MCLGS IN WATER CONTAMINATION LITIGATION: WHY HEALTH-BASED STANDARDS MATTER

by Timothy J. Hopkins

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Imagine you manage a public water system serving 400,000 people. Your laboratory detects perfluorooctanoic acid (PFOA), a persistent "forever chemical," at 2 parts per trillion (ppt) in a production well. The federal maximum contaminant level (MCL) is 4 ppt, so you are in full regulatory compliance. The water is "safe" according to federal law. But the federal maximum contaminant level goal (MCLG), the level at which no known or anticipated adverse health effects would occur, is zero. Your customers consume water above the level the U.S. Environmental Protection Agency (EPA) considers health-protective, yet you have violated no regulation and face no enforcement action. EPA's 2024 per- and polyfluoroalkyl substances (PFAS) regulation, establishing MCLGs of zero for PFOA and perfluorooctane sulfonic acid (PFOS) while setting MCLs at 4 ppt, exemplifies this persistent gap between health goals and regulatory feasibility.[1]

This disconnect creates profound implications for water contamination litigation. When a polluter contaminates a public water supply, what is the appropriate measure of harm? The regulatory standard, the MCL, which balances health against technical feasibility and economic costs? Or the health-based standard, the MCLG, representing the level at which no known or anticipated adverse effects occur? Courts have recognized that water providers can suffer compensable injury from contamination below regulatory standards.[2] Despite their fundamental importance to public health and litigation, no comprehensive analysis exists examining MCLGs as a damages framework.

During my three decades as chief legal officer of Suffolk County Water Authority, the nation's largest public groundwater supplier, I wrestled with this question. In prosecuting contamination cases involving methyl tertiary-butyl ether (MTBE), 1,4-dioxane, PFAS, perchlorate, and other emerging contaminants, litigation resulting in settlements and judgments exceeding $280 million, it became clear that damages should be measured from the point at which health effects may occur, not where regulatory violations begin. That distinction between MCLG and MCL can mean the difference between tens of millions of dollars and hundreds of millions of dollars in damages, and determines whether communities receive full compensation for harm to their water supplies. The historic PFAS class action settlement confirms this principle: manufacturers agreed to pay more than $13 billion to water providers for contamination at any detectable level, implicitly recognizing that harm begins where the MCLG of zero is exceeded, not where regulatory limits are violated.[3]

Despite their fundamental importance, MCLGs remain overlooked in regulatory policy and litigation strategy. EPA establishes MCLGs for every contaminant under a national primary drinking water regulation, but these non-enforceable health goals rarely receive deserved attention. More troubling, as states increasingly adopt their own drinking water standards for emerging contaminants, many fail to establish corresponding MCLGs. New York, despite leading in adopting aggressive state MCLs for contaminants like 1,4-dioxane and PFAS, has not adopted MCLGs for these substances. The state health department, working

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Author's Note: The author served as Chief Legal Officer and General Counsel of Suffolk County (New York) Water Authority for over 30 years, managing drinking water contamination litigation that resulted in settlements and judgments exceeding $280 million. He successfully prosecuted complex multi-district litigation involving methyl tertiary-butyl ether (MTBE), 1,4-dioxane, per- and polyfluoroalkyl substances (PFAS), perchlorate, and other emerging contaminants on behalf of the nation's largest public groundwater supplier, and helped draft and successfully lobbied for passage of 13 New York State laws related to water law and environmental protection.

Editor's Note: As Chief Legal Officer and General Counsel of Suffolk County Water Authority, the author managed the following cases: In re MTBE Products Liability Litigation, In re AFFF Products Liability Litigation, State v. Fermenta ASC Corp., *and* Suffolk County Water Authority v. Dow Chemical Co. *As Principal of Hopkins Expert Services, the author anticipates serving as a fact witness (and has been designated as an expert witness to the extent his testimony may be expert in nature) in the* Suffolk County *case, which involves 1,4-dioxane contamination.*

1. *See* National Primary Drinking Water Regulation for Six PFAS, 89 Fed. Reg. 32452 (Apr. 26, 2024).

2. *See* In re MTBE Prods. Liab. Litig., 725 F.3d 65, 87-88 (2d Cir. 2013).

3. *See* In re AFFF Prods. Liab. Litig., MDL No. 2873, No. 2:18-mn-2873-RMG (D.S.C. filed Dec. 7, 2018) (public water supplier class claims settled; other claims pending).

with limited resources, has prioritized enforceable standards while health-based goals have received less attention.

This regulatory gap has real consequences. Water suppliers lack clear health-based treatment targets. Consumers cannot make informed decisions about their drinking water. And in litigation, courts struggle to determine the appropriate baseline for calculating damages when contamination occurs below regulatory limits but above levels EPA considers as having no impact on human health (i.e., the MCLG).

This Comment addresses the importance of MCLGs in three contexts: regulatory policy, water system management, and litigation strategy. Part I explains the regulatory framework creating MCLGs and MCLs, and their critical differences. Part II examines how New York's failure to adopt MCLGs for state-regulated contaminants creates uncertainty and litigation risk. Part III articulates five reasons why MCLGs matter. Part IV provides in-depth analysis of how MCLGs should function in water contamination litigation, including damage calculation methodologies and responses to common defense arguments. Part V concludes with recommendations for regulators, water suppliers, and courts.

I. The Regulatory Framework—How MCLGs and MCLs Are Established

A. *The Safe Drinking Water Act's Two-Step Process*

The U.S. Congress structured drinking water regulation as a two-step process. First, EPA establishes a nonenforceable MCLG based solely on health considerations. Second, EPA sets an enforceable MCL that must be as close to the MCLG as is "feasible" considering available technology and costs. This framework has remained consistent since EPA began implementing the Safe Drinking Water Act (SDWA).[4]

The SDWA defines an MCLG as "the level at which no known or anticipated adverse effects on the health of persons occur and which allows an adequate margin of safety."[5] This is purely health-based. EPA considers toxicological studies, epidemiological data, and safety factors, but not treatment costs, analytical capabilities, or implementation challenges.

In contrast, an MCL is "as close to the maximum contaminant level goal as is feasible."[6] "Feasible" means "feasible with the use of the best technology, treatment techniques and other means which the Administrator finds, after examination for efficacy under field conditions and not solely under laboratory conditions, are available (taking cost into consideration)."[7]

This creates an inherent gap. The MCLG represents the aspirational health goal. The MCL represents the practical regulatory requirement. The distance between them reflects compromises necessitated by technological limitations, analytical detection capabilities, and economic considerations.

B. *How EPA Establishes MCLGs*

EPA's MCLG methodology depends on the contaminant's health effects. The Agency has followed consistent principles since at least 1988.[8]

For *carcinogens with no known threshold*, EPA typically sets the MCLG at zero. Examples include PFOA, PFOS, arsenic, and vinyl chloride. The zero MCLG reflects that any exposure may present cancer risk, however small. EPA's 2024 PFAS regulation reaffirmed this approach.[9]

For *noncarcinogens and threshold carcinogens*, EPA calculates a reference dose (RfD) from toxicological studies. The MCLG is derived from the RfD using assumptions about daily water consumption and body weight.

For *microbiological contaminants*, EPA generally sets the MCLG at zero because any pathogen exposure presents infection risk.

MCLGs incorporate safety factors, often tenfold or greater, to account for uncertainty and protect sensitive populations, including infants, children, pregnant women, the elderly, and the immunocompromised.

C. *How EPA Establishes MCLs*

After determining the health-based MCLG, EPA establishes the enforceable MCL "as close to the MCLG as is feasible."[10] This feasibility determination involves:

> **Analytical methods:** Can laboratories reliably detect and measure the contaminant at the proposed MCL?
> **Treatment technology:** Are treatment technologies available that can consistently achieve the proposed MCL under field conditions?
> **Economic costs:** What are the costs to public water systems? EPA must consider whether smaller systems can afford compliance.
> **Multiple contaminants:** Water systems often face multiple contaminants simultaneously.
> **Treatment byproducts:** Some treatment methods create their own potentially harmful byproducts.

MCLs frequently exceed MCLGs, sometimes by orders of magnitude.

4. *See* U.S. EPA, Guidance From Hotline Compendium, WSG H15: Determination of MCLGs and MCLs (1988) [hereinafter Guidance From Hotline Compendium]; 89 Fed. Reg. 32452; SDWA, 42 U.S.C. §§300f et seq.
5. 42 U.S.C. §300g-1(b)(4)(A).
6. *Id.* §300g-1(b)(4)(B).
7. *Id.* §300g-1(b)(4)(D).
8. *See* Guidance From Hotline Compendium, *supra* note 4.
9. *See* 89 Fed. Reg. 32452.
10. *See* Guidance From Hotline Compendium, *supra* note 4.

D. Examples of the MCL-MCLG Gap

Table 1 illustrates the gap between health goals and regulatory requirements. EPA's methodology has remained consistent since 1988.[11]

For carcinogens with zero MCLGs, the MCL represents a practical compromise between the health ideal (zero exposure) and analytical/treatment reality. EPA's 2024 PFAS regulation illustrates this: despite setting MCLGs at zero for PFOA and PFOS based on cancer risk, EPA set MCLs at 4 ppt, the lowest level reliably achievable with current technology.[12] This gap exemplifies the distinction between health goals and regulatory feasibility that has characterized EPA's standard-setting since 1988.

Notably, EPA sets the MCL equal to the MCLG when treatment technology and analytical methods allow achievement of the health goal at reasonable cost. There are 47 contaminants regulated by EPA that have MCL values that equal their respective MCLG values. They are typically noncarcinogenic chemicals.

The SDWA explicitly contemplates this evolution. Under §1412(b)(9), enacted in 1996, EPA must "not less often than every 6 years, review and revise, as appropriate, each national primary drinking water regulation." The statute directs EPA to determine whether to revise each MCL "based on new scientific data" and treatment technology advances. Critically, any revision must set the MCL "as close to the maximum contaminant level goal as is feasible," encouraging the Agency to narrow the gap as science and technology advance.

This six-year review recognizes that MCLs are not static. As methods improve, technologies advance, and understanding deepens, what was "feasible" a decade ago may no longer represent the appropriate balance. The MCLG, by contrast, remains constant unless new toxicological evidence emerges. It represents the health-based target toward which regulatory standards should move. EPA reduced the arsenic MCL from 50 ppb to 10 ppb in 2001 based on new scientific evidence and improved treatment technology, bringing it closer to (though still far from) the MCLG of zero.

E. The Stability of MCLGs Amid Regulatory Change

Recent developments in PFAS regulation demonstrate why MCLGs provide a more stable baseline for damages than MCLs. Following EPA's April 2024 establishment of MCLs for six PFAS compounds, water utilities challenged aspects of the regulation, seeking additional time for compliance and clarity regarding certain contaminants.[13] In May 2025, EPA announced it would maintain the PFOA and PFOS standards but reconsider regulations for perfluorohexanesulfonic acid (PFHxS), perfluorononanoic acid (PFNA), and hexafluoropropylene oxide dimer acid (HFPO-DA (GenX)), extending compliance deadlines to 2031.[14]

These regulatory adjustments illustrate a critical point: MCLs change based on feasibility considerations, analytical capabilities, treatment technology availability, compliance costs, and implementation timelines. MCLGs, by contrast, remain constant because they reflect only health-based determinations. EPA's reconsideration of certain PFAS MCLs does not alter the underlying health science establishing MCLGs.

This stability makes MCLGs the superior framework for damages calculations. If courts measured damages from MCLs, contamination that warranted full damages today might warrant lesser damages tomorrow if EPA relaxed an MCL based on feasibility constraints. Conversely, if EPA

Table 1. The MCLG-MCL Gap for Selected Contaminants

Contaminant	MCLG	MCL	Reason for Gap
PFOA	0	4 ppt	Carcinogen; detection/treatment limits (2024 rule)
PFOS	0	4 ppt	Carcinogen; detection/treatment limits (2024 rule)
Arsenic	0	10 parts per billion (ppb)	Carcinogen; treatment costs
Lead	0	15 ppb (AL)*	Neurotoxin; infrastructure constraints
Total Trihalomethanes	0 (some)	80 ppb	Disinfection byproducts; treatment balance
Chloroform	70 ppb	80 ppb	Possible carcinogen with threshold
Atrazine	3 ppb	3 ppb	MCLG equals MCL
Nitrate	10 milligrams per liter (mg/L)	10 mg/L	MCLG equals MCL

* AL stands for Action Level. For lead and copper, EPA uses ALs rather than MCLs to trigger required regulatory responses. On October 30, 2024, EPA finalized the Lead and Copper Rule Improvements, lowering the lead AL from 15 ppb to 10 ppb, with a compliance date of November 1, 2027. See National Primary Drinking Water Regulations for Lead and Copper: Improvements (LCRI), 89 Fed. Reg. 86418 (Oct. 30, 2024).

11. *See id.*; 89 Fed. Reg. 32452.
12. *See* 89 Fed. Reg. at 32460-63.
13. *See* American Water Works Ass'n v. Environmental Prot. Agency, No. 24-1188 (D.C. Cir. filed June 7, 2024).
14. Press Release, U.S. EPA, EPA Announces It Will Keep Maximum Contaminant Levels for PFOA, PFOS (May 14, 2025), https://www.epa.gov/newsreleases/epa-announces-it-will-keep-maximum-contaminant-levels-pfoa-pfos.

tightened an MCL as technology improved, previously "harmless" contamination would retroactively become compensable. Using MCLGs as the baseline avoids this instability. The health-based goal remains constant; only the feasibility-constrained regulatory standard fluctuates.

F. The Legal Status of MCLGs

MCLGs are non-enforceable health advisories. A water system delivering water exceeding an MCLG but below the MCL violates no federal law and faces no EPA enforcement action. Only MCL violations trigger regulatory consequences. This creates a paradox: EPA officially recognizes that water exceeding the MCLG may present health risks, yet the Agency cannot compel treatment to achieve the health goal if doing so exceeds feasibility limits.

II. The State Regulatory Gap—When States Adopt MCLs Without MCLGs

States increasingly adopt drinking water standards more protective than federal requirements, particularly for emerging contaminants where EPA has not yet acted. However, when states establish their own MCLs, they often fail to adopt corresponding MCLGs. This creates uncertainty for water suppliers, consumers, and courts, particularly in contamination litigation. This regulatory gap becomes acute in litigation, where the absence of state MCLGs forces courts to determine appropriate damages baselines without clear guidance, the subject of Part IV.

A. The Challenge of Emerging Contaminants

Consider 1,4-dioxane, a synthetic industrial chemical classified by EPA as a likely human carcinogen. EPA has not yet established either a federal MCLG or MCL for 1,4-dioxane. In this regulatory gap, several states have acted.

In 2020, New York adopted the nation's first state MCL for 1,4-dioxane at 1 ppb.[15] The regulation requires monitoring and action if levels exceed 1 ppb, but it does not establish a state-specific MCLG. In fact, the New York State Sanitary Code does not even utilize the term "maximum contaminant level goal."

This creates practical problems. When a water system detects 1,4-dioxane above zero but below 1 ppb, what should it do? From a regulatory compliance standpoint, no obligation to treat exists. But because 1,4-dioxane is a likely carcinogen, EPA's standard methodology would establish an MCLG of zero, consistent with its approach to other carcinogens. Any detection above zero means customers consume water containing a likely carcinogen at detectable levels, even though the system complies with state law.

Without a formally adopted MCLG, water systems lack clear regulatory guidance on treatment targets.

15. N.Y. Comp. Codes R. & Regs. 10, §5-1.52, tbl.B.

B. Additional Examples From State Regulations

New York's PFAS regulation illustrates a similar issue. In 2020, New York adopted MCLs for six PFAS compounds at 10 ppt.[16] Again, the regulation did not adopt MCLGs for these contaminants. EPA's 2024 PFAS regulation subsequently established MCLGs of zero for PFOA and PFOS based on their carcinogenic properties.[17]

Water systems must meet state MCLs, but had no official state guidance on health-based treatment targets below those levels. For PFOA and PFOS, where federal MCLGs are zero, any detectable level presents potential health concerns according to EPA. Water systems committed to providing the highest-quality water have adopted policies to treat to non-detectable levels for these carcinogenic compounds, but this represents a voluntary decision based on federal health goals rather than state requirements. Water systems demonstrate their commitment to providing the highest-quality water by voluntarily treating to health-based goals even when not required by regulation. Water systems that pursue health-based goals beyond regulatory requirements are the leaders in the industry.

C. The Litigation Implications

The absence of state-adopted MCLGs creates litigation complexity. Consider a scenario where a polluter contaminates a water supply with 1,4-dioxane at levels ranging from 0.6-0.8 ppb. The water system installs treatment to reduce 1,4-dioxane to non-detectable levels and sues for damages.

What is the appropriate damages baseline? The polluter will argue damages should be measured only for contamination exceeding the 1 ppb state MCL. The water system will argue damages should be measured from zero, consistent with EPA's approach to carcinogens, because any detectable level of this likely carcinogen presents potential health effects. In accordance with the water system perspective, federal courts have recognized that water providers may suffer compensable injury from contamination below applicable regulatory limits.[18]

The consequences are not theoretical. In litigation involving tetrachloroterephthalic acid (TCPA) contamination, the absence of a specific MCLG proved costly. New York had only a generic 50 ppb standard for "Unspecified Organic Contaminants." Plaintiffs could establish trespass and damages only for wells exceeding that 50 ppb level, despite concerns about health effects at lower concentrations.[19] Wells with detectable TCPA less than 50 ppb received no compensation.

However, where there is an established MCLG for the contaminant, the MCLG should serve as the foundation for calculating damages. Where no MCLG has been established, other factors should be considered, including

16. *Id.*
17. *See* 89 Fed. Reg. 32452.
18. *See* In re MTBE Prods. Liab. Litig., 725 F.3d 65, 87-88 (2d Cir. 2013).
19. State v. Fermenta ASC Corp., 630 N.Y.S.2d 884, 890 (N.Y. Sup. Ct. 1995), *aff'd*, 656 N.Y.S.2d 342 (N.Y. App. Div. 1997).

the contaminant's carcinogenic potential. For known and likely carcinogens without established MCLGs, the baseline for damages should be zero, consistent with EPA's methodology for carcinogens.

Damages should be calculated using MCLGs as the baseline, or zero for carcinogens where no MCLG exists, even where New York has not adopted corresponding state MCLGs.[20] Defendants have challenged this approach, arguing that state regulatory standards should govern damages calculations. The issue remains unsettled in New York jurisprudence, although the U.S. Court of Appeals for the Second Circuit held that recovery for contamination below established MCLs can be compensable for several reasons.[21]

D. *The Need for State MCLG Adoption*

When states adopt MCLs more stringent than federal standards, simultaneously adopting corresponding MCLGs would provide several benefits as detailed in Part III. States could adopt federal MCLGs where EPA has established them or conduct their own health-based analyses for contaminants unique to state regulation.

III. Five Reasons MCLGs Matter

MCLGs often function as overlooked provisions in drinking water law. But they serve at least five critical functions that benefit public health, water system management, and the legal system.

A. *Public Transparency: Distinguishing "Safe" From "Safest"*

MCLGs enable transparency. When water systems report that water is "safe" because it meets all MCLs, consumers deserve to know whether that water also meets health-based goals.

Consider the earlier PFOA example. A water system detecting 2 ppt PFOA is in full compliance with the 4 ppt MCL, and can truthfully report the water meets all federal standards. But the MCLG is zero. Consumers drinking that water are exposed to levels above what EPA considers the health-based goal.

Without knowing about MCLGs, consumers cannot distinguish between water that barely meets regulatory requirements and water that achieves health-based goals. Water meeting MCLs is "safe" in regulatory terms, but water achieving MCLGs represents the "safest" level according to EPA's health-based determinations. Moreover, even when contamination remains below regulatory limits, public confidence can be undermined when consumers detect contaminants through taste or odor.[22] Drinking water with contamination that is above MCLGs could have a similar undermining effect on public confidence.

B. *Protecting Vulnerable Populations*

MCLGs specifically protect vulnerable populations, those most at risk from contaminant exposure. EPA establishes MCLGs using safety factors that account for sensitive subpopulations: infants and children (whose developing systems are more vulnerable), pregnant women (whose exposures affect fetal development), the elderly (whose systems may be less resilient), and the immunocompromised (whose defenses against toxins are weakened).[23]

MCLs, by contrast, represent population-wide standards that balance health protection against practical constraints. When feasibility forces EPA to set MCLs above MCLGs, the regulatory standard may not adequately protect the most vulnerable.

C. *Rational Treatment Decisions*

MCLGs enable rational treatment decisions when water systems face multiple contaminants or must prioritize limited resources. Water systems frequently detect multiple contaminants simultaneously. Treatment decisions must consider which contaminants present the greatest health concerns and which treatment investments provide the most health benefit per dollar spent.

MCLGs provide the health-based hierarchy enabling these rational decisions. Contaminants exceeding MCLGs present potential health effects and warrant immediate attention. Contaminants below MCLGs but above detection limits may warrant monitoring and future treatment, but do not present the same urgency.

Suffolk County Water Authority operates approximately 600 public supply wells, many with detections of various PFAS contaminants. Wells with PFOA and PFOS detections (MCLGs of zero) require treatment to non-detectable levels to achieve the health-based goal. However, other PFAS contaminants have MCLGs above zero. For example, PFHxS, PFNA, and GenX have MCLGs of 10 ppt. A well detecting only PFHxS at 8-12 ppt needs treatment only to the 10 ppt MCLG level. But if that same well also has PFOA or PFOS detections, treatment capable of achieving non-detectable levels for all PFAS is warranted as they all can be removed with the same granular activated carbon treatment system. The MCLG distinction allows rational treatment decisions that protect health while preserving resources.

When utilities avoid overtreatment, they can maintain more affordable rates while protecting public health. They can invest in multiple priorities, addressing several contaminants, replacing critical infrastructure, and improving system resilience, rather than exhausting

20. *See, e.g.*, Suffolk Cnty. Water Auth. v. Dow Chem. Co., No. 17-CV-06980 (E.D.N.Y. filed Nov. 30, 2017) (pending case involving 1,4-dioxane).
21. *See MTBE Prods. Liab. Litig.*, 725 F.3d at 87-88.
22. *See id.* at 88.
23. U.S. EPA, *How EPA Regulates Drinking Water Contaminants*, https://www.epa.gov/sdwa/how-epa-regulates-drinking-water-contaminants (last updated Sept. 30, 2025).

budgets on single-contaminant treatment to levels below any health concern.

This argument is not a license to defer addressing genuine contamination. When MCLGs are zero, or when contaminant levels substantially exceed MCLGs above zero, aggressive treatment remains warranted. The rationality of treating to MCLGs of zero for carcinogenic contaminants has been validated: in the PFAS class action settlement for public water suppliers, manufacturers paid more than $13 billion to water providers for contamination at any detectable level, implicitly recognizing that treatment to non-detectable levels is reasonable and necessary.[24]

D. *Preserving Scarce Water Resources*

MCLGs help preserve scarce groundwater and surface water resources. When contamination exceeds MCLGs but remains below MCLs, water systems must decide whether to continue using the source with treatment or to abandon it entirely.

For water systems with limited supply options, particularly in arid regions or areas with fully allocated surface water, every well or intake matters. If treatment can achieve the health-based goal (the MCLG), then preserving the source makes sense.

MCLGs provide the answer: if the contaminant has a zero MCLG (indicating potential health effects at any level), treat to non-detectable levels. If the contaminant has an MCLG above zero (indicating a safe threshold), treat to that level. This guidance helps water systems make cost-effective decisions that protect both public health and precious water resources.

E. *Foundation for the Legal System: A Framework for Assessing Harm*

The fifth reason MCLGs matter, their role in contamination litigation and damages assessment, deserves extensive discussion. Because this litigation function has profound implications for how courts, attorneys, and water suppliers approach contamination cases, the following part is devoted entirely to this topic.

IV. MCLGs in Water Contamination Litigation—A Damages Framework

Despite their fundamental importance to the SDWA's regulatory structure, MCLGs have received virtually no scholarly attention as a framework for calculating damages in contamination litigation. The Second Circuit in *In re MTBE Products Liability Litigation* recognized that water providers can suffer compensable injury from sub-MCL contamination based upon health concerns, organoleptic effects (taste and odor impacts), and impairment of public confidence in the water supply.[25] However, most courts have not articulated a consistent framework for measuring those damages.[26] This part fills that gap by demonstrating why MCLGs provide the appropriate legal and scientific baseline for damages calculations, while recognizing that organoleptic effects may warrant damages even when contamination remains at or below MCLG levels.

A. *The Fundamental Question: Where Does Harm Begin?*

In any property damage case, courts must identify where harm begins. For water contamination, this determination is critical: At what point does contamination transform clean water into damaged water that warrants compensation?

Defendants typically argue that harm begins only when contamination exceeds enforceable regulatory standards, the MCL. Under this theory, if contamination remains below the MCL, no regulatory violation occurred, the water remains "safe," and no compensable harm exists. This argument is legally and logically flawed for three reasons.

First, it conflates regulatory compliance with absence of harm. That a water system violates no regulation does not mean its resource remains undamaged. Regulations represent minimum acceptable standards, not optimal conditions. Water containing contaminants above health-based goals but below regulatory limits suffers diminution in value.

Second, it ignores property rights in uncontaminated water. Water suppliers and property owners have a right to water in its natural, uncontaminated condition. When a polluter introduces contaminants that did not naturally occur in the water source, the polluter has damaged the owner's property regardless of whether regulatory limits are exceeded. Property law recognizes that any unauthorized intrusion onto another's property constitutes a trespass, regardless of the extent of harm caused.[27]

Third, it creates perverse incentives. If damages begin only at regulatory violation, polluters face no liability for contamination up to the MCL. This incentivizes pollution up to (but not over) regulatory limits and undermines the polluter-pays principle.[28]

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24. *See* In re AFFF Prods. Liab. Litig., MDL No. 2873, No. 2:18-mn-2873-RMG (D.S.C. filed Dec. 7, 2018) (public water supplier class claims settled; other claims pending).

25. *MTBE Prods. Liab. Litig.*, 725 F.3d at 87-88.

26. The Second Circuit in *MTBE Products Liability Litigation* held that damages can occur below the MCL, but did not address MCLGs. The court was addressing New York's MCL for MTBE, and New York does not incorporate MCLGs into its State Sanitary Code, illustrating the gap in guidance that this Comment addresses. EPA has not established a national primary drinking water regulation for MTBE. Thus, there is no federal MCLG for MTBE.

27. *See* Hill v. Raziano, 880 N.Y.S.2d 173, 175 (N.Y. App. Div. 2009) (nominal damages presumed from trespass even without actual injury); *see also* Town of New Windsor v. Avery Dennison Corp., No. 10-CV-8611, 2012 U.S. Dist. LEXIS 27264, at *10-11 (S.D.N.Y. Mar. 1, 2012) (groundwater contamination constitutes trespass where defendant intended the act and had reason to know pollutants would migrate to plaintiff's land).

28. *See* 42 U.S.C. §9607 (Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) liability provisions embodying polluter-pays principle).

The better approach measures harm from the point at which health effects may occur, the MCLG. This aligns with traditional property damage principles, respects the science underlying drinking water standards, and ensures full compensation for contaminated resources.

B. *Why MCLGs Are the Appropriate Damages Baseline*

MCLGs represent the appropriate starting point for contamination damages for several interrelated reasons.

1. MCLGs Reflect Health-Based Harm

MCLGs represent the level at which "no known or anticipated adverse effects on the health of persons occur," with an adequate margin of safety. When contamination exceeds an MCLG, potential health effects may occur even if regulatory standards are met. EPA has consistently defined MCLGs as health-based goals since at least 1988.[29] Water that may cause adverse health effects is objectively less valuable than water that poses no health concerns.

2. MCLGs Represent the Baseline Condition

Before contamination occurred, the water resource contained zero or background levels of the contaminant. The MCLG typically approaches this natural baseline far more closely than the MCL. Using the MCLG as the damages baseline restores the property owner to its rightful position, the condition that would exist but for the contamination. The largest drinking water settlement in American history, more than $13 billion paid by PFAS manufacturers, was structured around this principle, providing compensation for water systems with any detectable PFAS contamination.[30]

3. MCLGs Respect the Regulatory Framework

Using MCLGs as the damages baseline respects the two-step regulatory framework Congress established. Congress directed EPA to first determine the health-based goal (MCLG), and only then to set the practical regulatory standard (MCL) as close to the MCLG as feasible. This framework signals congressional intent that the MCLG represents the desired condition and the MCL represents a compromise necessitated by practical constraints.

4. MCLGs Provide Consistent Standards Across Contaminants

Using MCLGs provides a consistent analytical framework applicable to all contaminants. Two equally harmful carcinogens should generate equivalent damages even if one has superior analytical methods that permit a lower MCL.

5. MCLGs Account for Vulnerable Populations

MCLGs specifically protect vulnerable populations through the safety factors incorporated into their calculation. Damage calculations using MCLGs ensure that harm to sensitive subpopulations is fully compensated.

6. MCLGs Reflect the Best Available Science

EPA bases MCLGs on comprehensive reviews of peer-reviewed toxicological and epidemiological studies. Using MCLGs as the damages baseline aligns with the principle of grounding damages in health science rather than regulatory compromise.

C. *Application to Common Contamination Scenarios*

1. Carcinogens With MCLGs of Zero

A dry cleaner releases tetrachloroethylene (PCE) that migrates to a municipal well. PCE levels range from 1-3 ppb. The MCL for PCE is 5 ppb. The MCLG is zero.

Harm begins at any detectable level because the MCLG is zero. The water supplier can recover costs to treat the well to non-detectable levels, monitoring costs, public notification costs, and diminution in value of the contaminated wellfield. Courts recognize that injury can occur from sub-MCL contamination through health concerns, organoleptic effects, and impairment of public confidence.[31]

2. Non-Carcinogens With MCLGs Above Zero

A manufacturing facility releases chromium-3 that contaminates a water supply. Chromium-3 levels range from 50-80 ppb. The MCLG and MCL are both 100 ppb.
Harm begins only at 100 ppb because that is both the health goal and regulatory limit. However, the water supplier may be able to recover costs for monitoring and contingency planning.

3. Contaminants Without Established MCLGs

A public water supplier's wellfield is contaminated with 1,4-dioxane, a likely carcinogen, at levels ranging from 0.6-0.8 ppb. The state has adopted an MCL of 1 ppb. EPA

29. *See* Guidance From Hotline Compendium, *supra* note 4; National Primary Drinking Water Regulation for Six PFAS, 89 Fed. Reg. 32452, 32456 (Apr. 26, 2024).
30. *See* In re AFFF Prods. Liab. Litig., MDL No. 2873, No. 2:18-mn-2873-RMG (D.S.C. filed Dec. 7, 2018) (public water supplier class claims settled; other claims pending).
31. *See* In re MTBE Prods. Liab. Litig., 725 F.3d 65, 87-88 (2d Cir. 2013).

has classified 1,4-dioxane as a likely carcinogen, but has not yet established a federal MCLG or MCL.

Although EPA has not formally established an MCLG for 1,4-dioxane, the contaminant's classification as a likely carcinogen is instructive. EPA's long-standing methodology establishes MCLGs of zero for carcinogens. Harm should begin at any detectable level, consistent with EPA's approach to other carcinogens. The water supplier can recover costs to treat to non-detectable levels based on the carcinogenic classification.

4. Multiple Contaminants Requiring Prioritized Treatment

A manufacturing facility releases both PFOA and PFHxS into a municipal wellfield. Testing reveals PFOA at 3-5 ppt and PFHxS at 8-12 ppt across multiple wells. The MCL for PFOA is 4 ppt with an MCLG of zero. The MCL for PFHxS is 10 ppt with an MCLG of 10 ppt.

The MCLG framework provides clear prioritization. PFOA, with its zero MCLG, requires treatment to non-detectable levels because any exposure may present cancer risk. PFHxS requires treatment only to 10 ppt, its MCLG. The water system should install treatment capable of achieving non-detectable levels for both contaminants (since the technology must address PFOA), but damages for PFHxS are calculated based on achieving the 10 ppt MCLG, not zero.

This scenario illustrates how MCLGs enable rational treatment and damages determinations when multiple contaminants are present. The water supplier can recover costs for a comprehensive treatment system while avoiding claims of "overtreatment" for the non-carcinogenic contaminant.

5. Regulatory Changes During Litigation

A water supplier files suit in 2018 for contamination by Contaminant X at levels of 15-20 ppb. At filing, EPA has established an MCL of 25 ppb and an MCLG of 10 ppb based on 2015 toxicological data. In 2020, during discovery, EPA revises the MCLG to 5 ppb based on new epidemiological studies showing adverse effects at lower levels. In 2023, before trial, EPA further revises the MCLG to zero after studies confirm carcinogenicity.

The appropriate MCLG for damages is the one in effect at the time of trial or judgment, not the one in effect when contamination began or when suit was filed. MCLGs reflect the best available science about health effects. As science evolves and demonstrates harm at lower levels, the damages baseline should reflect current understanding.

Defendants may argue that applying a revised MCLG constitutes unfair retroactive liability. This argument fails for three reasons. First, the defendant's liability arose when contamination began, not when the MCLG was established. Second, the harm (presence of a carcinogen in water) existed regardless of regulatory recognition. Third, damages measure the cost to remediate the contamination, which necessarily occurs after suit is filed and should be calculated using the best current science about safe levels. MCLG revisions represent evolution in scientific understanding of health effects and should be incorporated into damages calculations.

D. *Responding to Defense Arguments*

Defense Argument 1: "MCLGs are non-enforceable and therefore irrelevant to damages."

Response: That MCLGs are non-enforceable for regulatory purposes does not make them irrelevant for damages purposes. MCLGs represent EPA's official determination of health-based goals. The non-enforceable nature of the standard does not preclude its use in damages calculations. Courts routinely consider industry standards, professional guidelines, and best practices when calculating damages, even though these standards carry no regulatory force.[32]

Defense Argument 2: "The water supplier violated no regulation, so it suffered no harm."

Response: Regulatory compliance and absence of harm are distinct concepts. Water suppliers have property rights in uncontaminated water. When contamination degrades that resource, even if it remains above regulatory thresholds, compensable harm occurs. The Second Circuit confirmed this principle in *MTBE Products Liability Litigation*, holding that a public water provider may be injured by contamination at levels below the applicable MCL.[33]

Defense Argument 3: "Treatment to achieve MCLGs is not required and therefore not compensable."

Response: Remediation need not be legally required to be compensable in damages. Property owners harmed by pollution may recover costs to restore their property to pre-contamination conditions even where no legal mandate requires such restoration. The historic PFAS settlement, where manufacturers paid more than $13 billion to water providers for contamination at any detectable level, demonstrates that treatment to health-based goals is reasonable and compensable.[34] New York courts have recognized that property owners may recover costs to remediate contamination to pre-contamination conditions.[35]

Defense Argument 4: "MCLG-based damages would impose liability without limit."

Response: MCLG-based damages are bounded by the actual costs of treatment, monitoring, and remediation.

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32. *See id.* (water provider may be injured by contamination below MCL based on taste, odor, and public confidence concerns).
33. *Id. See also* Town of New Windsor v. Avery Dennison Corp., No. 10-CV-8611, 2012 U.S. Dist. LEXIS 27264 (S.D.N.Y. Mar. 1, 2012) (allowing trespass and public nuisance claims for groundwater contamination of public water supply); Plumbing Supply, LLC v. ExxonMobil Oil Corp., No. 14-cv-3674 (S.D.N.Y. May 27, 2016) (nuisance claims for injunctive relief not time-barred for continuing contamination).
34. *AFFF Prods. Liab. Litig.*, No. 2:18-mn-2873-RMG (settlement providing compensation for water systems with any PFAS detection).
35. *See Town of New Windsor*, 2012 U.S. Dist. LEXIS 27264 (recognizing claims for groundwater contamination remediation).

Courts applying traditional damages principles, reasonableness, necessity, and proportionality, will limit damages to costs that are reasonable under the circumstances.

Defense Argument 5: "EPA set the MCL as the health-protective standard."

Response: EPA set the MCL as the feasibility-constrained standard, not the health-protective standard. The MCLG is the health-protective standard. If MCLs represented EPA's judgment of adequate health protection, Congress would not have required EPA to establish separate MCLGs.[36]

E. Calculating Damages Using MCLGs

Damages should be calculated using MCLGs as the baseline. For carcinogens with MCLGs of zero, this means treatment to non-detectable levels. For noncarcinogens with MCLGs above zero, this means treatment to the MCLG level. For contaminants without established MCLGs, courts should look to the contaminant's classification and apply EPA's standard methodology—zero for carcinogens, health-based calculations for noncarcinogens. Recoverable damages include treatment system capital and operating costs, monitoring expenses, wellfield value diminution, public notice costs, engineering and planning expenses, and any period of lost use of the resource while treatment is designed and constructed.

F. Proof Issues and Expert Testimony

Depending on the facts and circumstances of each case, proving MCLG-based damages may require expert testimony on several points.

1. The Distinction Between MCLs and MCLGs

Expert witnesses may be needed to explain why MCLGs provide the appropriate baseline for health protection.

2. Health Effects at Levels Exceeding MCLGs

Experts may be needed to explain what health effects may occur at levels between the MCLG and MCL.

3. Treatment Technology and Costs

Engineering experts may be needed to testify regarding available treatment technologies, their efficacy in achieving MCLG levels, and their costs.

4. Causation

Standard causation testimony may be needed to link the defendant's contamination to the levels detected in the water supply.

5. Necessity of Treatment

Experts may be needed to explain why treatment to MCLG levels is necessary given health considerations, even though regulatory standards are met. Expert testimony should also address the multiple bases for injury from sub-MCL contamination, including health effects at levels between MCLG and MCL, organoleptic impacts, and damage to public confidence in the water supply.[37]

Expert testimony demonstrating EPA's methodology for establishing MCLGs, the nonlinear dose-response relationships for carcinogens that inform zero MCLGs, and the specific health endpoints (cancer, developmental effects, neurological effects) that MCLGs are designed to prevent provides a solid foundation for an appropriate damages framework.[38]

6. Admissibility of MCLG-Based Expert Testimony

Defendants may challenge the admissibility of expert testimony regarding MCLGs under *Daubert v. Merrell Dow Pharmaceuticals, Inc.*[39] or state equivalents. Such challenges should fail.

MCLGs are established by EPA through comprehensive peer-reviewed processes. The methodology EPA employs—toxicological studies, RfD calculations, and safety factors—represents the consensus approach of the scientific community. Expert testimony explaining MCLGs does not propose novel or unreliable methodologies; it explains EPA's application of widely accepted toxicological principles.

The *Daubert* factors—testing, peer review, error rates, and acceptance—all support admissibility:

- **Testing:** MCLGs are based on controlled toxicological studies and epidemiological research.
- **Peer review:** EPA's methodology and specific MCLG determinations undergo extensive peer review through the Science Advisory Board and public comment processes.
- **Error rates:** EPA's methodology incorporates safety factors specifically to account for uncertainty.
- **Acceptance:** EPA's approach to establishing health-based standards represents the consensus methodology in regulatory toxicology.

36. *See* Guidance From Hotline Compendium, *supra* note 4, at 1 ("Unlike the MCLG, the MCL is an enforceable regulation that the EPA considers practically and feasibly attainable[.]"); 42 U.S.C. §300g-1(b)(4).
37. *See MTBE Prods. Liab. Litig.*, 725 F.3d at 88.
38. *See generally* Fed. R. Evid. 702; Daubert v. Merrell Dow Pharms., Inc., 509 U.S. 579 (1993).
39. 509 U.S. 579.

The relevant question is not whether MCLGs are scientifically reliable, they manifestly are, but whether they provide an appropriate legal framework for damages. That is a legal question for the court, not an admissibility question under *Daubert*.

7. Judicial Notice of MCLGs

Courts may take judicial notice of EPA's establishment and values of MCLGs. Federal Rule of Evidence 201(b) permits judicial notice of facts "not subject to reasonable dispute," that are "generally known" or "can be accurately and readily determined from sources whose accuracy cannot reasonably be questioned."

MCLGs meet these criteria. They are published in the *Federal Register* and *Code of Federal Regulations*, official government sources whose accuracy cannot reasonably be questioned. While no court has taken judicial notice of EPA MCLGs to date, several courts have taken judicial notice of EPA MCLs.[40]

Courts may take judicial notice that EPA has established specific MCLG values, but expert testimony may remain necessary to explain the significance of MCLGs, the health effects they are designed to prevent, and why they provide the appropriate baseline for damages calculations.

G. *The Organoleptic and Secondary Drinking Water Standard Exceptions to MCLG-Based Damages*

While MCLGs generally provide the appropriate baseline for damages calculations, two categories of exceptions warrant acknowledgment: organoleptic effects and secondary maximum contaminant levels (SMCLs).

1. Organoleptic Effects

A contaminant may be present at or below its MCLG yet still produce taste, odor, or other sensory impacts that render water unmarketable or damage public confidence. The Second Circuit recognized this principle in *MTBE Products Liability Litigation*, where MTBE at concentrations below the MCL produced a distinctive "turpentine-like" taste and odor that undermined public confidence in New York City's water supply.[41] The jury reasonably could find that this organoleptic impact constituted compensable injury even though MTBE levels remained below regulatory limits.

This organoleptic exception does not undermine the MCLG framework. Rather, it recognizes that water utilities suffer distinct categories of harm: health-based harm (measured from the MCLG) and organoleptic harm (measured from the threshold of sensory impact). Where contamination causes both health concerns and organoleptic effects, damages should reflect both categories of harm.

2. SMCLs

EPA also establishes SMCLs for contaminants that affect the aesthetic qualities of drinking water—taste, odor, color, and appearance—but are not considered to present health risks at the SMCLs.[42] Unlike MCLs, SMCLs are non-enforceable federal guidelines. Examples include iron and manganese (which can cause water discoloration), chloride and sulfate (which affect taste), and pH (which can impact corrosivity).

When contamination exceeds SMCLs, water utilities may suffer compensable harm even though no health-based MCLG is implicated. Water that tastes unpleasant, appears discolored, or stains plumbing fixtures suffers diminution in value regardless of health effects. Consumers may refuse to drink aesthetically unacceptable water or may lose confidence in their water supply, creating the same category of harm recognized in *MTBE Products Liability Litigation*.

For contaminants with both health-based standards (MCLGs/MCLs) and aesthetic standards (SMCLs), damages should be measured from whichever threshold is lower. This ensures full compensation for all categories of harm, health effects, aesthetic impacts, and impairment of public confidence. Like the organoleptic exception, SMCL-based damages represent a distinct category of harm that complements rather than contradicts the MCLG framework for health-based contamination.

H. *The Path Forward*

The MCLG-based damages framework represents sound law, good policy, and fair compensation. As water contamination litigation continues to expand, courts will increasingly confront the question of appropriate damages measures.

For plaintiffs' counsel: Frame your damages case around MCLGs from the outset. The historic PFAS settlement, more than $13 billion paid to water providers for any detectable contamination, demonstrates that MCLG-based damages theories can succeed.[43]

For defense counsel: Understand that courts may find the MCLG-based framework compelling when plaintiffs present strong expert testimony.

For judges: Recognize that the MCLG-based framework honors property rights, compensates for actual harm, and aligns with traditional damages principles.

The fundamental question remains: Should courts measure harm from the point where health protection ends or

40. *See, e.g.*, United States v. Bay Area Realty Co., 312 F. Supp. 2d 162, 165 (D. Mass. 2004); United States v. Alisal Water Corp., 326 F. Supp. 2d 1010 (N.D. Cal. 2004); United States v. City of Waukegan, 152 F. Supp. 2d 943 (N.D. Ill. 2001); United States v. B & W Inv. Props., 38 F.3d 362 (7th Cir. 1994); United States v. Midway Heights Cnty. Water Dist., 695 F. Supp. 1072 (E.D. Cal. 1988).
41. *MTBE Prods. Liab. Litig.*, 725 F.3d at 88.
42. *See* 40 C.F.R. §143.3.
43. *See* In re AFFF Prods. Liab. Litig., MDL No. 2873, No. 2:18-mn-2873-RMG (D.S.C. filed Dec. 7, 2018) (public water supplier class claims settled; other claims pending).

from the point where regulatory violations begin? MCLGs represent the foundation for rational, science-based damages in water contamination litigation.

V. Conclusion—Goals Matter

Return to being the water system manager from our opening scenario. You detect PFOA at 2 ppt, below the 4 ppt MCL but above the zero MCLG. Your system is in regulatory compliance, but your customers consume water above EPA's health-based goals. If contamination from a polluter caused this situation, what damages can you recover?[44]

This Comment has provided the answer. Harm occurs where health protection ends, at the MCLG, not where regulatory violations begin. The water system can recover costs to treat to non-detectable levels, preserving both public health and precious water resources while ensuring that polluters, not ratepayers, bear remediation costs. This framework honors property rights, respects scientific determinations, and ensures full compensation for contaminated resources.

In sports, business, and life, we can achieve what we aim for. When we set ambitious goals, we stretch to reach them. When we accept minimum standards, we settle for less. The same principle applies to drinking water. When we focus only on regulatory compliance, meeting MCLs, we accept water quality defined by what is feasible, not what is healthiest. When we embrace health-based goals, achieving MCLGs, we aspire to provide water as safe as science allows.

MCLGs serve five critical functions: they provide transparency about water quality, protect vulnerable populations, enable rational treatment decisions, preserve scarce water resources, and establish appropriate baselines for contamination damages. These functions benefit water suppliers, consumers, courts, and society.

Yet too often, MCLGs are overlooked. Regulators focus on enforceable MCLs. Water suppliers prioritize regulatory compliance. Courts struggle with damages questions that could be resolved through reference to health-based goals. Consumers remain unaware that "safe" water meeting all regulations may not be as healthy as water achieving health-based goals, the "safest" water.

The regulatory framework Congress established recognizes the importance of goals. The two-step process—first establish the health goal (MCLG), then set the practical standard (MCL) as close to the goal as feasible—reflects congressional judgment that health aspirations matter even when practical constraints may prevent their achievement.

For regulators: States that adopt drinking water standards more protective than federal requirements should establish MCLGs alongside MCLs. The modest investment in toxicological review pays dividends in clarity, transparency, and rational litigation outcomes.

For water suppliers: Advocate for MCLG adoption. Press state health departments to establish health-based goals. Set internal treatment targets based on MCLGs where they exist. Lead by example in pursuing health protection beyond regulatory compliance.

For courts: Recognize that MCLGs represent the appropriate baseline for contamination damages. Property rights extend to uncontaminated water. Harm begins where health protection ends, not where regulatory violations begin.

The question water consumers ask—"How much contamination do I want in my drinking water?"—deserves an answer grounded in health science, not regulatory compromise. MCLGs provide that answer. It is time we paid attention to them.

44. This example illustrates the principles discussed, though PFOA contamination claims by public water suppliers have now been addressed through class action settlement.