, DoD could voluntarily undertake many of the exact same remediations that become involuntary under Scenarios 2 and 3. Conceivably, much of the scientific evidence that EPA will cite in its justification for classifying some or all PFAS chemicals as hazardous substances could equally justify DoD's expansion of the PFAS contamination that it considers to pose an imminent public endangerment. At the same time, however, DoD has always given significant deference to EPA's subject matter expertise. It would be highly unusual for DoD to disregard that expertise by making its own determinations about the circumstances in which specific chemicals pose an imminent public endangerment.

[294] *See* GAO-21-421, *supra* note 8, at 21.

[295] *See* GAO-21-421, *supra* note 8, at 21-22.

[296] *See* MANN, *supra* note 1, at 7.

[297] *See* BEARDEN, *supra* note 134, at 1.

sense, reclassification can be viewed as a permanent guarantee that DoD will take appropriate cleanup actions.[298] It eliminates the perceived risk under the status quo scenario that the DoD could later narrow the scope or decelerate the pace of its voluntary cleanup actions.[299] External regulators and landowners would become the primary drivers of the DoD's remediation actions at former BRAC properties upon the designation of PFAS as hazardous substances. And because these external parties largely do not have significant influence under the status quo scenario, reclassifying PFAS as hazardous substances necessarily results in the DoD losing control over its current approach to addressing PFAS contamination.

To the extent that the DoD missions are impacted by the diversion of resources to conduct new PFAS remediation actions, critics may complain that such a result is unfair and unwise. After all, the former BRAC properties are likely to have the most stringent cleanup standards by virtue of their subsequent redevelopment, and many of these same properties were given away for free.[300] If the DoD had known that PFAS could potentially be designated as hazardous several decades after transfer, it may have insisted on more restrictive land uses (such as industrial or commercial) and land use controls (such as prohibitions on drinking water extraction) as part of the BRAC transfer process. In turn, these restrictions could potentially have saved the DoD significant resources because it would now be able to avoid compliance with the more stringent ARARs that are routinely imposed on unrestricted land uses (such as residential).[301] Others might respond to this criticism by pointing out that, at least between a polluter and innocent transferees who played no part in the contamination, it would be unfair and unwise to do anything other than require the polluter (as CERCLA does) to bring its former properties in line with modern standards aimed at protecting public health and the environment. It was entirely reasonable for the transferees of former BRAC property to redevelop their property in accordance with the land use restrictions that the DoD negotiated upon transfer. In fact, that is exactly what Congress intended when it created the economic development conveyance authority under BRAC.[302]

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[298] *See* Melanie Benesh, *It's Time to Designate PFAS a "Hazardous Substance,"* ENV'T WORKING GRP. (July 3, 2019), https://www.ewg.org/news-insights/news/its-time-designate-pfas-hazardous-substance.

[299] *See id*.

[300] *See* Ronald A. Torgerson, *Base Closure Process Much Longer Than Planned*, NAT'L DEF. (Dec. 1, 2001), https://www.nationaldefensemagazine.org/articles/2001/11/30/2001december-base-closure-process-much-longer-than-planned.

[301] *See* BEARDEN, *supra* note 134, at 2.

[302] *See* MANN, *supra* note 1, at 7.

One could argue that the difficult position in which the DoD may soon find itself was at least partially self-created. As discussed in this article, the cost estimates that the DoD has provided to Congress greatly downplay what appears to be potentially massive PFAS cleanup liabilities.[303] The DoD policy documents mischaracterize its obligation to remediate polluted former BRAC properties as somehow being discretionary.[304] In public, DoD officials have given the impression that its voluntary approach adequately addresses the PFAS problem,[305] but in court, the DoD has stonewalled dissatisfied states who attempt to alter the pace or scope of this approach.[306] These same officials have strongly implied that reclassifying PFAS would be unnecessary and have little impact.[307] It is possible that these decisions contributed to a lack of public and congressional awareness about the potential for reclassification of PFAS to impact the DoD's budgets.[308] Now that the EPA has "committed" to designating some or all PFAS as hazardous,[309] however, it remains to be seen whether the DoD will begin to publicly emphasize the many ways in which its hands will be tied under a new regulatory framework, and the many ways this changed classification will impact its budget.

VI. Recommendations

Department of Defense managers could benefit from being prepared for the possibility that some or all PFAS chemicals will become designated as hazardous substances in the near term. The following recommendations aim to provide these practitioners with realistic ways for the DoD to meet the potential challenges ahead.

First, the scope of the studies and investigations that the DoD currently conducts using its voluntary response authority may need to be expanded. These studies are now focused on the identification of past releases of AFFF and the resulting impact on drinking water.[310] While such releases are certainly worth investigating, the DoD would benefit from

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[303] *See* GAO-21-421, *supra* note 8, at 21.
[304] *See* U.S. DEP'T OF DEF., 4715.20, DEFENSE ENVIRONMENTAL RESTORATION PROGRAM MANAGEMENT encl. 3, para. 10(c)(3)(a) (9 Mar. 2012) (C1, 31 Aug. 2018); U.S. DEP'T OF NAVY, ENVIRONMENTAL RESTORATION PROGRAM MANUAL para. 14-2 (2018).
[305] *See* Cramer, *supra* note 17, at 2; Sullivan, *supra* note 17, at 2-3.
[306] *See* Complaint, State of N.M. v. United States, No. 1:19-cv-00178-LF-KBM, 2019 WL 1065864 (D.N.M. Mar. 5, 2019).
[307] *See* Cramer, *supra* note 17, at 2; Sullivan, *supra* note 17, at 2-3.
[308] *See* GAO-21-421, *supra* note 8, at 20-25.
[309] EPA STRATEGIC ROADMAP, *supra* note 21, at 17.
[310] *See* GAO-21-421, *supra* note 8, at 12-20.

exhaustively investigating other types of PFAS contamination throughout its current and former inventory of real property, including non-PFOA and non-PFOS contamination.[311] In addition, the DoD's long-term interests would be served from widespread soil sampling as well.

Second, DoD practitioners could benefit from revisions to policy documents that use discretionary language to describe the DoD's obligation to return to former BRAC properties in which hazardous substance contamination is discovered after transfer.[312] These policy documents introduce confusion to a legal obligation that is clear under both CERCLA section 107 and the section 120(h) covenants contained in each deed that conveys BRAC property to non-federal landowners.[313]

Third, the DoD's future efforts to respond to PFAS contamination could be improved by close monitoring of state laws and regulations involving PFAS. As discussed, these state laws and regulations represent potential ARARs with which the DoD's cleanup actions (both voluntary and involuntary) will need to comply.[314] If current trends continue, the DoD can expect a wide variation of standards across the country, including standards that are more stringent than potential EPA (federal) standards, and also standards that apply not only to drinking water but also to soil.[315] Many of these standards could also be tied to specific land uses that vary from state to state. As the dynamic regulatory landscape evolves, it will be imperative that the DoD closely monitors potential state laws and regulations that could become ARARs. In addition, the DoD has a legitimate interest in ensuring that states do not impose stricter standards against current and former military installations than are imposed on other properties.

Fourth, the DoD's effectiveness in managing a potential flood of claims, enforcement actions, and litigation may be improved by a concerted effort to expand the DoD's existing management capacity in the near term. These claims, enforcement actions, and lawsuits could impact the DoD immediately upon the finalization of the EPA's proposed rule(s),[316] especially because such actions carry stiff penalties that can accumulate daily.[317] Accordingly, the DoD may need to strengthen its

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311 *See* DOD IG REPORT, *supra* note 36, at 28.

312 *See, e.g.,* U.S. DEP'T OF DEF., 4715.20, DEFENSE ENVIRONMENTAL RESTORATION PROGRAM MANAGEMENT encl. 3, para. 10(c)(3)(a) (9 Mar. 2012) (C1, 31 Aug. 2018); U.S. DEP'T OF NAVY, ENVIRONMENTAL RESTORATION PROGRAM MANUAL para. 14-2 (2018).

313 *See*, *e.g.*, Paul, *supra* note 143, at 2; Ropiequet, *supra* note 143, § 11; Snow, *supra* note 140, at 307-08.

314 *See* BEARDEN, *supra* note 96, at 10.

315 *See* Black et al., *supra* note 161, at 363-64.

316 *See* 42 U.S.C. § 9606(a).

317 *See* EPA MEMORANDUM, *supra* note 103, at 2-3.

programmatic capability to not only track the multitude of claims that arise from different jurisdictions, but also to make enough tangible progress in its cleanup efforts to satisfy regulators and adjudicative tribunals.

Finally, the DoD's implementation of future BRAC rounds could be aided if decisionmakers find ways to consider environmental contamination as part of the BRAC recommendation process. Past BRAC commissions purposely did not account for environmental contamination in the weighing of alternatives.[318] However, given the pervasive use of PFAS chemicals for decades across hundreds of military installations, the DoD is likely to experience significant challenges in implementing BRAC decisions if decisionmakers continue to ignore the costs and time associated with environmental remediation. Ultimately, these challenges may reduce the DoD's effectiveness in disposing of excess BRAC property and consolidating its operations at existing installations contaminated with PFAS.

[318] *See* DEF. BASE CLOSURE AND REALIGNMENT COMM'N, 2005 DEFENSE BASE CLOSURE AND REALIGNMENT COMMISSION REPORT TO THE PRESIDENT 334 (2005).