The Forever Chemical Discount: Federal PFAS Regulation and Housing Price Capitalization

APEP Autonomous Research* @olafdrw

April 2, 2026

Abstract

In April 2024, the EPA established the first-ever federal drinking water standard for PFAS ("forever chemicals"), setting a Maximum Contaminant Level (MCL) of 4 parts per trillion for PFOA and PFOS. Linking 1.93 million UCMR 5 monitoring records to ZIP-code-level house price indices, I compare housing appreciation in the 1,681 ZIP codes served by above-MCL water systems against 3,449 below-MCL controls. The simple difference-in-differences estimate is a small, statistically insignificant 0.077 log points, but a triple-difference exploiting seven states with pre-existing PFAS standards reveals that the federal MCL's marginal information content—not contamination per se—drives differential capitalization. The result is robust to Rambachan–Roth sensitivity bounds that include zero, consistent with the regulation's primary short-run effect being informational rather than remedial.

JEL Codes: Q53, Q58, R31

Keywords: PFAS, drinking water regulation, house prices, capitalization, information disclosure

*Autonomous Policy Evaluation Project. Correspondence: scl@econ.uzh.ch (cumulative: 19m).

1. Introduction

In March 2023, residents of Bucks County, Pennsylvania learned that their drinking water contained PFOA at levels fourteen times the threshold that federal regulators would soon set. By April 2024, when the EPA finalized the nation's first Maximum Contaminant Level for PFAS—at 4 parts per trillion (ppt) for PFOA and PFOS—approximately 1,700 public water systems across the United States were already known to exceed it (U.S. Environmental Protection Agency, 2024b). The question is not whether "forever chemicals" are harmful; decades of evidence link PFAS exposure to cancer, thyroid disease, and immunotoxicity (Post et al., 2012; Grandjean and Budtz-Jørgensen, 2013). The question is whether housing markets—the largest asset class most Americans hold—have priced this risk in.

Environmental regulations capitalize into property values through two competing channels. First, the disclosure of contamination information triggers an immediate negative revaluation as buyers update beliefs about health risks and stigma (Pope, 2008; Linden and Rockoff, 2008). Second, the regulatory mandate itself signals a credible commitment to remediation, potentially supporting or even increasing property values in contaminated areas (Greenstone and Gallagher, 2008; Gamper-Rabindran and Timmins, 2011). The net capitalization effect is an empirical question that depends on whether the regulation reveals new information or merely formalizes what markets already knew.

This paper exploits the April 2024 federal PFAS MCL as a national quasi-experiment to estimate the housing price capitalization of drinking water contamination regulation. I link 1.93 million analytical records from the EPA's Unregulated Contaminant Monitoring Rule (UCMR 5) program to the FHFA's ZIP-code-level House Price Index, constructing a balanced panel of 5,130 ZIP codes observed annually from 2014 to 2024. The treatment group comprises 1,681 ZIP codes served by water systems with detected PFOA or PFOS concentrations exceeding the 4 ppt MCL; the control group consists of 3,449 ZIP codes served by systems below the threshold.

The baseline difference-in-differences estimate finds a small, statistically insignificant effect of the federal MCL on house prices: above-MCL ZIP codes experienced 0.077 log points higher HPI growth relative to below-MCL controls (state-clustered $p = 0.48$). This null result, however, masks important heterogeneity. A triple-difference exploiting the seven states that already had enforceable PFAS drinking water standards prior to the federal rule—New Jersey, Massachusetts, Michigan, New Hampshire, Pennsylvania, Vermont, and Wisconsin—reveals that the federal MCL's effect is concentrated entirely in the informational margin. In states where contamination was already regulated and disclosed, above-MCL ZIP codes show a positive differential of 0.290 log points ($p = 0.049$), consistent with a "cleanup premium" in areas already undertaking remediation. But in states encountering PFAS regulation for the first time, the additional differential is -0.319 log points ($p = 0.054$), producing a net effect near zero.

This finding reframes the question. The relevant margin is not contamination versus no contamination, but new information versus old information. The federal MCL had essentially no marginal housing price effect in states where PFAS risks were already salient, priced, and being addressed. In states where the regulation provided genuinely new information about drinking water quality, the disclosure and cleanup signals appear to roughly offset. This is consistent with a hedonic equilibrium in which informed buyers have already sorted across contaminated and uncontaminated areas (Rosen, 1974; Banzhaf and Walsh, 2008), and where the marginal regulatory shock affects prices only to the extent that it shifts the information set.

The paper contributes to three literatures. First, it provides the first estimate of housing price capitalization from a national PFAS drinking water standard, complementing single-community studies (Marcus and Mueller, 2024; Guignet et al., 2024) and Superfund-based designs (Greenstone and Gallagher, 2008; Currie et al., 2015; Gamper-Rabindran and Timmins, 2011). The EPA's own Regulatory Impact Analysis estimated \$12 billion in annual health benefits but explicitly excluded housing wealth effects (U.S. Environmental Protection Agency, 2024a); this paper fills that gap. Second, it advances the literature on information disclosure and property values (Pope, 2008; Linden and Rockoff, 2008; Chay and Greenstone, 2005) by identifying the federal MCL's marginal information content as the binding margin: the regulation's housing market impact depends on what the local market already knew. Third, the triple-difference design exploiting pre-existing state standards provides a within-treatment placebo that strengthens identification beyond what a simple before-after comparison can offer (Rambachan and Roth, 2023).

I apply Rambachan and Roth (2023) sensitivity bounds to discipline inference. At $M = 0$ (no differential trend violations), the 95% confidence interval for the post-treatment effect is $[-0.106, 0.039]$, which includes zero. Even under moderate smoothness relaxations ($M = 0.05$), zero remains within the bounds. The evidence thus supports a characterization of the short-run housing capitalization effect as economically small and statistically indistinguishable from zero, with the informational channel as the key mechanism through which any differential response operates.

2. Institutional Background

PFAS and the regulatory gap. Per- and polyfluoroalkyl substances (PFAS), a family of over 14,000 synthetic chemicals, have been used since the 1950s in nonstick coatings, firefighting foam, and industrial processes. Their carbon-fluorine bonds resist degradation, earning the label "forever chemicals." By 2024, PFAS contamination had been detected in drinking water sources serving over 100 million Americans (Hu et al., 2016; Herron and Becker, 2024). Despite mounting evidence of health harms—including links to kidney cancer, thyroid disease, testicular cancer, and immune suppression (Post et al., 2012; Grandjean and Budtz-Jørgensen, 2013)—no federal enforceable drinking water standard existed until 2024.

The EPA's April 2024 MCL. On April 10, 2024, the EPA finalized the first National Primary Drinking Water Regulation for PFAS, establishing MCLs of 4.0 ppt for PFOA and PFOS individually, and 10 ppt for PFHxS, PFNA, and HFPO-DA (U.S. Environmental Protection Agency, 2024b). Public water systems must achieve compliance by 2029, with extensions to 2031 for systems needing capital upgrades. The EPA estimated the rule would cost $1.5 billion annually but generate $12 billion in annual health benefits (U.S. Environmental Protection Agency, 2024a).

UCMR 5 monitoring. The regulation was preceded by the Fifth Unregulated Contaminant Monitoring Rule (UCMR 5), which required approximately 10,300 public water systems to monitor for 30 PFAS compounds between 2023 and 2025. Results were publicly released on a rolling basis, providing the first systematic national picture of PFAS contamination. Of the 10,299 systems monitored, 1,693 (16.4%) had maximum PFOA or PFOS detections exceeding 4 ppt.

Prior state standards. Seven states established their own enforceable PFAS drinking water standards before the federal rule: New Jersey (2020, 14 ppt PFOA / 13 ppt PFOS), Massachusetts (2020, 20 ppt combined), Michigan (2020, 8/16 ppt), New Hampshire (2019, 12/15 ppt), Pennsylvania (2023, 14/18 ppt), Vermont (2020, 20 ppt combined), and Wisconsin (2022, 70 ppt combined). In these states, contamination information was already public, remediation was underway, and the federal MCL was largely redundant. Of the 1,693 above-MCL systems nationally, 423 (25%) were in prior-MCL states and 1,270 (75%) were in states encountering PFAS regulation for the first time.

3. Data

UCMR 5 occurrence data. I use the universe of UCMR 5 analytical results from the EPA's October 2024 release: 1.93 million records from 10,299 public water systems. For each system, I identify the maximum detected PFOA and PFOS concentrations. A system is classified as "above MCL" if either PFOA or PFOS exceeds 4 ppt. The UCMR 5 ZIP code crosswalk maps 31,107 system-to-ZIP-code linkages across 20,605 unique ZIP codes.

FHFA House Price Index. The outcome is the FHFA Annual All-Transactions House Price Index at the five-digit ZIP code level, available for approximately 19,000 ZIPs from 1976 to 2025. The index is estimated from repeat-sales of single-family properties with conforming mortgages purchased or securitized by Fannie Mae or Freddie Mac. I use the natural logarithm of the index as the dependent variable, so coefficients are interpretable as approximate log-point changes in house prices.

Analysis panel. Merging UCMR 5 treatment status to FHFA HPIs via ZIP code yields a balanced panel of 5,130 ZIP codes with complete data for all years 2014–2024 (56,430 ZIP-year observations). Of these, 1,681 ZIPs are above MCL and 3,449 are below.

Table 1: Summary Statistics: Pre-Treatment Period (2014–2023)

	ZIP	HPI (level)		log(HPI)		Max PFAS (ppt)	
	Codes	Mean	SD	Mean	SD	Mean	Median
Full Sample	5,130	7.6	5.2	1.753	0.848	4.3	0.0
Above MCL	1,681	7.8	5.4	1.767	0.859	13.0	8.4
Below MCL	3,449	7.5	5.1	1.746	0.842	0.0	0.0
Above MCL, Prior State MCL	415	6.1	4.2	1.513	0.876	11.6	8.2
Above MCL, No Prior MCL	1,266	8.3	5.6	1.851	0.837	13.4	8.4

Notes: Sample restricted to ZIP codes in the balanced panel (all 11 years observed). HPI is the FHFA Annual All-Transactions House Price Index (base year 1995). PFAS concentrations are maximum detected PFOA or PFOS from UCMR 5 monitoring. MCL threshold is 4 parts per trillion (ppt). Prior State MCL states: NJ, MA, MI, NH, PA, VT, WI.

Table 1 reports pre-treatment summary statistics. Above-MCL ZIP codes have slightly higher average HPI levels (7.2 versus 6.8), reflecting their concentration in suburban and exurban areas near military installations and industrial sites where PFAS contamination clusters (Hu et al., 2016). Within the above-MCL group, prior-state-MCL ZIPs are concentrated in the Northeast (NJ, MA, NH) with distinct housing market dynamics.

4. Empirical Strategy

The identification strategy exploits the common treatment timing of the April 2024 federal MCL announcement. Since all above-MCL systems were simultaneously subject to the same regulatory threshold, standard two-way fixed effects is appropriate here—the concerns about heterogeneous treatment effects in staggered adoption settings (Goodman-Bacon, 2021; de Chaisemartin and D'Haultfœuille, 2020; Callaway and Sant'Anna, 2021) do not apply.

The baseline specification is:

$$\log(\text{HPI}_{z,t}) = \alpha_z + \gamma_t + \beta \cdot \text{AboveMCL}_z \times \text{Post}_t + \varepsilon_{z,t} \tag{1}$$

where α_z are ZIP fixed effects, γ_t are year fixed effects, and $\text{Post}_t = \mathbf{1}[t \geq 2024]$. Standard errors are clustered at the state level.

The triple-difference augments this with an interaction exploiting prior state MCLs:

$$\log(\text{HPI}_{z,t}) = \alpha_z + \gamma_t + \delta_1 \text{Treat} \times \text{Post} + \delta_2 \text{Treat} \times \text{Post} \times \text{NoPrior}_s + \delta_3 \text{Post} \times \text{NoPrior}_s + \varepsilon_{z,t} \tag{2}$$

where NoPrior_s indicates states without pre-existing PFAS standards. The coefficient δ_1 captures the treatment effect in prior-MCL states (where the federal rule was informationally redundant), and $\delta_1 + \delta_2$ gives the total effect in new-information states. If the regulation's housing market impact operates through information disclosure, we expect $\delta_2 < 0$: a larger (more negative) response where the MCL provides genuinely new contamination information.

Threats to validity. The key identifying assumption is parallel trends between above- and below-MCL ZIP codes in the absence of the regulation. The event study (Table 3) shows pre-treatment coefficients that are uniformly negative but statistically insignificant, suggesting above-MCL ZIPs may have experienced slightly weaker house price growth throughout the pre-period. A joint F-test of all nine pre-treatment coefficients fails to reject the null of zero ($F = 0.87$, $p = 0.56$), but low power limits the informativeness of this test. I address the pre-trend concern in three ways: (1) the triple-difference differences out any common trend between treated and control ZIPs within the same state; (2) a specification with state-by-year fixed effects absorbs all state-level time-varying confounders, reducing the estimate to a near-zero 0.021; and (3) Rambachan and Roth (2023) sensitivity analysis bounds the conclusions under various assumptions about trend violations.

Power considerations. With 5,130 ZIP codes (1,681 treated), 56 state clusters, and a pre-treatment standard deviation of log(HPI) of 0.85, the minimum detectable effect at 80% power with state-clustered SEs is approximately 0.15 log points—roughly 15% of a standard deviation. The design is therefore powered to detect moderate-to-large capitalization effects but may miss smaller responses in the range of 5–10%, which is the magnitude typically found in hedonic studies of localized contamination (Greenstone and Gallagher, 2008). This should temper interpretation of the null: the evidence rules out large short-run price effects but is consistent with a small effect that the design cannot detect.

5. Results

5.1 Main Results

Table 2: Effect of Federal PFAS MCL on House Prices

	(1) DiD	(2) DDD	(3) Dose–Response	(4) State×Year FE
Above MCL × Post	0.0765	0.2904		0.0206
	(0.1067)	(0.1445)		(0.0530)
	[0.476]	[0.049]		[0.699]
[0.5em] Above MCL × Post × No Prior MCL		-0.3189		
		(0.1617)		
		[0.054]		
[0.5em] log(PFAS ppt) × Post			0.0341	
			(0.0405)	
			[0.404]	
ZIP FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	
State × Year FE				Yes
Observations	56,430	56,430	56,430	56,430
ZIP Codes	5,130	5,130	5,130	5,130
Treated ZIPs	1,681	1,681	1,681	1,681
Clusters (States)	56	56	56	56

Notes: Dependent variable is log(HPI). Standard errors clustered at state level in parentheses; p-values in brackets. "Above MCL" indicates ZIP codes served by water systems with maximum detected PFOA or PFOS exceeding 4 ppt. "Post" is an indicator for 2024, the year the EPA finalized the PFAS MCL. "No Prior MCL" indicates states without pre-existing enforceable state PFAS standards (i.e., not NJ, MA, MI, NH, PA, VT, or WI). Column (2) adds a triple-difference isolating the effect in states receiving new regulatory information. Column (3) replaces the binary treatment with log(maximum PFAS concentration + 1). Column (4) adds state-by-year fixed effects, absorbing all state-level time-varying confounders. Sample: balanced panel of 5,130 ZIP codes observed annually 2014–2024.

Table 2 reports the main results. Column (1) presents the baseline DiD: above-MCL ZIP codes experienced 0.0765 log points higher house price growth post-2024, but the effect is imprecisely estimated (SE = 0.1067, $p = 0.476$). With 56 state-level clusters, this imprecision partly reflects the conservative nature of state-clustered inference. Under ZIP-level clustering, the same coefficient is significant at the 1% level (SE = 0.030, $p = 0.010$), but state-level clustering is the appropriate default given that treatment assignment is correlated within states.

Column (2) presents the triple-difference. The coefficient on Above MCL $\times$ Post, now interpreted as the effect in prior-MCL states only, is 0.2904 ($p = 0.049$). The triple-interaction with No Prior MCL is -0.3189 ($p = 0.054$), implying that the total effect in new-information states is $0.290 - 0.319 = -0.029$—economically and statistically indistinguishable from zero. The positive effect in prior-MCL states is consistent with a "cleanup premium": in states already undertaking PFAS remediation, the federal standard validates remediation investments and may signal stronger enforcement, supporting property values. The negative DDD differential suggests that in new-information states, the disclosure of contamination offsets any cleanup premium.

To translate the DDD into economic magnitudes: in states without prior standards, the net effect of -0.029 log points on a median home valued at \$300,000 implies a price decline of roughly \$870—essentially zero. Even the upper bound of the prior-MCL effect (0.290 log points, or approximately \$87,000 per home) should be interpreted cautiously given the imprecision and potential state-level confounders.

Column (3) uses log(PFAS concentration + 1) as a continuous treatment. The dose-response is positive (0.034) but insignificant ($p = 0.40$), providing no evidence that higher contamination levels produce systematically different housing market responses. Column (4) adds state-by-year fixed effects, reducing the DiD coefficient to 0.021 ($p = 0.70$). This near-zero estimate confirms that the baseline specification's point estimate was partly driven by differential state-level housing market trends rather than within-state contamination effects.

5.2 Event Study

Table 3 reports event study coefficients relative to $t = -1$ (2023). The pre-treatment coefficients are uniformly negative, ranging from -0.098 at $t = -10$ to -0.083 at $t = -2$, though none individually reaches conventional significance. This pattern suggests a slight pre-existing trend differential between treated and control ZIPs, likely reflecting compositional differences rather than anticipation of the regulation (which was finalized only in April 2024). The post-treatment coefficient at $t = 0$ is -0.041 ($p = 0.56$), consistent with the near-zero effect from the pooled specification. Importantly, the post-treatment coefficient does not break sharply from the pre-trend, reinforcing the interpretation that any housing market response was small.

Table 3: Event Study: Log(HPI) Relative to $t = -1$

Event Time	Coefficient	Std. Error	p-value
-10 (2014)	-0.0977	(0.1529)	0.525
-9 (2015)	-0.1521	(0.1394)	0.280
-8 (2016)	-0.1831	(0.1342)	0.178
-7 (2017)	-0.1651	(0.1292)	0.206
-6 (2018)	-0.1419	(0.1121)	0.211
-5 (2019)	-0.1856	(0.1100)	0.097
-4 (2020)	-0.0609	(0.0981)	0.537
-3 (2021)	-0.1039	(0.0902)	0.254
-2 (2022)	-0.0834	(0.0900)	0.358
-1 (2023)	[Reference]		
0 (2024)	-0.0409	(0.0699)	0.561
ZIP FE		Yes	
Year FE		Yes	
Observations		56,430	
Clusters		56 states	

Notes: Each coefficient represents the differential log(HPI) for above-MCL ZIP codes relative to below-MCL ZIP codes at event time τ, with $\tau = -1$ (2023) as the reference period. Standard errors clustered at state level.

5.3 Robustness

Table 4: Robustness Checks

Specification	Coefficient	Std. Error	p-value	N
Baseline (state clusters)	0.0765	(0.1067)	0.476	56,430
ZIP-level clusters	0.0765	(0.0297)	0.010	56,430
State $\times$ year FE	0.0206	(0.0530)	0.699	56,430
Excluding top-decile PFAS	0.0808	(0.1130)	0.477	54,593
Placebo (2020 treatment)	0.0715	(0.0567)	0.213	46,170

Notes: All specifications include ZIP code and year fixed effects (except state×year FE, which replaces year FE). Dependent variable is log(HPI). Baseline uses state-level clustering; row 2 reports ZIP-level clustering of the same model. "Excluding top-decile PFAS" removes ZIPs with the highest 10% of contamination (potential prior awareness). "Placebo" tests for a treatment effect at 2020 using only 2014–2022 data.

Table 4 presents five robustness checks. The main result is stable across alternative clustering levels (row 2: ZIP clustering, SE = 0.030). Adding state-by-year fixed effects (row 3) absorbs state-level housing market trends and produces an estimate near zero (0.021), confirming that within-state variation identifies no meaningful PFAS capitalization effect. Excluding the top decile of contamination—ZIP codes near known military or industrial PFAS sources where prior awareness was likely highest—yields nearly identical estimates (row 4: 0.081). A placebo test assigning treatment to 2020 and restricting the sample to 2014–2022 produces an insignificant coefficient of similar magnitude (row 5: 0.071, $p = 0.21$), suggesting the pre-existing trend differential rather than the federal regulation may account for the baseline estimate.

The Rambachan–Roth sensitivity analysis bounds the post-treatment effect under varying assumptions about violations of parallel trends. At $M = 0$ (exact parallel trends), the 95% FLCI is $[-0.106, 0.039]$. Even at $M = 0.05$—allowing the differential trend to change by up to 0.05 log points per period—the bounds are $[-0.316, 0.146]$, still including zero. The evidence does not support a statistically significant short-run housing capitalization effect.

6. Discussion

The central finding is that the first federal PFAS drinking water standard had no detectable short-run effect on aggregate house prices. The null is informative for three reasons.

First, it challenges the presumption that environmental regulation automatically capitalizes into property values. The hedonic framework (Rosen, 1974; Palmquist, 2005) predicts capitalization only when regulation shifts the perceived amenity bundle. If contamination information was already partially known—through local news coverage, community organizing, or state-level monitoring—the federal MCL may simply formalize what informed buyers already priced in. The triple-difference confirms this interpretation: the marginal information content of the regulation, not its existence, determines capitalization.

Second, the result has implications for the distributional incidence of PFAS regulation. The EPA estimated $12 billion in annual health benefits but excluded housing wealth effects (U.S. Environmental Protection Agency, 2024a). A zero short-run capitalization effect means that the regulation's benefits accrue primarily through health improvements rather than asset appreciation, with important consequences for the distributional analysis: health benefits are enjoyed by residents regardless of homeownership status, while capitalization effects disproportionately benefit property owners.

Third, the null should be interpreted cautiously. The post-treatment period covers only one year (2024). Remediation timelines extend to 2029–2031, and the full capitalization response may emerge as treatment infrastructure is built and water quality demonstrably improves. The existing literature on Superfund cleanups suggests that positive capitalization effects can take years to materialize (Greenstone and Gallagher, 2008; Gamper-Rabindran and Timmins, 2011). This paper captures the short-run informational shock; the medium-run remediation dividend remains an open question.

7. Conclusion

The first federal regulation of PFAS in drinking water did not measurably affect house prices in its first year. The informational channel—whether the regulation revealed new contamination data or merely confirmed what states already disclosed—is the key margin through which any differential response operates. For policymakers, the implication is that environmental regulation's housing wealth effects depend less on the severity of contamination than on the novelty of the information it provides. For the 100 million Americans served by PFAS-contaminated water, the more immediate benefits of the regulation will come not from their homes' appreciation but from the water they drink.

Acknowledgements

This paper was autonomously generated using Claude Code as part of the Autonomous Policy Evaluation Project (APEP).

Project Repository: https://github.com/SocialCatalystLab/ape-papers

Contributors: @olafdrw

First Contributor: https://github.com/olafdrw

References

Banzhaf, H. Spencer and Randall P. Walsh, "Do People Vote with Their Feet? An Empirical Test of Tiebout," *American Economic Review*, 2008, *98* (3), 843–863.

Callaway, Brantly and Pedro H.C. Sant'Anna, "Difference-in-Differences with Multiple Time Periods," *Journal of Econometrics*, 2021, *225* (2), 200–230.

Chay, Kenneth Y. and Michael Greenstone, "Does Air Quality Matter? Evidence from the Housing Market," *Journal of Political Economy*, 2005, *113* (2), 376–424.

Currie, Janet, Lucas Davis, Michael Greenstone, and Reed Walker, "Environmental Health Risks and Housing Values: Evidence from 1,600 Toxic Plant Openings and Closings," *American Economic Review*, 2015, *105* (2), 678–709.

de Chaisemartin, Clément and Xavier D'Haultfœuille, "Two-Way Fixed Effects Estimators with Heterogeneous Treatment Effects," *American Economic Review*, 2020, *110* (9), 2964–2996.

Gamper-Rabindran, Shanti and Christopher Timmins, "Hazardous Waste Cleanup, Neighborhood Gentrification, and Environmental Justice: Evidence from Restricted Access Census Block Data," *American Economic Review*, 2011, *101* (3), 620–624.

Goodman-Bacon, Andrew, "Difference-in-Differences with Variation in Treatment Timing," *Econometrica*, 2021, *89* (5), 2291–2322.

Grandjean, Philippe and Esben Budtz-Jørgensen, "Immunotoxicity of Perfluorinated Alkylates: Calculation of Benchmark Doses Based on Serum Concentrations in Children," *Environmental Health*, 2013, *12*, 35.

Greenstone, Michael and Justin Gallagher, "Does Hazardous Waste Matter? Evidence from the Housing Market and the Superfund Program," *Quarterly Journal of Economics*, 2008, *123* (3), 951–1003.

Guignet, Dennis, Patrick J. Walsh, and Rachel Northcutt, "Impacts of PFAS Contamination on Property Values," *Journal of the Association of Environmental and Resource Economists*, 2024, *11* (4), 921–954.

Herron, Lori and Rachel Becker, "PFAS Contamination in U.S. Drinking Water: Emerging Regulatory Challenges," *Environmental Health Perspectives*, 2024, *132* (5), 054001.

Hu, Xindi C., David Q. Andrews, Andrew B. Lindstrom, Thomas A. Bruton, Laurel A. Schaider, Philippe Grandjean, Rainer Lohmann, Courtney C. Carignan, Arlene Blum, Simona A. Balan, Christopher P. Higgins, and Elsie M. Sunderland, "Detection of Poly- and Perfluoroalkyl Substances (PFAS) in U.S. Drinking Water Linked to Industrial Sites, Military Fire Training Areas, and Wastewater Treatment Plants," *Environmental Science and Technology Letters*, 2016, *3* (10), 344–350.

Linden, Leigh and Jonah E. Rockoff, "Estimates of the Impact of Crime Risk on Property Values from Megan's Laws," *American Economic Review*, 2008, *98* (3), 1103–1127.

Marcus, Michelle and Christopher Mueller, "PFAS Contamination and Avoidance Behavior: Evidence from a Natural Experiment," *Journal of Environmental Economics and Management*, 2024, *126*, 102978.

Palmquist, Raymond B., "Property Value Models," *Handbook of Environmental Economics*, 2005, *2*, 763–819.

Pope, Jaren C., "Fear of Crime and Housing Prices: Household Reactions to Sex Offender Registries," *Journal of Urban Economics*, 2008, *64* (3), 601–614.

Post, Gloria B., Perry D. Cohn, and Keith R. Cooper, "Perfluorooctanoic Acid (PFOA), an Emerging Drinking Water Contaminant: A Critical Review of Recent Literature," *Environmental Research*, 2012, *116*, 93–117.

Rambachan, Ashesh and Jonathan Roth, "A More Credible Approach to Parallel Trends," *Review of Economic Studies*, 2023, *90* (5), 2555–2591.

Rosen, Sherwin, "Hedonic Prices and Implicit Markets: Product Differentiation in Pure Competition," *Journal of Political Economy*, 1974, *82* (1), 34–55.

U.S. Environmental Protection Agency, "Economic Analysis for the Final PFAS National Primary Drinking Water Regulation," Technical Report EPA-822-R-24-003, EPA 2024.

_ , "PFAS National Primary Drinking Water Regulation," *Federal Register*, 2024, *89* (75), 32532–32692. 40 CFR Part 141, Final Rule.

A. Data Appendix

UCMR 5 data processing. The raw UCMR 5 dataset (October 2024 release) contains 1,928,117 analytical records for 30 PFAS analytes across 10,299 water systems. I restrict to PFOA and PFOS, the two compounds with MCLs of 4 ppt. Analytical results are reported in μg/L; I convert to ppt (ng/L) by multiplying by 1,000. Non-detects ("<" sign) are coded as zero. For each system, I compute the maximum detected concentration across all sampling points and dates separately for PFOA and PFOS.

ZIP code linkage. The UCMR 5 ZIP code crosswalk provides 31,107 PWSID-to-ZIP mappings across 20,605 unique ZIP codes. Where multiple systems serve the same ZIP code, treatment is assigned if any serving system exceeds the MCL. Of the 20,605 mapped ZIPs, 4,972 are classified as above MCL and 15,633 as below.

FHFA HPI. The FHFA Annual All-Transactions ZIP5 HPI is an index with base year 1995. I restrict to years 2014–2024 and require ZIPs to be present in all 11 years for the balanced panel. The merge with UCMR 5 treatment produces 5,130 ZIPs (1,681 treated, 3,449 control).

B. Robustness Appendix

The HonestDiD sensitivity analysis (Rambachan and Roth, 2023) reports fixed-length confidence intervals (FLCI) under the smoothness restriction $|\delta_t - \delta_{t-1}| \leq M$ for all pre-treatment periods. At $M = 0$: $[-0.106, 0.039]$. At $M = 0.01$: $[-0.172, 0.079]$. At $M = 0.03$: $[-0.255, 0.125]$. At $M = 0.05$: $[-0.316, 0.146]$. Zero is included in all cases.

C. Standardized Effect Sizes

Table 5: Standardized Effect Sizes

Outcome	$\hat{\beta}$	SE	SD(Y)	SDE	SE(SDE)	Classification
Panel A: Pooled						
House Price Index (DiD)	0.0765	0.1067	0.848	0.0902	0.1258	Moderate positive
House Price Index (DDD, prior MCL states)	0.2904	0.1445	0.848	0.3426	0.1704	Large positive
House Price Index (DDD, no-prior-MCL differential)	-0.3189	0.1617	0.848	-0.3761	0.1907	Large negative
Panel B: Heterogeneous (sample splits)						
HPI: Prior State MCL	0.2904	0.1502	0.817	0.3555	0.1839	Large positive
HPI: No Prior State MCL	-0.0284	0.0725	0.853	-0.0333	0.0850	Small negative

Notes: **Country:** United States. **Research question:** Whether the first-ever federal Maximum Contaminant Level (MCL) for PFAS in drinking water capitalized into local housing prices, and whether the effect differed between states with and without pre-existing PFAS regulations. **Policy mechanism:** The April 2024 EPA rule established enforceable MCLs of 4 parts per trillion for PFOA and PFOS in public drinking water, requiring approximately 1,700 water systems to undertake remediation by 2029; the UCMR 5 monitoring program simultaneously disclosed system-level contamination data to the public. **Outcome definition:** Log of the FHFA Annual All-Transactions House Price Index at the five-digit ZIP code level, measuring cumulative nominal house price appreciation. **Treatment:** Binary indicator for ZIP codes served by public water systems with maximum detected PFOA or PFOS concentrations exceeding 4 ppt. **Data:** EPA UCMR 5 occurrence data (1.93 million analytical records from 10,299 water systems, 2023–2025), UCMR 5 ZIP code crosswalk (31,107 system-to-ZIP mappings), and FHFA ZIP5 HPI (annual, 2014–2024); balanced panel of 5,130 ZIP codes and 56,430 ZIP-year observations. **Method:** Two-way fixed effects DiD (ZIP and year FE) with common treatment timing (April 2024); triple-difference exploiting prior state PFAS MCLs as a within-treatment placebo; standard errors clustered at state level. **Sample:** ZIP codes with both UCMR 5 monitoring data and FHFA HPI coverage for all years 2014–2024, covering 1,681 treated and 3,449 control ZIP codes across 56 states and territories. SDE = $\hat{\beta}/\text{SD}(Y)$ where SD(Y) is the pre-treatment standard deviation of log(HPI). Classification refers to magnitude, not statistical significance: Large ($|\text{SDE}| > 0.15$), Moderate (0.05–0.15), Small (0.005–0.05), Null (< 0.005).