2006

Emerging Litigation with Perchlorate Contamination Annual Review of the Law

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Recent Developments in Environmental Law

Emerging Litigation with Perchlorate Contamination

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I. Introduction

PERCHLORATE IS QUICKLY BECOMING ONE of the major groundwater contaminants of the decade.[1] With the new ability to detect perchlorate at low-level concentrations and the increasing detection of perchlorate in drinking water supplies nationwide, perchlorate-related environmental claims are emerging across the country.[2] Alongside these claims are ongoing developments within state and federal governments to set a maximum contaminant level.[3] As the government works to find safe levels of perchlorate for human consumption, a struggle between science and policy is also emerging.

California presents a good illustration of this struggle to regulate perchlorate amidst fluctuating standards of safe levels of consumption in drinking water. In May 2005, the California State Water Resources Control Board (State Board) restricted the Regional Water Quality Control Board's (Regional Board) discretion in determining when replacement water must be supplied to consumers whose drinking water sources were contaminated by perchlorate. The State Board determined that such decisions would be deferred to the California Department of Health Services' (DHS) recommendations for safe consumption levels. As more sites across the nation are requiring replacement water for perchlorate contaminated waters, this new development has potentially significant economic effects.

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1. Robert D. Morrison, J. Michael Sowinski & Emily A. Vavricka, *Facing the Growing Challenges of Perchlorate Contamination: Detection, Source Assessment, and Cleanup*, at *1 http://www.dpraenvironmentalforensics.com/articles/Perchlorate2003.pdf (last visited May 10, 2006).

2. *Id.*

3. EPA Groundwater & Drinking Water, http://www.epa.gov/safewater/glossary.htm (last visited May 10, 2006) (defining the maximum contaminant level as "[t]he highest level of a contaminant that EPA allows in drinking water. MCLs ensure that drinking water does not pose either a short-term or long-term health risk. EPA sets MCLs at levels that are economically and technologically feasible. Some states set MCLs which are more strict than EPA's.")

II. Perchlorate—The New Environmental Contaminant

Perchlorate is emerging as the new environmental contaminant due to its presence in many drinking water aquifers throughout the United States.[4] Since 1997, perchlorate has been detected in the drinking water supplies of over 15 million people in Arizona, California, Iowa, Massachusetts, Nevada, Texas, and Utah,[5] and at over 250 sites in thirty-five states in the United States and Puerto Rico.[6] These sites include not only aquifers, but also the surface waters of Lake Mead and the Colorado River.[7] In addition, areas that do not have reported perchlorate detections at this time may only appear that way due to a lack of sampling in the area.[8]

Perchlorate is both a naturally occurring and a man-made chemical that exists as a part of other salts (ammonium, potassium, magnesium, and sodium).[9] It is naturally found in arid environments; however, man-made sources are the main cause of the high levels of contamination.[10] Military and industrial activities have used man-made perchlorate widely since the mid 1940s.[11] Some uses include fireworks, safety flares, match manufacturing, electroplating, paint and enamel production, aluminum refining, air bag inflators, electronic tubes, and lubricating oils.[12] However, perchlorate is mainly manufactured as an oxidizer for use in solid rocket fuel.[13] The shelf life of perchlorate for use in this capacity is

4. Brent Duncan, Robert D. Morrison & and Emily Vavricka, *Forensic Identification of Anthropogenic and Naturally Occurring Sources of Perchlorate*, 6 ENVTL. FORENSICS 205, 205–06 (2005).

5. DIANE S. ROOTE, GROUND-WATER REMEDIATION TECHNOLOGIES ANALYSIS CENTER, TECHNOLOGY STATUS REPORT, PERCHLORATE TREATMENT TECHNOLOGIES (1st ed. 2001), *available at* http://www.groundwatercentral.info/org/pdf/S_perc_rpt.pdf (last visited May 10, 2006).

6. EPA, Federal Facilities Restoration and Reuse, Known Perchlorate Releases in the U.S. (2005), http://www.epa.gov/fedfac/pdf/detect0305.pdf (last visited May 10, 2006).

7. ROBERT D. MORRISON ET AL., ENVIRONMENTAL FORENSICS: A CONTAMINANT SPECIFIC GUIDE 168 (Robert D. Morrison & Brian L. Murphy eds., Elsevier Pub. Co. 2005).

8. Interstate Tech. & Reg. Council, *Perchlorate: Overview of Issues, Status, and Remedial Options* (2005), http://www.itrcweb.org/documents/perc-1.pdf (last visited May 10, 2006) (explaining that many smaller water systems may contain detectable levels of perchlorate, however, many such areas have yet to be sampled).

9. Eric Burton & Peter Hsiao, *New Developments in Perchlorate and Its Regulation*, SK094 ALI-ABA 677 (2005).

10. Duncan et al., *supra* note 4, at 206.

11. *Id.* at 206; *see also* Press Release, Senator Feinstein Announces $6.5 Million for Perchlorate Cleanup (July 21, 2004) (on file with author) ("The Department of Defense is the number one contributor to perchlorate contamination . . ."), *available at* http://feinstein.senate.gov/04Releases/r-dod-perch.pdf (last visited May 10, 2006).

12. *Id.* at 206; *see also* Burton & Hsiao, *supra* note 9 (describing the industrial uses of perchlorate).

13. *Id.* at 206.

limited and has therefore needed to be replaced over the years in missiles, rockets, etc.[14] This has led to the disposal of large quantities of the chemical in California, Utah, Nevada, and Texas for over six decades.[15]

Because of its chemical property as a salt, perchlorate is highly soluble in water and therefore dangerously mobile in aquifer systems.[16] The chemical properties of perchlorate, combined with decades of its unregulated disposal have resulted in widespread groundwater contamination. The damage has been compared to that caused by the gasoline additive MTBE.[17] However, while MTBE was only a recent additive to gasoline, perchlorate has had over six decades to infiltrate groundwater resources. The result is that perchlorate plumes are much more expansive than their MTBE counterparts.[18]

Despite its long history of use, the ability to detect perchlorate at low concentrations only became available in 1997.[19] Subsequent testing for the chemical has resulted in the discovery of the contaminant in groundwater, soil, and food.[20] There is now public concern over the health risks associated with this chemical. The main concern regarding perchlorate is that it inhibits the thyroid gland from accepting iodide, which can decrease thyroid hormone production.[21] This, in turn, can affect growth and development in sensitive populations, such as infants and fetuses.[22]

III. Regulation of Perchlorate

There is currently no state or federal standard for the safe level of perchlorate in drinking water.[23] The development of a maximum con-

14. ROOTE, *supra* note 5, at 9.
15. *Id.*
16. Duncan et al., *supra* note 4, at 205.
17. *Id.* at 13. Methyl Tertiary-Butyl Ether (MTBE) was the additive to gasoline to reduce air emissions, but resulted in widespread groundwater contamination. EPA, MTBE in Drinking Water, http://www.epa.gov/safewater/mtbe.html (last visited May 10, 2006).
18. Steve Ross, Rich Chandler & John Rohrer, *Perchlorate v. MTBE*, Slide Show presentation at NGWA Costa Mesa Conference (June 3–4, 2004), http://www.komex.com/solutions/PerchloratevsMTBE.pdf (last visited May 10, 2006).
19. Morrison et al., *supra* note 7, at 168.
20. U.S. Food and Drug Administration, Exploratory Data on Perchlorate in Food (Nov. 2004), http://www.cfsan.fda.gov/~dms/clo4data.html (last visited May 10, 2006).
21. Arizona Department of Environmental Quality, Perchlorate Studies FAQs, http://www.azdeq.gov/function/about/perchfaq.html (last visited May 10, 2006).
22. *Id.*
23. Department of Defense Perchlorate Work Group, http://www.dodperchlorate info.net/facts/ (last visited May 10, 2006); *see also* Cal. Dep't of Health Services, Perchlorate in California Drinking Water: Overview & Links, http://www.dhs.ca.gov/ps/ddwem/chemicals/perchl/perchlindex.htm (last visited May 10, 2006).

taminant level (MCL) has been an up-and-down roller coaster of reference doses and notification levels.[24] Since 1997, the EPA has proposed reference doses of eighteen parts per billion (ppb), four ppb, and one ppb. Then, in 2005, the EPA set a much higher reference dose of 24.5 ppb.[25] It based this most recent level on a report published by the National Academy of Sciences in January 2005.[26]

Meanwhile, across the country, state agencies are trying to establish their own safe consumption levels for perchlorate in drinking water. From state to state, the designated safe consumption level for perchlorate currently ranges from one ppb to eighteen ppb.[27] In trying to complete a state MCL for perchlorate in California, the Department of Health Services initially followed the EPA's proposed reference doses.[28] However, in March 2004, the California Office of Environmental Health Hazard Assessment (OEHHA) conducted a study and published a public health goal of six ppb[29] based upon the level of perchlorate that would pose no significant health risk to individuals consuming the water on a daily basis over a lifetime.[30] The OEHHA reviewed the National Academy of Sciences 2005 report that the EPA relied on, but determined that the California public health goal of six ppb of perchlorate in drinking water should not be revised.[31] The lack of consensus

24. California Department of Health Services, Drinking Water Program, at *13, http://www.dhs.ca.gov/ps/ddwem/chemicals/AL/notificationoverview.pdf (defining notification levels as the "health-based advisory levels established by the department [in California] for contaminants in drinking water for which maximum contaminant levels have not been established"); EPA Glossary of IRIS Terms, http://www.epa.gov/IRIS/gloss8.htm (last visited May 10, 2006) (defining the reference dose to be "an estimate . . . of a daily oral exposure to the human population . . . that is likely to be without an appreciable risk of deleterious effects during a lifetime.").

25. EPA Federal Facilities Restoration & Reuse, Perchlorate Links, http://www.epa.gov/fedfac/documents/perchlorate_links.htm (last visited May 10, 2006).

26. BOARD ON ENVIRONMENTAL STUDIES & TOXICOLOGY, HEALTH IMPLICATIONS OF PERCHLORATE INGESTION (Nat'l Academies Press 2005), *available at* http://www.nap.edu/books/0309095689/html (last visited May 10, 2006).

27. EPA Federal Facilities Restoration & Reuse, Perchlorate Links, http://www.epa.gov/fedfac/documents/perchlorate_links.htm (follow "State Perchlorate Advisory Levels and Other Resources" hyperlink) (last visited May 11, 2006).

28. The DHS is the state agency responsible for "protect[ing] and improv[ing] the health of all Californians." Department of Health Services, http://www.dhs.ca.gov/ (last visited May 11, 2006).

29. The DHS uses the public health goal of a chemical to ultimately establish its drinking water standard, or MCL. OFFICE OF ENVIRONMENTAL HEALTH HAZARD ASSESSMENT, OEHHA, 2004, PUBLIC HEALTH GOAL FOR PERCHLORATE IN DRINKING WATER (2004), *available at* http://www.oehha.ca.gov/water/phg/pdf/finalperchlorate31204.pdf (last visited May 10, 2006).

30. *Id.*

31. California Department of Health Services, Perchlorate in Drinking Water: California MCL Status, http://www.dhs.ca.gov/ps/ddwem/chemicals/perchl/perchlorateMCL.htm (last visited May 11, 2006).

on what consumption level of perchlorate in the drinking water is safe shows a residual uncertainty in the scientific community regarding the health risks perchlorate poses.

IV. Who Gets to Decide What's Safe? A California Case Study

A. *The Role of the Regional Board*

The water quality objectives of the regional board ultimately direct the cleanup levels for contaminated groundwater in California.[32] The regional board has a nondegradation policy and can require any person who has contaminated a water source to restore it to its previous uncontaminated state, e.g., background levels.[33] Alternatively, the regional board may elect to seek cleanup to health-based levels, such as MCLs or public health goals.[34] As part of a cleanup and abatement order, the regional board also has the ability to require replacement water service "to each affected public water supplier or private well owner."[35] Accordingly, the "replacement water provided . . . shall meet all applicable federal, state, and local drinking water standards, and shall have comparable quality to that pumped by the public water system or private well owner prior to the discharge of waste."[36]

While the regional board has the authority to require that replacement water be supplied until the groundwater quality has returned to a pre-contaminated state, the state board's decision in *Olin* has limited the requirement of replacement water only to water that exceeds health-based levels.

B. *Olin/Standard Fusee Site—State Water Resources Control Board Order WQ 2005-0007*

Olin and Standard Fusee each manufactured signal flares in California and used perchlorate in the manufacturing process. In August 2000, perchlorate was detected in the water samples, and shortly thereafter, Olin began an investigation of the contamination with the guidance of the local regional board. In 2002, Olin was ordered to provide replacement water to nearly 800 households[37] whose domestic wells contained

32. CAL. WATER CODE § 13,241 (West 2006).
33. CAL. WATER CODE § 13,304.
34. Morgan Gilhuly, The Oldest Question in Environmental Law (July 25, 2005), http://envirolawdiary.blogspot.com/ (last visited May 11, 2006).
35. CAL. WATER CODE § 13,304(a).
36. CAL. WATER CODE § 13,304(f).
37. EPA, Federal Facility & Superfund Sites Where Action Has Been Taken to Address Perchlorate Contamination, (Aug. 4, 2004), http://www.epa.gov/fedfac/documents/perchlorate_site_summaries.htm (last visited May 11, 2006).

perchlorate concentrations exceeding four ppb, which was the Department of Health Service's notification level at that time. Two years later, the notification level was changed to six ppb following the publication of OEHHA's report.[38] Olin requested that the cleanup order be amended to require them to provide replacement water only for water supplies with perchlorate concentrations greater than the new public health goal of six ppb.[39] The regional board denied its request.[40] Olin then argued to the state board that the regional board "abused its discretion by requiring continued water replacement service for wells with perchlorate detections based upon a [four ppb] trigger level rather than the final public health goal [PHG] of [six ppb] adopted by the OEHHA."[41] Referring to the fluctuating reference doses of the recent past, the regional board argued that a conservative approach was needed to ensure safe drinking water until a definite safe level for perchlorate is established.[42] In addition, it cited State Board Resolution 92–49, which allows the regional board to require cleanup of contaminated groundwater to background levels, as support for its use of discretion in deciding whether replacement water should be supplied at a stricter standard than the public health goal.[43]

The state board determined that the regional board's decision to require replacement water must be based on the public health standards for drinking water.[44] OEHHA and Department of Health Services are the state agencies responsible for determining health risks, therefore the regional board must defer to their expertise in this area.[45] The regional board may not set their own safe consumption levels, because it would lead to inconsistent standards and enforcement.[46] Until there is a set state, federal, or local standard, the regional board should defer to the health department on drinking water safety in deciding when replacement water needs to be provided.[47] The state board clearly noted that

38. OFFICE OF ENVIRONMENTAL HEALTH HAZARD ASSESSMENT, *supra* note 29.
39. State of California, State Water Resources Control Board, Order WQ 2005–0007, *available at* http://www.swreb.ca.gov/resdec/wqorders/2005/wqo/wqo2005_0007.pdf (last visited May 11, 2006).
40. *Id.*
41. *Id.*
42. *Id.* at 5.
43. *Id.* (citing State Water Board Resolution 92-49, Policies & Procedures for Investigation & Cleanup & Abatement of Discharges under Water Code § 13304).
44. *See supra* note 39, at 6.
45. *Id.*
46. *Id.*
47. *Id.* at 7; *see also Amended Bill Targets WRCB's Disputed Replacement Water Order*, 16 INSIDE CALIFORNIA EPA No. 27, July 8, 2005, at 1–2, *available at* http://www.watercenter.ucla.edu/Press%20Room/issue%2027.pdf (last visited May 11, 2006).

this decision was only regarding replacement water supplies and in no way affected cleanup levels.[48]

The amended order now establishes that Olin can stop providing replacement water to those owners whose wells test above six ppb for twelve consecutive months.[49] The result is that this decision will lower Olin's annual cost of supplying water from $745,000 to $321,000.[50]

Facilities in Iowa and Massachusetts are also supplying bottled water to residents affected by perchlorate contamination in groundwater.[51] There are varying contamination levels that trigger the need for replacement water in these states. The *Olin* decision could affect the outcome of cleanup orders in other states and could also have substantial economic effects to those companies having to provide replacement water.

V. Concerns About Health Standards-Policy vs. Science

There are looming concerns that, despite the state board's distinction that its decision does not apply to the regional board's discretion to require cleanup of contaminated water to background levels, this decision will eventually lead to health goal cleanup levels as the appropriate cleanup levels for contaminated sites.[52] Ensuring safe drinking water is arguably one of the most important concerns when evaluating the cleanup of a contaminated groundwater source. Therefore, if the standard for replacement water only has to meet public health goals, there is arguably no further health benefit to validate the cleanup to background levels. Cleanup costs become exponentially higher as the cleanup levels get lower, so which cleanup level is ordered has major economic effects. Companies required to clean up the contamination will likely argue a balancing test of economic cost versus community benefit to push for health-based levels over background levels.

The public concern about cleanup levels and the backlash to *Olin* prompted the proposal of a bill that would restore the regional board's discretion to require replacement water for drinking water that has been contaminated beyond background levels.[53] However, despite strong

48. State Water Resources Control Board, Order WQ 2005–0007, *supra* note 39, at 7.
49. *Id.* at 8.
50. Matt King, *Bottled Water Tapped Out*, GILROY DISPATCH, Mar. 7, 2005, *available at* http://www.gilroydispatch.com/news/contentview.asp?c=148050 (last visited May 11, 2006).
51. EPA, *supra* note 27.
52. Matt King, *Floodgate Wide Open for Olin?*, GILROY DISPATCH, Jan. 12, 2005, *available at* http://www.gilroydispatch.com/news/contentview.asp?c=139442 (last visited May 11, 2006).
53. Press Release, John Laird, Laird Perchlorate Legislation Addresses Decision by State Water Resources Control Board (June 30, 2005), *available at* http://democrats.assembly.ca.gov/members/a27/press/a272005020.htm (last visited May 11, 2006).

public support, this bill is struggling under the strong disapproval from water agencies.[54]

There is a real concern over whether policy or science is driving the MCL for perchlorate. As the Department of Defense will have extensive liability for perchlorate contamination, there has been pressure from the Department of Defense and military contractors on the EPA to set a high drinking water standard.[55] A very low standard may not be ideal for municipal water suppliers either. If the standard is too low, it could potentially prevent the distribution of some public water supplies, especially in those states using water from the Colorado River, which has perchlorate detections from four ppb to six ppb.[56] In addition, in areas where perchlorate naturally occurs, a drinking water standard below the natural level could also require an alternative drinking water source.

Scientists have not agreed upon experimental results, making the creation of a safe level all the more difficult, and possibly making the policy argument even more influential. Two government-sponsored scientific studies to find a safe level of perchlorate in drinking water resulted in two very different results—twenty-four ppb and six ppb.[57] These studies were criticized by some as not being representative of sensitive populations.[58] Another study, paid for by a group of defense contractors, was conducted to evaluate the effect of perchlorate on fetal rats.[59] The study was intended to find a dose at which there were no adverse effects, but no safe dose was found. At the conclusion of the study, the contractors hired a consultant to discredit the study and elected not to perform another.[60] Further testing and analysis of how perchlorate affects the growth and development of sensitive populations will likely need to be performed.

54. Municipal Water District of Orange County, Action Item One (Sept. 21, 2005) (adopting a position of opposition to AB 1421), *available at* http://www.mwdoc.com/documents/082205PAMO830AM.pdf (last visited May 11, 2006).

55. American Water Works Association, *NRC Experts Seek Less Perchlorate Risk Than USEPA*, Jan. 10, 2005, *available at* http://www.awwa.org/Communications/news/index.cfm?ArticleID=391 (last visited May 11, 2006).

56. Municipal Water District of Orange County, *supra* note 54.

57. OFFICE OF ENVIRONMENTAL HEALTH HAZARD ASSESSMENT, *supra* note 29.

58. Peter Waldman, *Debate Rages over Safe Levels of Toxin for Adults and Infants*, WALL ST. J., Dec 16, 2002, *available at* http://www.mindfully.org/Pesticide/2002/Perchlorate-Water-Toxic16dec02.htm (last visited May 10, 2006).

59. *Id.*

60. *Id.*

VI. Conclusion

The EPA is working to determine a MCL for perchlorate, and states are doing the same. As certain agencies are trying to establish these safe consumption levels for perchlorate in drinking water, other agencies are simultaneously directing the cleanup of perchlorate-contaminated sites. Together, the EPA and various state and local governments must protect the public from any harmful effects of perchlorate contamination, while trying to set a reasonable cleanup level. In California, it has been decided that the agency overseeing the cleanup of these sites must defer to the health agencies in assessing when replacement water needs be provided. In addition, the *Olin* decision has refueled the debate on whether a reasonable cleanup level should consider economic costs alongside health benefits. Policy and science are both playing a role in the development of safe perchlorate levels in drinking water and will continue to be an element in emerging perchlorate litigation.