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UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF WASHINGTON

HANFORD CHALLENGE, UNITED ASSOCIATION OF PLUMBERS AND STEAMFITTERS LOCAL UNION, and the STATE OF WASHINGTON,

Plaintiffs,

v.

ERNEST J. MONIZ, in his official capacity as Secretary, the UNITED STATES DEPARTMENT OF ENERGY, and WASHINGTON RIVER PROTECTION SOLUTIONS LLC,

Defendants.

NO. 4:15-cv-05086-TOR

(*consolidated with* NO. 4:15-cv-05087-TOR)

STATE OF WASHINGTON'S MOTION FOR PRELIMINARY INJUNCTION

August 19, 2016, at 6:30 p.m.
Without Oral Argument

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I. INTRODUCTION

The State of Washington moves the Court for a preliminary injunction to require the Defendants to do what their own panel of experts has already advised is necessary to protect Hanford's workers from the potentially devastating effects of chemical vapor exposures. The State strongly believes, and history confirms, that in the absence of injunctive relief additional workers *will* be harmed before the Court is able to fully adjudicate the matter at trial.

Indeed, during April and June of this year alone, over 50 Hanford tank farm workers were sickened by toxic vapors spewed into the air from Hanford's underground storage tanks—tanks that hold over 50 million gallons of some of the most toxic substances known to man. Workers suffered nosebleeds, chest and lung pain, headaches, coughing, sore throats, irritated eyes, and difficulty breathing. These injuries occurred shortly after defendant Washington River Protection Solutions (WRPS) reduced safety protections at the site, including reductions in the use of supplied air. More troubling still, the exposures occurred a mere six months after the State filed this lawsuit and only 18 months after the Department of Energy (Energy) and WRPS were warned by their own panel of experts that worker safety measures at Hanford are inadequate to protect workers from toxic vapors.

Those warnings came in the form of a study, the Tank Vapors Team Assessment Report, that documents a multitude of problems in the current safety program and includes specific recommendations to fix those problems

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and protect workers. Yet rather than proceed with haste to implement the report's recommendations, WRPS has spent much of its time trying to debunk the report's conclusions. Energy is responsible for the performance of its contractor but has done nothing meaningful to turn this dangerous situation around. The results are unfortunately all too clear. More workers are exposed to toxins and more workers get sick.

This year's exposures are far from isolated events. For decades, workers have gotten sick from inhaling poisons from the tank farms. Energy has studied the problem over, and over, and over. Each study it has commissioned since 1992 included recommendations for protecting workers from chemical vapors. But the recommendations have not been adequately implemented, little has changed, and workers continue to get sick. Preliminary injunctive relief is needed to break this pattern now, until a full adjudication of the State's claim can be made.

For these reasons, the State requests that the Court order the following relief on an interim basis pending trial:

1. Mandatory use of supplied air at all times for all personnel working within the perimeter fence lines of the tank farms;

2. During waste-disturbing activities, establishment of an expanded vapor control zone not less than 200 feet outside the perimeter fence line of the affected tank farms, and effective barricading of all roads and access points to prevent entry into the expanded zone;

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3. Mandatory use of supplied air for all personnel working inside a vapor control zone, including the expanded zone described above; and

4. Installation and use of monitoring and alarming equipment in affected tank farms during waste-disturbing activities, to include optical gas-imaging cameras, optical spectrometers, optical stack monitors, and VMD integration software, to effectively and actually warn workers when toxic vapors are emitted.

In the absence of these measures, there is an unacceptable risk of continued vapor exposures and related worker injuries at the Hanford site.

II. FACTS IN SUPPORT OF MOTION

A. For Decades, Workers at Hanford Have Been Sickened by Breathing Tank Vapors

Hanford's underground storage tanks contain over 50 million gallons of mixed radioactive and chemical waste left over from plutonium production at the site beginning in the 1940s. Declaration of Russ Ogle (Ogle Decl.) ¶¶ 11-15. There are 177 tanks on the site: 149 single-shell tanks and 28 double-shell tanks arranged into "farms." The farms differ in the number and the size of tanks they contain. Ogle Decl. ¶¶ 16–19. Each farm is surrounded by a perimeter chain-link fence within which access is controlled. Declaration of Thomas J. Young (Young Decl.), Ex. 1 at 131–32; Young Decl., Ex. 2 at 131. In recent years, most of the activity at the site has been concentrated in the east area farms, where Energy and its contractors have been engaged in

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"retrieving," or pumping out, the single-shell tanks in C-Farm and transferring their contents to the double-shell tanks in other farms.

Wastes within the tanks consist of solids, liquids, and sludge, as well as vapors emitted from those wastes. Ogle Decl. ¶ 14. Vapors collect in the head space of the tanks (the area between the waste level and the dome of the tank) and within the liquids, solids, and sludge. Ogle Decl. ¶¶ 29, 58. In the older, single-shell tanks, the vapors are passively vented through pipes called "risers." The newer, double-shell tanks use pumps to actively ventilate vapors through exhaust stacks. Ogle Decl. ¶¶ 19–20. Numerous other fugitive sources and pathways exist for vapors to escape the tanks, including concrete pits with open floor drains, mounted instrumentation, and wire conduits. Ogle Decl. ¶¶ 54, 55. Occasionally, given the right atmospheric and waste conditions, or when the waste in the tanks is disturbed, the tanks "burp"—i.e., they emit a large volume of toxic vapors at once. Ogle Decl. ¶¶ 57–60.

Energy and its contractors acknowledge that waste-disturbing activities greatly increase the concentration of the head space gases, in some cases by as much as three orders of magnitude (or 1,000 times). Declaration of Charles Halbert (Halbert Decl.) ¶ 12. As discussed in more detail below, the vapors escaping the tanks contain many toxic chemicals, including dimethyl mercury, n-nitrosodimethylamine, ammonia, volatile organic compounds, nitrous oxide, butanol, furans, and others. In sufficient concentrations, these chemicals are

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known to cause cancer, liver damage, lung damage, eye and skin irritation, and even brain damage. *See* Declaration of Joyce Tsuji (Tsuji Decl.) ¶¶ 34–38.

The chemical vapors known to be present in the tanks constitute a serious health risk. Tsuji Decl. ¶¶ 12, 34–39; *see also id*. ¶ 89. Chemicals such as butanol, ammonia, n-nitrosodimethylamine, methyl vinyl ketone, and others have been measured in the tanks at levels sufficient to cause respiratory tract irritation and potentially more severe effects, including cancer. Tsuji Decl. ¶¶ 82, 91. As a mixture, these chemicals may be even more toxic if breathed by a worker than they are individually. *Id*. ¶¶ 77–81. Moreover, neither Energy nor its contractors know the full suite of chemicals present in the various tanks or their precise concentrations. Wartime and post-war record keeping is not reliable. Because of the mixing of contents and chemical reactions, values measured in the past are not necessarily representative of what exists today or what may escape from the tanks under waste-disturbing or other unusual conditions. Ogle Decl. ¶¶ 35–36, 72–74; Halbert Decl. ¶¶ 12, 16; Tsuji Decl. ¶¶ 15–16. The chemicals known to exist in the tanks may act in combination with each other or with the many other chemicals in the tanks to produce even greater harm. Tsuji Decl. ¶¶ 77–81.

Tank workers have been sickened by chemical vapors at Hanford for at least four decades. Although the full number of workers exposed is not known, past reports indicate the problem is persistent and widespread. For example, according to a 1992 report, approximately 30 workers reported exposure to tank

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vapors over a five year period from the late 1980s to the early 1990s. *See* Young Decl., Ex. 1 at 3-3 through 3-17. A 2003 report from the Government Accountability Project documented 67 workers requiring medical attention between January 2002 and August 2003. Young Decl., Ex. 3, App. B.

Similarly, according to a 2004 report, there were nine reported exposures in 2001, 21 in 2002, 30 during 2003, and another 10 in the first three months of 2004. Young Decl., Ex. 5 at 9. Worker descriptions of exposure events are remarkably consistent over time. A typical event involves the worker smelling a "musty" or "metallic" odor, followed by difficulty breathing, headache, nosebleed, or other symptoms. Young Decl., Ex. 3 at 3-3 through 3-17; Ex. 5 at 8–10; *see also* Declarations of Roszeita Calderon, Abelardo Garza, Dave Klug. Many workers have been exposed multiple times.

Between 1992 and 2014, Energy, its contractors, and others conducted at least five major investigations into worker exposures to tank vapors. Young Decl. Exs. 3–6; Declaration of Bruce Miller (Miller Decl.), Ex. 6 (TVAT Report). The reports of these investigations recommend a variety of protective measures, including adequate, real time monitoring of vapor releases, fuller and more complete characterization of head space vapors, more thorough toxicological evaluation of the chemicals, and a commitment on the part of management to take vapor exposures seriously. Young Decl., Ex. 3 at 2-3 through 2-5; Ex. 5 at 14–16; Ex. 6 at 2–5.

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Despite these repeated recommendations from their own experts, neither Energy nor its contractors have adequately or consistently implemented the reforms recommended in these studies. The history of tank vapor exposures at Hanford reveals a disturbing pattern: after a series of exposures, Energy and its contractors institute some improvements. Over time, however, they allow the improvements to lapse, or discontinue them, and another group of workers get injured as a result. *See* Klug Decl. ¶ 3 ("[t]he requirements for the use of personal protective equipment for workers . . . have shifted back and forth over the years"); *see also* Miller Decl., Ex. 6 (TVAT Report) at 25 (noting that risk of exposure to chemical vapors has consistently received a low priority since 1986). This unfortunate pattern continues to this day.

B. The 2014 Tank Vapors Assessment Team Recommended a Comprehensive Suite of Reforms

In 2014, a series of some 40 exposures led WRPS to commission the Savannah River National Laboratory to conduct the most thorough investigation of vapor exposures to date. Young Decl., Ex. 2 at 149–50; Miller Decl., Ex. 6 (TVAT Report). That report, known as the Tank Vapors Assessment Team (TVAT) Report, documents serious flaws in WRPS's industrial hygiene

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program.[1] TVAT concluded that short-term, episodic, "bolus" vapor releases from the tanks, or from other contaminated areas, expose workers to dangerous levels of toxic chemicals for short periods of time. Miller Decl., Ex. 6 (TVAT Report) at 9, 17. TVAT also concluded that WRPS's industrial hygiene program contains serious flaws because it "is not designed to detect and is incapable of detecting and quantifying this type of transient exposure event." *Id*. at 17; *see also id*. at 10, 58. TVAT criticized WRPS' reliance on monitoring techniques that are not capable of capturing bolus events, and WRPS's reliance on occupational exposure limits that are based on long-term chronic exposures, rather than short-term acute exposures typical of a bolus event. *Id*. at 17. According to TVAT, these inadequacies led WRPS to conclude—erroneously and to the detriment of workers—that the tank farms are safe when in fact they are not. *See id*. at 19–20 (discussing "communication gaps").

WRPS's failure to properly characterize the hazard presented by tank vapors stems from a number of flaws in its monitoring program. WRPS relies on monitoring results obtained from a combination of handheld instruments, area-wide monitors, and exhaust stack samples. This equipment, however, does

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[1] Since 2008, WRPS has been Energy's prime contractor for tank operations and is responsible for storing, retrieving, and treating Hanford tank waste. Compl. ¶ 11, ECF No. 1; WRPS Answer ¶ 11, ECF No. 21.

not sample for all the chemicals potentially emitted by the tanks. Rather, they only sample for a small number of chemicals, primarily volatile organic compounds, mercury, ammonia, and nitrous oxide. *See* Miller Decl., Ex. 6 (TVAT Report) at 30; Declaration of Kevin Newcomb (Newcomb Decl.) ¶ 9; Young Decl., Ex. 1 at 71, 80–81, 148–50. In addition, the sampling devices only monitor the air in their immediate vicinity or, in the case of exhaust stack monitors, what is emitted by the stack.

A bolus event, as described by TVAT, is a sudden, episodic release that spreads through the site in a narrow plume. Unless this plume happens to strike a handheld detector or area monitor, it will not be detected by such devices. Miller Decl., Ex. 6 (TVAT Report) at 30. In addition, a bolus event may not originate from an exhaust stack, but instead may be emitted from other vents or risers, and thus may not be detected by a stack monitor. Finally, much of the monitoring upon which WRPS relies occurs long after a vapor exposure is reported, when technicians carrying the monitoring equipment are able to arrive at the location. *Id*. at 24 (noting 45 to 120 minute delays); Newcomb Decl. ¶ 16 (15 to 30 minute delay); Declaration of Roszeita Calderon (Calderon Decl.) ¶ 12 (almost an hour); Young Decl., Ex. 7 at 44–45 (approximately 40 minute delay). By then, the bolus plume has dissipated.

The TVAT Report, as well as prior reports, noted these deficiencies in monitoring and recommended use of continuous stack monitors, optical imaging cameras, and alarming devices to better capture episodic plumes and

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warn employees of their presence. Miller Decl., Ex. 6 (TVAT Report) at 31. TVAT also recommended sampling equipment that is capable of capturing a broader range of chemicals. *Id*. at 36–37. These recommendations, however, have not been adequately implemented.

Another deficiency identified by the TVAT involves the "vapor control zones" that WRPS relies on to establish the areas within which workers must use supplied air. WRPS uses air dispersion modeling to establish the boundaries of these zones. Young Decl., Ex. 1 at 81–82; *see also id*., Ex. 8. Starting with what it believes to be the "maximum" head space concentration of chemicals in a particular tank, WRPS uses models to predict the concentrations of those chemicals at various distances from the tank vent or stack under different atmospheric conditions. In most cases, the boundary established by these models is five feet because, according to the models, the concentrations of the head space chemicals drops to 50% below occupational exposure limits within this short distance. Young Decl., Ex. 7 at 133, 152, 178; Ex. 1 at 79, 86, 88–89. These five-foot vapor control zones are flagged or roped off in a tank farm. *See* Newcomb Decl. ¶ 17; Young Decl., Ex. 1 at 99.

Unfortunately, the models WRPS uses to establish these zones are inadequate. Halbert Decl. ¶ 22. The models are not capable of accurately representing short-term, near-field exposure concentrations. WRPS's models are designed to represent concentrations at long distances and results are averaged over time. Short-term, episodic emissions of high concentrations—as

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in a bolus event—cannot be captured by typical air dispersion models. Halbert Decl. ¶¶ 24–27. In addition, the head space concentrations used by WRPS are not the maximum values that may be present in a tank, because most of the data on chemical head space concentrations came from so-called "quiescent" tanks—i.e., tanks that were not subject to waste-disturbing activity. Halbert Decl. ¶ 16.

For these reasons, TVAT recommended that WRPS conduct better modeling and update their characterization of the tank head spaces using more recent samples. Miller Decl., Ex. 6 (TVAT Report) at 28, 37. TVAT explicitly criticized the five-foot vapor control zones as too small because "the vapor hazard zone for bolus exposures is much larger than a radius of five feet." *Id.* at 24. Energy's own expert reviewers have repeatedly commented on the inadequacy of WRPS's modeling efforts. *See, e.g.*, Young Decl., Ex. 1 at 196-98.

In all, the TVAT made ten overarching recommendations and a total of 47 more detailed recommendations to Energy and WRPS to address the identified deficiencies in WRPS's industrial hygiene program. Miller Decl., Ex. 6 (TVAT Report), App. B at 78–83 (listing recommendations). Many of these recommendations are very similar to ones made by previous reports, including the need for better characterization of tank head spaces, better monitoring, and a commitment by management to take vapor exposures seriously. Young Decl., Ex. 3 at 5-11 through 5-14; Ex. 5 at 14–16; Ex. 6

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at 24–26. The TVAT envisioned that many of its recommendations would be addressed immediately, in a matter of weeks or months. *See* Miller Decl., Ex. 6 (TVAT Report), App. D at 90–91 (giving examples of remedial actions and timeline for completion in days, weeks, and months.) This, however, has not occurred.

In February 2015, WRPS released a plan to implement the TVAT Report's recommendations, the Implementation Plan for Hanford Tank Vapor Assessment Report Recommendations (Implementation Plan). Miller Decl., Ex. 8. The Implementation Plan is divided into two phases: a data gathering and testing phase (Phase I), and an implementation phase (Phase II). Young Decl., Ex. 7 at 112–13. Although it is supposed to implement the TVAT recommendations, a major focus of Phase I of the plan is actually to question one of the TVAT Report's central findings, i.e., that bolus events occur and lead to vapor exposures at the Hanford site. *See* Miller Decl., Ex. 8 ("primary focus of Phase I . . . will be data collection to determine the validity of the hypothetical bolus exposure or identify other exposure mechanisms"); *see also* Young Decl., Ex. 7 at 193; Ex. 2 at 151–52.

Furthermore, while the Implementation Plan contains a rough schedule for both Phase I and Phase II activities, neither WRPS nor Energy attached any enforceable schedules or milestones for completing the Plan. To date, WRPS is already behind on Phase I work and, in fact, many of the items identified in the Implementation Plan as Phase I actions have been postponed to Phase II.

Young Decl., Ex. 7 at 116; Exs. 9–10, Answers to Interrogatories Nos. 5–12. As of the date of this motion, there is no schedule or agreement in place for WRPS to implement Phase II. Young Decl., Ex. 7 at 116–18.

Pending completion of the Implementation Plan, WRPS and Energy instituted what appeared to be a promising policy in late 2014 that expanded the use of self-contained breathing apparatus (SCBA) in the tank farms. Young Decl., Ex. 7 at 138–40; *see also* Ex. 11. Pursuant to this policy, SCBA was required in the single-shell farms at all times and required in the double-shell farms during waste-disturbing activities and for certain other job tasks. These requirements were imposed in addition to the existing requirement to wear SCBA in designated "vapor control zones."

Despite initially instituting these protective measures, Energy and its contractors have recently scaled back protections. Relying on the very same inadequate monitoring results criticized by TVAT, WRPS and Energy reduced vapor control zones and discontinued the use of SCBA in some areas. These reductions are yet another example of WRPS and Energy failing to take vapor exposures seriously and their failure to consistently implement reforms recommended by their own studies.

C. Despite the TVAT Report, WRPS and Energy Reduced Safety Protections, and Workers Continue to Get Sick From Tank Vapors

In March 2016, WRPS began the process of retrieving nearly 800 thousand gallons of mixed radioactive and chemical waste from leaking double-

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shell tank AY-102 to another double-shell tank in AP-Farm (AP-102). *See* Young Decl., Ex. 12. This transfer process involved the disturbance of waste in both the source and target tank farms, creating a high potential for vapor exposures in and around the transfer site.

To address this potential, WRPS initially established a broad vapor control zone for the transfer that extended beyond the perimeter fence line of the two farms and set up physical barriers around the zone to prevent access to impacted areas. *Id.*; Ex. 2 at 112–14. As the work progressed, however, WRPS shrank this vapor control zone. Apparently, WRPS established the wider zone at the outset without believing it was necessary, and intended to shrink the zone as soon as possible. Young Decl., Ex. 2 at 124–27; Ex. 7 at 77–81. They shrank the zone step-by-step as the work progressed. Most critically, on April 13, 2016, WRPS Chief Operating Officer Robert Gregory announced that sampling data justified eliminating the use of SCBA or other respiratory protections in the impacted farms altogether, except for a small vapor control zone around the AP-Farm exhauster. Young Decl., Ex. 13. In doing so, WRPS relied on the same flawed monitoring results and techniques that TVAT criticized as inadequately protective. *See id.*; Ex. 7 at 70–73.

In addition, WRPS's decision to reduce vapor zones came at a time that, even according to WRPS's own limited monitoring data, the AZ exhaust stack and AP exhaust stack emitted peak volumes of ammonia of 220 parts per million (ppm) and 250 ppm, respectively. Young Decl., Ex. 14 at 4. These

exhaust levels greatly exceed the established occupational exposure limit for ammonia of 25 ppm, and are at levels that are known to cause disabling effects even during brief exposures. Tsuji Decl. ¶¶ 45–46. Modeling done in 2004, and noted by TVAT, shows that, under certain conditions, toxic plumes from the tanks may travel as far as 100 meters and still retain concentrations of chemicals far above exposure limits. Miller Decl., Ex. 6 (TVAT Report), App. I at 133–34 (discussing modeling study by Droppo). Despite these warnings, WRPS reduced the size of its protective areas and then tried to assure workers the areas were "safe."

The impact of the decision to reduce protective gear was borne by the workers just two weeks later when, starting on April 28, 2016, more than 40 tank farm workers required medical treatment for exposure to chemical vapors in and around the tank farms over a five-day period. Young Decl., Ex. 15. Many of these exposures occurred outside the tank farm boundary or fence line, with some up to 200 feet away from the farms. *See* Declarations of Guy Johnson and David Fritch; Young Decl., Ex. 7 at 96–97. Workers experienced nosebleeds, gagging burns, chest pain, irritated eyes, headaches, coughing, sore throats, and difficulty breathing, all of which are consistent with exposure to elevated levels of the chemicals found in the tanks, and exposure history going back to the 1990s. Tsuji Decl. ¶¶ 84–90; Young Decl., Ex. 15.

Some of the workers involved in these recent events describe a lack of communication by management, failure by industrial hygiene technicians to

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properly respond to vapor complaints, and failure by management to take the exposures seriously. Declarations of Johnson and Fritch. At least one worker quit because he concluded, after attending a briefing by management, that WRPS did not care for his safety. Fritch Decl., Ex. A (discussing his reasons for leaving). Another worker went to the hospital and was diagnosed with occupational chemical exposure. Johnson Decl. ¶ 16. Some workers were exposed immediately after removing respiratory protection as they exited the then-reduced vapor control zone. Young Decl., Ex. 16 at 2. Stack readings recorded on April 28, 2016, indicate levels of ammonia and volatile organic compounds in the AP stack at more than three and two times the occupational exposure limits, respectively. *Id*.

All told, more than 50 workers sought medical attention after being exposed to chemical vapors in the tank farms from April through June 2016. Young Decl., Ex. 15.

III. AUTHORITY AND ARGUMENT

Energy and WRPS are failing to adequately protect workers from vapor exposures and, remarkably, are actively reducing worker protections based on unsound sampling methodologies that their own expert panel warned them against. In order to prevent Energy and WRPS from further relaxing protective policies, and to ensure worker safety during the pendency of this suit, the State respectfully requests that this Court grant a preliminary injunction to mandate supplied air use throughout the tank farms, expand vapor control zones, and

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improve vapor event monitoring and alarming. All of these measures are consistent with good industrial hygiene practice and are immediately necessary to protect workers until the Court can issue a decision on the merits following trial. *See* Miller Decl. ¶ 18.

A. Legal Standard for Obtaining a Preliminary Injunction

The primary purpose of RCRA is to regulate the management of hazardous waste " 'so as to minimize the present and future threat to human health and the environment.' " *Meghrig v. KFC W., Inc.*, 516 U.S. 479, 483, 116 S. Ct. 1251, 1254 (1996) (quoting 42 U.S.C. § 6902(b)). To effectuate this statutory purpose, RCRA empowers district courts to exercise "broad and flexible equity powers" to reduce or eliminate the risk of harm to human health. *United States v. Price*, 688 F.2d 204, 211 (3rd Cir. 1982). In particular, 42 U.S.C. § 6972 grants district courts the authority to order preliminary injunctive relief in order to prevent irreparable harm. *Meghrig*, 516 U.S. at 484; *Francisco Sanchez v. Esso Standard Oil Co.*, 572 F.3d 1, 20 (1st Cir. 2009).

To obtain a preliminary injunction, courts employ the four-part test set out in *Winter v. Natural Resourses Defense Council, Inc.*, 555 U.S. 7, 129 S. Ct. 365 (2008). Under the *Winter* test, the moving party must demonstrate: (1) a likelihood of success on the merits; (2) a likelihood of irreparable harm in the absence of preliminary injunctive relief; (3) the balance of hardships favors the moving party; and (4) injunctive relief is in the public interest. *Winter*, 555 U.S. at 20. The likelihood of succeeding on the merits is the most important

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factor in the four-part framework. *Garcia v. Google, Inc.*, 786 F.3d 733, 740 (9th Cir. 2015).

The application of the *Winter* factors is not static and must be viewed through the lens of the case at issue, as well as "the purposes of the underlying environmental statute." *Me. People's Alliance & Natural Res. Def. Coun. v. Mallinckrodt, Inc. (Mallinckrodt)*, 471 F.3d 277, 296 (1st Cir. 2006). Here, because the "overriding concern" of RCRA is "the grave danger to people and the environment from hazardous wastes[,]" a RCRA plaintiff's burden is not substantial; rather, RCRA authorizes courts to issue injunctive relief not only when harm is imminent, but even "when there is but a *risk* of harm." *United States v. Hoflin*, 880 F.2d 1033, 1038 (9th Cir. 1989); *Price*, 688 F.2d at 211 (emphasis added).

B. The State Is Likely to Prevail on the Merits of Its Case

To prevail at trial, the State must show that the activities of Energy and WRPS at the Hanford site may present an imminent and substantial endangerment to health or the environment. Specifically, under § 7002 of RCRA, any person, including the state, may file a lawsuit:

> against any person, including the United States and any other governmental instrumentality or agency . . . and including any past or present generator, past or present transporter, or past or present owner or operator of a treatment, storage, or disposal facility, who has contributed or who is contributing to the past or present handling, storage, treatment, transportation, or disposal of any solid or hazardous waste which may present an imminent and substantial endangerment to health or the environment.

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42 U.S.C. § 6972(a)(1)(B).

As set out below, based on Hanford workers' repeated and continued exposure to dangerous chemical vapors—including more than 50 workers in the past several months alone—the State has more than enough evidence to establish the elements necessary to prevail on its underlying RCRA claim.

1. The first element is met because Energy and WRPS are past/present owners or operators who contribute to the handling, storage, treatment, or disposal of solid or hazardous waste at Hanford

There is no question that Hanford's tank farms constitute a waste treatment, storage, or disposal facility. The Hanford facility currently stores over 50 million gallons of mixed radioactive and hazardous waste in its underground tanks. Compl. ¶ 13, ECF No. 1; Energy Answer ¶ 13, ECF No. 20. The hazardous component of the waste is regulated as solid and hazardous waste by the State under RCRA and analogous state law. *United States v. Manning*, 527 F.3d 828, 832 (9th Cir. 2008). In addition to storage, some of the waste is being handled and treated through use of a chemical mixture and sluicing to remove hardened waste material ("saltcake") from the tanks. Compl. ¶ 14, ECF No. 1; Energy & WRPS Answers ¶ 14, ECF Nos. 20, 21.

Similarly, there is no question that Energy and WRPS are owners/operators of the facility and are contributing to the handling, storage, and treatment of these hazardous wastes. Energy owns and operates the

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Hanford site. Compl. ¶ 10, ECF No. 1; Energy Answer ¶ 10, ECF No. 20. WRPS—Energy's prime contractor in charge of the Hanford tank farms and the entity currently responsible for storing, retrieving, and treating Hanford's tank waste—is an operator. Compl. ¶ 11, ECF No. 1; WRPS Answer ¶ 11, ECF No. 21. As persons who contribute to the "past or present handling, storage, treatment, transportation, or disposal of any solid or hazardous waste," Energy and WRPS are properly liable in this citizen suit.

2. The second element is met because workers' exposure to dangerous chemical vapors presents an imminent and substantial endangerment to health

This spring, over 50 Hanford workers had to seek medical attention after exposure to vapors emitted from tanks containing some of the most toxic chemicals in existence. This is the very definition of a case in which a defendants' handling, storage, or treatment of the waste "may present an imminent and substantial endangerment to health or the environment." 42 U.S.C. § 6972(a)(1)(B). Consequently, under RCRA, this Court can and should issue a preliminary injunction.

The imminent and substantial endangerment standard is not particularly onerous; in fact, courts have repeatedly held that the operative word in the analysis is "may." *Burlington N. & Santa Fe Ry. Co. (BNSF) v. Grant*, 505 F.3d 1013, 1020 (10th Cir. 2007). This expansive standard gives courts the necessary tools to eliminate *any* risks posed by dangerous toxic wastes, even those not yet actualized. *Mallinckrodt*, 471 F.3d at 287 (citing S. Rep. No. 98-

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284, at 59 (1983)). Indeed, this Court has stated that "the term 'imminent' does not require a showing that actual harm will occur immediately so long as the risk of threatened harm is present." *Cmty. Ass'n for Restoration of the Env't, Inc. v. Cow Palace, LLC (Cow Palace)*, 80 F. Supp. 3d 1180, 1227 (E.D. Wash. 2015) (quoting *Price v. U.S. Navy*, 39 F.3d 1011, 1019 (9th Cir. 1994)).

With regard to the level of that threatened harm, an "endangerment is substantial if there is some reasonable cause for concern that someone or something may be exposed to a risk of harm . . . if remedial action is not taken." *Interfaith Cmty. Org. v. Honeywell Int'l, Inc.*, 399 F. 3d 248, 259 (3d Cir. 2005). This risk of harm need not be quantified and can be assessed using "nondefinitive" data. *Me. People's Alliance v. Holtrachem Mfg. Co.*, 211 F. Supp. 2d 237, 247 (D. Me. 2002) ("the evaluation of a risk of harm involves medical and scientific conclusions that 'clearly lie on the frontiers of scientific knowledge', such that 'proof with certainty is impossible' " (citations omitted)). Furthermore, any error in applying the endangerment standard "must be made in favor of protecting public health, welfare, and the environment." *Cow Palace*, 80 F. Supp. 3d at 1227 (quoting *BNSF*, 505 F.3d at 1021).

Where human health is at stake, as it is at Hanford, this standard is particularly protective. For example, this Court previously found that nitrate contamination in groundwater met the citizen suit standard because of potentially serious human health consequences, especially to infants. *Cow Palace*, 80 F. Supp. 3d at 1227–28. The First Circuit Court of Appeals found

imminent and substantial endangerment based on methylmercury contamination of the lower Penobscot River. *Mallinckrodt*, 471 F.3d at 296. The Eleventh Circuit found imminent and substantial endangerment from the presence of dangerous chemicals that can affect humans' central nervous systems, upper respiratory systems, and motor skills. *Parker v. Scrap Metal Processors, Inc.*, 386 F.3d 993, 1015 (11th Cir. 2004). And, the Tenth Circuit found that the standard could be met through the presence of a known human carcinogen in soil. *BNSF*, 505 F.3d at 1022. None of these cases hinged on a showing of actual harm; instead, the likelihood of harm was established by showing hazardous agents capable of producing harm combined with a possibility that those agents can come in contact with human and ecological receptors. *See, e.g.*, *Parker*, 386 F.3d at 1015 (finding a violation of § 6972(a)(1)(B) from evidence of PCBs and lead migrating to off-site soils from the subject property). In fact, in *Cow Palace*, this Court firmly rejected the notion that Congress intended RCRA's protections to kick in only *after* individuals were hurt. *See Cow Palace*, 80 F. Supp. at 1228.

Given the applicable standard, no reasonable trier of fact would fail to conclude that an imminent and substantial endangerment is present in this case. Well beyond the mere hypothetical risk of harm required by the statute, dozens of Hanford workers are suffering actual harm in the field via exposure to dangerous chemical vapors. The risk of harm (and indeed actual harm) is established by: (1) the presence of extremely toxic vapors in the tanks at

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concentrations that can cause serious short and long-term harm; (2) the existence of numerous pathways by which such vapors can, and do, escape from the tanks at harmful levels; (3) the lack of adequate engineering or administrative controls to eliminate the hazard; and (4) ample evidence, from Defendants' own disclosures and the testimony of numerous workers, that Hanford workers continue to be exposed to chemical vapors and suffer adverse, and potentially devastating, health effects after breathing tank vapors.

To begin with, and as set out above, it is undisputed that Hanford's tanks contain a mix of some of the most toxic chemicals in existence. These chemicals are present within the tanks in liquid and solid form, as well as in the head space vapors. The full catalog of constituents in these wastes has not been determined; however, Energy and its contractors confirmed that the tanks contain mixtures of thousands of organic and inorganic chemicals, used solvents, complexing agents, and various other compounds that have been caused by degradation and ongoing chemical and radiolytic reactions over time. Halbert Decl. ¶ 8. Various studies identified dozens of high priority chemicals of concern in the head space vapors, including many known and likely carcinogens and other toxic chemicals present in quantities that pose concerns for worker health. Tsuji Decl. ¶ 18. Concentrations of chemicals in head space vapors can greatly increase during waste-disturbing activities. Halbert Decl. ¶ 12. These hazardous substances "are, by definition, capable of causing

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serious harm." *United States v. Conserv. Chem. Co.*, 619 F. Supp. 162, 195 (W.D. Mo. 1985).

Next, hazardous chemicals in the tanks are released to the environment from the waste tanks through active or passive ventilation of the head space vapors, waste spills, or during waste-disturbing activities. Ogle Decl. ¶¶ 37–60. As recognized by the TVAT, these vapor releases can result in brief-duration, high-concentration (bolus) events that contain nearly undiluted concentrations within one to several meters of the release point. Tsuji Decl. ¶ 33. Current sampling programs and methods are incapable of capturing these peak concentrations, and Defendants' use of occupational exposure limits are unreliable as measures of worker protectiveness. Tsuji Decl. ¶ 31. However, the limited monitoring evidence available indicates that chemicals are being discharged from the exhaust stacks at levels well above occupational exposure limits. *See* Miller Decl., Ex. 6 (TVAT Report) at 41–43, tbl. 6-1 (ammonia discharged at 100 ppm); Young Decl., Ex. 16 at 7 (ammonia discharged at 89 ppm); Ex. 14 at 4 (ammonia discharged at 250 ppm and 220 ppm). Furthermore, Defendants have failed to implement the engineering controls necessary to prevent these events from occurring. *See* Miller Decl. ¶ 13.

As a result, workers in the tank farms have been—and continue to be—exposed to elevated levels of chemicals in the tanks. Indeed, over the course of at least four decades, Hanford workers have been breathing in toxic chemical vapors known to cause cancer, brain damage, nerve damage, liver and lung

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damage, eye and skin irritation, and other health effects. While Energy has studied this problem extensively, and its own studies document the substantial risks to its workforce, workers continue to be exposed. As described above, from April through June of this year alone, well over 50 workers sought medical attention for chemical exposures from tank vapors. Tsuji Decl. ¶¶ 26-27; Young Decl., Ex. 15.

Impacted workers reported a variety of respiratory and central nervous system symptoms, including headaches, nasal bleeding, burning eyes/throat, nausea, dizziness, and gagging. Young Decl., Ex. 15. These symptoms are not just responses to "odors"; rather, the impacts felt by workers are consistent with chemical exposures and with the direct harmful effects of tank vapor chemicals on workers' respiratory and central nervous systems. Tsuji Decl. ¶ 84. In addition to the immediate impacts on workers, exposures of this type, when repeated, increase the likelihood of serious and permanent injury. *Id*.

In short, well beyond the potential for harm to Hanford workers, conditions at the Hanford tank farms are causing actual harm to human health. The State is thus likely to succeed on the merits of its claim.

C. Irreparable Harm is Likely in the Absence of Injunctive Relief

Without immediate steps to prevent continued worker exposure to harmful vapors, Hanford workers could face a significant threat of episodic exposure to high concentrations of dangerous chemical vapors released during unpredictable bolus events or during waste-disturbing activities. Under the

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second prong of the *Winter* test, that constitutes a "significant threat" that irreparable harm will occur before a decision on the merits would be issued. *Boardman v. Pac. Seafood Grp.*, 822 F.3d 1011, 1023 (9th Cir. 2016) (citing *Winter*, 555 U.S. at 22); *Simula, Inc. v. Autoliv, Inc.*, 175 F.3d 716, 725 (9th Cir. 1999). Irreparable harm is defined as an injury "for which there is no adequate legal remedy, such as an award of damages." *Az. Dream Act Coal. v. Brewer*, 757 F.3d 1053, 1068 (9th Cir. 2014). There is no adequate legal remedy for "harm to human life" or "otherwise avoidable human suffering, illness, and possibly death." *Shell Offshore, Inc. v. Greenpeace, Inc.*, 709 F.3d 1281, 1291 (9th Cir. 2013); *Golden Gate Rest. Ass'n v. City & Cty. of San Francisco*, 512 F.3d 1112, 1125 (9th Cir. 2008).

Here, in the absence of a preliminary injunction requiring Energy and WRPS to take adequate precautions for protecting workers from chemical vapors, workers are facing a significant threat. Discovery in this case reveals that Defendants' "implementation" of TVAT recommendations consists, in large part, of debunking TVAT's core findings. Miller Decl., Ex. 8 at 2; Young Decl., Ex. 2 at 151–52. Hanford workers face an environment where significant obstacles to voluntary use of SCBA exist and even the concept of bolus exposure faces open ridicule by WRPS managers. Johnson Decl. ¶ 5.

As a result, Defendants have amply demonstrated a failure to take the steps necessary to protect workers from vapor exposures and, in fact, have actually *reduced* worker protections in recent months based upon the same

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monitoring methodology TVAT determined to be inappropriate and ineffective. *See* Young Decl., Ex. 13. This reduction resulted in harm to human life. Of the more than 50 workers exposed this spring, some were exposed in areas that would have required respiratory protection prior to the reduction in size of the vapor control zone. *See* Young Decl., Ex. 16 at 2.

Hanford's prior history of worker exposures also demonstrates that significant harm to workers will continue to occur absent a preliminary injunction. *See Ctr. for Food Safety v. Vilsack*, 636 F.3d 1166, 1173 (9th Cir. 2011) ("Past harms can tend to show the threat of a repeated injury."). This year's exposures are only the latest in a string of incidents dating back until at least the late 1970s. Tsuji Decl. ¶¶ 22–25. As is clear from the Defendants' own commissioned study on worker exposures (TVAT), the discovery in this case, and Plaintiffs' retained experts, the Defendants do not have a handle on how, where, and in what concentrations workers are being exposed to chemical vapors. As a result, the second prong of the *Winter* test is met: workers will continue to get sick until Energy and WRPS are given a binding mandate to implement the measures needed to protect workers from harmful vapors.

D. The Balance of Equities Tips in Favor of the State

The balance of equities in this case tilts strongly in favor of preventing continued harm to Hanford workers. When evaluating the balance of equities, the court considers the relative hardships that are likely to occur before a final ruling on the merits can be issued. *League of Wilderness Defenders v.*

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Connaughton, 752 F.3d 755, 765 (9th Cir. 2014); *Golden Gate Rest. Ass'n*, 512 F.3d at 1125. In particular, the court weighs the "harm to the moving party if the injunction is not issued" against the "harm the non-moving party would suffer from a wrongfully-issued injunction." *Nat'l City Bank, N.A. v. Prime Lending, Inc.*, 737 F. Supp. 2d 1257, 1270 (E.D. Wash. 2010). When weighing temporary economic injury against "preventable human suffering," courts typically find that the balance of equities " 'tips decidedly' in favor of the latter." *Golden Gate Rest. Ass'n*, 512 F.3d at 1126 (quoting *Lopez v. Heckler*, 713 F.2d 1432, 1437 (9th Cir. 1983)).

In the context of RCRA, the court must take into account the statute's overarching purpose: to address situations where hazardous wastes imperil human health. *See Mallinckrodt*, 471 F.3d at 296–97. RCRA's citizen suit provision places "a congressional thumb" on the scale in favor of environmental protection. *See id.* at 297. This congressional pre-balancing of the interests must be weighed against a defendant's complaints about the cost of injunctive relief. *See id.* at 297–98. In the end, costs cannot and should not thwart human safety.

Here, the balancing of equities clearly favors the preliminary relief sought by the State. Any hardship the Defendants may face as a result of this Court's issuance of a preliminary injunction would be temporary and purely monetary. Such short-term economic hardship pales in comparison to the irreparable harm that workers may suffer during that same period of time in the

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absence of injunctive relief. For example, the long-term physiological and psychological burden that workers would be forced to bear in the event of additional mass exposure incidents clearly outweighs the marginal financial cost of implementing mandatory use of supplied air throughout the tank farms. This element has been met.

E. Issuance of a Preliminary Injunction Is in the Public Interest

The public interest in this matter lies firmly with protecting the health of Hanford workers. When the impact of an injunction will reach beyond the parties, the court must consider whether injunctive relief is in the public interest. *Stormans, Inc. v. Selecky*, 586 F.3d 1109, 1139 (9th Cir. 2009). When employees' health is at stake, consideration of the public interest includes not only those employees who are party to the suit but all employees who may be impacted by the injunction. *See Golden Gate Rest. Ass'n*, 512 F.3d at 1126. The general public also has an interest in the health of state workers and residents. *Id.* Against this, any likely public consequences of an injunction must be considered. Speculative, insubstantial, or remote consequences need not be part of the consideration. *Stormans*, 586 F.3d at 1139.

Here, the State has a compelling interest in protecting the health of Hanford workers who are being exposed to toxic vapors. Energy and WRPS should share that interest. Indeed, it is difficult to envision any interest that Energy and WRPS could identify that would surpass the importance of protecting workers from this serious workplace danger.

Furthermore, the relief the State requests is narrowly tailored to protect workers on an interim basis until the court may rule on the merits and give full consideration to more permanent protective measures, such as engineering solutions. As set forth above, the State requests:

1. Mandatory use of supplied air within the perimeter fence lines of the tank farms, both single and double-shell farms, so that workers may be protected while working within this hazardous area;

2. During waste-disturbing activities, establishment of an expanded vapor control zone at least 200 feet (which represents the furthest distance that workers have been exposed) from the fence line of the affected tank farms, and effective barricading of entry points into the expanded zone;

3. Mandatory use of supplied air within the expanded vapor control zone; and

4. Installation and use of better monitoring and alarming equipment during waste-disturbing activities, to include optical gas-imaging cameras, optical spectrometers, optical stack monitors, and VMD integration software—all of which Energy and WRPS have already tested and are installing in some tank farms on a pilot basis. *See* Young Decl., Ex. 7 at 140–43; Ex. 2 at 202–06.

These measures are reasonable, appropriate under the circumstances, and consistent with the public interest. Indeed, Energy apparently has no objection

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to them. Young Decl., Ex. 2 at 102–03, 129–31, 135–36, 229–31. WRPS appears to recognize the need for expanded vapor control zones and other improvements. *See* Young Decl., Ex. 17. Especially in light of Defendants' failure to stem the tide of continued exposures, these measures should be incorporated into a court order so they are mandatory and enforceable.

The public interest thus favors the grant of preliminary injunctive relief to the State.

IV. CONCLUSION

Hanford tank farm workers are being exposed to a toxic soup of hazardous chemicals released from the headspaces of Hanford's 177 underground storage tanks. Well beyond a mere risk of harm, these exposures cause significant and potentially irreversible harm to impacted workers. These exposures coincide with, and in some cases result from, the Defendants' relaxation of worker protections within the tank farms and their delay in implementing recommendations from their own commissioned report on vapor exposure events at Hanford. In the absence of injunctive relief from the Court, these harms will continue to occur.

Plaintiffs have met their burden to establish a likelihood of success on the merits at trial, irreparable harm in the absence of injunctive relief, and that both the balance of equities and the public interest favor of an injunction. As a

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result, the State respectfully requests this Court to grant the State's Motion for Preliminary Injunction.

DATED this 21st day of July 2016.

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PROOF OF SERVICE

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