STATE OF NEW YORK
SUPREME COURT COUNTY OF RENSSELAER

JAY BURDICK, CONNIE PLOUFFE, EDWARD PLOUFFE, FRANK SEYMOUR, EMILY MARPE, as parent and natural guardian of E.B., an infant, and, G.Y., an infant, JACQUELINE MONETTE, WILLIAM SHARPE, EDWARD PERROTTI-SOUSIS, MARK DENUE and MEGAN DUNN, individually, and on behalf of all similarly situated,

Plaintiffs,

v.

TONOGA INC., (d/b/a TACONIC),

Defendant.

AFFIDAVIT IN OPPOSITION TO MOTION TO EXCLUDE TESTIMONY

Index No.: 00253835

STATE OF MASSACHUSETTS)

COUNTY OF SUFFOLK) ss:

JEFFREY E. ZABEL, Ph.D., being duly sworn, deposes and says:

1. I am a Professor of Economics at Tufts University in Medford, Massachusetts. My fields of research focus on urban and real estate economics, environmental economics, and the economics of education. I hold a Ph.D. in Economics from the University of California, San Diego. A copy of my curriculum vitae is attached as **Exhibit A**. I provide the following affidavit, under oath, based upon my education, training, and experience and information provided to me by counsel regarding the PFOA contamination discovered in Petersburgh, New York in opposition to Defendant's Motion to Exclude my testimony.

FACTUAL BACKGROUND

2. It is my understanding that the public water supply in the Town of Petersburgh, New York as well as numerous private wells used as a source of water by residents of the area have been found to be contaminated with perfluorooctanoic acid (PFOA).
3. It is further my understanding based on the affidavit of plaintiffs' expert Dr. Hyeong-Moo Shin that a manufacturing facility in Petersburgh owned by Tonoga, Inc. (Taconic facility) utilized ammonium perfluorooctanoate (APFO), during its manufacturing processes. It is my understanding that APFO is converted to PFOA when released into the environment,
4. Dr. Shin's affidavit indicates that the principal source of documented PFOA contamination in soils and groundwater in the area is airborne deposition of emissions from the Taconic facility, and that the contamination is likely to persist for decades.
5. It is further my understanding based on the affidavits of plaintiffs' experts Drs. David Savitz and Alan Ducatman that PFOA exposure has been associated with a variety of human health effects.
6. From data provided by plaintiffs' counsel, I understand that the Petersburgh municipal water system and over 200 private wells within an approximate seven-mile radius of the Taconic facility and located in the Little Hoosic River Valley have tested positive for PFOA. I understand that the proposed property damage class definitions in this matter are: 1) all properties served by the municipal system; and, 2) all other properties with private wells contaminated with PFOA within a seven-mile radius of the Taconic facility. I have been asked by plaintiffs' counsel to provide an opinion regarding the potential for the PFOA contamination to adversely impact the value of properties within the class area, as

well as the existence and applicability of methods to assess such impacts on a class-wide basis.

METHODOLOGY

7. Environmental contamination on or adjacent to a property may reduce the market value of that property due to, among other things, actual or perceived health risks. Environmental contamination may also affect marketability, as reflected in reduced transaction rates or increased time on the market for listed properties.

8. The standard economic approach to measuring the impact of environmental conditions on property values is the hedonic property value method. The method was first used over 50 years ago to estimate the impact of air quality on house prices (1)[1]. Since then, it has been used extensively to estimate the impacts of a wide variety of environmental and other characteristics. I have used this approach to estimate the value of school quality, the impacts of Superfund sites and leaking underground storage tanks, the perceived health risks of living near nuclear power plants, discrimination and prejudice in the housing market, air quality, and the impact of minimum lot size regulations on house prices (2, 3, 4, 5, 6, 7, 8). It has also been used to value crime, open space, flooding, and noise (9, 10, 11, 12).

9. The hedonic method involves developing a statistical model that explains variation in house prices as a function of property and structural features (e.g., lot size, square footage, number of bathrooms) and characteristics of the area in which the house is located.

[1] Parenthetical references are to articles listed in **Exhibit B**.

10. When estimating the impact of environmental contamination, data on home sales prices and characteristics from the affected area and a nearby unaffected area (or areas), both before and after the contamination is discovered and becomes public knowledge, are obtained. The hedonic model is used to estimate the impact of the contamination while controlling for all other factors that affect prices.
11. Any difference in prices attributable to the contamination, typically expressed as a percentage, can then be applied to the properties in the affected area.

APPLICATION OF METHODOLOGY TO ANALYSIS OF AFFECTED AREA

12. To perform an analysis of the potential impact on property values within the area of contamination, I acquired data on all single-family home transactions from 1998 forward for communities in eastern Rensselaer County from CoreLogic, a leading source for real estate data, and a source of data that is regularly relied upon in the profession to perform such analyses. The dataset includes over 6,000 transactions recorded through April 30, 2018. [*note: due to reporting errors complete data from May through September were unavailable at the time I conducted these analyses*].
13. To investigate the potential impacts of the contamination, information is required on: 1) the affected area, or geographic extent of the contamination; and, 2) the approximate time when the presence and extent of contamination became public knowledge. The property damage class definitions in this matter are: 1) all properties served by the Town of Petersburgh municipal water system; and, 2) all other properties with private wells contaminated with PFOA within a seven-mile radius of the Taconic facility.

14. In performing my analyses, I have relied on the opinions offered by Dr. Hyeong-Moo Shin and Dr. Donald I. Siegel, that areas to the north, south and east of the Taconic facility are most likely to be contaminated due to prevailing wind direction and local geography—specifically a north-south oriented valley. Therefore, I have focused my analysis on the area within seven miles of the facility to the east of the ridgeline that runs north from the town of Berlin through Petersburgh ("contaminated area") (*See* **Exhibit C**).

15. Additionally, I base my analysis on, among other things, the fact that information regarding the contamination became public in February of 2016, that the facility was designated as a State Superfund Site by the New York State Department of Environmental Conservation (NYSDEC) in May of 2016, and that testing of private wells occurred throughout that year. Therefore, I have focused my analysis on property sales occurring within the defined area in 2017 and 2018 as the time-period when prices are likely to be affected by the information about the local contamination from the facility.

16. As an initial comparison, I calculated the annual percentage change in mean sales price for the contaminated area versus other towns outside of the seven-mile radius around the facility (for example, Sand Lake, Poestenkill, and Pittstown). In performing this analysis, I found that the mean sales price in 2017 and the beginning of 2018 in the contaminated area was 33.2% lower than in 2016. This compares to an increase of 6.3% in the other areas for the same time-period.[2]

17. For a more rigorous comparison, I conducted a standard hedonic property value analysis that models sales prices as a function of property characteristics, and controls for

[2] The comparable change in median sales price was a decline of 28.9% and an increase of 5.5% for the contaminated area and the other towns, respectively.

differences in communities and market changes over time. I compared percentage price differences in the contaminated area versus the other nearby towns and found that prices in the contaminated area were approximately four percent lower in 2016 relative to the other towns. In 2017 and the beginning of 2018, that difference increased to nearly 24 percent, for a net decrease of 20 percent.

18. The 20 percent estimate has a probability value (p-value) equal to 0.14. This means that for a chosen significance level below 0.14 (e.g., 0.05 or 0.10) we would conclude that the effect is not significantly different from zero, whereas for a chosen significance level equal to or above 0.14 (e.g., 0.15 or 0.20) we would conclude that the effect is significantly different from zero. The selection of a significance level implies a tradeoff between the likelihood of a "false positive" (type I error) versus a "false negative" (type II error) conclusion regarding the effect.[3] It is important to note that the 20 percent estimate is based on a small number of sales within the contaminated area in 2017 and 2018 (n = 24) and when data are limited, the chances of a type II error increase. Thus, in this situation it may be appropriate to choose a higher significance level (such as 0.15 or 0.20) than what is conventionally used with larger data sets.

19. **Exhibit D** illustrates the results of the hedonic model. It shows the comparison between the sales prices in the affected area with those in the other unaffected areas, controlling for differences in property and community characteristics. As shown, prices within the contaminated area were increasing from 2013 to 2016, and then drop significantly in 2017 and 2018 relative to the other areas.

[3] A type I error occurs when concluding the effect is significantly different from zero when, in fact, it is zero. A type II error occurs when concluding the effect is zero when, in fact, it is different from zero.

20. Finally, the 20 percent diminution estimate from the model is used to estimate what prices would otherwise be, but for the contamination. The mean sales price in the contaminated area for 2017 and 2018 (24 sales) was $100,000. Therefore, it is predicted that the mean sales price without the contamination would have been $125,000.
21. Residential property value diminution of 20% is within the range of studies that have examined the impact of hazardous waste sites, and groundwater contamination specifically (References 13 and 14 in **Exhibit B** provide summaries of this literature).

RESPONSE TO CRITICISMS OF MY OPINIONS

22. I have reviewed the affidavits of Dr. Desvousges and Ms. King, dated February 27 and 28, 2019, respectively, that were submitted in support of Defendant's Motion to Exclude my testimony.
23. In his affidavit, Dr. Desvousges provides various criticisms of my opinions as described in plaintiffs' December 3, 2018 expert disclosure (and summarized in the preceding section), as well as his own opinions regarding the impact of PFOA contamination on property values in this matter. In doing so he mischaracterizes fundamental aspects of my analyses and presents information that is inaccurate and misleading.
24. Most importantly, Dr. Desvousges ignores that the estimate of a 20 percent reduction in property values in the contaminated area, described on p.60 of the disclosure, is derived from a statistical model of housing prices. He states: "This comparison of means is fatally flawed for several reasons…comparing mean values does not account for the other factors that may affect property prices such as the age, size of the home and the lot size." (p. 13-14).

25. While a comparison of average (and median) prices in the contaminated area versus other communities is provided in the disclosure as one perspective on property value impacts, the 20 percent estimate is based on a model that explicitly controls for differences in property and housing characteristics, as well as differences in community attributes and changes in the housing market over time. This is referred to as a hedonic property value model.

26. As described above, the hedonic property value method is the standard approach to measuring the impact of environmental disamenities, such as soil and groundwater contamination, on property values. It is supported by decades of research and applications in the peer-reviewed economics literature.

27. Average sales prices in a given year reflect, among other things, the types of houses that sell that year. Failure to control for these differences results in what is referred to as "composition bias." By controlling for house characteristics, a hedonic analysis is able to overcome this composition bias. All of the comparisons and opinions Dr. Desvousges provides regarding the impact of the PFOA contamination on property values are based on mean or median sales prices and hence are subject to composition bias. Despite his criticisms, Dr. Desvousges does not present nor discuss results of an appropriate model that addresses this very issue.

28. Leaving aside this fundamental problem, I address three additional areas of defendants' experts' misplaced criticisms: 1) data sources; 2) definition of the affected area; and, 3) timing of property value impacts.

A. Data Sources

29. First, Ms. King contends that the data I relied upon are from "an insufficient data source" and that the Multiple Listing Service (MLS) "is a better source of data on housing sales because the MLS data provides the information needed to control for property characteristics which affect property price." She adds that "Corelogic is not utilized as the data source for the selection of comparable sales when determining an opinion of market value in this market area." (p. 2-3)

30. Ms. King appears to misunderstand that my conclusions are based on statistical analyses of these data, as opposed to opinions that might be provided by a realtor or appraiser. The CoreLogic data contain many property characteristics (e.g., lot size, square footage, baths, beds, year built), which I used to develop the hedonic property value model. This is a standard source of data for such analyses. In other words, my analysis differs from what an appraiser would do in looking for comparable properties for purposes of estimating the value of a particular property. A hedonic property value model compares housing transactions in different areas and over time, using statistical techniques to isolate and derive estimates of the influence of an event or attribute of interest - in this case, the effect of the PFOA contamination.

B. Definition of Affected Area

31. Dr. Desvousges asserts that my inclusion of a portion of the town of Berlin in the contaminated area is inappropriate. He states: "It appears that Dr. Zabel incorrectly added the city of Berlin to Petersburgh when examining price changes over time. The market conditions in Berlin should not be viewed the same as Petersburgh. There has been no

publicity in the media about PFOA affecting wells or the water supply in Berlin, so there is no reason to include Berlin in the analysis."

32. First, the portion of the Town of Berlin that is included in my analysis is within the seven-mile radius of the Taconic facility and within the Little Hoosick Valley, which is what I have defined as the contamination area.

33. In addition, the statement that there was no publicity in the media about PFOA affecting wells in Berlin is factually incorrect. In 2016, at least seven news articles and two television news stories described PFOA contamination in Berlin. Early in 2016, news stories covered New York State Department of Health and Rensselaer County testing of private wells and municipal water in Berlin. In response to testing results, the Berlin community advocated for PFOA filters in the public water supply that serves the Berlin Elementary school. In the beginning of the 2016-2017 school year, NYSDEC supplied Berlin Elementary school with water coolers for drinking. Public pressure from the community also resulted in an agreement with NYSDEC to install a filtration system for Berlin's municipal water supply. Several additional sources reference PFOA contamination at the closed Berlin/Petersburgh landfill, a 22.5-acre site located between the two towns that was declared a potential State Superfund Site. All of these sources are summarized in Exhibit E.

C. Time Frame

34. Dr. Desvousges suggests that my focus on 2017 and 2018 as the time-period when prices were impacted in the contaminated area is inappropriate. He begins by stating: "The timing and availability of information is an important consideration in evaluating the potential impacts of PFOA on property values…identifying the appropriate time period is important

because there could be a lag time between the discovery of PFOA and potential changes in the market prices." (p.11) In an apparent contradiction, however, Dr. Desvousges then provides examples of media coverage of the contamination dating from February 15 to February 28, 2016 and concludes that March 1, 2016 is the appropriate date after which to evaluate PFOA-related changes in property values.

35. Dr. Desvousges goes on to state, in reference to my comparison of property values in 2017 and 2018 relative to 2016: "…the first flaw is that the comparison uses a year that is potentially impacted as the baseline…" (p. 13) This claim is illogical. If property values were in fact affected in 2016 by public knowledge of the PFOA contamination, then my estimate of a 20 percent reduction in 2017/18 relative to 2016 understates the overall impact. As indicated in the expert disclosure, the results of my hedonic analysis indicate that "prices in the contaminated area were approximately four percent lower in 2016 relative to the other towns. In 2017 and the beginning of 2018 that difference increased to nearly 24 percent, for a net decrease of 20 percent." (p.60)

CONCLUSION

36. The methodology I utilized to analyze the difference in sales prices in the affected area compared to sales prices in unaffected areas in Rensselaer County (the hedonic property value method) is generally accepted as reliable in the field of economics and is the most commonly utilized method of analyzing the effects of contamination on property values. Neither of Defendants' experts refute that or present another model that is superior.

37. In performing my hedonic property value assessment of the affected area of contamination, I applied this method as required to obtain the most reliable outcome. Defendants' experts'

criticisms of my application of this methodology demonstrate a basic misunderstanding of the methodology or are deliberate attempts to mislead the Court. In either case, I have applied the methodology appropriately and consistently with what is generally accepted in my field.

JEFFREY E. ZABEL

Sworn to me this 26

day of April, 2019

NOTARY PUBLIC

VICKI M TRUONG
Notary Public
COMMONWEALTH OF MASSACHUSETTS
My Commission Expires
June 6, 2025