Federal Register

Monday,
March 29, 2010

Part II

Environmental Protection Agency

National Primary Drinking Water Regulations; Announcement of the Results of EPA's Review of Existing Drinking Water Standards and Request for Public Comment and/or Information on Related Issues; Notice

ENVIRONMENTAL PROTECTION AGENCY

[EPA–HQ–OW–2008–0747; FRL–9130–3]

RIN 2040–AE90

National Primary Drinking Water Regulations; Announcement of the Results of EPA's Review of Existing Drinking Water Standards and Request for Public Comment and/or Information on Related Issues

AGENCY: Environmental Protection Agency (EPA).

ACTION: Notice; request for comments.

SUMMARY: The Safe Drinking Water Act (SDWA) requires the United States Environmental Protection Agency (EPA) to conduct a periodic review of existing National Primary Drinking Water Regulations (NPDWRs) and determine which, if any, need to be revised. The purpose of the review, called the Six-Year Review, is to identify those NPDWRs for which current health effects assessments, changes in technology, and/or other factors provide a health or technical basis to support a regulatory revision that will improve or strengthen public health protection. EPA has completed its detailed review of 71 NPDWRs and at this time believes that four NPDWRs are candidates for regulatory revision. These four NPDWRs are acrylamide, epichlorohydrin, tetrachloroethylene, and trichloroethylene. EPA requests public comment and/or relevant information that will assist the Agency as we move forward with regulatory action to revise these four NPDWRs. In addition to the 71 NPDWRs discussed in detail in today's action, this review also includes 14 other NPDWRs that need no detailed review because of recent or ongoing revision actions.

DATES: Comments must be received on or before May 28, 2010, 60 days after publication in the **Federal Register.**

ADDRESSES: Submit your comments, identified by Docket ID No. EPA–HQ–OW–2008–0747, by one of the following methods:

- *http://www.regulations.gov:* Follow the online instructions for submitting comments.
- *Mail:* Water Docket, Environmental Protection Agency, Mailcode: 2822T, 1200 Pennsylvania Ave., NW., Washington, DC 20460.
- *Hand Delivery:* EPA Docket Center Public Reading Room, EPA Headquarters West, Room 3334, 1301 Constitution Ave., NW., Washington, DC. Such deliveries are only accepted during the Docket's normal hours of operation, and special arrangements should be made for deliveries of boxed information.

Instructions: Direct your comments to Docket ID No. EPA–HQ–OW–2008–0747. EPA's policy is that all comments received will be included in the public docket without change and may be made available online at *http://www.regulations.gov,* including any personal information provided, unless the comment includes information claimed to be Confidential Business Information (CBI) or other information whose disclosure is restricted by statute. Do not submit information that you consider to be CBI or otherwise protected using *http://www.regulations.gov.* Please contact EPA prior to submitting CBI.

The *http://www.regulations.gov* Web site is an "anonymous access" system, which means EPA will not know your identity or contact information unless you provide it in the body of your comment. If you send an e-mail comment directly to EPA without going through *http://www.regulations.gov* your e-mail address will be automatically captured and included as part of the comment that is placed in the public docket and made available on the Internet. If you submit an electronic comment, EPA recommends that you include your name and other contact information in the body of your comment and with any disk or CD–ROM you submit. If EPA cannot read your comment due to technical difficulties and cannot contact you for clarification, EPA may not be able to consider your comment. Electronic files should avoid the use of special characters, any form of encryption, and be free of any defects or viruses. For additional instructions on submitting comments, go to section I.B of this document.

Docket: All documents in the docket are listed in the *http://www.regulations.gov* index. Although listed in the index, some information is not publicly available, *e.g.,* CBI or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, will be publicly available only in hard copy. Publicly available docket materials are available either electronically in *http://www.regulations.gov* or in hard copy at the Water Docket, EPA/DC, EPA West, Room 3334, 1301 Constitution Ave., NW., Washington, DC. The Public Reading Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is (202) 566–1744, and the telephone number for the EPA Docket Center is (202) 566–2426.

FOR FURTHER INFORMATION CONTACT: For technical inquiries contact: Rajiv Khera, (202) 564–4881, or Karen Wirth, (202) 564–5246, Office of Ground Water and Drinking Water, Environmental Protection Agency. For general information about, and copies of, this document or information about the existing NPDWRs discussed in this action, contact the Safe Drinking Water Hotline. Callers within the United States may reach the Hotline at (800) 426–4791. The Hotline is open Monday through Friday, excluding Federal holidays, from 9 a.m. to 5:30 p.m. Eastern Time.

Abbreviations and Acronyms Used in This Action

>—greater than
2,4-D—2,4-dichlorophenoxyacetic acid
µg/L—microgram per liter
AMG—Alternative Monitoring Guidelines
ASDWA—Association of State Drinking Water Administrators
ATSDR—Agency for Toxic Substances and Disease Registry
AWWA—American Water Works Association
BAT—best available technology
CARC—Cancer Assessment Review Committee
CBI—Confidential Business Information
CCL—Contaminant Candidate List
CFR—Code of Federal Regulations
Cr III—trivalent chromium
Cr VI—hexavalent chromium
CWS—community water system
DBPs—disinfection byproducts
DBCP—1,2-dibromo-3-chloropropane
DBPR—Disinfectants and Disinfection Byproducts Rule
DEHA—di(2-ethylhexyl)adipate
DEHP—di(2-ethylhexyl)phthalate
DWEL—drinking water equivalent level
EDB—ethylene dibromide
EPA—U.S. Environmental Protection Agency
EQL—estimated quantitation level
ESA—ethanesulfonic acid
FR—**Federal Register**
FQPA—Food Quality Protection Act
GAC—granular activated carbon
GWR—Ground Water Rule
HAA5—haloacetic acids
IARC—International Agency for Research on Cancer
ICR—Information Collection Request
IRED—Interim Reregistration Eligibility Decision
IRIS—Integrated Risk Information System
LCR—Lead and Copper Rule
LH—lutenizing hormone
LOAEL—lowest-observed-adverse-effect level
LT2ESWTR—Long-Term 2 Enhanced Surface Water Treatment Rule
MCL—maximum contaminant level
MCLG—maximum contaminant level goal
MDL—method detection limit
mg/kg-day—milligrams per kilogram of body weight per day
mg/L—milligrams per liter
MOA—mode of action
MRL—minimum reporting level
N—nitrogen
NAS—National Academy of Sciences

NAWQA—National Water Quality Assessment
NCFAP—National Center for Food and Agricultural Policy
NCOD—National Drinking Water Contaminant Occurrence Database
NDWAC—National Drinking Water Advisory Council
NELAC—National Environmental Laboratory Accreditation Conference
NOAEL—no-observed-adverse-effect level
NPDWR—National Primary Drinking Water Regulation
NRC—National Research Council
NTNCWS—non-transient, non-community water system
NTP—National Toxicology Program
OPP—Office of Pesticide Programs
ORD—Office of Research and Development
OW—Office of Water
PCBs—polychlorinated biphenyls
PCE—tetrachloroethylene
PE—Performance Evaluation
pCi/L—picoCurie per liter
PN—public notification
ppb—part per billion (*e.g.,* microgram per liter)
ppm—part per million (*e.g.,* milligram per liter)
PQL—practical quantitation limit
PT—Performance Testing
PTA—packed tower aeration
PWS—public water system
R2S2—Regulatory Review Support Spreadsheet
RED—Reregistration Eligibility Decision
RfD—reference dose
RSC—relative source contribution
SAB—Science Advisory Board
SSCT—Small System Compliance Technology
SDWA—Safe Drinking Water Act
SDWIS/FED—Safe Drinking Water Information System/Federal version
SMCL—secondary maximum contaminant level
SOC—synthetic organic chemical
STORET—STOrage and RETrieval data system
SWTR—Surface Water Treatment Rule
T3—triiodothyronine (thyroid hormone)
T4—levothyroxine (thyroid hormone)
TCDD—tetrachlorodibenzo-p-dioxin
TCE—trichloroethylene
TNCWS—transient, non-community water system
TP—trichlorophenoxypropionic acid
TRED—Interim Tolerance Reassessment and Risk Management Decisions
TRI—Toxics Release Inventory
TSC—Technical Support Center
TT—treatment technique
TTHM—total trihalomethanes
USDA—U.S. Department of Agriculture
UCMR 2—second Unregulated Contaminant Monitoring Rule
USGS—U.S. Geological Survey
VOC—volatile organic compound
WS—water supply

Table of Contents

I. General Information
A. Does This Action Apply to My Public Water System?
B. How Should I Submit Comments on This Action?
C. What Should I Consider as I Prepare My Comments for EPA?
II. Statutory Requirements for the Six-Year Review
III. Stakeholder Involvement in the Six-Year Review Process
A. How Have Stakeholders Been Involved in the Review Process?
B. How Did EPA Incorporate Feedback from the Science Advisory Board's 2002 Comments on the Six-Year Review Protocol?
IV. Regulations Included in the Six-Year Review
V. EPA's Protocol for Reviewing the NPDWRs Included in This Action
A. What Was EPA's Review Process?
B. How Did EPA Conduct the Initial Review and Evaluate Key Technical Elements of the NPDWRs?
1. Initial Review
2. Health Effects
3. Analytical Feasibility
4. Occurrence and Exposure Analysis
5. Treatment Feasibility
6. Other Regulatory Revisions
C. How Did EPA Factor Children's Health Concerns Into the Review?
VI. Results of EPA's Review of NPDWRs
A. What Are the Review Result Categories?
1. No Action at This Time and the NPDWR is Still Appropriate
2. Candidate for Revision
B. What Are the Details of EPA's Review of Each NPDWR?
1. Acrylamide
2. Alachlor
3. Alpha Particle Emitters
4. Antimony
5. Arsenic
6. Asbestos
7. Atrazine
8. Barium
9. Benzene
10. Benzo(a)pyrene
11. Beryllium
12. Beta Particle and Photon Emitters
13. Cadmium
14. Carbofuran
15. Carbon Tetrachloride
16. Chlordane
17. Chromium
18. Cyanide
19. 2,4-D (2,4-Dichlorophenoxyacetic acid)
20. Dalapon (2,2-Dichloropropionic Acid)
21. Di(2-ethylhexyl)adipate (DEHA)
22. Di(2-ethylhexyl)phthalate (DEHP)
23. 1,2-Dibromo-3-chloropropane (DBCP)
24. 1,2-Dichlorobenzene (o-Dichlorobenzene)
25. 1,4-Dichlorobenzene (p-Dichlorobenzene)
26. 1,2-Dichloroethane (Ethylene Dichloride)
27. 1,1-Dichloroethylene
28. cis-1,2-Dichloroethylene
29. trans-1,2-Dichloroethylene
30. Dichloromethane (Methylene Chloride)
31. 1,2-Dichloropropane
32. Dinoseb
33. Diquat
34. Endothall
35. Endrin
36. Epichlorohydrin
37. Ethylbenzene
38. Ethylene Dibromide (EDB; 1,2-Dibromoethane)
39. Fluoride
40. Glyphosate
41. Heptachlor
42. Heptachlor Epoxide
43. Hexachlorobenzene
44. Hexachlorocyclopentadiene
45. Lindane (gamma-Hexachlorocyclohexane)
46. Mercury (Inorganic)
47. Methoxychlor
48. Monochlorobenzene (Chlorobenzene)
49. Nitrate (as N)
50. Nitrite (as N)
51. Oxamyl (Vydate)
52. Pentachlorophenol
53. Picloram
54. Polychlorinated Biphenyls (PCBs)
55. Combined Radiums (226 and 228)
56. Selenium
57. Simazine
58. Styrene
59. 2,3,7,8–TCDD (Dioxin)
60. Tetrachloroethylene
61. Thallium
62. Toluene
63. Toxaphene
64. 2,4,5-TP (Silvex; 2,4,5-Trichlorophenoxypropionic Acid)
65. 1,2,4-Trichlorobenzene
66. 1,1,1-Trichloroethane
67. 1,1,2-Trichloroethane
68. Trichloroethylene
69. Uranium
70. Vinyl chloride
71. Xylenes (Total)
VII. EPA's Request for Comments
A. Request for Comment and/or Information on the Candidates for Revision
B. Request for Information/Data on Other Review Topics
C. Requests for Information on the Impacts of Climate Change on Water Quality
VIII. EPA's Next Steps
IX. References

SUPPLEMENTARY INFORMATION:

I. General Information

A. Does This Action Apply to My Public Water System?

This action itself does not impose any requirements on anyone. Instead, it notifies interested parties of EPA's review of existing NPDWRs and its conclusions about which of these warrants new regulatory action at this time. EPA requests public comment on the four NPDWRs identified as candidates for revision, with a specific focus on comments and/or relevant information that will inform the regulatory revisions.

B. How Should I Submit Comments on This Action?

Please *see* Section VII for the issues related to this notice for which EPA requests comment and/or information. EPA will accept written or electronic comments (please do not send both). Instructions for submitting comments are in the preceding section. EPA prefers electronic comments. No

facsimiles (faxes) will be accepted. Commenters who want EPA to acknowledge receipt of their comments should also send a self-addressed, stamped envelope.

The Agency intends to address the comments received on the four NPDWRs identified as candidates for revision in subsequent **Federal Register** notices proposing and finalizing the regulatory revisions, and in documents that will be made available in the docket for those notices.

C. What Should I Consider as I Prepare My Comments for EPA?

You may find the following suggestions helpful for preparing your comments:

- Explain your views as clearly as possible.
- Describe any assumptions that you used.
- Provide any technical information and/or data you used that support your views.
- If you estimate potential burden or costs, explain how you arrived at your estimate.
- Provide specific examples to illustrate your concerns.
- Offer alternatives.
- Make sure to submit your comments by the comment period deadline.
- To ensure proper receipt by EPA, identify the appropriate docket identification number in the subject line on the first page of your response. It would also be helpful if you provided the name, date, and **Federal Register** citation related to your comments.

II. Statutory Requirements for the Six-Year Review

Under the SDWA, as amended in 1996, EPA must periodically review existing national primary drinking water regulations (NPDWRs) and, if appropriate, revise them. Section 1412(b)(9) of SDWA states:

> The Administrator shall, not less often than every 6 years, review and revise, as appropriate, each national primary drinking water regulation promulgated under this title. Any revision of a national primary drinking water regulation shall be promulgated in accordance with this section, except that each revision shall maintain, or provide for greater, protection of the health of persons.

Pursuant to the 1996 SDWA Amendments, EPA completed and published the results of its first Six-Year Review (Six-Year Review 1) July 18, 2003 (68 FR 42908, USEPA, 2003e) after developing a systematic approach, or protocol, for the review of NPDWRs. EPA has applied the same protocol with minor refinements (revised protocol) to the second Six-Year Review of NPDWRs (Six-Year Review 2). Section V of today's action describes the protocol and the minor refinements used for the Six-Year Review 2 and section VI describes the review findings for each of the NPDWRs covered by the current effort (*see* Table IV–1).

III. Stakeholder Involvement in the Six-Year Review Process

A. How Have Stakeholders Been Involved in the Review Process?

The Agency developed a Six-Year Review protocol during the first review cycle with extensive stakeholder inputs, including a stakeholder meeting, Agency presentations at a variety of meetings, and consultation with the National Drinking Water Advisory Council (NDWAC). NDWAC formed a working group to develop recommendations regarding the process the Agency should apply to conduct a periodic and systematic review of existing NPDWRs. The Working Group held two meetings and a conference call during June through September 2000 (67 FR 19030, April 17, 2002, USEPA, 2002c). The NDWAC approved the Working Group's recommendations in November 2000, and formally provided them to EPA in December 2000 (NDWAC, 2000). The NDWAC recommended that EPA's review include consideration of five key elements, as appropriate: health effects, analytical and treatment feasibility, implementation-related issues, occurrence and exposure, and economic impacts. As discussed in more detail in section V of today's action, EPA continues to follow the general protocol recommended by the NDWAC.

B. How Did EPA Incorporate Feedback From the Science Advisory Board's 2002 Comments on the Six-Year Review Protocol?

In June 2002 and during the Six-Year Review 1, EPA consulted with the Science Advisory Board (SAB) Drinking Water Committee and requested their review and comment on whether the protocol that EPA developed based on the NDWAC's recommendations was consistently applied and appropriately documented. The SAB provided verbal feedback regarding the transparency and clarity of EPA's criteria for making its Six-Year Review 1 decisions. At that time, EPA revised the protocol to better explain how the decision criteria were applied. For the Six-Year Review 2 and to increase transparency and clarity, EPA also developed a more detailed decision tree and an automated tool, called the Regulatory Review Support Spreadsheet (R2S2). The more detailed decision tree incorporates the sequential relationships between the various NPDWR review elements and R2S2 tracks each contaminant through the decision making process. The Agency has documented the decision tree and the automated tool in the document, "EPA Protocol for the Second Review of Existing National Primary Drinking Water Regulations (Updated)" (USEPA, 2009a).

IV. Regulations Included in the Six-Year Review

Table IV–1 lists all the NPDWRs established to date. The table also reports the maximum contaminant level goal (MCLG), which is "set at the level at which no known or anticipated adverse effects on the health of persons occur and which allows an adequate margin of safety" (SDWA section 1412(b)(4)), and the maximum contaminant level (MCL), which is the maximum permissible level of a contaminant in water delivered to any user of a public water system and "is as close to the maximum contaminant level goal as is feasible" (SDWA section 1412(b)(4)(B)), except for contaminants that have a treatment technique (TT) in lieu of an MCL because it is not "economically or technically feasible" to set an MCL (SDWA section 1412(b)(7)(A)).[1] Of these 85 NPDWRs, EPA has reviewed 14 as part of recent or ongoing regulatory actions and, as a result, they are not subject to a detailed review in today's notice. The review for the remaining 71 is discussed in detail in today's action.

[1] Under limited circumstances, SDWA Section 1412(b)(6)(A) also gives the Administrator the discretion to promulgate an MCL that is less stringent than the feasible level and that "maximizes health risk reduction benefits at a cost that is justified by the benefits."

TABLE IV–1—CONTAMINANTS WITH NPDWRS INCLUDED IN SIX-YEAR REVIEW 2

Contaminants	MCLG (mg/L) [1]	MCL (mg/L) [1]	Contaminants	MCLG (mg/L) [1]	MCL (mg/L) [1]
Acrylamide	0	TT	Epichlorohydrin	0	TT
Alachlor	0	0.002	Ethylbenzene	0.7	0.7
Alpha particles	0 (pCi/L)	15 (pCi/L)	Ethylene dibromide (EDB)	0	0.00005
Antimony	0.006	0.006	Fluoride	4	4
Arsenic	0	0.01	*Giardia lamblia*	0	TT
Asbestos	7 (million fibers/L)	7 (million fibers/L)	Glyphosate	0.7	0.7
Atrazine	0.003	0.003	Haloacetic acids (HAA5)	n/a [2]	0.06
Barium	2	2	Heptachlor	0	0.0004
Benzene	0	0.005	Heptachlor Epoxide	0	0.0002
Benzo(a)pyrene	0	0.0002	Hexachlorobenzene	0	0.001
Beryllium	0.004	0.004	Hexachlorocyclopentadiene	0.05	0.05
Beta particles	0 (millirems/yr)	4 (millirems/yr)	Lead	0	TT
Bromate	0	0.01	*Legionella*	0	TT
Cadmium	0.005	0.005	Lindane	0.0002	0.0002
Carbofuran	0.04	0.04	Mercury (Inorganic)	0.002	0.002
Carbon tetrachloride	0	0.005	Methoxychlor	0.04	0.04
Chloramines	4	4	Monochlorobenzene (Chlorobenzene).	0.1	0.1
Chlordane	0	0.002	Nitrate (as nitrogen, N)	10	10
Chlorine	4	4	Nitrite (as N)	1	1
Chlorine dioxide	0.8	0.8	Oxamyl (Vydate)	0.2	0.2
Chlorite	0.8	1	Pentachlorophenol	0	0.001
Chromium (total)	0.1	0.1	Picloram	0.5	0.5
Coliform	0% [3]	5% [3]	Polychlorinated biphenyls (PCBs).	0	0.0005
Copper	1.3	TT	Radium	0 (pCi/L)	5 (pCi/L)
Cryptosporidium	0	TT	Selenium	0.05	0.05
Cyanide	0.2	0.2	Simazine	0.004	0.004
2,4-Dichlorophenoxyacetic acid (2,4-D).	0.07	0.07	Styrene	0.1	0.1
Dalapon	0.2	0.2	2,3,7,8-Tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD or dioxin).	0	3.00E-08
Di(2-ethylhexyl)adipate (DEHA).	0.4	0.4	Tetrachloroethylene (PCE)	0	0.005
Di(2-ethylhexyl)phthalate (DEHP).	0	0.006	Thallium	0.0005	0.002
1,2-Dibromo-3-chloropropane (DBCP).	0	0.0002	Toluene	1	1
1,2-Dichlorobenzene (o-Dichlorobenzene).	0.6	0.6	Total trihalomethanes (TTHM).	n/a [4]	0.08
1,4-Dichlorobenzene (p-Dichlorobenzene).	0.075	0.075	Toxaphene	0	0.003
1,2-Dichloroethane (Ethylene dichloride).	0	0.005	2,4,5-Trichlorophenoxypropionic acid (2,4,5-TP or Silvex).	0.05	0.05
1,1-Dichloroethylene	0.007	0.007	1,2,4-Trichlorobenzene	0.07	0.07
cis-1,2-Dichloroethylene	0.07	0.07	1,1,1-Trichloroethane	0.2	0.2
trans-1,2-Dichloroethylene	0.1	0.1	1,1,2-Trichloroethane	0.003	0.005
Dichloromethane (Methylene chloride).	0	0.005	Trichloroethylene (TCE)	0	0.005
1,2-Dichloropropane	0	0.005	Uranium	0 (μg/L)	30 (μg/L)
Dinoseb	0.007	0.007	Vinyl chloride	0	0.002
Diquat	0.02	0.02	Viruses	0	TT
Endothall	0.1	0.1	Xylenes (total)	10	10
Endrin	0.002	0.002.			

1. Units are in milligrams per liter (mg/L) unless otherwise noted, *e.g.,* micrograms per liter (μg/L) and picoCuries per liter (pCi/L). Milligrams per liter are equivalent to parts per million (ppm) and micrograms per liter are equivalent to parts per billion (ppb).

2. There is no MCLG for all five haloacetic acids. MCLGs for some of the individual contaminants are: dichloroacetic acid (zero), trichloroacetic acid (0.02 mg/L), and monochloroacetic acid (0.07 mg/L). Bromoacetic acid and dibromoacetic acid are regulated with this group but have no MCLGs.

3. No more than 5.0% samples total coliform-positive in a month.

4. There is no MCLG for total trihalomethanes. MCLGs for some of the individual contaminants are: bromodichloromethane (zero), bromoform (zero), dibromochloromethane (0.06 mg/L), and chloroform (0.07mg/L).

V. EPA's Protocol for Reviewing the NPDWRs Included in This Action

A. What Was EPA's Review Process?

The protocol document, "EPA Protocol for the Review of Existing National Primary Drinking Water Regulations (Updated)" (USEPA, 2009a), contains a detailed description of the process the Agency used to review the NPDWRs discussed in today's action. EPA's primary goal was to identify and prioritize candidates for regulatory revision to target those revisions that are most likely to result in an increased level of public health protection and/or result in substantial cost savings for systems and their customers while maintaining the level of public health protection.[2] This section provides an overview of the review process and section V.B provides a more detailed description of how EPA applied the process to the review of the NPDWRs discussed in today's action.

EPA applied the following basic principles to the review process:

- The Agency sought to avoid redundant review efforts. Because EPA has reviewed information for 14 contaminants as part of recent or ongoing regulatory actions, they are not subject to the detailed review in today's notice.
- EPA evaluated the potential for new information to affect NPDWRs in a manner consistent with existing policies and procedures for developing NPDWRs. For example, in determining whether a possible change in analytical feasibility existed, the Agency considered the current policy and procedures for calculating the practical quantitation level for drinking water contaminants.[3]
- Because any possible change in an MCLG affects other NPDWR elements, EPA will not generally consider potential revisions to any contaminant with a health effects assessment in process that would not be completed during the review period, where either the contaminant's MCL is equal to its MCLG or the MCL is based on the 1996 SDWA Amendments' cost-benefit provision. The rationale for this outcome is that any new information from the health effects assessment could affect the MCL or the assessment of the benefits associated with the MCL for these contaminants. Therefore, the Agency does not believe it is appropriate to consider revisions to these NPDWRs while a health effects assessment is ongoing.
- For those contaminants with ongoing health assessments that have MCLGs equal to or greater than zero and MCLs limited by analytical feasibility or the standard is based on a Treatment Technique, EPA conducted a further review of the potential to revise the MCL or TT. The rationale for this approach is that the MCL or TT is based on technology limitations and therefore, EPA should consider whether there have been improvements in technology and whether any revision might provide a meaningful opportunity to improve or at least maintain public health protection. If EPA found that there were no changes in technology (*i.e.,* analytical feasibility or a TT) or if changes were possible but there was no meaningful opportunity to improve public health protection or reduce costs (while maintaining public health protection), these contaminants remained in the ongoing health effects assessment category.
- For this review, EPA considered new information from health effects assessments that were completed by a March 1, 2009 cutoff date. If an updated assessment is completed after the March 1, 2009 information cutoff date, then EPA will review the update and any new conclusions or additional information associated with the contaminant during the next review cycle or during the revision of an NPDWR (*e.g.,* acrylamide, PCE and TCE). If the health effects assessments are not completed in time for the regulatory revisions for acrylamide, PCE and TCE, EPA does not plan to change the existing MCLG of zero. EPA is currently considering how best to evaluate the benefits for these regulatory revisions if the EPA health effects assessments are not complete. One option would be to use the same health effects information that was used for promulgating the original regulation. Another option is to consider using other best available, peer-reviewed health risk assessments that are complete as the Agency is proceeding with the regulatory revisions. EPA requests comment on these options and any other options that the public considers appropriate to evaluate the benefits.
- The Agency may consider accelerating a review and potential revision for a particular NPDWR before the next review cycle when justified by new public health risk information.
- During the review, EPA identified areas where information is inadequate or unavailable (data gaps) or emerging and is needed to determine whether revision to an NPDWR is appropriate. When the Agency is able to fill such gaps or fully evaluate the emerging information, the Agency will consider it as part of the next review cycle. The Agency may consider accelerating a review and potential revision for a particular NPDWR if the information becomes available before the next review cycle and if review and a potential revision are justified by new public health risk information.
- EPA applied the Agency's peer review policy (USEPA, 2000d), where appropriate, to any new analyses.

During Six-Year Review 1, the Agency developed a systematic approach or protocol (USEPA, 2003b). The Agency based this protocol on the recommendations of the NDWAC, through internal Agency deliberations, and discussions with the diverse group of stakeholders involved in drinking water and its protection. The overview of the protocol in Figure V–1 shows the sequence of key decisions that led to EPA assigning each NPDWR to one of two major categories of outcomes in the Six-Year Review 2. The two major outcomes of the review are either: 1) The NPDWR is still appropriate and no action is necessary at this time, or 2) the NPDWR is a candidate for revision. The reasons for a Six-Year Review outcome of no further action at this time include at least one or more of the following reasons:

- The NPDWR has been reviewed or is being reviewed in a recent or ongoing action;
- The NPDWR has an ongoing health effects assessment (*i.e.,* for those

[2] Note that the legislative history of the 1996 SDWA Amendments indicate that Congress envisioned the possibility that a relaxed standard might be appropriate under circumstances that would not result in a lessening of the level of public health protection (*see* Senate Report Number 104–169, 104th Congress, 1st Session, 1995 at 38). In other words, an MCL could be relaxed (*i.e.,* increased) in cases where a revised health risk assessment leads to a less stringent (higher) MCLG than the existing MCL so that the level of health protection is maintained. There have been several instances in which revised health assessments have suggested higher MCLGs and the Agency could have considered relaxing the MCLs. In these instances and because SDWA allows EPA to determine when revisions are appropriate, the Agency decided that there would be a negligible gain in public health protection and/or cost savings and any revision would be a low priority activity because of competing workload priorities, the administrative costs associated with rulemaking, and the burden on States and the regulated community to implement any regulatory changes.

[3] The following **Federal Register** notices describe the process the Agency has used to determine analytical feasibility for drinking water contaminants: 50 FR 46880, November 13, 1985 (USEPA, 1985); 52 FR 25690, July 8, 1987 (USEPA, 1987); 54 FR 22062, May 22, 1989 (USEPA, 1989b). For this Six Year Review effort and to supplement the analytical feasibility evaluation, the Agency also reviewed extensive minimum reporting level (MRL) data obtained from States and primacy entities as part of the Six-Year Review information collection request (ICR) for SDWA compliance monitoring data.

NPDWRs with an MCL set at the MCLG or the MCL is based on the SDWA cost benefit provision);

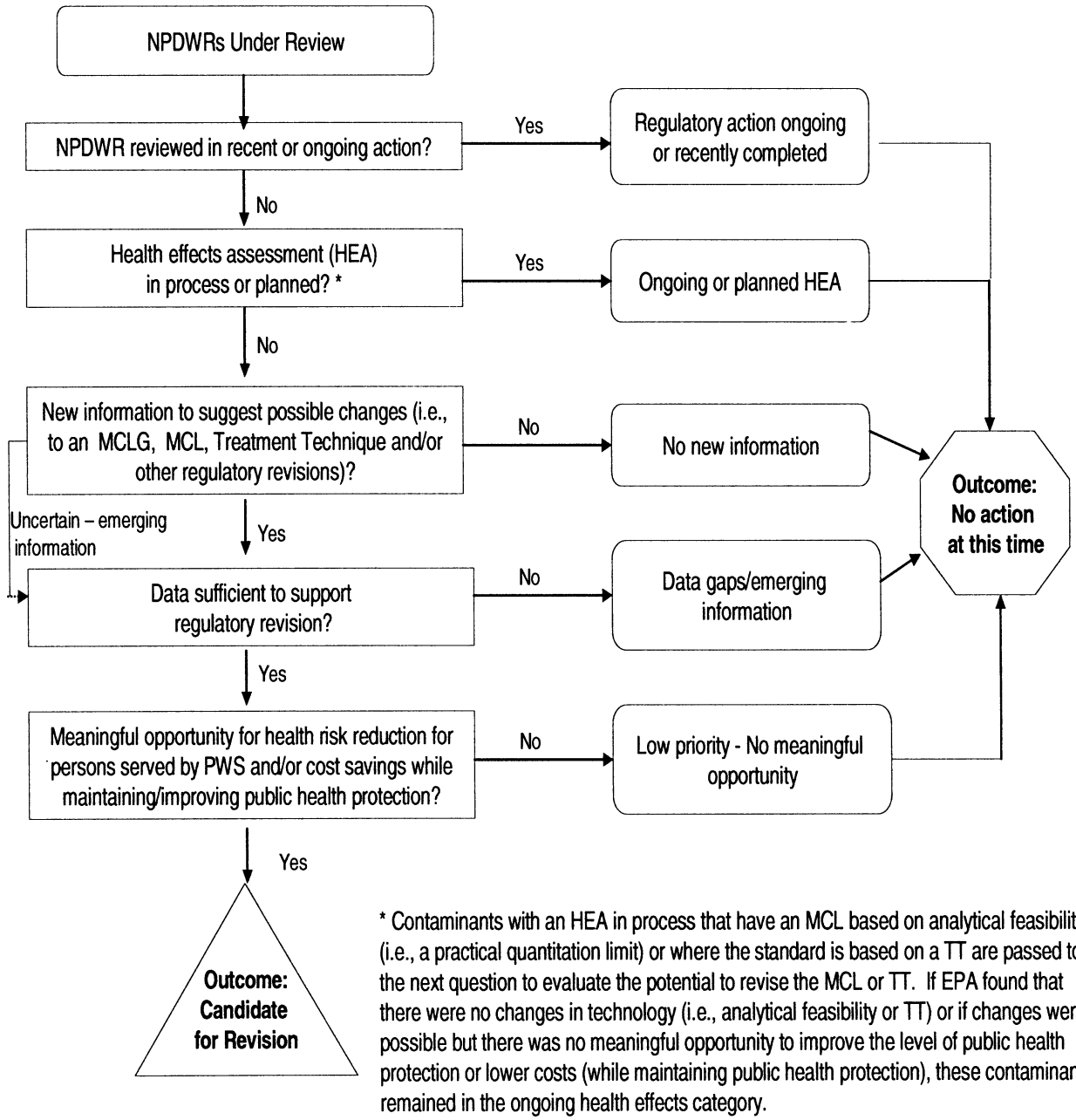
• EPA is considering whether a new health effects assessment is needed;

• EPA did not identify any new, relevant information that indicate changes to the NPDWR;

• New information indicate a possible change to the MCLG and/or MCL but changes to the NPDWR are a low priority activity due to negligible gains in public health protection and/or cost savings; or

• There are data gaps or emerging information that needs to be evaluated.

Figure V-1. Six-Year Review Protocol Overview and Major Categories of Revise/Take No Action Outcomes



During the current Six-Year Review, the Agency assessed the protocol and determined it remained appropriate and suitable for the second review. The research requirements and decision-making process of the Six-Year Review 2 protocol are essentially the same as those implemented during Six-Year Review 1. The Agency made some minor refinements to enhance the Agency's effectiveness in applying the protocol to the review of NPDWRs. The

refinements that address SAB's comments about the clarity and the transparency of the protocol's decision making process are described in the next two paragraphs. Section V.B describes the key technical elements and any refinements in the data and/or the analysis methods used during Six-Year Review 2.

The primary refinement to the protocol during Six-Year Review 2 is the implementation of a more detailed "decision tree" than either the one used during Six-Year Review 1 (USEPA, 2003b) or the overview shown in Figure V–1. The protocol is broken down into a series of questions about whether there is new information for a contaminant that suggests potential to revise each of the NPDWR elements. These questions are logically ordered into a decision tree that incorporates the sequential relationships between the different NPDWR elements. For example, when EPA establishes an MCL, it must generally set the MCL as close to the MCLG as feasible. Consequently, for a contaminant that has an MCL equal to its MCLG, EPA must make decisions about the availability and adequacy of new information regarding the possibility to revise the MCLG before decisions regarding the possibility to revise the MCL. It also means that if there is no possibility to revise a contaminant's MCLG and the MCL is already equal to the MCLG, then there is no basis for revising the MCL. In this instance, the MCL branch of the decision tree is not reached, and it is not necessary to make related decisions such as whether the practical quantitation limit (PQL) can be revised. This approach results in a more efficient review process. EPA also developed an automated tool called the R2S2 that tracks each contaminant's movement through the decision tree, including the revise/take no action outcomes. This tool enhances transparency throughout the decision process. The automation also streamlines the decision process and facilitates the Agency's reporting of its review results. The Agency has documented the decision tree and the automated tool in the document entitled, "EPA Protocol for the Second Review of Existing National Primary Drinking Water Regulations (Updated)" (USEPA, 2009a).

B. How Did EPA Conduct the Initial Review and Evaluate Key Technical Elements of the NPDWRs?

This section describes the specific technical reviews that EPA conducted, including the initial review, health effects, analytical methods, occurrence and exposure, treatment feasibility, and economic analysis.

1. Initial Review

EPA's initial review of all the contaminants included in the Six-Year Review 2 involved a simple identification of the NPDWRs that were being reviewed under concurrent EPA actions or had been reviewed and revised in EPA actions completed since 2002. Table V–1 provides a list of the 14 contaminants that met one of these criteria and identifies the recent or ongoing action in which the contaminant has been reviewed or is undergoing review. While these 14 contaminants are part of the Six-Year Review 2, they were not subject to any detailed analysis given that new information on these contaminants has been recently reviewed under separate actions. However, EPA requests comments on these contaminants along with the other contaminants discussed in detail in this notice.

The remaining 71 contaminants pass through this step to the review of the technical NPDWR elements, which are described in the following sections.

TABLE V–1—NPDWRS THAT HAVE BEEN REVIEWED OR ARE BEING REVIEWED UNDER RECENT OR ONGOING ACTIONS

Contaminant/indicator	Recent or ongoing action
Disinfection Byproducts	
Bromate	Stage 2 DBPR.
Chlorite[1]	Stage 2 DBPR.
HAA5: monochloroacetic acid, dichloroacetic acid, trichloroacetic acid, monobromoacetic acid, dibromoacetic acid.	Stage 2 DBPR.
TTHMs: chloroform, bromodichloromethane, dibromochloromethane, bromoform	Stage 2 DBPR.
Disinfectant Residuals	
Chloramines[1]	Stage 2 DBPR.
Chlorine[1]	Stage 2 DBPR.
Chlorine dioxide	Stage 2 DBPR.
Inorganics	
Copper	Under consideration for long-term revisions.
Lead	LCR Short-Term Revisions Under consideration for long-term revisions.
Microorganisms	
Coliform	Total Coliform Rule-making currently underway.
Cryptosporidium	LT2ESWTR.
Giardia lamblia	LT2ESWTR.
Legionella[2]	LT2ESWTR, CCL3[3].
Viruses[2]	LT2ESWTR, GWR, CCL3[3].

DBPR—Disinfectants and Disinfection Byproducts Rule.
LT2ESWTR—Long-Term 2 Enhanced Surface Water Treatment Rule.
LCR—Lead and Copper Rule.
GWR—Ground Water Rule.

Dates of promulgation are as follows:
Stage 2 DBPR: 71 FR 388, January 4, 2006 (USEPA, 2006h).
LT2ESWTR: 71 FR 654, January 5, 2006 (USEPA, 2006g).
LCR Short-Term Regulatory Revisions: 72 FR 57782, October 10, 2007 (USEPA, 2007f).
GWR: 71 FR 65574, November 8, 2006 (USEPA, 2006f).

[1] Although the standard for this disinfectant was not revised as part of the Stage 2 DBPR, regulatory revisions need to be considered in conjunction with other disinfectant residuals and disinfection byproducts.

[2] LT2ESWTR and GWR promulgated treatment techniques that built upon and enhanced the existing regulations (Surface Water Treatment Rule, Interim Enhanced Surface Water Treatment Rule, and Long-Term 1 Enhanced Surface Water Treatment Rule) that address broad categories of microorganisms in treated water.

[3] Listed on the third Drinking Water Contaminant Candidate List or CCL3 (74 FR 51850, October 8, 2009 (USEPA, 2009l) in order to capture health and treatment information that may not be addressed by the current regulations.

2. Health Effects

The document, "Six-Year Review 2—Health Effects Assessment—Summary Report" (USEPA, 2009b), describes how EPA reviewed the contaminants discussed in today's action and provides the results of the health effects technical review. The principal objectives of the health effects review are to identify: (1) Contaminants for which a new health effects assessment indicates that a change in MCLG might be appropriate (*e.g.,* because of a change in cancer classification or a reference dose (RfD)), and (2) contaminants for which the Agency identifies new health effects information suggesting a need to initiate a new health effects assessment.

To meet the first objective, the Agency reviewed the results of health effects assessments completed under the following programs and identified, where feasible, possible MCLG values.

- EPA Integrated Risk Information System (IRIS).
- EPA Office of Pesticide Programs (OPP).
- National Academy of Sciences (NAS; when commissioned by EPA).

To meet the second objective, the Agency first conducted an extensive literature review to identify peer-reviewed studies. Then the Agency reviewed the studies to determine whether there was new health effects information such as reproductive and developmental toxicity that potentially affects the MCLG of any of the remaining contaminants that do not have an ongoing health effects assessment, including those with recently completed health effects assessments.

Table V–2 reflects the outcome of the health effects review for the NPDWRs discussed in today's action. EPA placed each contaminant into one of the following 13 categories.

- *Agency health effects assessment in process and not completed as of March 1, 2009.* The Agency currently is conducting a health effects assessment for the contaminant. That assessment will consider all available, relevant studies on the toxicology of the contaminant, including developmental and reproductive toxicity. This outcome contains three categories of contaminants.
- Category 1 contains 15 contaminants with MCLGs equal to or greater than zero and either MCLs that are limited by analytical feasibility or TT standards. For this category, EPA conducted further review of the potential for revisions to the MCL due to possible changes in analytical feasibility. The Agency's review of new information that might affect the MCL for one of these contaminants is a refinement of the protocol. During Six-Year Review 1, EPA took no further action on any contaminants with ongoing health effects assessments. EPA generally sets each MCL as close to the MCLG as is feasible, and a common limitation is the availability of analytical methods to reliably measure the contaminant.
- Category 2 contains two contaminants (arsenic and uranium) that have MCLGs equal to zero and MCLs that are based on the costs and benefits balancing provision in SDWA 1412(b)(6)(A). Any changes in the ongoing health effects assessment could impact the evaluation of benefits for these contaminants. Therefore, EPA has decided to take no further action to evaluate these two contaminants until completion of the health effects assessment.
- Category 3 contains 13 contaminants with non-zero MCLGs and MCLs generally equal to their respective MCLGs. Because EPA cannot determine whether there is potential to revise either the MCLG or the MCL until after the health effects assessment is completed, EPA plans to take no further action on these contaminants at this time.
- *New health effects assessment completed since Six-Year Review 1.* An IRIS or OPP assessment has been completed since 2002. EPA also conducted a follow-up literature search to confirm that no new information became available following the completion of the new health effects assessment. Table V–2 shows four categories of contaminants with new health effects assessments: four with results indicating potential for lower MCLG (Category 4), five with results indicating potential for higher MCLG (Category 5), two with results indicating the MCLG remains appropriate (Category 6), and three contaminants for which emerging information following the completion of a health effects assessment or a pending pesticide cancellation decision may affect EPA's review (Category 7).
- *Literature review only conducted during Six-Year Review 2.* For the contaminants that did not have an ongoing health effects assessment or a new one completed during the current review period, EPA conducted a review of the health effects literature to identify whether there was new information with potential to revise the MCLG. There are six categories of contaminants.
- Three categories pertain to contaminants that had a health effects assessment completed during Six-Year Review 1, including two with possible lower MCLGs (Category 8), three with possible higher MCLGs (Category 9), and three with no potential to revise their MCLGs (Category 10). During Six-Year Review 1, the Agency determined that possible changes to these contaminants' NPDWRs were a low priority activity for the Agency because of: competing workload priorities, the administrative costs associated with rulemaking, and the burden on States and the regulated community to implement any regulatory changes. As part of Six-Year Review 2, EPA is assessing whether there is new information that affects this determination.
- Category 11 contains five contaminants for which the Agency identified new information, described in section VI, that could impact the MCLG and, therefore, these contaminants are considered potential nominees for a new health assessment.
- Category 12 contains seven carcinogens for which the literature review sought new information on whether there might be a nonlinear mode of action or other reproductive and developmental health effects.

- Category 13 contains seven contaminants with non-zero MCLGs, for which EPA conducted a full literature search, including developmental and reproductive toxicity.

Table V-2. Summary of the Outcome of the Six-Year Health Effects Review

Health Effects Review Category			Contaminants
Health Effects Assessment in Process During Information Review Period for the Notice (and not available by the March 1, 2009 cutoff date)	Category 1: MCLG ≥ 0 and MCL based on Analytical Feasibility or standard is a TT		15 Total - acrylamide; alpha particles; benzo(a)pyrene; beta particles; carbon tetrachloride; DEHP; 1,2-dichloroethane; dichloromethane; pentachlorophenol; PCBs; radium; dioxin; tetrachloroethylene; thallium; and trichloroethylene
	Category 2: MCLG = 0 and MCL based on cost-benefit		2 Total – arsenic and uranium
	Category 3: MCLG > 0 and the MCL is set at the MCLG		13 Total – antimony; asbestos; beryllium; cadmium; cyanide; DEHA; 1,2-dichlorobenzene; 1,4-dichlorobenzene; cis-1,2-dichloroethylene; trans-1,2-dichloroethylene; ethylbenzene; fluoride; and styrene
Health Effects Assessment Completed Since Six-Year Review 1	Category 4: New health risk information could lower MCLG/MCL		4 Total – 2,4-D (2005, new data); endothall (2005, new data); toluene (2005, uncertainty factor adjustment); and total xylenes (2003, uncertainty factor adjustment)
	Category 5: New health risk information could raise MCLG/MCL		5 Total – alachlor (2006[1]); barium (2005); diquat (2002[2]); glyphosate (2002[3]); and 1,1,1-trichloroethane (2007, new data)
	Category 6: No new health risk information		2 Total – benzene (2003); EDB (2004)
	Category 7: Awaiting the outcome of emerging information or cancellation decision		3 Total - atrazine[4]; simazine[4]; and carbofuran[5]
Literature Review Only	Health Effects Assessment Completed During Six-Year Review 1	Category 8: New health risk information could lower MCLG/MCL	2 Total – hexachlorocyclopentadiene (2001); and oxamyl (2000)
		Category 9: New health risk information could raise MCLG/MCL	3 Total – 1,1-dichloroethylene (2002); lindane (2002); and picloram (1995)
		Category 10: No new health risk information	3 Total – chlordane (1998), inorganic mercury (1997),and vinyl chloride (2000)
	Category 11: New Information Identified; Potential Nominee for a New Assessment		5 Total – total chromium (hexavalent); nitrate; nitrite; selenium; and 1,2,4-trichlorobenzene
	Category 12: MCLG = 0 No new health risk information		7 Total — DBCP; 1,2-dichloropropane; epichlorohydrin; heptachlor; heptachlor epoxide; hexachlorobenzene; and toxaphene
	Category 13:MCLG > 0 No new health risk information		7 Total – dalapon; dinoseb; endrin; methoxychlor; monochlorobenzene; 2,4,5-TP; and 1,1,2-trichloroethane

1. The 2006 cumulative risk document (USEPA, 2006a) does not present a new assessment; it uses the cancer assessment in the 1998 Reregistration Eligibility Decision (RED; USEPA, 1998a).
2. The 2002 Interim Tolerance Reassessment and Risk Management Decisions (TRED; USEPA, 2002d) does not include a change in risk values, which are those reported in the 1995 RED (USEPA, 1995a).
3. The 2002 TRED (USEPA, 2002a) uses risk values consistent with those reported in the 1993 RED (USEPA, 1993b), with differences only in RfD rounding.
4. Although atrazine and simazine had new health effects assessments completed during the Six-Year Review 2 information period, on October 7, 2009, the Agency announced its intent to re-evaluate the risk assessment for atrazine. Because the simazine assessment is based on atrazine data, simazine was placed in this same category.
5. Although carbofuran had a new health effects assessment completed during the Six-Year Review 2 information period, a recent pesticide cancellation decision could affect the MCLG.

In addition to identifying for which contaminants there is information that potentially affects the MCLG, the health effects review indicates which contaminants proceed to other review steps under the protocol. Several

contaminants proceed to the analytical methods review to determine whether improvements in analytical methods indicate potential to revise the practical quantitation limit (PQL) in the NPDWRs. As Table V–3 shows, 14 contaminants from Category 1 proceed to the analytical methods review—despite an ongoing health effects assessment—because their MCLs are limited by their respective PQLs. These 14 include alpha particles; benzo(a)pyrene; beta particles; carbon tetrachloride; DEHP; 1,2-dichloroethane; dichloromethane; pentachlorophenol; PCBs; radium; dioxin; tetrachloroethylene; thallium; trichloroethylene. In addition, two contaminants in Category 6 (benzene and EDB) and two in Category 10 (chlordane and vinyl chloride) have MCLs that are limited by PQLs and, therefore, these contaminants proceed to the analytical methods review even though their health effects assessments indicated no change to their respective MCLG values. Similarly, six contaminants in Category 12 (DBCP; 1,2-dichloropropane; heptachlor; heptachlor epoxide; hexachlorobenzene; toxaphene) and one in Category 13 (1,1,2-trichloroethane) have MCLs that are limited by their respective PQL and, therefore, proceed to the analytical methods review despite there being no new information on health effects.

Among the contaminants having new health effects information during either Six-Year Review 2 or the previous review that potentially affects their respective MCLG values (*i.e.,* potentially lower MCLGs), four in Category 4 (2,4-D; endothall; toluene; total xylenes) and two in Category 8 (hexachlorocyclopentadiene and oxamyl) proceed to the analytical methods review. For each of these contaminants, EPA evaluated whether analytical feasibility might become a limiting factor if EPA were to consider a lower MCLG and whether new information indicates there is a potential to revise the PQL.

Two contaminants (acrylamide from Category 1 and epichlorohydrin from Category 12) bypass the analytical methods review because they have TT standards and PQLs are not a limiting factor for the standards. Five contaminants from Category 5 (alachlor; barium; diquat; glyphosate; 1,1,1-trichloroethane) and three from Category 9 (1,1-dichloroethylene; lindane; picloram) bypass the analytical methods review because the new health effects information identified either during Six-Year Review 2 or Six-Year Review 1 indicated possible increases in their respective MCLGs. Each of these contaminants has a PQL that is lower than its MCLG and, therefore, a review of whether the PQL could be lower is inconsequential.

TABLE V–3—CONTAMINANTS PROCEEDING TO ANALYTICAL FEASIBILITY REVIEW FROM HEALTH EFFECTS REVIEW

Health effects review category[1]	Contaminants proceeding to analytical feasibility review
Health Effects Assessment in Process During Information Review Period for the Notice (and not available by the March 1, 2009 cutoff date):	
Category 1	14 of 15 proceeding because PQL limits MCL: alpha particles; benzo(a)pyrene; beta particles; carbon tetrachloride; DEHP; 1,2-dichloroethane; dichloromethane; pentachlorophenol; PCBs; radium; dioxin; tetrachloroethylene; thallium; trichloroethylene. Acrylamide bypasses the analytical review because it does not have a PQL.
Category 2	0 of 2 proceeding because there is no potential to revise MCL unless completed health effects assessment indicates change to benefits analysis (arsenic and uranium).
Category 3	0 of 13 did not proceed because MCL set at MCLG and health assessment still in process.
Health Effects Assessment Completed Since Six-Year Review 1:	
Category 4	4 of 4 proceeding to evaluate whether PQL is or could be below possible MCLG: 2,4-D; endothall; toluene; total xylenes.
Category 5	0 of 5 proceeding; all 5 bypass analytical review because PQL not a factor in review.
Category 6	2 of 2 proceeding because PQL limits MCL: benzene and EDB.
Category 7	0 of 3 proceeding because there is no potential to revise an MCL that is based on the MCLG under review.
Literature Review Only:	
Category 8	2 of 2 proceeding to evaluate whether PQL is or could be below possible MCLG: hexachlorocyclopentadiene; oxamyl.
Category 9	0 of 3 proceeding; all 3 bypass analytical review because PQL not a factor in review.
Category 10	2 of 3 proceeding because PQL limits MCL: chlordane and vinyl chloride.
Category 11	0 of 3 proceeding because there is no potential to revise an MCL that is based on the MCLG that may be further reviewed.
Category 12	6 of 7 proceeding because PQL limits MCL: DBCP; 1,2-dichloropropane; heptachlor; heptachlor epoxide; hexachlorobenzene; toxaphene epichlorohydrin bypasses the analytical review because it does not have a PQL.
Category 13	1 of 7 proceeding because PQL limits MCL: 1,1,2-trichloroethane.

[1] These categories correspond to the categories in Table V–2.

3. Analytical Feasibility

EPA has a process in place to approve new analytical methods for drinking water contaminants; therefore, the review and approval of potential new methods are outside the scope of the Six-Year Review protocol. EPA recognizes, however, that the approval and addition of new and/or improved analytical methods (since the promulgation of the NPDWRs considered under this section of the review) may enhance the ability of laboratories to quantify contaminants at lower levels. This ability of laboratories to measure a contaminant at lower levels could affect its PQL, the value at which an MCL is set when it is limited by analytical feasibility. Therefore, the Six-Year Review process includes a

review of whether there have been changes in analytical feasibility for the subset of the NPDWRs that reached this stage of the decision tree. These include contaminants with or without ongoing health effects assessments that have MCLs limited by analytical feasibility and contaminants with possible MCLGs that are lower than their current PQLs.

The document, "Analytical Feasibility Support Document for the Second Six-Year Review of Existing National Primary Drinking Water Regulations" (USEPA, 2009c), describes the process EPA used to evaluate whether changes in PQL are possible in those instances where the MCL is limited, or might be limited, by analytical feasibility. EPA uses the PQL to estimate the level at which laboratories can routinely measure a chemical contaminant in drinking water. Historically, EPA has used two main approaches to determine a PQL for SDWA analytes: (1) Performance Evaluation (PE) data from Water Supply (WS) studies, which is the preferred alternative when sufficient data are available; or (2) a multiplier method, in which the PQL is calculated by multiplying the EPA-derived method detection limit (MDL) by a factor of 5 or 10 (50 FR 46880, November 13, 1985 (USEPA, 1985); 52 FR 25690 July 8, 1987 (USEPA, 1987); 54 FR 22062 May 22, 1989 (USEPA, 1989b)).

The review protocol for Six-Year Review 1 utilized data from PE studies, which were laboratory accreditation studies conducted under EPA oversight until 1999, when the program was privatized. Now, the National Environmental Laboratory Accreditation Conference (NELAC) conducts the accreditation program via Performance Testing (PT) studies. PQL reassessments discussed in this notice are based on the Six-Year 1 PE data collected through late 1999 and laboratory passing rate PT data collected from late 1999 through 2004. One PT provider made pass/fail rates from PT studies available to EPA. This major provider accounts for a large portion of the PT results nationwide (USEPA, 2009c).

Using PE or PT data to derive the PQL for chemical NPDWRs involves determining the concentration of an analyte at which 75 percent of EPA Regional and State laboratories achieve results within a specified acceptance range (*see* 54 FR 22062 at 22100, May 22, 1989 (USEPA, 1989b)). For Six-Year Review 2, EPA did not have sufficient PT and PE data to recalculate any PQL values, in part because the spiked concentrations were rarely far enough below current PQLs. Instead, EPA used the PT and PE passing rate results (*i.e.,* the percent of laboratories passing a performance test for a given study) at and below the current PQL to determine whether data may support a lower PQL.

When PT results were not available below the PQL or when the results did not provide conclusive indications regarding a potential to revise a PQL, EPA used two alternate approaches to estimate possible PQLs: an approach based on the minimum reporting levels (MRLs) obtained as part of the Six-Year Review Information Collection Request (ICR) (*see* section V.B.4), and an approach based on method detection limits (MDL). While EPA prefers to use laboratory performance data to calculate a PQL, the MRL and MDL information can be valuable for this review to indicate whether it is possible to quantitate at levels below the current PQL.

A laboratory reports an MRL when it does not detect a particular contaminant in a sample of water. The MRL is the lowest concentration level of a contaminant that a laboratory can reliably measure or quantitate within specified limits of precision and accuracy under routine laboratory operating conditions using a given method (USEPA, 2009c). MRL values were included with the data provided by the States in response to the Six-Year Review ICR. EPA evaluated the distribution of MRL values for each contaminant to identify the mode or value occurring most frequently for that contaminant (*i.e.,* the modal MRL) and estimated the percentage of MRL values that are equal to or less than the modal MRL. When this percentage was at least 80 percent and the modal MRL was below the PQL, EPA chose to use this modal MRL value as an estimated quantitation limit (also referred to as an EQL throughout this document). The use of modal MRLs is a refinement of the protocol, necessitated by limited availability of PT and PE data below the current PQL and made possible by the extensive amount of information included in the Six-Year Review ICR dataset (*see* section V.B.4).

When the MRL data did not meet the 80 percent threshold used for deriving an EQL via this approach, EPA used an MDL approach to derive an EQL. As noted previously, this approach has been used in the past to derive PQLs for regulated contaminants. In addition, this same approach was used to identify possible analytical feasibility levels for Six-Year Review 1 (USEPA, 2003a). In deriving these levels, the Agency used the MDLs associated with the analytical methods approved by EPA for drinking water analysis. EPA obtained MDL values from individual analytical methods developed and approved by EPA for use on drinking water. EPA applied a multiplier to these MDL values and based the EQL on the midpoint of the resulting range (*i.e.,* the mean if there are two MDLs or a median if there are more than two MDLs). The multiplier is 10 for most contaminants except dioxin and EDB, which have PQLs that were historically based on an MDL multiplier of 5.[4] EPA also used the MDL multiplier approach to confirm whether EQLs based on MRL data are consistent with the range of values based on an MDL multiplier approach.

EPA used the EQL thresholds derived via the modal MRL or MDL-multiplier approaches for the occurrence analysis (*see* section V.B.4) to help the Agency determine if there may be a meaningful opportunity to improve public health protection. It should be noted, however, that the EQL does not represent the Agency's intent to promulgate new PQLs with this notice. Any revisions to PQLs will be part of future rule making efforts.

EPA performed analytical feasibility analyses for the contaminants identified in Table V–3 as proceeding to this portion of the review. Table V–4 shows the contaminants gathered into three more general categories and the outcomes of the Agency's review.

• *A health effects assessment indicates potential for lower MCLG.* This category includes the six contaminants identified in the health effects review as having information indicating the potential for a lower MCLG—four with new health effects assessments completed during Six-Year Review 2 and two with health effects assessments completed during Six-Year Review 1. Although their current MCLs are not limited by a PQL, EPA reviewed analytical feasibility to determine if analytical feasibility might limit the potential for MCL revisions. For two contaminants (endothall and oxamyl), the current PQL is higher than the possible MCLG identified in the health effects review. For these contaminants, the potential to lower their PQLs based on PE and PT data is inconclusive, but MRL and MDL data indicate the potential to revise the PQL. EPA thus proceeded to evaluate occurrence data to determine whether a lower PQL, and thus the MCL, may provide a meaningful opportunity to improve public health protection. The current PQL is not a limiting factor for the

[4] As noted in Table V–4 and sections VI.38 and VI.59, EPA found that there was no potential to lower the PQL for dioxin and EDB. Even if EPA had used a 10 × MDL multiplier for these two contaminant instead of the 5 x MDL multiplier, this would not have changed the outcome of the analytical feasibility assessments.

remaining four contaminants identified by the health effects review as having possible changes in their MCLG (*i.e.,* 2,4–D, hexachlorocyclopentadiene, toluene, and xylenes).

• *Contaminants with ongoing health effects assessments and existing MCLs are based on analytical feasibility.* This category includes 14 contaminants with ongoing health assessments with existing MCLs that are greater than their MCLGs because they are limited by analytical feasibility. One contaminant has a non-zero MCLG (thallium) and the remaining 13 contaminants have MCLGs equal to zero. Although a risk assessment is in process for these contaminants, because SDWA requires the Agency to set the MCL as close to the MCLG as feasible, EPA evaluated whether the PQL is likely to be lower for these contaminants. For four of these contaminants (carbon tetrachloride, 1,2-dichloroethane, tetrachloroethylene, and trichloroethylene), EPA concluded that new information from PT studies, along with MRL and MDL data, indicate the potential to revise the PQL. For one contaminant (dichloromethane), data from PT studies are inconclusive, but MRL and MDL data indicate the potential to revise the PQL. For these five contaminants, EPA proceeded to evaluate occurrence data to determine whether lowering the PQL, and thus the MCL, may provide a meaningful opportunity to improve public health protection.[5] For the remaining nine contaminants, either EPA did not have sufficient new information to evaluate analytical feasibility or EPA concluded that new information does not indicate the potential for a PQL revision. Consequently, the outcome of the review for these nine contaminants is to take no action at this time.

• Contaminants without ongoing health effects assessments or for which no new health risk information was identified and for which existing MCLs are based on analytical feasibility and greater than their MCLGs. For the 11 contaminants in this category, EPA evaluated available PT and PE data as well as MRL and MDL data to determine whether there is potential to lower the PQL and thereby set the MCL closer to the MCLG. For five of these contaminants (benzene chlordane, 1,2-dichloropropane, hexachlorobenzene, and 1,1,2-trichloroethane) EPA concluded that new information from PT studies, along with MRL and MDL data, indicates that while it might be possible to set a lower PQL, the data are insufficient to support an actual PQL recalculation at this time. Consequently, the outcome of the review for these contaminants is to take no action at this time. For five additional contaminants (DBCP, heptachlor, heptachlor epoxide, toxaphene, and vinyl chloride), the data from PT studies are inconclusive, but MRL and/or MDL data indicate potential for a lower PQL, as indicated in Table V–4. For these five contaminants, EPA proceeded to evaluate occurrence data to determine whether lowering the PQL, and thus the MCL, may provide a meaningful opportunity to improve public health protection. For the final contaminant, ethylene dibromide (EDB), none of the data sources indicate potential to revise and the outcome of the review for this contaminant is to take no action at this time.

Table V–4 lists the type of data that indicate potential for a PQL reduction. The list includes "PT" when the PQL reassessment based on PT and PE data (USEPA, 2009c) reports that a reduction is supported. The list also includes "MRL" and "MDL" when either of these approaches indicates potential for PQL reduction. A result of "PQL reduction supported" without a "PT" in the list indicate that the PQL reassessment outcome is uncertain, but other data (*i.e.,* MRL and/or MDL) indicate potential for PQL reduction. When the PQL reassessment outcome is that the current PQL remains appropriate, Table V–4 shows the result "Data do not support PQL reduction." The contaminant specific discussions in section VI of today's action provide the results of the analytical feasibility review for all the contaminants in Table V–4.

TABLE V–4—NPDWRS INCLUDED IN THE ANALYTICAL FEASIBILITY REASSESSMENT AND THE RESULT OF THAT ASSESSMENT

Contaminant	Current PQL	Analytical feasibility reassessment result
6 Contaminants Identified Under the Health Effects Review as Having Potential for Lower MCLG		
2,4-D (possible MCLG: 0.04 mg/L)	0.005 mg/L	PQL not limiting.
Endothall (possible MCLG: 0.05 mg/L)	0.09 mg/L	PQL reduction supported (MRL, MDL).
Hexachlorocyclopentadiene (possible MCLG: 0.04 mg/L)	0.001 mg/L	PQL not limiting.
Oxamyl (possible MCLG: 0.002 mg/L)	0.02 mg/L	PQL reduction supported (MRL, MDL).
Toluene (possible MCLG: 0.6 mg/L)	0.005 mg/L	PQL not limiting.
Total xylenes (possible MCLG: 1 mg/L)	0.005 mg/L	PQL not limiting.
14 Contaminants *with* Ongoing Health Effects Assessments (as of March 1, 2009) and MCLs Are Based on Analytical Feasibility and Higher than MCLGs		
Alpha particles	No PQL and no new information.	
Benzo(a)pyrene	0.0002 mg/L	Data do not support PQL reduction.
Beta particles	No PQL and no new information.	
Carbon Tetrachloride	0.005 mg/L	PQL reduction supported (PT, MRL, MDL).
DEHP	0.006 mg/L	Data do not support PQL reduction.
1,2-dichloroethane	0.005 mg/L	PQL reduction supported (PT, MRL, MDL).
Dichloromethane	0.005 mg/L	PQL reduction supported (MRL, MDL).
Pentachlorophenol	0.001 mg/L	Data do not support PQL reduction.
PCBs	0.0005 mg/L	Data do not support PQL reduction.
Radium	No PQL and no new information.	

[5] If EPA found that there was no meaningful opportunity to revise the MCL (*i.e.,* carbon tetrachloride, 1,2-dichloroethane and dichloromethane), these contaminants remained in the health effects assessment in process category.

TABLE V–4—NPDWRS INCLUDED IN THE ANALYTICAL FEASIBILITY REASSESSMENT AND THE RESULT OF THAT ASSESSMENT—Continued

Contaminant	Current PQL	Analytical feasibility reassessment result
Dioxin	3E–08 mg/L	Data do not support PQL reduction.
Tetrachloroethylene	0.005 mg/L	PQL reduction supported (PT, MRL, MDL).
Thallium	0.002 mg/L	Data do not support PQL reduction.
Trichloroethylene	0.005 mg/L	PQL reduction supported (PT, MRL, MDL).
11 Contaminants *without* Ongoing Health Effects Assessments and MCLs Are Based on Analytical Feasibility and Higher than MCLGs		
Benzene	0.005 mg/L	PQL reduction supported (PT, MRL, MDL).
Chlordane	0.002 mg/L	PQL reduction supported (PT, MRL, MDL).
DBCP	0.0002 mg/L	PQL reduction supported (MDL).
1,2-dichloropropane	0.005 mg/L	PQL reduction supported (PT, MRL, MDL).
EDB	0.0005 mg/L	Data do not support PQL reduction.
Heptachlor	0.0004 mg/L	PQL reduction supported (MRL, MDL).
Heptachlor epoxide	0.0002 mg/L	PQL reduction supported (MRL, MDL).
Hexachlorobenzene	0.001 mg/L	PQL reduction supported (PT, MRL, MDL).
Toxaphene	0.003 mg/L	PQL reduction supported (MRL, MDL).
1,1,2-trichloroethane	0.005 mg/L	PQL reduction supported (PT, MRL, MDL).
Vinyl chloride	0.002 mg/L	PQL reduction supported (MRL).

mg/L—milligrams per liter

EPA conducted occurrence and exposure analyses for the contaminants in Table V–4 for which a PQL reduction is supported or the PQL is not limiting. This includes the 6 contaminants with new health effects assessments that indicate potentially lower MCLGs, 5 of the 14 contaminants with ongoing health effects assessments and MCLs limited by PQLs, and 10 of the 11 contaminants without ongoing health effects assessments and MCLs limited by PQLs.

4. Occurrence and Exposure Analysis

To support the national contaminant occurrence assessments under Six-Year Review 2, EPA conducted an Information Collection Request. Through this process EPA requested that all States and primacy entities voluntarily submit their SDWA compliance monitoring data. This request was for the submission of compliance monitoring data collected between January 1998 and December 2005 for 79 regulated contaminants. A total of 51 States and entities provided compliance monitoring data that included all analytical detection and non-detection records. These data represent the national occurrence of regulated contaminants in public drinking water systems. Through extensive data management efforts, quality assurance evaluations, and communications with State data management staff, EPA established a high quality dependable contaminant occurrence database consisting of data from 45 States and two Indian Tribes (*see* map in Figure V–2). Details of the data management and data quality assurance evaluations are available in the support document entitled, "Analysis of Occurrence Data from the Second Six-Year Review of Existing National Primary Drinking Water Regulations" (USEPA, 2009f).

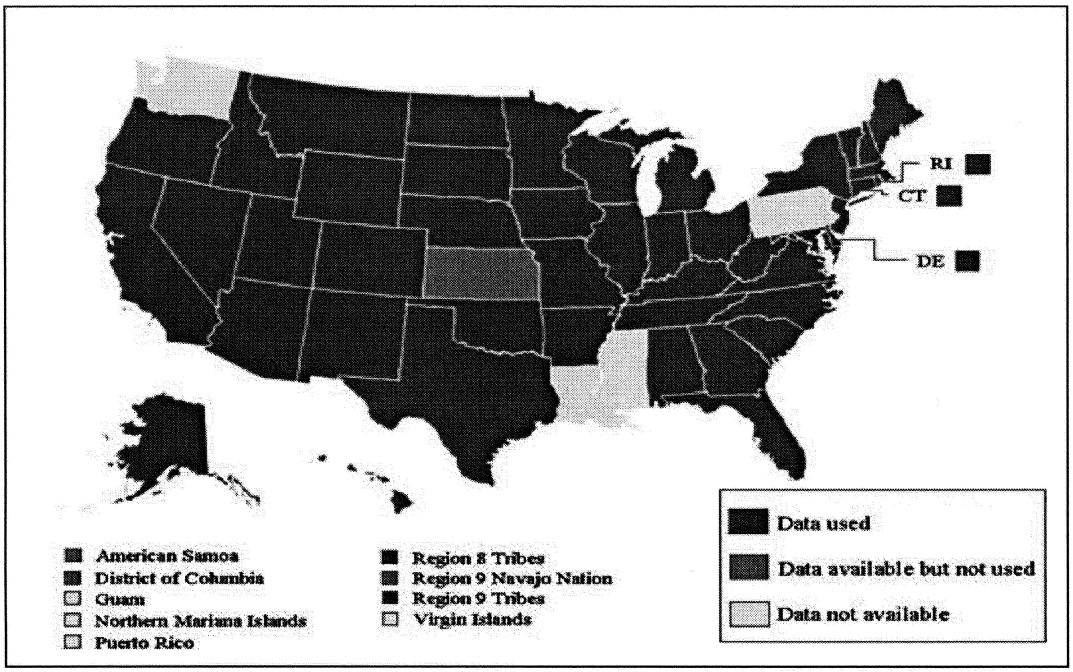


Figure V-2. States with Compliance Monitoring Data Included in the Six-Year Review 2

The contaminant occurrence data from the 45 States and two Indian Tribes comprise more than 15 million analytical records from approximately 132,000 public water systems. Approximately 254 million people are served by these public water systems nationally. Records were submitted for 16 inorganic chemicals, 32 synthetic organic chemicals, 21 volatile organic chemicals, 7 radiological contaminants, and 3 microbiological [6] contaminants. The number of States and public water systems represented in the dataset varies across contaminants because of variability in voluntary State data submissions and contaminant monitoring schedules. This is the largest, most comprehensive set of drinking water compliance monitoring data ever compiled and analyzed by EPA.

EPA used a two-stage analytical approach to analyze these data and characterize the national occurrence of contaminants.[7] The first stage of analysis provides a straightforward evaluation of contaminant occurrence. This stage 1 occurrence analysis is a simple, non-parametric count of occurrence of regulated contaminants in public water systems.[8] A typical stage 1 occurrence analysis generates a count of the number (or percentage) of systems with at least one analytical detection having a concentration greater than a concentration threshold of interest, *i.e.,* a possible MCLG or EQL. It provides a health protective approach that may be more appropriate for contaminants that produce health effects after shorter than lifetime exposure periods (*e.g.,* several months or less). This approach also generates a conservative (*i.e.,* upwardly biased) estimate of the number of potential systems having contaminant occurrence at levels of interest for contaminants having health risks that are only related to chronic or long-term exposure over many years.

The stage 2 occurrence analysis estimates national contaminant occurrence by generating estimated long-term mean concentrations of a specific contaminant at systems nationally. This provides occurrence analyses that are less conservative than the stage 1 occurrence analysis (because the stage 2 occurrence analysis is based on estimated mean concentrations rather than on single maximum concentrations), and also provides occurrence analyses that may be more reflective of potential chronic exposure. Generally, the stage 1 occurrence analysis reflects a rough approximation of peak occurrence while the stage 2 occurrence analysis is based on estimated average occurrence. A complete description of the two-stage analytical approach and a detailed presentation of occurrence estimates are available in the support document entitled, "Analysis of Occurrence Data from the Second Six-Year Review of Existing National Primary Drinking Water Regulations" (USEPA, 2009f).

EPA calculated the system means for the stage 2 occurrence analysis using a simple arithmetic average of all detection and non-detection data for each public water system. Because the contaminant concentrations associated with the non-detection data are unknown, EPA assigned three different values to the non-detection results to estimate a range of system-level means, which then allowed EPA to estimate number and percent of systems with estimated means exceeding selected threshold values. Two of the three values are based on the MRL values that accompany the non-detection results in the Six-Year Review ICR dataset. The MRL is the lowest level that can be reliably achieved within specified limits of precision and accuracy under routine laboratory operating conditions using a given method. The three values that EPA substituted for non-detection results were MRL, ½ MRL, and zero.

The most conservative approach was to assume that all non-detection results

[6] The compliance monitoring data for the microbiological contaminants were collected to support ongoing rule development so these data have not been analyzed separately in this action.

[7] The use of the stage 1 and stage 2 terminology should not be confused with the Stage 1 and Stage 2 Disinfectants and Disinfection By Products Rulemakings. Instead, this terminology has been used to describe the two stages of the occurrence analyses performed for Six-Year Review 2, as well as Six-Year Review 1.

[8] These analyses are conservative in the sense that they are protective of human health (*i.e.,* they are more likely to overestimate risks to human health than underestimate them).

were equal to the MRL. This approach yields an upper-bound estimate of each system's level of exposure. EPA also explored the less conservative assumption that concentrations of the non-detection results were uniformly distributed between the MRL and zero, thereby substituting one-half the MRL for all non-detection results. Finally, EPA considered the assumption that the actual concentration for each non-detection result was typically much smaller than the MRL, supporting the use of zero to represent each non-detection. This method yielded a lower-bound estimate of the system's mean. This simplified approach differs from the stage 2 occurrence analysis approach in the Six-Year Review 1, which used more sophisticated modeling methods to address the non-detection results. That analysis, however, was based on a substantially smaller dataset (*i.e.,* data from 16 States instead of 45 States). (Note that many States substitute zero for all non-detections when determining compliance with the NPDWRs.) EPA uses each of the assumptions in the stage 2 occurrence analyses in order to obtain reasonable bounds on the actual system mean concentrations. Once the system means were calculated for each of the three substitution methods, the results means were then compared to the various thresholds of interest (*e.g.,* the number and percent of systems with a mean concentration above a health threshold of concern).

The two-stage analytical approach was previously developed for Six-Year Review 1. The data management and general occurrence analytical approach were peer-reviewed for use under the Six-Year Review 1.

EPA conducted the stage 2 occurrence analysis for 5 of the 14 NPDWRs in Table V–4 with ongoing health effects assessment and MCLs that are limited by PQLs for which EPA identified analytical feasibility data supporting possible PQL revision: carbon tetrachloride; dichloromethane; 1,2-dichloroethane; tetrachloroethylene; and trichloroethylene. EPA also conducted the stage 2 occurrence analysis for the five contaminants with health effects assessment changes that indicate potential to reduce the MCLG and the ten contaminants that do not have ongoing health effects assessments, but do have MCLs limited by PQLs and new data indicate potential to reduce the PQLs (*see* Table V–4). Note that EPA conducted the Stage 1 analysis for one contaminant with health effects assessment changes that indicate a potential to reduce the MCLG (*i.e.,* oxamyl) because the health endpoint is associated with acute exposure. EPA used the results of these analyses to identify which possible NPDWR revisions present a meaningful opportunity to improve the level of health protection. Section VI contains the occurrence estimates for each of the 21 contaminants (shown in Table V–4) having either new information suggesting potentially lower MCLGs or MCLs based on PQLs that might be lower based on new information.

Because the Six-Year Review ICR data reflect water quality at entry points to the distribution system, the occurrence analysis method described above is not adequate to evaluate the cost savings potential for the nine contaminants that have health effects assessment changes that indicate potential for higher MCLG values (*see* Table V–2). EPA lacks the comprehensive information on source water quality and existing treatment needed to determine how many systems would be able to alter treatment practices were an MCLG to increase. To review the potential for cost savings, EPA conducted a qualitative assessment of the potential for treatment cost savings based on three factors: the magnitude of the difference between the current MCLG and the possible MCLG; available source water occurrence information; and the potential for systems having best available technologies (BATs) or small system compliance technologies (SSCTs) to realize operational cost savings (USEPA, 2009g).

There is no comprehensive database of water quality in drinking water sources. Therefore, EPA used source water quality information from two national data sources, the National Water Quality Assessment (NAWQA) program conducted by the U.S. Geological Survey (USGS), and EPA's STORET (short for STOrage and RETrieval) data system, which are part of EPA's Office of Ground Water and Drinking Water's National Contaminant Occurrence Database (NCOD). The STORET data come from a variety of monitoring programs and the NAWQA data come from watershed or "study units" that USGS selected to reflect important hydrologic and ecological resources; critical sources of contaminants, including agricultural, urban, and natural sources; and a high percentage of population served by municipal water supply and irrigated agriculture. The original 51 study units account for more than 70 percent of total water use (excluding thermoelectric and hydropower) and more than 50 percent of the population's supply of drinking water (Gilliom *et al.,* 2006). For each dataset, EPA estimated the number and percent of monitoring locations with at least one sample result above each contaminant's current MCL, and above a possible MCLG based on the new information from the contaminant's health effects assessment. Although these results do not indicate how many systems may be treating for each contaminant, they provide the best available information regarding the frequency of contaminant occurrence at levels of interest. Section VI reports the results by contaminant.

5. Treatment Feasibility

An NPDWR either identifies the BATs for meeting an MCL, or establishes enforceable treatment technique requirements. For the NPDWRs addressed in section VI of today's action, two have TT requirements and the rest have an MCL. All of the MCLs are set equal to the MCLG or the PQL or by benefit-cost analysis; none are currently limited by treatment feasibility. As a refinement for Six-Year Review 2, EPA considered treatment feasibility after identifying contaminants with potential to lower an MCL or change a TT that constituted a meaningful opportunity to improve the level of health protection. The EPA document, "Water Treatment Technology Feasibility Support Document for Chemical Contaminants for the Second Six-Year Review of National Primary Drinking Water Regulations" (USEPA, 2009g), describes the process EPA used to evaluate treatment feasibility, where appropriate, and provides the results of these analyses. As a part of this review, EPA utilized the same sources that have been the primary resources in development of EPA regulations and guidance, including published EPA treatment reports, peer-reviewed journals, and other technology sources, as well as information received from EPA stakeholders.

a. MCL-Type Rules

EPA evaluated existing treatment technology information for two MCL-type NPDWRs (tetrachloroethylene and trichloroethylene) where EPA determined that lowering the PQL and thus the MCL could lead to a meaningful opportunity to improve public health protection, to determine whether treatment feasibility would be a limiting factor.

Based on this evaluation, the Agency believes that treatment capabilities would be adequate to support a lower MCL value for these contaminants for which a lower MCL may be appropriate (USEPA, 2009g). EPA's assessment of the treatment technologies for these

contaminants that are specified as BAT in the current NPDWR and some of the small system compliance technologies specified by EPA in 1998 (USEPA, 1998b), shows that they are effective enough to achieve concentrations as low as the EQL. If EPA were to determine that it is appropriate to revise these NPDWRs, it would undertake a more thorough review of treatment feasibility, including a consideration of costs, to determine whether treatment feasibility would be a constraint or not.

b. Treatment Technique-Type Rules

EPA reviewed two chemical NPDWRs—acrylamide and epichlorohydrin (both classified B2 carcinogens)—for which a TT is set in lieu of an MCL. The TT requirement limits the allowable acrylamide and epichlorohydrin monomer levels in polymeric coagulant aids and their dosages for drinking water treatment, storage, and distribution. Although a health effects assessment for acrylamide is ongoing, it is a carcinogen with an MCLG of zero and the draft health effects assessment indicates that the cancer classification remains the same. As a refinement in Six-Year Review 2, EPA considered new information to determine if the TTs for these contaminants may need to be revised. This information indicates that improvements in manufacturing capabilities have reduced the residual monomer content in acrylamide and epichlorohydrin-based polymeric coagulants aids and these changes would support revisions to the TTs for acrylamide and epichlorohydrin. Sections VI.B.1 and VI.B.36 of today's action summarize these issues for acrylamide and epichlorohydrin, respectively.

6. Other Regulatory Revisions

In addition to possible revisions to MCLGs, MCLs, and TTs, EPA considered whether other regulatory revisions are needed, such as monitoring and system reporting requirements, as a part of the Six-Year Review 2. EPA utilized the protocol established during the Six-Year Review 1 to evaluate which implementation issues to consider (USEPA, 2003b). EPA's protocol focused on items that were not already being addressed, or had not been addressed, through alternative mechanisms (*e.g.,* as a part of a recent or ongoing rulemaking). EPA considered potential implementation-related revisions in these cases if the revisions:

- Represented a change to an NPDWR, as defined under section 1401 of SDWA; [9]
- Were "ready" for rulemaking—that is, the problem to be resolved had been clearly defined, and specific options to address the problem had been formulated; and
- Would clearly improve the level of public health protection and/or provide a meaningful opportunity for cost savings (either monetary or burden reduction) while not lessening public health protection.

a. Issues Identified by the EPA/State Workgroup

To gather input regarding implementation-related concerns and help the Agency identify the top one or two issues for Six-Year Review 2 (USEPA, 2009h), EPA requested that the Association of State Drinking Water Administrators (ASDWA) form a workgroup of member States and primacy agencies. In the fall of 2007, ten member States agreed to participate and confer with EPA on a joint EPA/State workgroup. The State/EPA workgroup initially identified 22 issues, but narrowed the list to 4 items. Of these four items, three appeared to be within the scope of this NPDWR review, and EPA agreed that an information or fact sheet might be appropriate for the fourth item regarding public notification (PN) requirements for fluoride.[10] The EPA/State workgroup agreed that public input via the **Federal Register** would provide additional insight on the national scope of these three issues (*i.e.,* Are the issues isolated to a few States or more widespread?), the importance of these issues to other States as well as water systems, and ideas on potential resolutions. Table V–5 provides a brief description of the remaining three issues and some of the potential solutions discussed in the workgroup meetings.

EPA is requesting public input and further information on these three implementation issues to better inform future State/EPA workgroup discussions. More specifically, EPA would like to gauge how many States and/or public water utilities may be affected by these issues, and which one or two issues are most important to States. EPA also requests input and suggestions from commenters regarding any other potential solutions to the issues. As part of the public comment process, EPA also welcomes any data on the occurrence of nitrates and/or nitrites in the distribution system, especially as it may relate to nitrification associated with the use of chloramines for disinfection.

TABLE V–5—ISSUES IDENTIFIED BY THE EPA/STATE WORKGROUP THAT FALL WITHIN THE SCOPE OF THIS NPDWR REVIEW

Implementation issue	Examples of potential solutions discussed by the workgroup
Change the location of nitrate-nitrite monitoring to address possible nitrification within the distribution system for water systems using chloramines[1]	• Location of Monitoring —Move sampling location from the entry point to the distribution to within the distribution system. —Or, maintain entry point sampling and also sample in the distribution system.

[9] The subject of the Six-Year-Review, as specified in section 1412(b)(9) of the SDWA, is "each national primary drinking water regulation," as defined under section 1401 of the SDWA.

[10] Currently, PWSs that exceed the fluoride MCL of 4.0 mg/L are required to notify their customers within 30 days of the exceedance. If a PWS exceeds the fluoride SMCL of 2.0 mg/L, they are required to notify their customers within 12 months of the exceedance. The States voiced concerns about (1) the confusion that occurs between the different PN requirements for the MCL and the SMCL, and (2) the timeliness of the PN requirement for the SMCL. The workgroup indicated that waiting 12 months to notify customers of an exceedance of the SMCL does not adequately protect young children from dental fluorosis during a critical stage of tooth enamel development. The participating States requested that EPA consider regulatory revisions to clarify the PN requirements and better reflect the health and aesthetic implications of each. EPA noted that PN requirements are not within the scope of this NPDWR review. However the Agency agreed that a fact or information sheet may be useful to clarify any confusion.

TABLE V–5—ISSUES IDENTIFIED BY THE EPA/STATE WORKGROUP THAT FALL WITHIN THE SCOPE OF THIS NPDWR REVIEW—Continued

Implementation issue	Examples of potential solutions discussed by the workgroup
Reduce the monitoring for ground water systems with historically low levels of nitrate-nitrite.	• Frequency of Monitoring —Consider sampling in conjunction with DBPs, TCR or some other scheme. • EPA notes that 40 Code of Federal Regulations (CFR) 141.23(a)(2) may allow surface water systems discretion to locate the sampling point in the distribution system if that is more representative of the source after treatment.[2] • Consider revisions to change the frequency of monitoring, the trigger level and the duration of time for systems to qualify for reduced monitoring. Examples included: —A monitoring frequency of 3, 6, or 9 years (consistent with the existing standardized monitoring framework) or some other frequency. —A new trigger level set at either ½ the MCL (or some other fraction), the PQL/MDL (or some other level of detection), or another appropriate level. —As for the duration of how long a system would need to meet the trigger level in order to be allowed to begin reduced monitoring, some options included a 3-, 6-, or 9-year period (consistent with the standardized monitoring framework) or a 5-, 10-, or 15-year period. • Or consider providing a waiver option to give States discretion to reduce monitoring. • Or consider a non-regulatory option such as the Alternative Monitoring Guidelines (which some considered too burdensome).
Revise the monitoring requirements for Non Community Water Systems (NCWS) to better target the potential health risks associated with chronic contaminants. In light of the probability and magnitude of health threats, some monitoring requirements for these systems may be insufficient, and others may be excessive.	• Revise all contaminant rules to include additional monitoring requirements for Transient Non Community Water Systems (TNCWS), as well as radionuclide monitoring requirements for Non Transient Non Community Water Systems (NTNCWS). • Or review existing regulated contaminants and include TNCWS monitoring requirements based on the relative health risk from chronic exposure. • Or develop general language that would apply to all contaminant rules, giving States the discretion to require additional monitoring for contaminants that pose chronic exposure risks and can have acute health effects at elevated levels potentially found at TNCWSs (the preferred option from States). • **Note:** For some of these options, EPA would need to evaluate whether sufficient occurrence and exposure information is available for TNCWS and NTNCWS to assess the need for revised monitoring strategies.

[1] The health effects technical review identified new information on developmental effects of nitrate and nitrite, as well as data regarding its carcinogenicity, that may indicate the need to update the Agency's risk assessment (*see* section VI.B.49 and VI.B.50 of today's action). In light of this information, EPA is considering nitrate and nitrite as potential candidates for new health effects assessments. If new assessments are initiated and completed, EPA will be able to determine the potential impacts on the MCLG, MCL, and/or monitoring requirements, and what future actions may or may not be appropriate.

[2] 40 CFR 141.23(a)(2) states: Surface water systems shall take a minimum of one sample at every entry point to the distribution system after any application of treatment or in the distribution system at a point which is representative of each source after treatment (hereafter called a sampling point) beginning in the initial compliance period. The system shall take each sample at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant.

b. Other Issues (Synthetic Organic Chemicals Trigger Levels)

40 CFR 141.24(h)18 of the national primary drinking water regulations lists detection limits for the synthetic organic chemicals (SOCs), including pesticides. These detection limits serve as triggers for determining whether the compliance monitoring frequency for SOCs may be reduced; public water systems detecting SOCs at or below trigger concentration can qualify for reduced monitoring. Several Regions and States have requested guidance and clarification on the use of detection limits in monitoring of drinking water samples for SOCs. The primary concern is that some laboratories have reported difficulty in achieving the detection limits for some SOCs on a regular basis and, in those cases, the water systems that they support are not able to qualify for reduced monitoring.

EPA is seeking information about the extent and magnitude of any issues related to the ability of laboratories to achieve the SOC trigger levels specified in section 141.24(h)(18). EPA wishes to determine if this issue is widespread or limited to specific SOCs and/or specific laboratories. EPA is requesting that stakeholders provide information/data to support their concerns related to SOC triggers.

C. How Did EPA Factor Children's Health Concerns Into the Review?

The 1996 amendments to SDWA require special consideration of all sensitive populations (*e.g.,* infants, children, pregnant women, elderly, and individuals with a history of serious illness) in the development of drinking water regulations (section 1412(b)(3)(C)(V) of SDWA, as amended in 1996). As a part of the Six-Year Review 2, EPA completed a literature search covering developmental and reproductive endpoints (*e.g.,* fertility, embryo survival, developmental delays, birth defects, and endocrine effects) for regulated chemicals that have not been the subject of a health effects assessment during this review period (*see* section V.B.1 of today's action). EPA reviewed the output from the literature searches to identify any studies that might have an influence on the present MCLG. Three chemicals were identified with potential developmental/reproductive endpoints of concern that might not be addressed by the current NPDWR: Nitrate, nitrite, and selenium. In each case, where the literature search indicated a need to consider recent studies of developmental or reproductive toxicity, EPA is considering whether to nominate the contaminant for a new health effects assessment.

VI. Results of EPA's Review of NPDWRs

Table VI–1 lists EPA's review results for each of the 71 NPDWRs discussed in this section of today's action along with the principal rationale for the review outcomes. Table VI–1 also includes a list of the 14 NPDWRs that have been or are being reviewed/revised by recent or ongoing regulatory actions.

A. What Are the Review Result Categories?

For each of the 71 NPDWRs discussed in detail in the following sections of today's action, the review results in one of the following outcomes:

1. No Action at This Time and the NPDWR Is Still Appropriate

The NPDWR is appropriate and no action is necessary at this time for one of the following reasons:

a. *A health effects assessment is in process or the Agency is considering whether to initiate an assessment.* The MCL remains appropriate because either, (1) it is equal to the MCLG, (2) the MCL is based on SDWA's cost-benefit provision, (3) there is no potential to change the MCL based on changes in analytical feasibility, or (4) there may be a potential change to the MCL based on analytical feasibility, but any such change is unlikely to provide a meaningful opportunity to improve public health protection. This group includes both contaminants where an assessment is in process, and contaminants where EPA identified new health information that may warrant a new health effects assessment.

b. *NPDWR remains appropriate after data/information review.* There is no ongoing health assessment and the outcome of the review indicates that the current regulatory requirements remain appropriate and, therefore, no regulatory revisions are warranted at this time. Any new information available to the Agency either supports the current regulatory requirements or does not justify a revision.

c. *New information is available that indicates potential for a regulatory revision, but no revision recommended because:*

- Negligible gain in public health protection and/or cost savings: Any resulting changes to the NPDWR would not significantly improve the level of public health protection or result in a major cost savings for public water systems and their customers.
- Information Gaps or Emerging Information: Either new information is emerging that could affect EPA's evaluation of the NPDWR or the available data are insufficient to support a definitive regulatory recommendation at this time.

2. Candidate for Revision

The NPDWR is a candidate for revision based on the review of new information.

Table VI-1. Summary of Six-Year Review 2 Results

Recent or Ongoing Action (14 NPDWRs)			Bromate Chloramines Chlorine Chlorine dioxide Chlorite Coliform Copper	*Cryptosporidium* *Giardia lamblia* HAA5 Lead *Legionella* TTHMs Viruses
Not Appropriate for Revision at this Time	Health effects assessment in process (as of March 1, 2009) or potential nominee for an assessment (32 NPDWRs)		Alpha particles (or emitters)[1] Antimony Arsenic Asbestos Benzo(a)pyrene[1] Beryllium Beta particles and photon emitters[1] Cadmium Carbon tetrachloride[1] Chromium Cyanide 1,2-Dichlorobenzene 1,4-Dichlorobenzene 1,2-Dichloroethane[1] cis-1,2-Dichloroethylene trans-1,2-Dichloroethylene	Dichloromethane[1] Di(2-ethylhexyl)adipate[1] Di(2-ethylhexyl)phthalate[1] Ethylbenzene Fluoride Nitrate Nitrite Pentachlorophenol[1] Polychlorinated biphenyls (PCBs)[1] Radiums[1] Selenium Styrene 2,3,7,8-TCDD (dioxin)[1] Thallium[1] 1,2,4-Trichlorobenzene Uranium
	NPDWR remains appropriate after data/information review (8 NPDWRs)		Dalapon Dinoseb Endrin Ethylene Dibromide (EDB) Mercury (inorganic)	Methoxychlor Monochlorobenzene (chlorobenzene) 2,4,5-Trichorophenoxy-propionic acid (2,4,5-TP)
	New information, but no revision recom-mended because:	Low priority (24 NPDWRs)	Alachlor Barium Benzene Chlordane 1,2-Dibromo-3-chloropropane (DBCP) 1,1-Dichloroethylene 1,2-Dichloropropane 2,4-Dichlorophenoxyacetic acid (2,4-D) Diquat Endothall Glyphosate	Heptachlor Heptachlor epoxide Hexachlorobenzene Hexachlorocyclopentadiene Lindane Oxamyl Picloram Toluene Toxaphene 1,1,1-Trichloroethane 1,1,2-Trichloroethane Xylenes Vinyl chloride
		Emerging information or data gaps (3 NPDWRs)	Atrazine Carbofuran	Simazine
Candidate for Revision	Based on new information (4 NPDWRs)		Acrylamide[2] Epichlorohydrin	Tetrachloroethylene (PCE)[2] Trichloroethylene (TCE)[2]

1. For these compounds, there is no potential to change the MCL based on changes in analytical feasibility or there may be a potential change to the MCL based on analytical feasibility but any such change is unlikely to provide a meaningful opportunity to improve public health protection. Therefore, EPA chose to leave these in the ongoing health assessment category.
2. Note that a health assessment is in process but new analytical feasibility and TT information may justify a revision.

B. What Are the Details of EPA's Review of Each NPDWR?

1. Acrylamide

a. *Background.* EPA published the current NPDWR for acrylamide on January 30, 1991 (56 FR 3526 (USEPA, 1991c)). The NPDWR established an MCLG of zero based on a cancer classification of B2, probable human carcinogen. The NPDWR imposes a TT requirement that limits the allowable monomer levels in products used during drinking water treatment, storage, and distribution to 0.05 percent acrylamide in polyacrylamide coagulant aids, and limits the dosage of such products to a maximum of 1 mg/L (ppm). Each water system is required to certify, in writing, to the State (using third-party or manufacturer's certification) that the product used meets these residual monomers and use-level specifications.

b. *Technical Reviews.* EPA has initiated a reassessment of the health risks resulting from exposure to acrylamide. The revised health effects assessment is considering relevant studies on the toxicity of acrylamide, including its potential developmental and reproductive toxicity. The draft assessment was published in the **Federal Register** on December 28, 2007 (72 FR 73813 (USEPA, 2007b)). The Science Advisory Board (SAB) conducted a peer review of the document, which also included a review of public comments received on the draft assessment. The SAB panel concurred with the Agency's rationale and justification for acrylamide being a "likely human carcinogen" via mutagenic mechanism. At the present time, acrylamide is still under evaluation by the Agency, and the IRIS Substance Assessment Tracking System Web site (*http://cfpub.epa.gov/iristrac/index.cfm*) has the most up-to-date information on the status of the health effects assessment.

Although there is an ongoing health effects assessment, the MCLG is zero and the current TT standard allows exposure at levels above the MCLG. Therefore, EPA reviewed whether there is potential to revise the TT for acrylamide. EPA has identified information that suggests that the residual acrylamide content in water treatment polymers has decreased significantly, likely due to improvements in manufacturing processes and technologies (USEPA, 2009g). NSF International analyses conducted between January 2005 and June 2007 found that, in 66 polyacrylamide products submitted for certification under NSF Standard 60, the median residual acrylamide content was 0.006 percent, and the 90th percentile acrylamide content was 0.025 percent, half of the limit set in the treatment technique.

Acrylamide standards in Europe and Australia are also stricter than the NPDWR. Based on the maximum allowable dosage and monomer level in the NPDWR, finished water could contain up to 0.5 µg/L (ppb) of acrylamide. By contrast, the European Union requires that finished water contain less than 0.1 µg/L (parts per billion or ppb) acrylamide, and Australia requires that the concentration in finished water be less than 0.2 µg/L (ppb). The United Kingdom requires that polyacrylamides used in drinking water contain less than 0.02 percent residual acrylamide, and that the polyacrylamide dose be less than 0.5 mg/L (parts per million or ppm) at all times, for a maximum finished water concentration of 0.1 µg/L (ppb).

To assess the occurrence of acrylamide in drinking water, EPA sought data on current usage practices for polyacrylamide coagulant aids. The Agency is not presently aware of any recent, large-scale studies of polymer usage in drinking water facilities, and therefore cannot fully characterize the occurrence of acrylamide in drinking water. However, the 1996 WATER:\STATS database (described in Levine *et al.,* 2004), based on an American Water Works Association (AWWA) survey, indicates that 13 percent of ground water systems and 66 percent of surface water systems surveyed use a polymer for water treatment. Many of these are anionic and nonionic polymers, particularly for ground water systems; anionic and nonionic polymers used to treat drinking water are most likely polyacrylamides.

Additional information on the extent of use of polyacrylamide in drinking water and the impending health effects assessment will further assist the Agency in determining the potential public health benefits associated with a revision to the treatment technique for acrylamide. Because most polyacrylamides available today have a lower residual monomer content than that specified in the current treatment technique (USEPA, 2009g), EPA believes that the costs of a revision would be minimal and recognizes that the benefits may also be small.

c. *Review Result.* The Agency believes it is appropriate to revise the NPDWR for acrylamide although a health effects assessment is currently in progress. The existing MCLG is still zero (based on the current B2 cancer classification) and NSF International data indicate that polyacrylamides are widely available with lower residual monomer levels than required by the existing NPDWR. Hence, revisions to the acrylamide NPDWR will provide a meaningful opportunity to maintain the health risk reductions achieved by technological advances in manufacturing. If the updated health effects assessment is completed in time to consider for the regulatory revision of acrylamide, the Agency will consider this final assessment in its evaluation of health benefits. As discussed in Section VII, the Agency solicits information from the public on the extent of use of polyacrylamide in drinking water facilities (since this may provide additional information on the occurrence of acrylamide in drinking water) to help inform the regulatory revision. EPA notes that any changes to the NPDWR for acrylamide may also include revisions to the closely related NPDWR for epichlorohydrin.

2. Alachlor

a. *Background.* EPA published the current NPDWR for alachlor on January 30, 1991 (56 FR 3526 (USEPA, 1991c)). The NPDWR established an MCLG of zero based on a cancer classification of B2, probable human carcinogen. The NPDWR also established an MCL of 0.002 mg/L, based on analytical feasibility.

b. *Technical Reviews.* In 2006, the Agency updated its health effects assessment of alachlor (USEPA, 2006a). The Agency identified a change in this assessment that could lead to a change in the MCLG. This assessment considered relevant studies on the toxicity of alachlor including developmental and reproductive toxicity. For noncancer effects, the assessment confirmed the RfD of 0.01 mg/kg-day (milligrams per kilogram of body weight per day). The assessment also concluded that alachlor is likely to be a human carcinogen at high doses; not likely to be a human carcinogen at low doses, and that a linear dose-response extrapolation is no longer appropriate. It established a health reference value of 0.005 mg/kg-day for the nonlinear cancer assessment (USEPA, 2006a). Since the health reference value of 0.005 mg/kg-day is lower than the RfD of 0.01 mg/kg-day, the Agency used this value to calculate a possible MCLG. Based on the health reference value of 0.005 mg/kg-day, and assuming a 70-kg adult body weight and 2 liters water intake per day, the drinking water equivalent level (DWEL) could be 0.2 mg/L. A relative source contribution (RSC) of 20 percent results

in a possible MCLG of 0.04 mg/L (USEPA, 2009b).

Since the health review for alachlor indicates that the MCLG could possibly increase to 0.04 mg/L (from its current MCLG of zero) and because the current MCL is based on a PQL of 0.002 mg/L, neither analytical nor treatment feasibility would be a limiting factor for a possible higher level of 0.04 mg/L.

EPA evaluated the results of the occurrence and exposure analyses for alachlor to determine whether a revised MCLG/MCL would be likely to result in a meaningful opportunity for cost savings to PWSs and their customers while maintaining or improving the level of public health protection (USEPA, 2009f). Review of health information for alachlor indicated that the MCLG could be increased to 0.04 mg/L from its current MCLG of zero. Consequently, the MCL of alachlor possibly can also increase to 0.04 mg/L. Although the Agency obtained and evaluated the finished water occurrence data for alachlor, its usefulness is limited for determining potential cost savings to PWSs and their customers because the Agency does not know which systems are treating for this contaminant. As an alternative, the Agency evaluated available data on source water quality and conducted a qualitative assessment of treatment cost savings.

Table VI–2 provides summary data for contaminant occurrence based on maximum sample values for the locations included in the STORET and NAWQA data. Although the degree to which these occurrence rates represent national drinking water source occurrence is uncertain, the information shows no to low occurrence at threshold levels of interest. This information indicates that any resulting NPDWR change would affect systems that rely on source water at less than 0.4 percent of the NAWQA locations and less than 1.8 percent of the STORET locations.

TABLE VI–2—AMBIENT WATER QUALITY MONITORING OCCURRENCE SUMMARY FOR ALACHLOR

Maximum concentration	Number of locations (% of locations)	
	STORET [1]	NAWQA [2]
Total	2,252 (100.0%)	9,236 (100.0%)
Nondetect	1,669 (74.1%)	8,571 (92.8%)
Detected	583 (25.9%)	665 (7.2%)
Exceeds current MCL of 0.002 mg/L	40 (1.8%)	35 (0.38%)
Exceeds alternative value of 0.04 mg/L	0 (0.0%)	1 (0.01%)

[1] STORET database 2002–2006.
[2] NAWQA database 1992–2008.
Source: USEPA, 2009d.

The BATs and small system compliance technologies for alachlor have other beneficial effects, *e.g.,* reduction of other co-occurring contaminants, precursors for disinfection byproducts (DBPs) or other common impurities. Therefore, if EPA were to consider a higher level, the Agency does not know how many PWSs that are currently treating to comply with the existing MCL of 0.002 mg/L would be likely to discontinue treatment that is already in place (USEPA, 2009d). Also, the Agency does not know to what extent affected systems might be able to reduce costs given that capital costs are not recoverable. However, the Agency recognizes that there may be opportunities to achieve operational cost savings if these systems are able to re-optimize current treatment.

Given these considerations, the Agency believes that any resulting revision is not likely to provide a meaningful opportunity for cost savings. In view of this, any revision would be a low priority activity and not appropriate at this time.

The Agency notes that alachlor and two of its unregulated acid degradates (alachlor ethanesulfonic acid or ESA and alachlor oxanilic acid or OA[11]) are currently listed on the second Unregulated Contaminants Monitoring Rule (UCMR 2) (72 FR 367, January 4, 2007 (USEPA, 2007e)). The Agency also listed alachlor ESA and OA on the CCL3 (74 FR 51850, October 8, 2009 (USEPA, 2009l)). Once the UCMR 2 monitoring results are available for alachlor and its degradates, the Agency will be able to more fully evaluate alachlor along with its degradates in determining how this information might impact the current regulation for alachlor and/or the need for any revised or new regulation to capture the impact from the ESA and OA degradates.

Since the occurrence analysis indicates that any revision to the MCL is unlikely to provide a meaningful opportunity to improve the level of public health protection, it was not necessary to perform any additional reviews on treatment feasibility or economic considerations.

c. *Review Result.* Although there are new data that support consideration of whether to revise the MCLG/MCL for alachlor, EPA does not believe a revision to the NPDWR for alachlor is appropriate at this time. In making this decision, the Agency considered whether any possible revision to the NPDWR for alachlor is likely to provide a meaningful opportunity for cost savings to public water systems and their customers. Taking into consideration the low occurrence of this contaminant in source waters, EPA has decided that any revision to the NPDWR would be a low priority activity for the Agency, and, thus, is not appropriate to revise at this time because of:

- Competing workload priorities;
- The administrative costs associated with rulemaking; and
- The burden on States and the regulated community to implement any regulatory change that resulted.

In addition, the Agency considers it premature to make any decision to revise the alachlor NPDWR pending the final UCMR 2 monitoring results.

3. Alpha Particle Emitters

a. *Background.* EPA published an interim NPDWR and set an MCL of 15 pCi/L for gross alpha particle activity on July 9, 1976 (41 FR 28402 (USEPA, 1976)). As noted in the August 14, 1975 proposal (40 FR 34324 (USEPA, 1975))

[11] Between 2004 and 2006, the United States Department Agriculture's Pesticide Data Program (USDA PDP) collected data for alachlor and its ESA and OA degradates from finished and untreated water samples for a limited number of water systems (USDA, 2004, 2005, and 2006). While alachlor was rarely detected (*i.e.,* 0 to 0.8 percent of the samples by year), the alachlor ESA and OA degradates were commonly detected (*i.e.,* 19 to 51 percent of the samples by year for the ESA degradate and 7 to 40 percent of the samples by year for the OA degradate). The detected values for the ESA and OA degradates ranged from 0.0028 to 0.357 μg/L and 0.001 to 0.102 μg/L, respectively. The detected values for alachlor ranged from 0.0163 to 0.043 μg/L.

and a subsequent September 30, 1986 FR notice (51 FR 34836 (USEPA, 1986a), EPA considered the feasibility of treatment techniques, analytical methods and monitoring when establishing the MCL of 15 pCi/L. EPA also considered the risks associated with other alpha particle emitters relative to radium-226, which generally fell within the Agency's acceptable risk range of 10^{-4} to 10^{-6} at the MCL of 15 pCi/L. On December 7, 2000 (65 FR 76708 (USEPA, 2000c)), EPA established an MCLG of zero based on a cancer classification of A (known human carcinogen) and finalized the NPDWR by retaining the MCL of 15 pCi/L. EPA noted in the December 7, 2000, FR notice that new risk estimates from *Federal Guidance Report 13* reaffirmed that the 15 pCi/L gross alpha particle MCL (including radium 226 but excluding uranium and radon) was appropriate and protective.

b. *Technical Reviews.* EPA has initiated a reassessment of the health risks resulting from exposure to alpha particle emitters. The revised health effects assessment will consider relevant studies on the toxicity of alpha particle emitters, including its potential developmental and reproductive toxicity. The new health effects assessment was not completed by March 1, 2009, the review cutoff date for this notice (USEPA, 2009b).

Although there is an ongoing health effects assessment, the MCLG is zero and the current MCL is higher than the MCLG. Therefore, EPA reviewed whether there is potential to revise the MCL based on new information regarding analytical and treatment feasibility for gross alpha particles. EPA promulgated a detection limit of 3 pCi/L in 1976 (41 FR 28402 (USEPA, 1976)) and retained the use of a detection limit as the required measure of sensitivity for radiochemical analysis in lieu of an MDL or PQL in the final rule (65 FR 76708 (USEPA, 2000c)). EPA did not identify new analytical methods during the current review that would feasibly lower the detection limit. In addition, since the December 7, 2000, regulation, there is no new information regarding treatment feasibility. Since there is no new information regarding analytical or treatment feasibility that suggests changes to the MCL, EPA does not believe it is necessary to conduct an occurrence analysis at this time.

c. *Review Result.* The Agency does not believe a revision to the NPDWR for gross alpha particles is appropriate at this time because a reassessment of the health risks resulting from exposure to alpha particles is in progress (USEPA, 2009b). Furthermore, there is no new information regarding analytical or treatment feasibility that would warrant reconsideration of the MCL.

4. Antimony

a. *Background.* EPA published the current NPDWR for antimony on July 17, 1992 (57 FR 31776 (USEPA, 1992)). The NPDWR established an MCLG and an MCL of 0.006 mg/L. EPA based the MCLG on a reference dose of 0.0004 mg/kg-day and a cancer classification of D, not classifiable as to human carcinogenicity.

b. *Technical Reviews.* EPA has initiated a reassessment of the health risks resulting from exposure to antimony. The revised health effects assessment will consider relevant studies on the toxicity of antimony, including its potential developmental and reproductive toxicity. The Agency does not expect the new health effects assessment to be completed in the time frame of the current Six-Year Review cycle (USEPA, 2009b). On December 21, 2007 (72 FR 72715 (USEPA, 2007c)), the Agency noted that the health effects assessment for antimony is in process.

c. *Review Result.* Since the MCL for antimony is set at its MCLG and a reassessment of the health risks resulting from exposure to antimony is in progress, the Agency does not believe a revision to the NPDWR is appropriate at this time.

5. Arsenic

a. *Background.* EPA published the current NPDWR for arsenic on January 22, 2001 (66 FR 6976 (USEPA, 2001c)). The NPDWR established an MCLG of zero based on a cancer classification of A, known human carcinogen. The NPDWR also established an MCL of 0.010 mg/L, which is higher than the feasible analytical level of 0.003 mg/L. EPA exercised its discretionary authority to set an MCL at a level higher than feasible (SDWA Section 1412(b)(6)), based on the finding that a final MCL of 0.010 mg/L represents the level that best maximizes health risk reduction benefits at a cost that is justified by the benefits (66 FR 6976 at 7020 (USEPA, 2001c)).

b. *Technical Reviews.* EPA has initiated a reassessment of the health risks resulting from exposure to arsenic. In June 2007, EPA's Science Advisory Board (SAB) issued its evaluation of the Agency's 2005 draft toxicological review for inorganic arsenic (USEPA, 2007a). In its 2007 report, SAB supports the continued use of a linear cancer risk model for inorganic arsenic, noting that the available data do not describe the shape of the dose-response curve at low doses. The new health effects assessment (both cancer and noncancer) were not completed by March 1, 2009, the review cutoff date for this notice. The revised health effects assessments will consider relevant studies on the toxicity of arsenic, including its potential developmental and reproductive toxicity. The IRIS Substance Assessment Tracking System Web site (*http://cfpub.epa.gov/iristrac/index.cfm*) has the most up-to-date information on the status of the health effects assessments.

c. *Review Result.* The Agency does not believe a revision to the NPDWR for arsenic is appropriate at this time because a reassessment of the health risks resulting from exposure to arsenic is ongoing (USEPA, 2009b). As noted previously, the arsenic MCL is based on the SDWA cost benefit provision (Section 1412(b)(6)) and the health effects assessment is important for reviewing the benefits associated with the basis of the MCL.

6. Asbestos

a. *Background.* EPA published the current NPDWR for asbestos on January 30, 1991 (56 FR 3526 (USEPA, 1991c)). The NPDWR established an MCLG and an MCL of 7 million fibers/L. EPA evaluated asbestos as a Category II [12] contaminant (equivalent to Group C, possible human carcinogen) by the oral route of exposure.

b. *Technical Reviews.* EPA has initiated a reassessment of the health risks resulting from exposure to asbestos. The revised health effects assessment will consider relevant studies on the toxicity of asbestos, including its potential developmental and reproductive toxicity. The Agency does not expect the new health effects assessment to be completed in the time frame of the current Six-Year Review cycle (USEPA, 2009b). The IRIS Substance Assessment Tracking System Web site (*http://cfpub.epa.gov/iristrac/index.cfm*) has the most up-to-date information on the status of the health effects assessment.

c. *Review Result.* Since the MCL for asbestos is set at its MCLG and a reassessment of the health risks resulting from exposure to asbestos is in

[12] Category II contaminants include those contaminants for which EPA has determined there is limited evidence of carcinogenicity from drinking water considering weight of evidence, pharmacokinetics, potency, and exposure. For Category II contaminants, EPA has used two approaches to set the MCLG: Either (1) setting the MCLG based upon noncarcinogenic endpoints of toxicity (the RfD) then applying an additional risk management factor of 1 to 10; or (2) setting the MCLG based upon a theoretical lifetime excess cancer risk range of 10^{-5} to 10^{-6} using a conservative mathematical extrapolation model.

progress, the Agency does not believe a revision to the NPDWR is appropriate at this time.

7. Atrazine

a. *Background.* EPA published the current NPDWR for atrazine on January 30, 1991 (56 FR 3526 (USEPA, 1991c)). The NPDWR established an MCLG and an MCL of 0.003 mg/L. EPA based the MCLG on a reference dose of 0.005 mg/kg-day and a cancer classification of C, possible human carcinogen.

b. *Technical Reviews.* In 2006, the Agency finalized a health effects assessment for the reregistration of atrazine as a pesticide (USEPA, 2006c). This assessment examined an extensive toxicology database and included investigation of atrazine's neuroendocrine mode of action and related reproductive and developmental effects. The assessment established a new RfD of 0.018 mg/kg-day, based on attenuation of pre-ovulatory luteinizing hormone (LH) surge, a key event indicative of hypothalamic function disruption. In accordance with the *1999 Interim Guidelines for Carcinogen Risk Assessment,* EPA's Cancer Assessment Review Committee (CARC) classified atrazine as "not likely to be carcinogenic to humans" because the tumor response in the Sprague-Dawley rats was determined to be a strain specific mechanism which is not relevant to humans.

c. *Review Result.* The Agency believes it is not appropriate to consider revisions to the NPDWR for atrazine at this time and has place atrazine in the emerging information/data gap category because of an impending re-evaluation of the Agency's risk assessment for atrazine. On October 7, 2009,[13] the Agency announced its intent to launch a comprehensive new evaluation of the atrazine to determine its effects on humans. At the end of this process, the Agency will decide whether to revise its current risk assessment for atrazine and whether new restrictions are necessary to better protect public health. EPA will evaluate the pesticide's potential cancer and non-cancer effects on humans. Included in this new evaluation will be the most recent studies on atrazine and its potential association with birth defects, low birth weight, and premature births. Our examination of atrazine will be based on transparency and sound science, including independent scientific peer review and will help determine whether a change in EPA's regulatory position on this pesticide is appropriate.

8. Barium

a. *Background.* EPA published the current NPDWR for barium on July 1, 1991 (56 FR 30266 (USEPA, 1991b)). The NPDWR established an MCLG and an MCL of 2 mg/L. EPA based the MCLG on a reference dose of 0.07 mg/kg-day and a cancer classification of D, not classifiable as to human carcinogenicity via the oral route.

b. *Technical Reviews.* In 2005, the Agency updated the health effects assessment of barium and revised the RfD from 0.07 mg/kg-day to 0.2 mg/kg-day (USEPA, 2005a). The change in the RfD could lead to a change in the MCLG. This assessment considered relevant studies on the toxicity of barium including developmental and reproductive toxicity. The assessment concluded that barium is not likely to be carcinogenic to humans (USEPA, 2005a). Based on the new IRIS assessment and RfD of 0.2 mg/kg-day, and assuming 70 kg body weight and 2 liters water intake per day, the DWEL could be 7.0 mg/L. An RSC of 80 percent[14] results in a possible MCLG of 6.0 mg/L.

Analytical feasibility does not pose any limitations for the current MCL and would not be a limiting factor if EPA were to raise the MCLG. EPA evaluated the results of the occurrence and exposure analyses for barium to determine whether a revised MCLG/MCL would be likely to result in a meaningful opportunity to achieve cost savings for PWSs and their customers while maintaining, or improving, the level of public health protection (USEPA, 2009f). Although the Agency obtained and evaluated the finished water occurrence data for barium, its usefulness is limited for determining potential cost savings to PWSs and their customers because the Agency does not know which systems are treating for this contaminant. As an alternative, the Agency evaluated available data on source water quality and conducted a qualitative assessment of treatment cost savings.

Table VI–3 provides summary data for contaminant occurrence based on maximum sample values for the locations included in the STORET and NAWQA data. Although the degree to which these occurrence rates represent national drinking water source occurrence is uncertain, the information shows no to low occurrence at threshold levels of interest. This information indicates that any resulting NPDWR change would affect systems that rely on source water at less than 0.1 percent of the NAWQA locations and less than 1.4 percent of the STORET locations.

TABLE VI–3—AMBIENT WATER QUALITY MONITORING OCCURRENCE SUMMARY FOR BARIUM

Maximum concentration	Number of locations (% of locations)	
	STORET[1]	NAWQA[2]
Total	16,595 (100.0%)	4,864 (100.0%)
Nondetect	2,299 (13.9%)	43 (0.9%)
Detected	14,296 (86.1%)	4,821 (99.1%)
Exceeds current MCL/MCLG of 2.0 mg/L	234 (1.4%)	3 (0.1%)
Exceeds alternative value of 6.0 mg/L	163 (1.0%)	0 (0.0%)

[1] STORET database 2002–2006.
[2] NAWQA database 1992–2008.
Source: USEPA, 2009d.

[13] Additional information is available at *http://www.epa.gov/pesticides/reregistration/atrazine/atrazine_update.htm.*

[14] The present MCLG for barium does not include an RSC because the dose used in the calculation applied to only the dose from the drinking water. If a new MCLG were to be developed from the animal data that support the 2005 IRIS RfD, an RSC would be required. Regulations or guidelines pertaining to barium from media other than water were not identified. Barium metaborate is a registered pesticide but it does not have any food uses and does not have a human health ambient water quality guideline value. EPA used the subtraction calculation method to determine the possible RSC of 80 percent for drinking water (the ceiling on RSC specified by the methodology).

The BATs and small system compliance technologies for barium have other beneficial effects, *e.g.,* reduction of other co-occurring contaminants or other common impurities. Therefore, if EPA were to consider a higher level, the Agency does not know how many PWSs that are currently treating to comply with the existing MCL of 2 mg/L would be likely to discontinue treatment that is already in place (USEPA, 2009d). Also, the Agency does not know to what extent affected systems might be able to reduce costs given that capital costs are not recoverable. However, the Agency recognizes that there may be opportunities to achieve operational cost savings if these systems are able to re-optimize current treatment.

Given these considerations, the Agency believes that any resulting revision is not likely to provide a meaningful opportunity for cost savings. In view of this, any revision would be a low priority activity and not appropriate at this time.

c. *Review Result.* Although there are new data that support consideration of whether to revise the MCLG/MCL for barium, EPA does not believe a revision to the NPDWR for barium is appropriate at this time. In making this decision, the Agency considered whether any possible revision to the NPDWR for barium is likely to provide a meaningful opportunity for cost savings to public water systems and their customers. Taking into consideration the low occurrence of this contaminant in source waters, EPA has decided that any revision to the NPDWR would be a low priority activity for the Agency, and, thus, is not appropriate to revise at this time because of:

- Competing workload priorities;
- The administrative costs associated with rulemaking; and
- The burden on States and the regulated community to implement any regulatory change that resulted.

9. Benzene

a. *Background.* EPA published the current NPDWR for benzene on July 8, 1987 (52 FR 25690 (USEPA, 1987)). The NPDWR established an MCLG of zero based on a cancer classification of A, known human carcinogen. The NPDWR also established an MCL of 0.005 mg/L, based on analytical feasibility.

b. *Technical Reviews.* In 2000 and 2003, the Agency updated the IRIS assessment of benzene. The cancer assessment was completed first and characterized benzene as a known human carcinogen by all routes of exposure; the one-in-a million risk estimates for cancer by the oral route of exposure ranged from 1 μg/L to 10 μg/L (USEPA, 2000b). This cancer assessment was also noted in the first Six-Year Review (67 FR 19030, April 17, 2002 (USEPA, 2002c)). As part of the Six-Year Review process, the Agency's Office of Water (OW) conducted a literature search through June 2007 for relevant data on the carcinogenicity of benzene as well as its potential developmental and reproductive toxicity (USEPA, 2009b). While the literature search did identify several new studies that evaluated the cancer and noncancer effects of benzene, none of the new studies would affect the cancer classification, which serves as the basis for the MCLG of zero. A recent occupational study (Lan *et al.,* 2004) of the noncancer effects of benzene identified hematological effects in workers at levels below those previously reported. The Agency for Toxic Substances and Disease Registry (ATSDR) (2007) chronic minimum risk level based on the Lan *et al.* (2004) data of 0.0005 mg/kg/day is lower than the IRIS RfD of 0.004 mg/kg/day. If the ATSDR minimum risk level were used as the basis for a noncancer health reference level, the value would be 0.004 mg/l, a value that is slightly below the current MCL. Because the MCLG remains at zero, the Agency believes that a further review of the health effects of benzene is not warranted at this time.

The current MCL for benzene is based on a PQL of 0.005 mg/L. For the Six-Year Review, the Agency considered whether changes in the analytical feasibility of benzene might lead to a lower MCL. EPA reviewed PE data from the first Six-Year Review cycle and then analyzed more recent PT data to determine if the PQL can be revised (*i.e.,* analytical feasibility). Passing rates for PE data available through late 1999 for benzene are above 95 percent around the current PQL of 0.005 mg/L, including two studies with true values below the current PQL. All passing rates in the PE data exceeded 75 percent. More recent PT data from late 1999 through 2004, supplied by a PT provider, also show greater than 90 percent passing rates for studies around the PQL, including eight with true values below the current PQL. Because most of the laboratory passing rates from PE and PT studies exceeded the 75 percent criterion typically used to derive a PQL, a lowering of the PQL for benzene might be possible. These results, however, are insufficient to recalculate a revised PQL for benzene because not enough data points are available below the current PQL to derive a value at the 75 percent passing rate (USEPA, 2009c).

EPA evaluated two alternative sources of information to determine whether an EQL below the current PQL could be estimated: Laboratory MRLs in the Six-Year Review ICR dataset, and the MDLs for approved methods for the detection of benzene (Methods 502.2 and 524.2). While EPA prefers to use laboratory performance data to calculate the PQL, the MRL and MDL information can be valuable for this review to indicate whether it is possible to quantitate at levels below the current PQL. The Six-Year Review ICR dataset contains MRL values for 139,190 samples. More than 80 percent of these values are less than or equal the modal MRL, 120,308 (86 percent) equal the modal MRL of 0.0005 mg/L, and an additional 17,964 (13 percent) are lower than 0.0005 mg/L. Therefore, EPA selected the modal MRL as the EQL (USEPA, 2009e). The MDLs of approved methods range from 0.00001 to 0.0004 mg/L. Applying a multiplier of 10 would give a possible PQL range from 0.0001 to 0.004 mg/L, which contains the EQL (USEPA, 2009e).

Based on these varied and unrelated approaches/sources of information, EPA believes that there is potential to lower the PQL for benzene. To determine whether any MCL revision is likely to provide a meaningful opportunity to improve public health protection, EPA evaluated the occurrence of benzene at the EQL of 0.0005 mg/L and additional thresholds of 0.001, and 0.0025 mg/L (USEPA, 2009f). Table VI–4 shows the results of the occurrence and exposure analysis for the current MCL and these thresholds. The Six-Year Review ICR occurrence data have a modal MRL of 0.0005 mg/L, which limits reliable contaminant detection to 0.0005 mg/L. As indicated, average concentrations exceed the current MCL for 10 of 50,435 systems (0.020 percent) serving 14,000 people (or 0.006 percent of 227 million people). Note that these results are based on the subset of monitoring data provided in response to the Six-Year Review ICR and do not necessarily reflect MCL violations, which are based on annual average concentrations at entry points; Safe Drinking Water Information System/Federal version (SDWIS/FED) indicates 41 MCL violations for benzene between 1998 and 2005, with annual violations ranging from 1 to 12 (USEPA, 2007g). The occurrence and exposure analysis shows that average concentrations at 95 to 123 of 50,435 systems (0.188 to 0.244 percent), serving 304,000 to 485,000 people (or 0.134 to 0.214 percent of 227

million people), exceed the EQL of 0.0005 mg/L.

TABLE VI–4—NUMBER AND PERCENT OF SYSTEMS WITH MEAN CONCENTRATIONS EXCEEDING BENZENE THRESHOLDS AND CORRESPONDING ESTIMATES OF POPULATION SERVED

Regulatory or feasibility-based threshold	Systems with mean concentrations that are greater than the regulatory or feasibility-based threshold (Percentages based on 50,435 systems with benzene data in the Six-Year Review ICR occurrence dataset)		
	Nondetect values = MRL [1]	Nondetect values = ½ MRL [2]	Nondetect values = 0 [3]
MCL (0.005 mg/L)	10 (0.020%)	10 (0.020%)	10 (0.020%)
½ MCL (0.0025 mg/L)	16 (0.032%)	14 (0.028%)	14 (0.028%)
2xEQL (0.001 mg/L)	70 (0.139%)	58 (0.115%)	52 (0.103%)
EQL (0.0005 mg/L)	not applicable	123 (0.244%)	95 (0.188%)
Regulatory or feasibility-based threshold	**Corresponding population served (Percentages based on 226,947,000 people served by the systems with benzene data in the Six-Year Review ICR occurrence dataset)**		
	Nondetect values = MRL [1]	Nondetect values = ½ MRL [2]	Nondetect values = 0 [3]
MCL (0.005 mg/L)	14,000 (0.006%)	14,000 (0.006%)	14,000 (0.006%)
½ MCL (0.0025 mg/L)	111,000 (0.049%)	110,000 (0.048%)	110,000 (0.048%)
2xEQL (0.001 mg/L)	180,000 (0.079%)	159,000 (0.070%)	158,000 (0.070%)
EQL (0.0005 mg/L)	not applicable	485,000 (0.214%)	304,000 (0.134%)

[1] Results are based on setting all nondetect results equal to MRL values in the Six-Year Review ICR dataset. Results are not reported at the EQL of 0.0005 mg/L because this is the modal MRL and setting a majority of the results equal to this value results in an upwardly biased estimate of the number of systems with mean concentrations that exceed this value.
[2] Results are based on setting all nondetect results equal to ½ MRL values in the Six-Year Review ICR dataset.
[3] Results are based on setting all nondetect results equal to zero.
Source: USEPA, 2009f.

Since the occurrence analysis indicates that any revision to the MCL is unlikely to provide a meaningful opportunity to improve the level of public health protection, it was not necessary to perform any additional reviews on treatment feasibility or economic considerations.

c. *Review Result.* Although there are new data that support consideration of a possibly lower PQL (and therefore a possibly lower MCL), EPA does not believe a revision to the NPDWR for benzene is appropriate at this time. The occurrence and exposure analysis based on possible changes in analytical feasibility indicates that any revision to the MCL is unlikely to provide a meaningful opportunity to improve public health protection. Taking into consideration the low occurrence of this contaminant, EPA has decided that any revision to the NPDWR would be a low priority activity for the Agency, and, thus, is not appropriate to revise at this time because of:

- Competing workload priorities;
- The administrative costs associated with rulemaking; and
- The burden on States and the regulated community to implement any regulatory change that resulted.

10. Benzo(a)pyrene

a. *Background.* EPA published the current NPDWR for benzo(a)pyrene on July 17, 1992 (57 FR 31776 (USEPA, 1992)). The NPDWR established an MCLG of zero based on a cancer classification of B2, probable human carcinogen. The NPDWR also established an MCL of 0.0002 mg/L, based on analytical feasibility.

b. *Technical Reviews.* EPA has initiated a reassessment of the health risks resulting from exposure to benzo(a)pyrene. The revised health effects assessment will consider relevant studies on the toxicity of benzo(a)pyrene, including its potential developmental and reproductive toxicity. The new health effects assessment was not completed by March 1, 2009, the review cutoff date for this notice (USEPA, 2009b). The IRIS Substance Assessment Tracking System Web site (*http://cfpub.epa.gov/iristrac/index.cfm*) has the most up-to-date information on the status of the health effects assessment.

Although a risk assessment is in process for benzo(a)pyrene, the existing MCLG is zero and the current MCL of 0.0002 mg/L is based on the PQL. Therefore, EPA reviewed whether there is potential to revise the PQL. EPA reviewed PE data from the first Six-Year Review cycle and then analyzed more recent PT data to determine if the PQL can be revised (*i.e.,* analytical feasibility). Passing rates for PE data available through late 1999 for benzo(a)pyrene are all above 75 percent. However, the true concentrations were all higher than the current PQL of 0.0002 mg/L. More recent PT data from late 1999 through 2004, supplied by a PT provider, show several true concentrations with passing rates less than the 75 percent criterion typically used to derive a PQL. All of the true concentrations in the PT data were higher than the current PQL. Given the variability in passing rates and the lack of data points below the current PQL, a lowering of the PQL for benzo(a)pyrene is not appropriate at this time (USEPA, 2009c).

EPA evaluated two alternative sources of information to determine whether an EQL below the current PQL could be estimated: laboratory MRLs in the Six-Year Review ICR dataset, and the MDLs for approved methods for the detection of benzo(a)pyrene (Methods 550, 550.1, and 525.2). While EPA prefers to use laboratory performance data to calculate the PQL, the MRL and MDL information can be valuable for this review to indicate whether it is possible to quantitate at levels below the current PQL. The Six-Year Review ICR dataset contains MRL values for 55,487 samples. Fewer than 80 percent of these values are less than or equal the modal MRL, 29,769 (54 percent) equal the modal MRL of 0.00002 mg/L and an additional 970 (2 percent) are lower

than 0.00002 mg/L. Therefore, EPA did not set the EQL equal to the modal MRL (USEPA, 2009e). The MDLs of approved methods are 0.000016, 0.000029, and 0.00023 mg/L. EPA selected the median value, applied a multiplier of 10, and rounded up to 0.0003 mg/L. The result is higher than the current PQL and, therefore, EPA did not estimate an EQL (USEPA, 2009e). Based on these varied and unrelated approaches/sources of information, EPA believes that there is no potential to lower the PQL for benzo(a)pyrene. Since the MCL is constrained by the PQL, and the PQL is unchanged, EPA does not believe it is necessary to conduct an occurrence analysis at this time.

c. *Review Result.* The Agency does not believe a revision to the NPDWR for benzo(a)pyrene is appropriate at this time because a reassessment of the health risks resulting from exposure to benzo(a)pyrene is in progress (USEPA, 2009b). Furthermore, a review of analytical feasibility did not identify a potential to revise the MCL, which is limited by feasibility.

11. Beryllium

a. *Background.* EPA published the current NPDWR for beryllium on July 17, 1992 (57 FR 31776 (USEPA, 1992)). The NPDWR established an MCLG and an MCL of 0.004 mg/L. EPA classified beryllium in Group B2, probable human carcinogen, based on clear evidence of its carcinogenicity via inhalation or injection in several animal species. However, EPA also placed beryllium in drinking water Category II for regulation, based on the weight of evidence for carcinogenicity via ingestion, and the potency, exposure and pharmacokinetics of this chemical. EPA derived the MCLG by applying an additional risk management factor of 10 to the RfD of 0.005 mg/kg-day (57 FR 31776 at 31785, July 17, 1992 (USEPA, 1992)).

b. *Technical Reviews.* As noted in Six Year Review 1 (68 FR 42908, USEPA, 2003e), EPA updated its assessment of the health risks resulting from exposure to beryllium in 1998 (USEPA, 1998c). The 1998 IRIS assessment uses the 1986 EPA cancer guidelines (USEPA, 1986b) and classifies beryllium as Group B1, probable human carcinogen, via inhalation route. However, the 1998 IRIS assessment states that the database is inadequate for assessing the carcinogenicity of ingested beryllium and concluded that the human carcinogenic potential of ingested beryllium cannot be determined. The Agency considered the 1998 assessessment in Six Year Review 1 and decided that it was not appropriate to revise the NPDWR at that time. EPA has initiated a reassessment of the health risks resulting from exposure to beryllium. The new assessment was not completed by March 1, 2009, the review cutoff date for this notice (USEPA, 2009b). The IRIS Substance Assessment Tracking System Web site (*http://cfpub.epa.gov/iristrac/index.cfm*) has the most up-to-date information on the status of the health effects assessment.

c. *Review Result.* Since the MCL for beryllium is set at its MCLG and a reassessment of the health risks resulting from exposure to beryllium is in progress, the Agency does not believe a revision to the NPDWR is appropriate at this time.

12. Beta Particle and Photon Emitters

a. *Background.* EPA published an interim NPDWR and set an MCL of 4 millirems/yr (mrem/yr) for beta particle and photon emitters on July 9, 1976 (41 FR 28402 (USEPA, 1976)). As noted in the August 14, 1975 proposal (40 FR 34324 (USEPA, 1975)) and a subsequent September 30, 1986 FR (51 FR 34836 (USEPA, 1986a) advanced notice of proposed rulemaking, EPA considered the feasibility of treatment techniques, analytical methods and monitoring when establishing the MCL of 4 mrem/yr. EPA also considered the risks associated with beta particle and photon emitters, which generally fell within the Agency's acceptable risk range of 10^{-4} to 10^{-6} at the MCL of 4 mrem/yr. On December 7, 2000 (65 FR 76708 (USEPA, 2000c)), EPA established an MCLG of zero based on a cancer classification of A (known human carcinogen) and finalized the NPDWR by retaining the MCL of 4 mrem/yr. EPA noted in the December 7, 2000, FR notice that new risk estimates from Federal Guidance Report 13 reaffirmed that the 4 mrem/yr MCL was appropriate and protective[15].

b. *Technical Reviews.* EPA has initiated a reassessment of the health risks resulting from exposure to beta particles. The revised health effects assessment will consider relevant studies on the toxicity of beta particles, including its potential developmental and reproductive toxicity. The new health effects assessment was not completed by March 1, 2009, the review cutoff date for this notice (USEPA, 2009b).

Although there is an ongoing health effects assessment, the MCLG is zero and the current MCL is higher than the MCLG. Therefore, EPA reviewed whether there is potential to revise the MCL based on new information available regarding the analytical and treatment feasibility for beta particle and photon emitters. EPA promulgated the MCL of 4 mrem/yr for man-made beta particle and photon emitters (present in any combination) in 1976 (41 FR 28402 (USEPA, 1976)) and retained the use of the detection limit as the required measure of sensitivity in the December 2000 final rule (65 FR 76708 (USEPA, 2000c)). The original rule estimated a risk ceiling of 5.6×10^{-5} for whole body doses. Limits were set in picoCurie units for each nuclide equivalent to a 4 mrem dose. The newer dosimetry found in Federal Guidance13 and reported in the December 2000 final rule reveals more exact risks that are still within the Agency's acceptable limits. While individual dose estimates changed over time, the overall limit of 4 mrem was retained along with a two-tiered screening level to avoid analyzing each possible nuclide below the screen, and still be protective. EPA did not identify new analytical methods during the current review that would feasibly lower the detection limits for beta particle and photon emitters. In addition, since the December 7, 2000 regulation, there is no new information regarding treatment feasibility. Since there is no new information regarding analytical or treatment feasibility that suggests changes to the MCL, EPA does not believe it is necessary to conduct an occurrence analysis at this time.

c. *Review Result.* The Agency does not believe a revision to the NPDWR for beta particles is appropriate at this time because a reassessment of the health risks resulting from exposure to beta particles is in progress (USEPA, 2009b). Furthermore, there is no new information regarding analytical or treatment feasibility that would warrant reconsideration of the MCL.

13. Cadmium

a. *Background.* EPA published the current NPDWR for cadmium on January 30, 1991 (56 FR 3526 (USEPA, 1991c)). The NPDWR established an MCLG and an MCL of 0.005 mg/L. Because of inadequate dose-response data to characterize the presence or lack of a carcinogenic hazard from oral

[15] After the December 7, 2000, final regulation, two trade associations and several municipal water systems challenged EPA's standard for the beta photon emitters by claiming that the Agency did not use the best available science when finalizing the standard. In February of 2003, the District of Columbia (DC) Circuit Court of Appeals upheld EPA's regulation for beta and photon emitters (as well as radium 226 and 228 and uranium). In July, 2004, the DC Circuit Court of Appeals also upheld the policy and scientific basis of EPA's application of the beta particle and photon (man-made) drinking water standards to the ground water protection standards used for Yucca Mountain under 40 CFR part 197 (66 FR 32073, June 13, 2001 (USEPA, 2001d)).

exposure, the Agency classified cadmium as a Group D carcinogen, not classifiable as to human carcinogenicity by the oral route of exposure. Therefore, EPA developed the MCLG for cadmium based on the RfD of 0.0005 mg/kg-day.

b. *Technical Reviews.* EPA has initiated a reassessment of the health risks resulting from exposure to cadmium. The revised health effects assessment will consider relevant studies on the toxicity of cadmium, including its potential developmental and reproductive toxicity. The new health effects assessment was not completed by March 1, 2009, the review cutoff date for this notice (USEPA, 2009b). The IRIS Substance Assessment Tracking System Web site (*http://cfpub.epa.gov/iristrac/index.cfm*) has the most up-to-date information on the status of the health effects assessment.

c. *Review Result.* Since the MCL for cadmium is set at its MCLG and a reassessment of the health risks resulting from exposure to cadmium is in progress, the Agency does not believe a revision to the NPDWR is appropriate at this time.

14. Carbofuran

a. *Background.* EPA published the current NPDWR for carbofuran on January 30, 1991 (56 FR 3526 (USEPA, 1991c)). The NPDWR established an MCLG and an MCL of 0.04 mg/L. EPA based the MCLG on a reference dose of 0.005 mg/kg-day and a cancer classification of E, evidence of non-carcinogenicity for humans.

b. *Technical Reviews.* In 2006, the Agency updated health effects assessment of carbofuran. The Agency identified a change in this assessment that could lead to a change in the MCLG (73 FR 44864, July 31, 2008 (USEPA, 2008a)). This assessment considered relevant studies on the toxicity of carbofuran including developmental and reproductive toxicity. The assessment revised the RfD from 0.005 mg/kg-day to an acute RfD of 0.00006 mg/kg-day and concluded that carbofuran is not likely to be carcinogenic to humans (USEPA, 2006d). Based on the revised acute RfD of 0.00006 mg/kg-day, and assuming 10 kg body weight and 1 liter water intake per day for a child, the resulting DWEL would be 0.0006 mg/L. Using an RSC of 20 percent, a possible new MCLG would be 0.00012 mg/L. The default RSC value of 20 percent was selected because of the significant exposures resulting from actual food dietary exposure for children from 1 to 6 years old, which approaches 100 percent of the updated RfD (USEPA, 2006d).

Two recent Agency actions may affect carbofuran presence in food and water sources. In May 2009, EPA revoked all tolerances (maximum residue limits) for carbofuran, which could prohibit all carbofuran residues on food, effective December 31, 2009 (74 FR 23046, May 15, 2009 (USEPA, 2009i)). The registrant and interested parties raised objections and requested a hearing on the tolerance revocations. EPA has reviewed the submissions and determined that a hearing was not warranted. Revoking carbofuran tolerances is part of a broader series of Agency actions to cancel all uses of carbofuran in the United States due to dietary, occupational, and ecological risks of concern. Following resolution of the current ongoing administrative process for resolving the safety of the tolerances, EPA will proceed to cancel the remaining uses of carbofuran.

In addition, prior to the tolerance revocation, the registrant, FMC Corporation, voluntarily cancelled 22 uses of carbofuran (74 FR 11551, March 18, 2009 (USEPA, 2009j)). Existing stocks of carbofuran can be applied to food crops until December 31, 2009, and to non-food crops according to the label until supplies are depleted. These decisions are expected to reduce exposure to carbofuran and its metabolite (3-hydroxycarbofuran) in food products and in water, which would affect the RSC used to derive a possible MCLG. Therefore, EPA believes that it should factor in the effect of these actions, once completed, before the Agency determines the potential for an NPDWR revision.

The occurrence of carbofuran in drinking water is an additional source of uncertainty in the review process that is compounded by the recent voluntary cancellations and tolerance revocations. The Six-Year Review ICR occurrence data are based on the Standardized Monitoring Framework for synthetic organic compounds, which is designed to evaluate long-term exposure to contaminants with chronic exposure health endpoints. As a result, short-term seasonal peaks, which correspond to carbofuran application as a pesticide, cannot be readily detected in this dataset. The cancellation will reduce carbofuran application and the potential for seasonal peaks to occur. Reductions in overall carbofuran use is expected to reduce the potential occurrence of carbofuran in drinking water sources.

c. *Review Result.* Although there are new health data that support consideration of whether to revise the MCLG/MCL for carbofuran, the ongoing regulatory actions could affect the possible MCLG. Therefore, EPA is placing carbofuran in the information gap category due to the uncertainty of how the cancellation impacts the MCLG. In addition, EPA notes that the decision to cancel the reregistration of carbofuran would reduce the presence of this compound in the environment and the likelihood of exposure to carbofuran in food and drinking water sources. Consequently, EPA believes it is not appropriate to consider any revisions to the NPDWR for carbofuran at this time.

15. Carbon Tetrachloride

a. *Background.* EPA published the current NPDWR for carbon tetrachloride on July 8, 1987 (52 FR 25690 (USEPA, 1987)). The NPDWR established an MCLG of zero based on a cancer classification of B2, probable human carcinogen. The NPDWR also established an MCL of 0.005 mg/L, based on analytical feasibility.

b. *Technical Reviews.* EPA has initiated a reassessment of the health risks resulting from exposure to carbon tetrachloride. The revised health effects assessment will consider relevant studies on the toxicity of carbon tetrachloride, including its potential developmental and reproductive toxicity. The new health effects assessment was not completed by March 1, 2009, the review cutoff date for this notice (USEPA, 2009b). The IRIS Substance Assessment Tracking System Web site (*http://cfpub.epa.gov/iristrac/index.cfm*) has the most up-to-date information on the status of the health effects assessment.

Although a risk assessment is in process for carbon tetrachloride, the existing MCLG is zero and the current MCL of 0.005 mg/L is based on the PQL. Therefore, EPA reviewed whether there is potential to revise the PQL. EPA reviewed PE data from the first Six-Year Review cycle and then analyzed more recent PT data to determine if the PQL can be revised (*i.e.,* analytical feasibility). Passing rates for PE data available through late 1999 for carbon tetrachloride are at or above 95 percent around the current PQL of 0.005 mg/L, including one study with a true value below the current PQL. More recent PT data from late 1999 through 2004, supplied by a PT provider, also show greater than 90 percent passing rates for studies around the PQL, except for one study with a passing rate of 85 percent. Nine PT studies had true values below the current PQL. Because most of the laboratory passing rates from PE and PT studies exceeded the 75 percent criterion typically used to derive a PQL, a lowering of the PQL for carbon tetrachloride might be possible. These

results, however, are insufficient to recalculate a revised PQL for carbon tetrachloride because not enough data points are available below the current PQL to derive a value at the 75 percent passing rate (USEPA, 2009c).

EPA evaluated two alternative sources of information to determine whether an EQL below the current PQL could be estimated: laboratory MRLs in the Six-Year Review ICR dataset, and the MDLs for approved methods for the detection of carbon tetrachloride (Methods 502.2, 524.2, and 551.1). While EPA prefers to use laboratory performance data to calculate the PQL, the MRL and MDL information can be valuable for this review to indicate whether it is possible to quantitate at levels below the current PQL. The Six-Year Review ICR dataset contains MRL values for 139,221 samples. More than 80 percent of these values are less than or equal the modal MRL: 119,849 (86 percent) equal the modal MRL of 0.0005 mg/L and an additional 16,195 (12 percent) are lower than 0.0005 mg/L. Therefore, EPA selected the modal MRL as the EQL (USEPA, 2009e). The MDLs of approved methods range from 0.000002 to 0.00021 mg/L. Applying a multiplier of 10 would give a possible PQL range from 0.00002 to 0.0021 mg/L, which contains the EQL (USEPA, 2009e).

Based on these varied and unrelated approaches/sources of information, EPA believes that there is potential to lower the PQL for carbon tetrachloride. To determine whether any MCL revision is likely to provide a meaningful opportunity to improve public health protection, EPA evaluated the occurrence of carbon tetrachloride at the EQL of 0.0005 mg/L and additional thresholds of 0.001 and 0.0025 mg/L (USEPA, 2009f). Table VI–5 shows the results of the occurrence and exposure analysis for the current MCL and these thresholds. The occurrence and exposure analysis shows that average concentrations exceed the current MCL for five of 50,446 systems (0.010 percent), serving fewer than 2,000 people (or 0.001 percent of 227 million people). Note that these results are based on the subset of monitoring data provided in response to the Six-Year Review ICR and do not necessarily reflect MCL violations, which are based on annual average concentrations at entry points; SDWIS/FED indicates 19 MCL violations for carbon tetrachloride between 1998 and 2005 with annual violations ranging from 1 to 4 (USEPA, 2007g). Average concentrations for 84 to 118 of 50,446 systems (0.167 to 0.234 percent), serving 368,000 to 750,000 people (or 0.162 to 0.330 percent of 227 million people), exceed the EQL of 0.0005 mg/L.

TABLE VI–5—NUMBER AND PERCENT OF SYSTEMS WITH MEAN CONCENTRATIONS EXCEEDING CARBON TETRACHLORIDE THRESHOLDS AND CORRESPONDING ESTIMATES OF POPULATION SERVED

Regulatory or feasibility-based threshold	Systems with mean Concentrations that are greater than the regulatory or feasibility-based threshold (Percentages based on 50,446 systems with carbon tetrachloride data in the Six-Year Review ICR occurrence dataset)		
	Nondetect values = MRL[1]	Nondetect values = ½ MRL[2]	Nondetect values = 0[3]
MCL (0.005 mg/L)	5 (0.010%)	5 (0.010%)	5 (0.010%)
½ MCL (0.0025 mg/L)	13 (0.026%)	12 (0.024%)	12 (0.024%)
2xEQL (0.001 mg/L)	59 (0.117%)	50 (0.099%)	40 (0.079%)
EQL (0.0005 mg/L)	not applicable	118 (0.234%)	84 (0.167%)
	Corresponding population served (Percentages based on 226,935,000 people served by the systems with carbon tetrachloride data in the Six-Year Review ICR occurrence dataset)		
Regulatory or feasibility-based threshold	Nondetect values = MRL[1]	Nondetect values = ½ MRL[2]	Nondetect values = 0[3]
MCL (0.005 mg/L)	1,800 (0.001%)	1,700 (0.001%)	1,700 (0.001%)
½ MCL (0.0025 mg/L)	5,800 (0.003%)	5,500 (0.002%)	5,500 (0.002%)
2xEQL (0.001 mg/L)	265,000 (0.117%)	212,000 (0.093%)	190,000 (0.084%)
EQL (0.0005 mg/L)	not applicable	750,000 (0.330%)	368,000(0.162%)

[1] Results are based on setting all nondetect results equal to MRL values in the Six-Year Review ICR dataset. Results are not reported at the EQL of 0.0005 mg/L because this is the modal MRL and setting a majority of the results equal to this value results in an upwardly biased estimate of the number of systems with mean concentrations that exceed this value.
[2] Results are based on setting all nondetect results equal to ½ MRL values in the Six-Year Review ICR dataset.
[3] Results are based on setting all nondetect results equal to zero.
Source: USEPA, 2009f.

Since the occurrence analysis indicates that any revision to the MCL is unlikely to provide a meaningful opportunity to improve the level of public health protection, it was not necessary to perform any additional reviews on treatment feasibility or economic considerations.

c. *Review Result.* The Agency does not believe a revision to the NPDWR for carbon tetrachloride is appropriate at this time because a reassessment of the health risks resulting from exposure to carbon tetrachloride is in progress (USEPA, 2009b). Furthermore, the occurrence and exposure analysis based on possible changes in analytical feasibility indicates that any revision to the MCL is unlikely to provide a meaningful opportunity to improve public health protection. After consideration of the low occurrence of this contaminant, EPA has decided that any revision to the NPDWR would be a low priority activity for the Agency, and, thus, is not appropriate to revise at this time because of:

- Competing workload priorities;
- The administrative costs associated with rulemaking; and
- The burden on States and the regulated community to implement any regulatory change that resulted.

16. Chlordane

a. *Background.* EPA published the current NPDWR for chlordane on January 30, 1991 (56 FR 3526 (USEPA, 1991c)). The NPDWR established an MCLG of zero based on a cancer classification of B2, probable human carcinogen. The NPDWR also established an MCL of 0.002 mg/L, based on analytical feasibility.

b. *Technical Reviews.* As part of the Six-Year Review process, EPA conducted a literature search for relevant data on the carcinogenicity of chlordane as well as its potential developmental and reproductive toxicity. EPA has not identified any new information that indicates that it is appropriate to consider revisions to the cancer classification for chlordane at this time (USEPA, 2009b). Because the MCLG remains at zero, the Agency believes that a further review of the health effects of chlordane is not warranted at this time.

The current MCL for chlordane is based on a PQL of 0.002 mg/L. For the Six-Year Review, the Agency considered whether changes in the analytical feasibility of chlordane might lead to a lower MCL. EPA reviewed PE data from the first Six-Year Review cycle and then analyzed more recent PT data to determine if the PQL can be revised (*i.e.,* analytical feasibility). Passing rates for PE data available through late 1999 for chlordane are above 80 percent around the current PQL of 0.002 mg/L, including three studies with true values below the current PQL. More recent PT data from late 1999 through 2004, supplied by a PT provider, also show greater than 80 percent passing rates, except for two studies with passing rates equal to or below 75 percent. There are no PT studies with true values below the PQL. Because most of the laboratory passing rates from PE and PT studies—including three below the PQL—exceeded the 75 percent criterion typically used to derive a PQL, a lowering of the PQL for chlordane might be possible. These results, however, are insufficient to recalculate a revised PQL for chlordane because not enough data points are available below the current PQL to derive a value at the 75 percent passing rate (USEPA, 2009c).

EPA evaluated two alternative sources of information to determine whether an EQL below the current PQL could be estimated: laboratory MRLs in the Six-Year Review ICR dataset, and the MDLs for approved methods for the detection of chlordane (Methods 505 and 508). While EPA prefers to use laboratory performance data to calculate the PQL, the MRL and MDL information can be valuable for this review to indicate whether it is possible to quantitate at levels below the current PQL. The Six-Year Review ICR dataset contains MRL values for 57,506 samples. Fewer than 80 percent of these values are less than or equal the modal MRL: 26,893 (47 percent) equal the modal MRL of 0.0002 mg/L and an additional 9,764 (17 percent) are lower than 0.0002 mg/L. Therefore, EPA did not set the EQL equal to the modal MRL (USEPA, 2009e). The MDLs of approved methods are 0.0000041 and 0.00014 mg/L. Applying a multiplier of 10 would give possible PQLs of 0.000041 and 0.0014 mg/L. EPA took the mean of the two values and, rounded up to 0.001 mg/L for the EQL (USEPA, 2009e).

Based on these varied and unrelated approaches/sources of information, EPA believes that there is potential to lower the PQL for chlordane. To determine whether any MCL revision is likely to provide a meaningful opportunity to improve public health protection, EPA evaluated the occurrence of chlordane at the EQL of 0.001 mg/L (USEPA, 2009f). Table VI–6 shows the results of the occurrence and exposure analysis for the current MCL and an EQL. The occurrence and exposure analysis shows that average concentrations exceed the current MCL for one of 31,841 systems (0.003 percent) serving 80 people (or 0.00004 percent of 182 million people). Note that these results are based on the subset of monitoring data provided in response to the Six-Year Review ICR do not necessarily reflect MCL violations, which are based on annual average concentrations at entry points; SDWIS/FED indicates no MCL violations for chlordane between 1998 and 2005 (USEPA, 2007g). Average concentrations at one to two of 31,841 systems (0.003 to 0.006 percent), still serving approximately 80 to 120 people (or 0.00004 to 0.00007 percent of 182 million people), exceed the EQL of 0.001 mg/L.

TABLE VI–6—NUMBER AND PERCENT OF SYSTEMS WITH MEAN CONCENTRATIONS EXCEEDING CHLORDANE THRESHOLDS AND CORRESPONDING ESTIMATES OF POPULATION SERVED

Regulatory or feasibility-based threshold	Systems with mean concentrations that are greater than the regulatory or feasibility-based threshold (Percentages based on 31,841 systems with chlordane data in the Six-Year Review ICR occurrence dataset)		
	Nondetect Values = MRL [1]	Nondetect Values = ½ MRL [2]	Nondetect Values = 0 [3]
MCL (0.002 mg/L)	1 (0.003%)	1 (0.003%)	1 (0.003%)
EQL (0.001 mg/L)	2 (0.006%)	2 (0.006%)	1 (0.003%)
Regulatory or feasibility-based threshold	Nondetect Values = MRL [1]	Nondetect Values = ½ MRL [2]	Nondetect Values = 0 [3]
MCL (0.002 mg/L)	80 (0.00004%)	80 (0.00004%)	80 (0.00004%)
EQL (0.001 mg/L)	120 (0.00007%)	120 (0.00007%)	80 (0.00004%)

[1] Results are based on setting all nondetect results equal to MRL values in the Six-Year Review ICR dataset.
[2] Results are based on setting all nondetect results equal to 1/2 MRL values in the Six-Year Review ICR dataset.
[3] Results are based on setting all nondetect results equal to zero.
Source: USEPA, 2009f.

Since the occurrence analysis indicates that any revision to the MCL is unlikely to provide a meaningful opportunity to improve the level of public health protection, it was not necessary to perform any additional reviews on treatment feasibility or economic considerations.

c. *Review Result.* Although there are new data that support consideration of a possibly lower PQL (and therefore a possibly lower MCL), EPA does not believe a revision to the NPDWR for chlordane is appropriate at this time. The occurrence and exposure analysis based on possible changes in analytical feasibility indicates that any revision to the MCL is unlikely to provide a

meaningful opportunity to improve public health protection. Taking into consideration the low occurrence of this contaminant, EPA has decided that any revision to the NPDWR would be a low priority activity for the Agency, and, thus, is not appropriate to revise at this time because of:

- Competing workload priorities;
- The administrative costs associated with rulemaking; and
- The burden on States and the regulated community to implement any regulatory change that resulted.

17. Chromium

a. *Background.* EPA published the current NPDWR for total chromium on January 30, 1991 (56 FR 3526 (USEPA, 1991c)). The NPDWR established an MCLG and an MCL of 0.1 mg/L. Although the NPDWR regulates total chromium, the adverse health effects associated with hexavalent chromium (Cr VI) are the basis of the current MCLG because that is the more toxic species (56 FR 3526, January 31, 1991 (USEPA, 1991a)). EPA based the MCLG on an RfD of 0.005 mg/kg-day and an assumed RSC from water of 70 percent for total chromium. EPA regulated chromium as a Group D carcinogen, not classifiable as to human carcinogenicity by the oral route of exposure.

b. *Technical Reviews.* The health effects technical review identified some information regarding the carcinogenicity of chromium that may indicate the need to update the Agency's health effects assessment (USEPA, 2009b). In 1998, the Agency (USEPA, 1998d) updated the IRIS assessment for Cr VI, which revised the RfD from 0.0048 mg/kg-day (rounded to 0.005) to 0.003 mg/kg-day. While both RfDs are based on the same one-year drinking water rat study (MacKenzie *et al.,* 1958), the change in the RfD in 1998 was due to the following factors: (a) A slight change in the no-observed-adverse-effect level (NOAEL), (b) a modification to the original uncertainty factor, and (c) the addition of a modifying factor of three because of data on the potential for gastrointestinal effects in humans as a result of oral exposure. There is no current RfD for soluble trivalent chromium (soluble Cr III); the Cr III RfD of 1.5 mg/kg-day on IRIS (USEPA, 1998e) is for insoluble Cr III salts.

In 2002 and as part of the first Six Year Review (67 FR 19030 (USEPA, 2002c)), EPA noted that the National Toxicology Program (NTP) had agreed to study the chronic toxicity and carcinogenicity of oral exposure to Cr VI. The NTP study, conducted with sodium dichromate dehydrate (*i.e.,* Cr VI) in rats and mice, is now available (NTP, 2008), as is a pre-peer review draft of a similar study with chromium picolinate (Cr III) (NTP, 2007). The Cr VI study found clear evidence of carcinogenic activity of sodium dichromate dihydrate in male and female F344 rats based on increased incidences of squamous cell neoplasms of the oral cavity, specifically the squamous epithelium that lines the oral mucosa and tongue (NTP, 2008). NTP also concluded that there was clear evidence of carcinogenic activity of sodium dichromate dihydrate in male and female B6C3F1 mice based on increased incidences of neoplasms in the small intestine (adenomas and/or carcinomas of the duodenum, jejunum, or ileum). The observed noncancer effects in the Cr VI study included histiocytic cellular infiltration in the liver, small intestine, and pancreatic and mesenteric lymph nodes of rats and mice, and diffuse epithelial hyperplasia in the small intestine of male and female mice. A peer-reviewed report for the study of chromium picolinate (Cr III) is not yet available. Zhang and Li (1987) evaluated the effects of human exposure to Cr VI in drinking water in Chinese villages. In a recent analysis of the human data originally reported in these Chinese villages, Sedman *et al.* (2006) further support a statistically significant increase in stomach cancer in the population exposed to Cr VI in their drinking water, thus suggesting a potential for carcinogenicity of Cr VI in drinking water.

An assessment for chromium VI currently exists on IRIS but does not include an evaluation of carcinogenicity via oral ingestion. As a result, on December 21, 2007 (72 FR 72715 (USEPA, 2007c)), the Agency nominated and included Cr VI on its 2008 IRIS agenda. The Agency is currently working with California EPA, New Jersey Department of Environmental Protection, and the Centers for Disease Control ATSDR (since they have recently developed draft assessments for chromium VI) and has posted a schedule for completion and the most up-to-date information on the status of the health effects assessment on the IRIS Substance Assessment Tracking System Web site (*http://cfpub.epa.gov/iristrac/index.cfm*).

A review of analytical or treatment feasibility is not necessary for total chromium because changes to the MCLG are not warranted at this time and the current MCL is set at the MCLG. Since EPA did not identify a health or technology basis for revising the total chromium NPDWR, the Agency did not conduct a detailed occurrence and exposure analysis.

c. *Review Result.* The Agency does not believe a revision to the NPDWR for total chromium is appropriate at this time. A reassessment of the health risks associated with chromium exposure is being initiated and the Agency does not believe it is appropriate to revise the NPDWR while that effort is in process.

18. Cyanide

a. *Background.* EPA published the current NPDWR for cyanide on July 17, 1992 (57 FR 31776 (USEPA, 1992)). The NPDWR established an MCLG and an MCL of 0.2 mg/L. EPA based the MCLG on a reference dose of 0.02 mg/kg-day and a cancer classification of D, not classifiable as to human carcinogenicity. During the first Six-Year Review cycle, EPA recommended a revision to the BATs for cyanide to clarify that "chlorine" should be "alkaline chlorine" to avoid potential for the formation of harmful cyanogen chloride. EPA promulgated that revision in 69 FR 38850, June 29, 2004 (USEPA, 2004b).

b. *Technical Reviews.* EPA has initiated a reassessment of the health risks resulting from exposure to cyanide. The revised health effects assessment will consider relevant studies on the toxicity of cyanide, including its potential developmental and reproductive toxicity. The new health effects assessment was not completed by March 1, 2009, the review cutoff date for this notice (USEPA, 2009b). The IRIS Substance Assessment Tracking System Web site (*http://cfpub.epa.gov/iristrac/index.cfm*) has the most up-to-date information on the status of the health effects assessment.[16]

c. *Review Result.* Since the MCL for cyanide is set at its MCLG and a reassessment of the health risks resulting from exposure to cyanide is in progress, the Agency does not believe a revision to the NPDWR is appropriate at this time.

19. 2,4-D (2,4-Dichlorophenoxyacetic acid)

a. *Background.* EPA published the current NPDWR for 2,4-D on January 30, 1991 (56 FR 3526 (USEPA, 1991c)). The NPDWR established an MCLG and an MCL of 0.07 mg/L. EPA based the MCLG on a reference dose of 0.01 mg/kg-day and a cancer classification of D, not classifiable as to human carcinogenicity.

b. *Technical Reviews.* In 2005, the Agency updated its health effects assessment of 2,4-D (USEPA, 2005c). The Agency identified a change in this

[16] Note that cyanide is listed as hydrogen cyanide in the IRIS tracking system.

assessment that could lead to a change in the MCLG. This assessment considered relevant studies on the toxicity of 2,4-D including developmental and reproductive toxicity. The assessment revised the RfD from 0.01 mg/kg-day to 0.005 mg/kg-day and concluded that 2,4-D is not classifiable as to its carcinogenicity (USEPA, 2005c). Based on the new Office of Pesticide Programs (OPP) assessment and RfD of 0.005 mg/kg-day, and assuming a 70-kg adult body weight and 2 liters water intake per day, the DWEL could be 0.2 mg/L. An RSC of 20 percent results in a possible MCLG of 0.04 mg/L (USEPA, 2009b).

Analytical feasibility does not pose any limitations for the current MCL and would not be a limiting factor for the possible MCLG decrease under consideration. EPA evaluated the results of the occurrence and exposure analyses for 2,4-D to determine whether a revised MCLG/MCL would be likely to result in a meaningful opportunity to improve the level of public health protection (USEPA, 2009f). Table VI–7 shows the results of the occurrence and exposure analysis for the current MCL and the possible MCLG set equal to 0.04 mg/L based on the new health effects information. The occurrence and exposure analysis shows that average concentrations do not exceed the current MCL for any system in the analysis. Note that these results are based on the subset of monitoring data provided in response to the Six-Year Review ICR and do not necessarily reflect MCL violations, which are based on annual average concentrations at entry points; SDWIS/FED indicates no MCL violations for 2,4-D between 1998 and 2005 (USEPA, 2007g). The occurrence and exposure analysis shows that average concentrations do not exceed the possible MCLG based on new health effects information (0.04 mg/L).

TABLE VI–7—NUMBER AND PERCENT OF SYSTEMS WITH MEAN CONCENTRATIONS EXCEEDING 2,4-D THRESHOLDS AND CORRESPONDING ESTIMATES OF POPULATION SERVED

Regulatory or health-based threshold	Systems with mean concentrations that are greater than the regulatory or health-based threshold (Percentages based on 33,187 systems with 2,4-D data in the Six-Year Review ICR occurrence dataset)		
	Nondetect values = MRL [1]	Nondetect values = ½ MRL [2]	Nondetect values = 0 [3]
MCL (0.07 mg/L)	0 (0.000%)	0 (0.000%)	0 (0.000%)
Possible MCLG (0.04 mg/L)	0 (0.000%)	0 (0.000%)	0 (0.000%)
Regulatory or health-based threshold	**Corresponding population served (Percentages based on 187,451,200 people served by the systems with 2,4–D data in the Six-Year Review ICR occurrence dataset)**		
	Nondetect values = MRL [1]	Nondetect values = ½ MRL [2]	Nondetect values = 0 [3]
MCL (0.07 mg/L)	0 (0.000%)	0 (0.000%)	0 (0.000%)
Possible MCLG (0.04 mg/L)	0 (0.000%)	0 (0.000%)	0 (0.000%)

[1] Results are based on setting all nondetect results equal to MRL values in the Six-Year Review ICR dataset.
[2] Results are based on setting all nondetect results equal to ½ MRL values in the Six-Year Review ICR dataset.
[3] Results are based on setting all nondetect results equal to zero.
Source: USEPA, 2009f.

Since the occurrence analysis indicates that any revision to the MCL is unlikely to provide a meaningful opportunity to improve the level of public health protection, it was not necessary to perform any additional reviews on treatment feasibility or economic considerations.

c. *Review Result.* Although there are new data that support consideration of whether to revise the MCLG/MCL for 2,4-D, EPA does not believe a revision to the NPDWR for 2,4-D is appropriate at this time. In making this decision, the Agency considered whether any possible revision to the NPDWR for 2,4-D is likely to provide a meaningful opportunity for health risk reductions. Taking into consideration the low occurrence of this contaminant, EPA has decided that any revision to the NPDWR would be a low priority activity for the Agency, and, thus, is not appropriate to revise at this time because of:

- Competing workload priorities;
- The administrative costs associated with rulemaking; and
- The burden on States and the regulated community to implement any regulatory change that resulted.

20. Dalapon (2,2-Dichloropropionic Acid)

a. *Background.* EPA published the current NPDWR for dalapon on July 17, 1992 (57 FR 31776 (USEPA, 1992)). The NPDWR established an MCLG and an MCL of 0.2 mg/L. EPA based the MCLG on a reference dose of 0.03 mg/kg-day and a cancer classification of D, not classifiable as to human carcinogenicity.

b. *Technical Reviews.* As part of the Six-Year Review process, EPA conducted a literature search for relevant data on the toxicology of dalapon, including its potential developmental and reproductive toxicity. The literature search did not identify any studies that warrant a review of the RfD or the cancer classification (USEPA, 2009b).

A review of analytical or treatment feasibility is not necessary for dalapon because changes to the MCLG are not warranted at this time and the current MCL is set at the MCLG. Since EPA did not identify a health or technology basis for revising the dalapon NPDWR, the Agency did not conduct a detailed occurrence and exposure analysis.

c. *Review Result.* EPA's review shows that there are no data supporting a change to the dalapon NPDWR. As a result, a revision to the NPDWR would not be appropriate at this time.

21. Di(2-ethylhexyl)adipate (DEHA)

a. *Background.* EPA published the current NPDWR for DEHA on July 17, 1992 (57 FR 31776 (USEPA, 1992)). The NPDWR established an MCLG and an MCL of 0.4 mg/L. EPA based the MCLG on a reference dose of 0.6 mg/kg-day and a cancer classification of C, possible human carcinogen.

b. *Technical Reviews.* EPA has initiated a reassessment of the health risks resulting from exposure to DEHA. The revised health effects assessment will consider relevant studies on the toxicity of DEHA, including its potential

developmental and reproductive toxicity. The new health effects assessment was not completed by March 1, 2009, the review cutoff date for this notice (USEPA, 2009b). The IRIS Substance Assessment Tracking System Web site (*http://cfpub.epa.gov/iristrac/index.cfm*) has the most up-to-date information on the status of the health effects assessment.

c. *Review Result.* Since the MCL for DEHA is set at its MCLG and a reassessment of the health risks resulting from exposure to DEHA is in progress, the Agency does not believe a revision to the NPDWR is appropriate at this time.

22. Di(2-ethylhexyl)phthalate (DEHP)

a. *Background.* EPA published the current NPDWR for DEHP on July 17, 1992 (57 FR 31776 (USEPA, 1992)). The NPDWR established an MCLG of zero based on a cancer classification of B2, probable human carcinogen. The NPDWR also established an MCL of 0.006 mg/L, based on analytical feasibility.

b. *Technical Reviews.* EPA has initiated a reassessment of the health risks resulting from exposure to DEHP. The revised health effects assessment will consider relevant studies on the toxicity of DEHP, including its potential developmental and reproductive toxicity. The new health effects assessment was not completed by March 1, 2009, the review cutoff date for this notice (USEPA, 2009b). The IRIS Substance Assessment Tracking System Web site (*http://cfpub.epa.gov/iristrac/index.cfm*) has the most up-to-date information on the status of the health effects assessment.

Although a risk assessment is in process for DEHP, the existing MCLG is zero and the current MCL of 0.006 mg/L is based on the PQL. Therefore, EPA reviewed whether there is potential to revise the PQL. EPA reviewed PE data from the first Six-Year Review cycle and then analyzed more recent PT data to determine if the PQL can be revised (*i.e.,* analytical feasibility). Passing rates for PE data available through late 1999 for DEHP are below 75 percent for several concentrations around the current PQL, including two studies with true values below the current PQL. More recent PT data from late 1999 through 2004, supplied by a PT provider, show passing rates below the 75 percent criterion for three studies, and all of the true concentrations in the PT data were higher than the current PQL. Given the passing rates around the current PQL, a lowering of the PQL for DEHP is not appropriate at this time (USEPA, 2009c).

EPA evaluated two alternative sources of information to determine whether an EQL below the current PQL could be estimated: laboratory MRLs in the Six-Year Review ICR dataset, and the MDLs for approved methods for the detection of DEHP (Methods 525.2 and 506). While EPA prefers to use laboratory performance data to calculate the PQL, the MRL and MDL information can be valuable for this review to indicate whether it is possible to quantitate at levels below the current PQL. The Six-Year Review ICR dataset contains MRL values for 50,490 samples. Fewer than 80 percent of these values are less than or equal the modal MRL: 22,980 (45 percent) equal the modal MRL of 0.001 mg/L and an additional 15,842 (31 percent) are lower than 0.001 mg/L. Therefore, EPA did not set the EQL equal to the modal MRL (USEPA, 2009e). The MDLs of approved methods are 0.0013 and 0.00225 mg/L. Applying a multiplier of 10 would give a possible PQL range from 0.013 to 0.0225 mg/L. The range is higher than the current PQL and, therefore, EPA did not estimate an EQL (USEPA, 2009e). Based on these varied and unrelated approaches/sources of information, EPA believes that there is no potential to lower the PQL for DEHP. Since the MCL is constrained by the PQL, and the PQL is unchanged, EPA does not believe it is necessary to conduct an occurrence analysis at this time.

c. *Review Result.* The Agency does not believe a revision to the NPDWR for DEHP is appropriate at this time because a reassessment of the health risks resulting from exposure to DEHP is in progress (USEPA, 2009b). Furthermore, a review of analytical feasibility did not identify a potential to revise the MCL, which is limited by feasibility.

23. 1,2-Dibromo-3-chloropropane (DBCP)

a. *Background.* EPA published the current NPDWR for DBCP on January 30, 1991 (56 FR 3526 (USEPA, 1991c)). The NPDWR established an MCLG of zero based on a cancer classification of B2, probable human carcinogen. The NPDWR also established an MCL of 0.0002 mg/L, based on analytical feasibility.

b. *Technical Reviews.* As part of the Six-Year Review process, EPA conducted a literature search for relevant data on the carcinogenicity of DBCP as well as its potential developmental and reproductive toxicity. EPA has not identified any new information that indicates that it is appropriate to consider revisions to the cancer classification for DBCP at this time (USEPA, 2009b). Because the MCLG remains at zero, the Agency believes that a further review of the health effects of DBCP is not warranted at this time.

The current MCL for DBCP is based on a PQL of 0.0002 mg/L. For the Six-Year Review, the Agency considered whether changes in the analytical feasibility of DBCP might lead to a lower MCL. EPA reviewed PE data from the first Six-Year Review cycle and then analyzed more recent PT data to determine if the PQL can be revised (*i.e.,* analytical feasibility). Passing rates for PE data available through late 1999 for DBCP are above 85 percent, including one study with a true value below the current PQL. More recent PT data from late 1999 through 2004, supplied by a PT provider, also show greater than 75 percent passing rates, including three with a true value below the current PQL. Because all of the laboratory passing rates from PE and PT studies, including four with true values slightly below the PQL, exceeded the 75 percent criterion typically used to derive a PQL, a lowering of the PQL for DBCP might be possible. These results, however, are insufficient to recalculate a revised PQL for DBCP because not enough data points are available below the current PQL to derive a value at the 75 percent passing rate (USEPA, 2009c).

EPA examined two alternative sources of information to determine whether an EQL below the current PQL could be estimated: laboratory MRLs in the Six-Year Review ICR dataset, and the MDLs for approved methods for the detection of DBCP (Methods 504.1 and 551.1). While EPA prefers to use laboratory performance data to calculate the PQL, the MRL and MDL information can be valuable for this review to indicate whether it is possible to quantitate at levels below the current PQL. However, there are substantial uncertainties in interpreting the MRLs (USEPA, 2009e). For example, some States have reported modal MRLs that are higher than the MCL. EPA therefore considered only MDL data to verify the potential to revise the PQL, and to establish a threshold for the occurrence and exposure analysis. The MDLs of approved methods are 0.000009 and 0.00001 mg/L. Applying a multiplier of 10 would give a possible PQLs of 0.00009 and 0.0001 mg/L. EPA took the mean and rounded up to 0.0001 mg/L for the EQL (USEPA, 2009e).

Based on the PT data and the MDLs for approved methods, EPA believes that there may be potential to lower the PQL for DBCP. To determine whether any MCL revision is likely to provide a meaningful opportunity to improve

public health protection, EPA evaluated the occurrence of DBCP at the EQL of 0.0001 mg/L (USEPA, 2009f). Table VI–8 shows the results of the occurrence and exposure analysis for the current MCL and an EQL. The occurrence and exposure analysis shows that average concentrations exceed the current MCL for 42 of 37,618 systems (0.112 percent) serving 25,000 people (or 0.013 percent of 194 million people). Note that these results are based on the subset of monitoring data provided in response to the Six-Year Review ICR and do not necessarily reflect MCL violations, which are based on annual average concentrations at entry points; SDWIS/FED indicates only nine MCL violations for DBCP between 1998 and 2005 (USEPA, 2007g). Average concentrations at 92 to 97 of 37,618 systems (0.245 to 0.258 percent), serving approximately 1.2 to 1.4 million people (0.610 to 0.713 percent of 194 million people), exceed the EQL of 0.0001 mg/L.

TABLE VI–8—NUMBER AND PERCENT OF SYSTEMS WITH MEAN CONCENTRATIONS EXCEEDING DBCP THRESHOLDS AND CORRESPONDING ESTIMATES OF POPULATION SERVED

Regulatory or feasibility-based threshold	Systems with mean concentrations that are greater than the regulatory or feasibility-based threshold (Percentages based on 37,618 systems with DBCP data in the Six-Year Review ICR occurrence dataset)		
	Nondetect values = MRL [1]	Nondetect values = ½ MRL [2]	Nondetect values = 0 [3]
MCL (0.0002 mg/L)	42 (0.112%)	42 (0.112%)	42 (0.112%)
EQL (0.0001 mg/L)	97 (0.258%)	93 (0.247%)	92 (0.245%)
Regulatory or feasibility-based threshold	Corresponding population served (Percentages based on 193,749,000 people served by the systems with DBCP data in the Six-Year Review ICR occurrence dataset)		
	Nondetect values = MRL [1]	Nondetect values = ½ MRL [2]	Nondetect values = 0 [3]
MCL (0.0002 mg/L)	25,000 (0.013%)	25,000 (0.013%)	25,000 (0.013%)
EQL (0.0001 mg/L)	1,382,000 (0.713%)	1,371,000 (0.707%)	1,181,000 (0.610%)

[1] Results are based on setting all nondetect results equal to MRL values in the Six-Year Review ICR dataset.
[2] Results are based on setting all nondetect results equal to ½ MRL values in the Six-Year Review ICR dataset.
[3] Results are based on setting all nondetect results equal to zero.
Source: USEPA, 2009f.

Since the occurrence analysis indicates that any revision to the MCL is unlikely to provide a meaningful opportunity to improve the level of public health protection, it was not necessary to perform any additional reviews on treatment feasibility or economic considerations.

c. *Review Result.* Although there are new data that support consideration of a possibly lower PQL (and therefore a possibly lower MCL), EPA does not believe a revision to the NPDWR for DBCP is appropriate at this time. The occurrence and exposure analysis based on possible changes in analytical feasibility indicates that any revision to the MCL is unlikely to provide a meaningful opportunity to improve public health protection. Taking into consideration the low occurrence of this contaminant, EPA has decided that any revision to the NPDWR would be a low priority activity for the Agency, and, thus, is not appropriate to revise at this time because of:

- Competing workload priorities;
- The administrative costs associated with rulemaking; and
- The burden on States and the regulated community to implement any regulatory change that resulted.

24. 1,2-Dichlorobenzene (o-Dichlorobenzene)

a. *Background.* EPA published the current NPDWR for 1,2-dichlorobenzene on January 30, 1991 (56 FR 3526 (USEPA, 1991c)). The NPDWR established an MCLG and an MCL of 0.6 mg/L. EPA based the MCLG on a reference dose of 0.09 mg/kg-day and a cancer classification of D, not classifiable as to human carcinogenicity.

b. *Technical Reviews.* EPA has initiated a reassessment of the health risks resulting from exposure to 1,2-dichlorobenzene. The revised health effects assessment will consider relevant studies on the toxicity of 1,2-dichlorobenzene, including its potential developmental and reproductive toxicity. The new health effects assessment was not completed by March 1, 2009, the review cutoff date for this notice (USEPA, 2009b). The IRIS Substance Assessment Tracking System Web site (*http://cfpub.epa.gov/iristrac/index.cfm*) has the most up-to-date information on the status of the health effects assessment.

c. *Review Result.* Since the MCL for 1,2-dichlorobenzene is set at its MCLG and a reassessment of the health risks resulting from exposure to 1,2-dichlorobenzene is in progress, the Agency does not believe a revision to the NPDWR is appropriate at this time.

25. 1,4-Dichlorobenzene (p-Dichlorobenzene)

a. *Background.* EPA published the current NPDWR for 1,4-dichlorobenzene on July 8, 1987 (52 FR 25690 (USEPA, 1987)). The NPDWR established an MCLG and an MCL of 0.075 mg/L. EPA based the MCLG on a reference dose of 0.1 mg/kg-day and a cancer classification of C, possible human carcinogen.

b. *Technical Reviews.* EPA has initiated a reassessment of the health risks resulting from exposure to 1,4-dichlorobenzene. The revised health effects assessment will consider relevant studies on the toxicity of 1,4-dichlorobenzene, including its potential developmental and reproductive toxicity. The new health effects assessment was not completed by March 1, 2009, the review cutoff date for this notice (USEPA, 2009b). The IRIS Substance Assessment Tracking System Web site (*http://cfpub.epa.gov/iristrac/index.cfm*) has the most up-to-date information on the status of the health effects assessment.

c. *Review Result.* Since the MCL for 1,4-dichlorobenzene is set at its MCLG and a reassessment of the health risks resulting from exposure to 1,4-

dichlorobenzene is in progress, the Agency does not believe a revision to the NPDWR is appropriate at this time.

26. 1,2-Dichloroethane (Ethylene Dichloride)

a. *Background.* EPA published the current NPDWR for 1,2-dichloroethane on July 8, 1987 (52 FR 25690 (USEPA, 1987)). The NPDWR established an MCLG of zero based on a cancer classification of B2, probable human carcinogen. The NPDWR also established an MCL of 0.005 mg/L, based on analytical feasibility.

b. *Technical Reviews.* EPA has initiated a reassessment of the health risks resulting from exposure to 1,2-dichloroethane. The revised health effects assessment will consider relevant studies on the toxicity of 1,2-dichloroethane, including its potential developmental and reproductive toxicity. The new health effects assessment was not completed by March 1, 2009, the review cutoff date for this notice (USEPA, 2009b). The IRIS Substance Assessment Tracking System Web site (*http://cfpub.epa.gov/iristrac/index.cfm*) has the most up-to-date information on the status of the health effects assessment.[17]

Although a risk assessment is in process for 1,2-dichloroethane, the existing MCLG is zero and the current MCL of 0.005 mg/L is based on the PQL. Therefore, EPA reviewed whether there is potential to revise the PQL EPA reviewed PE data from the first Six-Year Review cycle and then analyzed more recent PT data to determine if the PQL can be revised (*i.e.,* analytical feasibility). Passing rates for PE data available through late 1999 for 1,2-dichloroethane are above 95 percent around the current PQL of 0.005 mg/L, including one study with a true value below the current PQL. More recent PT data from late 1999 through 2004, supplied by a PT provider, also show greater than 90 percent passing rates for studies around the current PQL, including seven with true values below the current PQL. Because all of the laboratory passing rates from PE and PT studies—including several with true concentrations below the PQL—exceeded the 75 percent criterion typically used to derive a PQL, a lowering of the PQL for 1,2-dichloroethane might be possible. These results, however, are insufficient to recalculate a revised PQL for 1,2-dichloroethane because not enough data points are available below the current PQL to derive a value at the 75 percent passing rate (USEPA, 2009c).

EPA evaluated two alternative sources of information to determine whether an EQL below the PQL could be estimated: laboratory MRLs in the Six-Year Review ICR dataset, and the MDLs for approved methods for the detection of 1,2-dichloroethane (Methods 502.2 and 524.2). While EPA prefers to use laboratory performance data to calculate the PQL, the MRL and MDL information can be valuable for this review to indicate whether it is possible to quantitate at levels below the current PQL. The Six-Year Review ICR dataset contains MRL values for 139,085 samples. More than 80 percent of these values are less than or equal the modal MRL: 116,533 (84 percent) equal the modal MRL of 0.0005 mg/L and an additional 18,160 (13 percent) are lower than 0.0005 mg/L. Therefore, EPA selected the modal MRL as the EQL (USEPA, 2009e). The MDLs of approved methods range from 0.00003 to 0.00006 mg/L. Applying a multiplier of 10 would give a possible PQL range from 0.0003 to 0.0006 mg/L, which contains the EQL (USEPA, 2009e).

Based on these varied and unrelated approaches/sources of information, EPA believes that there is potential to lower the PQL for 1,2-dichloroethane. To determine whether any MCL revision is likely to provide a meaningful opportunity to improve public health protection, EPA evaluated the occurrence of 1,2-dichloroethane at the EQL of 0.0005 mg/L and additional thresholds of 0.001 and 0.0025 mg/L (USEPA, 2009f). Table VI–9 shows the results of the occurrence and exposure analysis for the current MCL and these thresholds. The occurrence and exposure analysis shows that average concentrations exceed the current MCL for three of 50,442 systems (0.006 percent) serving 150 people (or 0.00007 percent of 227 million people). Note that these results are based on the subset of monitoring data provided in response to the Six-Year Review ICR and do not necessarily reflect MCL violations, which are based on annual average concentrations at entry points; SDWIS/FED indicates 27 MCL violations for 1,2-dichloroethane between 1998 and 2005 (USEPA, 2007g). Average concentrations at 63 to 82 of 50,442 systems (0.125 to 0.163 percent), serving 210,000 to 277,000 people (or 0.092 to 0.122 percent of 227 million people), exceed the EQL of 0.0005 mg/L.

TABLE VI–9—NUMBER AND PERCENT OF SYSTEMS WITH MEAN CONCENTRATIONS EXCEEDING 1,2-DICHLOROETHANE THRESHOLDS AND CORRESPONDING ESTIMATES OF POPULATION SERVED

Regulatory or feasibility-based threshold	Systems with mean concentrations that are greater than the regulatory or feasibility-based threshold (Percentages based on 50,442 systems with 1,2-dichloroethane data in the Six-Year Review ICR occurrence dataset)		
	Nondetect values = MRL [1]	Nondetect values = ½ MRL [2]	Nondetect values = 0 [3]
MCL (0.005 mg/L)	3 (0.006%)	3 (0.006%)	3 (0.006%)
½ MCL (0.0025 mg/L)	9 (0.018%)	9 (0.018%)	8 (0.016%)
2xEQL (0.001 mg/L)	46 (0.091%)	37 (0.073%)	30 (0.059%)
EQL (0.0005 mg/L)	not applicable	82 (0.163%)	63 (0.125%)
Regulatory or feasibility-based threshold	Corresponding population served (percentages based on 226,934,000 people served by the systems with 1,2-dichloroethane data in the Six-Year Review ICR occurrence dataset)		
	Nondetect values = MRL [1]	Nondetect values = ½ MRL [2]	Nondetect values = 0 [3]
MCL (0.005 mg/L)	150 (0.00007%)	150 (0.00007%)	150 (0.00007%)
½ MCL (0.0025 mg/L)	870 (0.0004%)	870 (0.0004%)	830 (0.0004%)
2xEQL (0.001 mg/L)	190,000 (0.084%)	145,200 (0.064%)	87,150 (0.038%)

[17] Note that 1,2-dichloroethane is listed as ethylene dichloride in the IRIS tracking system.

TABLE VI–9—NUMBER AND PERCENT OF SYSTEMS WITH MEAN CONCENTRATIONS EXCEEDING 1,2-DICHLOROETHANE THRESHOLDS AND CORRESPONDING ESTIMATES OF POPULATION SERVED—Continued

Regulatory or feasibility-based threshold	Systems with mean concentrations that are greater than the regulatory or feasibility-based threshold (Percentages based on 50,442 systems with 1,2-dichloroethane data in the Six-Year Review ICR occurrence dataset)		
	Nondetect values = MRL [1]	Nondetect values = ½ MRL [2]	Nondetect values = 0 [3]
EQL (0.0005 mg/L)	not applicable	277,000 (0.122%)	210,000 (0.092%)

[1] Results are based on setting all nondetect results equal to MRL values in the Six-Year Review ICR dataset. Results are not reported at the EQL of 0.0005 mg/L because this is the modal MRL and setting a majority of the results equal to this value results in an upwardly biased estimate of the number of systems with mean concentrations that exceed this value.
[2] Results are based on setting all nondetect results equal to ½ MRL values in the Six-Year Review ICR dataset.
[3] Results are based on setting all nondetect results equal to zero.
Source: USEPA, 2009f.

Since the occurrence analysis indicates that any revision to the MCL is unlikely to provide a meaningful opportunity to improve the level of public health protection, it was not necessary to perform any additional reviews on treatment feasibility or economic considerations.

c. *Review Result.* The Agency does not believe a revision to the NPDWR for 1,2-dichloroethane is appropriate at this time because a reassessment of the health risks resulting from exposure to 1,2-dichloroethane is in progress (USEPA, 2009b). Furthermore, the occurrence and exposure analysis based on possible changes in analytical feasibility indicates that any revision to the MCL is unlikely to provide a meaningful opportunity to improve public health protection. After consideration of the low occurrence of this contaminant, EPA has decided that any revision to the NPDWR would be a low priority activity for the Agency, and, thus, is not appropriate to revise at this time because of:

- Competing workload priorities;
- The administrative costs associated with rulemaking; and
- The burden on States and the regulated community to implement any regulatory change that resulted.

27. 1,1-Dichloroethylene

a. *Background.* EPA published the current NPDWR for 1,1-dichloroethylene on July 8, 1987 (52 FR 25690 (USEPA, 1987)). The NPDWR established an MCLG and an MCL of 0.007 mg/L. EPA based the MCLG on a reference dose of 0.01 mg/kg-day and a cancer classification of C, possible human carcinogen.

b. *Technical Reviews.* In the first Six-Year Review cycle, EPA evaluated new information from a health effects assessment completed in 2002 (USEPA, 2002b). At that time, the Agency could not determine that a revision to the NPDWR would provide a meaningful opportunity for cost savings to public water systems or their customers, and decided that any revision would be a low priority activity for the Agency because of competing workload priorities, the administrative costs associated with rulemaking, and the burden on States and the regulated community to implement any regulatory change (68 FR 42908 (USEPA, 2003e)). The 2002 assessment considered relevant studies on the toxicity of 1,1-dichloroethylene including developmental and reproductive toxicity. The assessment revised the RfD from 0.01 mg/kg-day to 0.05 mg/kg-day and concluded that there is inadequate information to assess carcinogenic potential via the oral route (USEPA, 2002b). In the current review cycle, EPA conducted a literature search through June 2007 for relevant data on the toxicology of 1,1-dichloroethylene, including its potential developmental and reproductive toxicity. The literature search did not identify any additional new data that would affect the RfD or cancer classification (USEPA, 2009b). Based on the 2002 IRIS assessment and RfD of 0.05 mg/kg-day, and assuming a 70-kg adult body weight and 2 liters water intake per day, the DWEL could be 1.75 mg/L. The 2002 cancer assessment indicates that the risk management factor of 10, applied to the current MCLG, may no longer be needed. An RSC of 20 percent results in a possible MCLG of 0.35 mg/L (USEPA, 2009b).

Analytical feasibility does not pose any limitations for the current MCL and would not be a limiting factor if EPA were to raise the MCLG. EPA evaluated the results of the occurrence and exposure analyses for 1,1-dichloroethylene to determine whether a revised MCLG/MCL would be likely to result in a meaningful opportunity to achieve cost savings for PWSs and their customers while maintaining, or improving, the level of public health protection (USEPA, 2009f). Although the Agency obtained and evaluated the finished water occurrence data for 1,1-dichloroethylene, its usefulness is limited for potential cost savings to PWSs and their customers because the Agency does not know which systems are treating for this contaminant. As an alternative, the Agency evaluated available data on source water quality and conducted a qualitative assessment of treatment cost savings.

Table VI–10 provides summary data for contaminant occurrence based on maximum sample values for the locations included in the STORET and NAWQA data. Although the degree to which these occurrence rates represent national drinking water source occurrence is uncertain, the information shows no to low occurrence at threshold levels of interest. This information indicates that any resulting NPDWR change would affect systems that rely on source water at less than 0.02 percent of the NAWQA locations. The STORET results are driven by the 157 sampling locations in Phoenix, Arizona, that have a maximum sample above the MCL of 0.007 mg/L. Five of these locations also account for those having a maximum sample that exceeds 0.35 mg/L.

TABLE VI–10—AMBIENT WATER QUALITY MONITORING OCCURRENCE SUMMARY FOR 1,1-DICHLOROETHYLENE

Maximum concentration	Number of locations (% of locations)	
	STORET [1]	NAWQA [2]
Total	2,448 (100.0%)	5,788 (100.0%)
Nondetect	1,498 (61.2%)	5,636 (97.37%)
Detected	950 (38.8%)	152 (2.63%)
Exceeds current MCLG of 0.007 mg/L	165 (6.7%)	1 (0.02%)
Exceeds alternative value of 0.35 mg/L	5 (0.2%)	0 (0.0%)

[1] STORET database 2002–2007.
[2] NAWQA database 1992–2008.
Source: USEPA, 2009d.

The BATs and small system compliance technologies for 1,1-dichloroethylene have other beneficial effects, *e.g.,* reduction of other co-occurring contaminants, precursors for DBPs, or other common impurities. Therefore, if EPA were to consider a higher level, the Agency does not know how many PWSs that are currently treating to comply with the existing MCL of 0.007 mg/L would be likely to discontinue treatment that is already in place (USEPA, 2009d). Also, the Agency does not know to what extent affected systems might be able to reduce costs given that capital costs are not recoverable. However, the Agency recognizes that there may be opportunities to achieve operational cost savings if these systems are able to re-optimize current treatment.

Given these considerations, the Agency believes that any resulting revision is not likely to provide a meaningful opportunity for cost savings. In view of this, any revision would be a low priority activity and not appropriate at this time.

c. *Review Result.* Although there are new data that support consideration of whether to revise the MCLG/MCL for 1,1-dichloroethylene, EPA does not believe a revision to the NPDWR for 1,1-dichloroethylene is appropriate at this time. In making this decision, the Agency considered whether any possible revision to the NPDWR for 1,1-dichloroethylene is likely to provide a meaningful opportunity for cost savings to public water systems and their customers. Taking into consideration the low occurrence of this contaminant in source waters, EPA has decided that any revision to the NPDWR would be a low priority activity for the Agency, and, thus, is not appropriate to revise at this time because of:

- Competing workload priorities;
- The administrative costs associated with rulemaking; and
- The burden on States and the regulated community to implement any regulatory change that resulted.

28. cis-1,2-Dichloroethylene

a. *Background.* EPA published the current NPDWR for cis-1,2-dichloroethylene on January 30, 1991 (56 FR 3526 (USEPA, 1991c)). The NPDWR established an MCLG and an MCL of 0.07 mg/L. EPA based the MCLG on a reference dose of 0.01 mg/kg-day and a cancer classification of D, not classifiable as to human carcinogenicity.

b. *Technical Reviews.* EPA has initiated a reassessment of the health risks resulting from exposure to cis-1,2-dichloroethylene. The revised health effects assessment will consider relevant studies on the toxicity of cis-1,2-dichloroethylene, including its potential developmental and reproductive toxicity. The new health effects assessment was not completed by March 1, 2009, the review cutoff date for this notice (USEPA, 2009b). The IRIS Substance Assessment Tracking System Web site (*http://cfpub.epa.gov/iristrac/index.cfm*) has the most up-to-date information on the status of the health effects assessment.

c. *Review Result.* Since the MCL for cis-1,2-dichloroethylene is set at its MCLG and a reassessment of the health risks resulting from exposure to cis-1,2-dichloroethylene is in progress, the Agency does not believe a revision to the NPDWR is appropriate at this time.

29. trans-1,2-Dichloroethylene

a. *Background.* EPA published the current NPDWR for trans-1,2-dichloroethylene on January 30, 1991 (56 FR 3526 (USEPA, 1991c)). The NPDWR established an MCLG and an MCL of 0.1 mg/L. EPA based the MCLG on a reference dose of 0.02 mg/kg-day and a cancer classification of D, not classifiable as to human carcinogenicity.

b. *Technical Reviews.* EPA has initiated a reassessment of the health risks resulting from exposure to trans-1,2-dichloroethylene. The revised health effects assessment will consider relevant studies on the toxicity of trans-1,2-dichloroethylene, including its potential developmental and reproductive toxicity. The new health effects assessment was not completed by March 1, 2009, the review cutoff date for this notice (USEPA, 2009b). The IRIS Substance Assessment Tracking System Web site (*http://cfpub.epa.gov/iristrac/index.cfm*) has the most up-to-date information on the status of the health effects assessment.

c. *Review Result.* Since the MCL for trans-1,2-dichloroethylene is set at its MCLG and a reassessment of the health risks resulting from exposure to trans-1,2-dichloroethylene is in progress, the Agency does not believe a revision to the NPDWR is appropriate at this time.

30. Dichloromethane (Methylene Chloride)

a. *Background.* EPA published the current NPDWR for dichloromethane on July 17, 1992 (57 FR 31776 (USEPA, 1992)). The NPDWR established an MCLG of zero based on a cancer classification of B2, probable human carcinogen. The NPDWR also established an MCL of 0.005 mg/L, based on analytical feasibility.

b. *Technical Reviews.* EPA has initiated a reassessment of the health risks resulting from exposure to dichloromethane. The revised health effects assessment will consider relevant studies on the toxicity of dichloromethane, including its potential developmental and reproductive toxicity. The new health effects assessment was not completed by March 1, 2009, the review cutoff date for this notice (USEPA, 2009b). The IRIS Substance Assessment Tracking System Web site (*http://cfpub.epa.gov/iristrac/index.cfm*) has the most up-to-date information on the status of the health effects assessment.[18]

Although a risk assessment is in process for dichloromethane, the existing MCLG is zero and the current MCL of 0.005 mg/L is based on the PQL. Therefore, EPA reviewed whether there is potential to revise the PQL. EPA reviewed PE data from the first Six-Year

[18] Note that dichloromethane is listed as methylene chloride in the IRIS tracking system.

Review cycle and then analyzed more recent PT data to determine if the PQL can be revised (*i.e.,* analytical feasibility). Passing rates for PE data available through late 1999 for dichloromethane are all above 90 percent for studies near the PQL. More recent PT data from late 1999 through 2004, supplied by a PT provider, also show greater than 85 percent passing rates for studies around the PQL, except for one study with a passing rate of 76 percent. However, all of the true concentrations in the PE and PT data were higher than the current PQL of 0.005 mg/L. Given the lack of PE and PT study results below the current PQL to derive a value at the 75 percent passing rate, PE and PT data are insufficient to support a PQL reduction (USEPA, 2009c).

EPA evaluated two alternative sources of information to determine whether an EQL below the current PQL could be estimated: Laboratory MRLs in the Six-Year Review ICR dataset, and the MDLs for approved methods for the detection of dichloromethane (Methods 502.2 and 524.2). While EPA prefers to use laboratory performance data to calculate the PQL, the MRL and MDL information can be valuable for this review to indicate whether it is possible to quantitate at levels below the current PQL. The Six-Year Review ICR dataset contains MRL values for 138,445 samples. More than 80 percent of these values are less than or equal the modal MRL: 121,532 (88 percent) equal the modal MRL of 0.0005 mg/L and an additional 11,294 (8 percent) are lower than 0.0005 mg/L. Therefore, EPA selected the modal MRL as the EQL (USEPA, 2009e). The MDLs of approved methods range from 0.00002 to 0.00009 mg/L. Applying a multiplier of 10 would give a possible PQL range from 0.0002 to 0.0009 mg/L, which includes the EQL (USEPA, 2009e).

Based on these varied and unrelated approaches/sources of information, there is evidence of a potential to lower the PQL for dichloromethane even though the PE and PT data are insufficient to support a PQL reduction. To determine whether any MCL revision is likely to provide a meaningful opportunity to improve public health protection, EPA evaluated the occurrence of dichloromethane at the EQL of 0.0005 mg/L and additional thresholds of 0.001 and 0.0025 mg/L (USEPA, 2009f). Table VI–11 shows the results of the occurrence and exposure analysis for the current MCL and these thresholds. The occurrence and exposure analysis shows that average concentrations exceed the current MCL for 13 to 17 of 50,169 systems (0.026 to 0.034 percent) serving 11,000 to 12,000 people (or 0.005 percent of 227 million people). Note that these results are based on the subset of monitoring data provided in response to the Six-Year Review ICR and do not necessarily reflect MCL violations, which are based on annual average concentrations at entry points; SDWIS/FED indicates 67 MCL violations for dichloromethane between 1998 and 2005 with annual violations ranging from 4 to 14 (USEPA, 2007g). Average concentrations at 383 to 579 of 50,169 systems (0.763 to 1.154 percent), serving approximately 1.8 to 3.5 million people (or 0.813 to 1.542 percent of 227 million people), exceed the EQL of 0.0005 mg/L.

TABLE VI–11—NUMBER AND PERCENT OF SYSTEMS WITH MEAN CONCENTRATIONS EXCEEDING DICHLOROMETHANE THRESHOLDS AND CORRESPONDING ESTIMATES OF POPULATION SERVED

Regulatory or feasibility-based threshold	Systems with mean concentrations that are greater than the regulatory or feasibility-based threshold (percentages based on 50,169 systems with dichloromethane data in the Six-Year Review ICR occurrence dataset)		
	Nondetect values = MRL [1]	Nondetect values = ½ MRL [2]	Nondetect values = 0 [3]
MCL (0.005 mg/L)	17 (0.034%)	16 (0.032%)	13 (0.026%)
EQL (0.0025 mg/L)	53 (0.106%)	51 (0.102%)	46 (0.092%)
EQL (0.001 mg/L)	276 (0.550%)	208 (0.415%)	169 (0.337%)
EQL (0.0005 mg/L)	not applicable	579 (1.154%)	383 (0.763%)
	Corresponding population served (percentages based on 226,844,000 people served by the systems with dichloromethane data in the Six-Year Review ICR occurrence dataset)		
Regulatory or feasibility-based threshold	Nondetect values = MRL [1]	Nondetect values = ½ MRL [2]	Nondetect values = ≤0 [3]
MCL (0.005 mg/L)	12,000 (0.005%)	12,000 (0.005%)	11,000 (0.005%)
EQL (0.0025 mg/L)	44,000 (0.019%)	40,000 (0.018%)	39,000 (0.017%)
EQL (0.001 mg/L)	1,517,000 (0.669%)	1,386,000 (0.611%)	946,000 (0.417%)
EQL (0.0005 mg/L)	not applicable	3,497,000 (1.542%)	1,844,000 (0.813%)

[1] Results are based on setting all nondetect results equal to MRL values in the Six-Year Review ICR dataset. Results are not reported at the EQL of 0.0005 mg/L because this is the modal MRL and setting a majority of the results equal to this value results in an upwardly biased estimate of the number of systems with mean concentrations that exceed this value.
[2] Results are based on setting all nondetect results equal to ½ MRL values in the Six-Year Review ICR dataset.
[3] Results are based on setting all nondetect results equal to zero.
Source: USEPA, 2009f.

During Six-Year Review 1, a stakeholder questioned the feasibility of lowering the PQL for dichloromethane below 0.001 mg/L because its use in EPA analytical methods makes it a common laboratory contaminant (68 FR 42908 (USEPA, 2003e)). EPA responded that the high passing rates among PE studies at concentrations close to the current PQL of 0.005 mg/L would not be expected if this were the case and that EPA had no data to suggest that the occurrence estimates reflected monitoring sample contamination (68 FR 42908 (USEPA, 2003e)). For Six-Year Review 2, EPA notes that it does not have PE or PT study results at either 0.001 mg/L or 0.0005 mg/L and, therefore, cannot assess the potential for laboratory contamination of dichloromethane to affect passing rates at this level. A USGS study of volatile organic compound (VOC) occurrence (Moran, 2006) indicates this potential exists at low concentrations. The study presented dichloromethane laboratory reporting levels for newer low-level

analytical methods (*i.e.,* defined as the level that limits the frequency of false positives and false negatives to 1 percent of test results) that ranged from 0.00006 mg/L to 0.00757 mg/L, with a median value of 0.00038 mg/L. The report noted that the laboratory reporting levels for dichloromethane tend to be higher than levels for other VOCs such as PCE (levels ranging from 0.000027 mg/L to 0.0005 mg/L with a median of 0.0001 mg/L) and TCE (ranging from 0.000038 mg/L to 0.0005 mg/L with a median of 0.000038 mg/L) because it was a frequent laboratory contaminant.

A USGS study of ground water, source water, and drinking water quality indicated consistently lower dichloromethane (methylene chloride) occurrence frequencies compared to either PCE or TCE, which are among the most frequently occurring VOCs included in the study (Moran, 2006). Table VI–12 provides a summary of the occurrence results reported in the USGS study. This study also determined that population density was the strongest predictor of dichloromethane occurrence.

TABLE VI–12—SUMMARY OF USGS VOC OCCURRENCE STUDY FINDINGS FOR DICHLOROMETHANE (METHYLENE CHLORIDE)

	Ground water samples	Source water samples	Drinking water samples
Number	5,054	577	1,680
Type	3,877 NAWQA 1,177 Other sources.	Ground water sources for community water systems.	Ground water community water systems.
Location	National	National	New England and Mid-Atlantic States.
Dichloromethane Results	• 3% exceed 0.00002 mg/L • <1% exceed 0.0002 mg/L • Ranked 30th of 55 VOCs based on median concentration (0.00005 mg/L).	• 0.2% (1 sample) exceed 0.0002 mg/L. • Ranked 8th of 52 VOCs based on median concentration (0.0017 mg/L—1 sample).	• 3% exceed 0.0002 mg/L. • Ranked 11th of 51 VOCs in detection frequency. • Ranked 31st of 55 solvents in median concentration (0.001 mg/L).
PCE	• 11% exceed 0.00002 mg/L • 4% exceed 0.0002 mg/L • Ranked 12th of 55 VOCs based on median concentration (0.00007 mg/L).	• 4% exceed 0.0002 mg/L • Ranked 16th of 52 VOCs based on median concentration (0.0009 mg/L).	• 4% exceed 0.0002 mg/L. • Ranked 7th of 51 VOCs in detection frequency. • Ranked 11th of 55 solvents in median concentration (0.0014 mg/L).
TCE	• 5% exceed 0.00002 mg/L • 2.5% exceed 0.0002 mg/L • Ranked 20th of 55 VOCs based on median concentration (0.00012 mg/L).	• 3% exceed 0.0002 mg/L • Ranked 10th of 52 VOCs based on median concentration (0.0015 mg/L).	• 4% exceed 0.0002 mg/L. • Ranked 8th of 51 VOCs in detection frequency. • Ranked 8th of 55 solvents in median concentration (0.0015 mg/L).

Source: Moran, 2006.

EPA compared Six-Year Review ICR occurrence patterns for dichloromethane with contaminant release information to determine if drinking water occurrence corresponds with potential contaminant sources reported in the Toxics Release Inventory (TRI) and found that the states with the majority of systems with mean concentrations that exceed 0.0005 mg/L did not tend to be the States with the highest dichloromethane releases (Moran, 2006). Table VI–13 provides summary information from that comparison. In particular, the numbers of system means exceeding 0.0005 mg/L in Montana and Alaska seem inconsistent with TRI release information and the USGS study finding that population density is the strongest predictor of dichloromethane occurrence.

Because of data gaps regarding the feasibility of PQL reduction and potential occurrence data accuracy at the lowest EQL, EPA concluded that revising the MCL may not constitute a meaningful opportunity to improve the level of public health protection.

TABLE VI–13—STAGE 2 OCCURRENCE SUMMARY FOR DICHLOROMETHANE

State	Systems with mean > 0.0005 mg/L Nondetect = ½ MRL		Total reported TRI on-site or off-site disposal or release of dichloromethane—all industries, 2006 [1]		Total reported TRI on-site or off-site disposal or release of dichloromethane—all industries, 2004 [1]	
	Number	Percent of 579 total systems	Pounds	Percent of 6.8 Million Total Pounds	Pounds	Percent of 7.9 Million Total Pounds
MT	67	12	22,700	0	30,600	0
TX	45	8	314,120	5	410,103	5
FL	40	7	31,451	0	246,775	3
AK	37	6	No data	0	No data	0
IN	29	5	509,303	7	699,783	9
WI	28	5	111,403	2	98,113	1
MO	27	5	51,002	1	32,860	0
CA	26	4	149,423	2	86,554	1
OH	24	4	192,237	3	203,269	3
NM	21	4	No data	0	No data	0

TABLE VI–13—STAGE 2 OCCURRENCE SUMMARY FOR DICHLOROMETHANE—Continued

State	Systems with mean > 0.0005 mg/L Nondetect = ½ MRL		Total reported TRI on-site or off-site disposal or release of dichloromethane—all industries, 2006 [1]		Total reported TRI on-site or off-site disposal or release of dichloromethane—all industries, 2004 [1]	
	Number	Percent of 579 total systems	Pounds	Percent of 6.8 Million Total Pounds	Pounds	Percent of 7.9 Million Total Pounds
IL	19	3	279,024	4	285,101	4
AL	18	3	319,529	5	375,650	5
MN	17	3	39,851	1	81,309	1
CO	15	3	18,475	0	17,003	0
MI	13	2	75,141	1	129,959	2
WY	13	2	No data	0	No data	0
IA	12	2	2,348	0	1,657	0
MD	12	2	36,990	1	31,347	0
NC	12	2	49,800	1	600,032	8
NY	11	2	322,382	5	712,197	9

[1] *Source:* TRI Explorer Chemical Report Summary on-line state summaries for 2006 and 2004.

c. *Review Result.* The Agency does not believe a revision to the NPDWR for dichloromethane is appropriate at this time because a reassessment of the health risks resulting from exposure to dichloromethane is in progress (USEPA, 2009b). In view of the fact that dichloromethane is a common laboratory contaminant, there is uncertainty regarding the extent to which a PQL revision is feasible or whether the Six-Year Review ICR data are reliable at concentrations well below the current PQL. Furthermore, the occurrence and exposure analysis based on possible changes in analytical feasibility indicates that any revision to the MCL is unlikely to provide a meaningful opportunity to improve public health protection. After consideration of these factors, EPA has decided that any revision to the NPDWR would be a low priority activity for the Agency, and, thus, is not appropriate to revise at this time because of:

- Competing workload priorities;
- The administrative costs associated with rulemaking; and
- The burden on States and the regulated community to implement any regulatory change that resulted.

31. 1,2-Dichloropropane

a. *Background.* EPA published the current NPDWR for 1,2-dichloropropane on January 30, 1991 (56 FR 3526 (USEPA, 1991c)). The NPDWR established an MCLG of zero based on a cancer classification of B2, probable human carcinogen. The NPDWR also established an MCL of 0.005 mg/L, based on analytical feasibility.

b. *Technical Reviews.* As part of the Six-Year Review process, EPA conducted a literature search for relevant data on the carcinogenicity of 1,2-dichloropropane as well as its potential developmental and reproductive toxicity. EPA has not identified any new information that indicates that it is appropriate to consider revisions to the cancer classification for 1,2-dichloropropane at this time (USEPA, 2009b). Because the MCLG remains at zero, the Agency believes that a further review of the health effects of 1,2-dichloropropane is not warranted at this time.

The current MCL for 1,2-dichloropropane is based on a PQL of 0.005 mg/L. For the Six-Year Review, the Agency considered whether changes in the analytical feasibility of 1,2-dichloropropane might lead to a lower MCL. EPA reviewed PE data from the first Six-Year Review cycle and then analyzed more recent PT data to determine if the PQL can be revised (*i.e.,* analytical feasibility). Passing rates for PE data available through late 1999 for 1,2-dichloropropane are above 90 percent near the current PQL of 0.005 mg/L, but there were no results for PE studies with true values below the current PQL. More recent PT data from late 1999 through 2004, supplied by a PT provider, also show greater than 90 percent passing rates around the PQL, including nine studies with true values below the current PQL. Because most of the laboratory passing rates from PE and PT studies—including several with true concentrations below the PQL—exceeded the 75 percent criterion typically used to derive a PQL, a lowering of the PQL for 1,2-dichloropropane might be possible. These results, however, are insufficient to recalculate a revised PQL for 1,2-dichloropropane because not enough data points are available below the current PQL to derive a value at the 75 percent passing rate (USEPA, 2009c).

EPA evaluated two alternative sources of information to determine whether an EQL below the current PQL could be estimated: laboratory MRLs in the Six-Year Review ICR dataset, and the MDLs for approved methods for the detection of 1,2-dichloropropane (Methods 502.2 and 524.2). While EPA prefers to use laboratory performance data to calculate the PQL, the MRL and MDL information can be valuable for this review to indicate whether it is possible to quantitate at levels below the current PQL. The Six-Year Review ICR dataset contains MRL values for 139,237 samples. More than 80 percent of these values are less than or equal the modal MRL: 119,831 (86 percent) equal the modal MRL of 0.0005 mg/L and an additional 18,311 (13 percent) are lower than 0.0005 mg/L. Therefore, EPA selected the modal MRL as the EQL (USEPA, 2009e). The MDLs of approved methods range from 0.00003 to 0.00004 mg/L. Applying a multiplier of 10 would give a possible PQL range from 0.0003 to 0.0004 mg/Lwhich supports the EQL (USEPA, 2009e).

Based on these varied and unrelated approaches/sources of information, EPA believes that there is potential to lower the PQL for 1,2-dichloropropane. To determine whether any MCL revision is likely to provide a meaningful opportunity to improve public health protection, EPA evaluated the occurrence of 1,2-dichloropropane at the EQL of 0.0005 mg/L and additional thresholds of 0.001 and 0.0025 mg/L (USEPA, 2009f). Table VI–14 shows the results of the occurrence and exposure analysis for the current MCL and these thresholds. The occurrence and exposure analysis shows that average concentrations do not exceed the current MCL for any system in the analysis. Note that these results are based on the subset of monitoring data provided in response to the Six-Year

Review ICR and do not necessarily reflect MCL violations, which are based on annual average concentrations at entry points; SDWIS/FED indicates three MCL violations for 1,2-dichloropropane between 1998 and 2005 (USEPA, 2007g). Average concentrations at 47 to 61 of 50,437 systems (0.093 to 0.121 percent), serving 296,000 to 494,000 people (0.130 to 0.218 percent of 227 million people), exceed the EQL of 0.0005 mg/L.

TABLE VI–14—NUMBER AND PERCENT OF SYSTEMS WITH MEAN CONCENTRATIONS EXCEEDING 1,2-DICHLOROPROPANE THRESHOLDS AND CORRESPONDING ESTIMATES OF POPULATION SERVED

Regulatory or feasibility-based threshold	Systems with mean concentrations that are greater than the regulatory or feasibility-based threshold (percentages based on 50,437 systems with 1,2-dichloropropane data in the Six-Year Review ICR occurrence dataset)		
	Nondetect values = MRL [1]	Nondetect values = ½ MRL [2]	Nondetect values = 0 [3]
MCL (0.005 mg/L)	0 (0.000%)	0 (0.000%)	0 (0.000%)
½ MCL (0.0025 mg/L)	2 (0.004%)	2 (0.004%)	2 (0.004%)
2xEQL (0.001 mg/L)	27 (0.054%)	24 (0.048%)	21 (0.042%)
EQL (0.0005 mg/L)	not applicable	61 (0.121%)	47 (0.093%)
	Corresponding Population Served (percentages based on 226,912,000 people served by the systems with 1,2-dichloropropane data in the Six-Year Review ICR occurrence dataset)		
Regulatory or feasibility-based threshold	Nondetect values = MRL [1]	Nondetect values = ½ MRL [2]	Nondetect values = 0 [3]
MCL (0.005 mg/L)	0 (0.000%)	0 (0.000%)	0 (0.000%)
½ MCL (0.0025 mg/L)	120 (0.00005%)	120 (0.00005%)	120 (0.00005%)
2xEQL (0.001 mg/L)	286,000 (0.126%)	286,000 (0.126%)	284,000 (0.125%)
EQL (0.0005 mg/L)	not applicable	494,000 (0.218%)	296,000 (0.130%)

[1] Results are based on setting all nondetect results equal to MRL values in the Six-Year Review ICR dataset. Results are not reported at the EQL of 0.0005 mg/L because this is the modal MRL and setting a majority of the results equal to this value results in an upwardly biased estimate of the number of systems with mean concentrations that exceed this value.
[2] Results are based on setting all nondetect results equal to ½ MRL values in the Six-Year Review ICR dataset.
[3] Results are based on setting all nondetect results equal to zero.
Source: USEPA, 2009f.

Since the occurrence analysis indicates that any revision to the MCL is unlikely to provide a meaningful opportunity to improve the level of public health protection, it was not necessary to perform any additional reviews on treatment feasibility or economic considerations.

c. *Review Result.* Although there are new data that support consideration of a possibly lower PQL (and therefore a possibly lower MCL), EPA does not believe a revision to the NPDWR for 1,2-dichloropropane is appropriate at this time. The occurrence and exposure analysis based on possible changes in analytical feasibility indicates that any revision to the MCL is unlikely to provide a meaningful opportunity to improve public health protection. Taking into consideration the low occurrence of this contaminant, EPA has decided that any revision to the NPDWR would be a low priority activity for the Agency, and, thus, is not appropriate to revise at this time because of:

- Competing workload priorities;
- The administrative costs associated with rulemaking; and
- The burden on States and the regulated community to implement any regulatory change that resulted.

32. Dinoseb

a. *Background.* EPA published the current NPDWR for dinoseb on July 17, 1992 (57 FR 31776 (USEPA, 1992)). The NPDWR established an MCLG and an MCL of 0.007 mg/L. EPA based the MCLG on a reference dose of 0.001 mg/kg-day and a cancer classification of D, not classifiable as to human carcinogenicity.

b. *Technical Reviews.* As part of the Six-Year Review process, EPA conducted a literature search for relevant data on the toxicology of dinoseb, including its potential developmental and reproductive toxicity. The literature search did not identify any studies that warrant a review of the RfD or the cancer classification (USEPA, 2009b).

A review of analytical or treatment feasibility is not necessary for dinoseb because changes to the MCLG are not warranted at this time and the current MCL is set at the MCLG. Since EPA did not identify a health or technology basis for revising the dinoseb NPDWR, the Agency did not conduct a detailed occurrence and exposure analysis.

c. *Review Result.* EPA's review shows that there are no data supporting a change to the dinoseb NPDWR. As a result, a revision to the NPDWR would not be appropriate at this time.

33. Diquat

a. *Background.* EPA published the current NPDWR for diquat on July 17, 1992 (57 FR 31776 (USEPA, 1992)). The NPDWR established an MCLG and an MCL of 0.02 mg/L. EPA based the MCLG on a reference dose of 0.0022 mg/kg-day and a cancer classification of D, not classifiable as to human carcinogenicity.

b. *Technical Reviews.* In 2001, the Agency updated its health effects assessment of diquat (USEPA, 2001a). A subsequent reassessment of tolerances for residues in or on raw agricultural products (USEPA, 2002d) did not identify any new health effects information and based the updated tolerances on health effects information in the 2001 assessment (USEPA, 2001a). The Agency identified a change in this assessment that could lead to a change in the MCLG. This assessment considered relevant studies on the toxicity of diquat including developmental and reproductive toxicity. The assessment revised the RfD from 0.002 mg/kg-day to 0.005 mg/kg-day and developed a cancer classification of E, evidence of noncarcinogenicity (USEPA, 2001a). Based on the new OPP assessment and RfD of 0.005 mg/kg-day, and assuming a 70-kg adult body weight and 2 liters water intake per day, the DWEL could

be 0.175 mg/L. An RSC of 20 percent results in a possible MCLG of 0.035 mg/L, rounded to 0.04 mg/L.

Analytical feasibility does not pose any limitations for the current MCL and would not be a limiting factor if EPA were to raise the MCLG. EPA evaluated the available occurrence and exposure information for diquat to determine whether a revised MCLG/MCL would be likely to result in a meaningful opportunity to achieve cost savings for PWSs and their customers while maintaining, or improving, the level of public health protection (USEPA, 2009f). Although the Agency obtained and evaluated the finished water occurrence data for diquat, its usefulness is limited for determining potential cost savings to PWS and their customers because the Agency does not know which systems are treating for this contaminant. As an alternative, the Agency evaluated available data on source water quality and conducted a qualitative assessment of treatment cost savings. Because the primary informations sources used to evaluate potential source water occurrence—STORET and NAWQA—do not report monitoring results for diquat, the Agency obtained available information on diquat use and fate and transport.

Diquat's primary uses are as an algaecide, defoliant, desiccant, and herbicide (USEPA, 1995a). The most recent pesticide application estimates in the Pesticide Use Database developed by the National Center for Food and Agricultural Policy (NCFAP) indicate overall cropland application of almost 270,000 pounds in 1997, primarily on potato and alfalfa crops (NCFAP, 2000). The NCFAP based these estimates on State-level pesticide usage patterns for the period 1994–1998 and State-level crop acreage for 1997. These estimates reflect several limitations: they do not include noncropland applications, the data sources vary in quality, and State-level pesticide use data gaps are filled using data for nearby states. The USGS estimated county-level pesticide usage for 2002 based on crop acreage estimates in the 2002 Census of Agriculture and State-level application rates for the period 1999–2004 developed by the CropLife Foundation (USGS, no date), which implemented the NCFAP method for estimating pesticide usage (Gianessi and Regner, 2006) and, therefore, has similar limitations. The USGS estimates total diquat application to crops of approximately 200,000 pounds per year, with potatoes accounting for almost 90 percent of these applications (USGS, no date). Diquat use on crops occurred primarily in regions of New England, the Great Lakes, North Dakota, the Pacific Northwest, California, and Florida. In comparison to other commonly used pesticides, diquat has the lowest national estimate for use on crops (Gianessi and Regner, 2006).

The *Reregistration Eligibility Decision (RED) for Diquat Dibromide* (USEPA, 1995a) notes that although diquat is persistent (*i.e.,* it does not hydrolyze and is resistant to degradation), it becomes immobile when it adsorbs to soil particles and, therefore, is not expected to contaminate ground water. Furthermore, diquat dissipates quickly from surface water because it adsorbs to soil sediments, vegetation, and organic matter; the estimated half-life is 1 to 2 days for diquat in surface water based on a study of two ponds in Florida (USEPA, 1995a). These factors indicate the possibility of low occurrence in drinking water sources.

The BAT and small system compliance technologies for diquat have other beneficial effects, *e.g.,* removing other co-occurring contaminants. Therefore, if EPA were to consider a higher level, the Agency does not know how many PWSs that are currently treating to comply with the existing MCL of 0.02 mg/L would be likely to discontinue treatment that is already in place (USEPA, 2009d). Also, the Agency does not know to what extent affected systems might be able to reduce costs given that capital costs are not recoverable. However, the Agency recognizes that there may be opportunities to achieve operational cost savings if these systems are able to re-optimize current treatment.

Given these considerations, the Agency believes that any resulting revision is not likely to provide a meaningful opportunity for cost savings. In view of this, any revision would be a low priority activity and not appropriate at this time.

c. *Review Result.* Although there are new data that support consideration of whether to revise the MCLG/MCL for diquat, EPA does not believe a revision to the NPDWR for diquat is appropriate at this time. In making this decision, the Agency considered whether any possible revision to the NPDWR for diquat is likely to provide a meaningful opportunity for cost savings to public water systems and their customers. After consideration of this factor, EPA has decided that any revision to the NPDWR would be a low priority activity for the Agency, and, thus, is not appropriate to revise at this time because of:

- Competing workload priorities;
- The administrative costs associated with rulemaking; and
- The burden on States and the regulated community to implement any regulatory change that resulted.

34. Endothall

a. *Background.* EPA published the current NPDWR for endothall on July 17, 1992 (57 FR 31776 (USEPA, 1992)). The NPDWR established an MCLG and an MCL of 0.1 mg/L. EPA based the MCLG on a reference dose of 0.02 mg/kg-day and a cancer classification of D, not classifiable as to human carcinogenicity.

b. *Technical Reviews.* In 2005, the Agency updated its health effects assessment of endothall (USEPA, 2005d). The Agency identified a change in this assessment that could lead to a change in the MCLG. This assessment considered relevant studies on the toxicity of endothall including developmental and reproductive toxicity. The assessment revised the RfD from 0.02 mg/kg-day to 0.007 mg/kg-day and concluded that endothall is unlikely to be carcinogenic to humans (USEPA, 2005d). Based on the new OPP assessment and RfD of 0.007 mg/kg-day, and assuming a 70-kg adult body weight and 2 liters water intake per day, the DWEL could be 0.245 mg/L. An RSC of 20 percent results in a possible MCLG of 0.05 mg/L.

Because of a possible change in the MCLG for endothall, EPA considered whether analytical feasibility is likely to be a limitation if the Agency were to consider lowering the MCL to 0.05 mg/L (the possible MCLG). EPA reviewed PE data from the first Six-Year Review cycle and then analyzed more recent PT data to determine if the PQL can be revised (*i.e.,* analytical feasibility). Passing rates for PE data available through late 1999 for endothall are generally above 80 percent, but there were no results for PE studies with true values below the current PQL of 0.09 mg/L. More recent PT data from late 1999 through 2004, supplied by a PT provider, show passing rates above 75 percent for most studies, but there are four studies with passing rates equal to or less than the 75 percent criterion, including two close to the current PQL. No PT studies had true values below the current PQL. Given the variable results from the PT studies and the lack of PE and PT study results below the current PQL, PE and PT data are insufficient to support a PQL reduction (USEPA, 2009c).

While the PT data are not sufficient to support a lowering of the PQL for endothall at this time, the current PQL of 0.09 mg/L is greater than the possible MCLG. It would therefore limit a possible revision to the MCL. EPA

evaluated two alternative sources of information to determine whether they indicate any potential to revise the PQL: laboratory minimum reporting levels in the Six-Year Review ICR dataset, and the MDLs for the approved method for the detection of endothall (Method 548.1). While EPA prefers to use laboratory performance data to calculate the PQL, the MRL and MDL information can be valuable for this review to indicate whether it is possible to quantitate at levels below the current PQL. The Six-Year Review ICR dataset contains MRL values for 21,792 samples. Of these, 21,445 (98 percent) have an MRL value of 0.05 mg/L or lower. Because more than 80 percent of the MRL values are at or below the possible MCLG of 0.05 mg/L, EPA selected that value as the minimum threshold for the occurrence and exposure analysis (USEPA, 2009e). The MDL of the approved method is 0.00179 mg/L. Applying a multiplier of 10 would give a possible PQL of 0.0179 mg/L,which is below the possible MCLG (USEPA, 2009e).

Based on these varied and unrelated approaches/sources of information, there is evidence of a potential to lower the PQL for endothall even though the PE and PT data are insufficient to support a PQL reduction. To determine whether any MCL revision is likely to provide a meaningful opportunity to improve public health protection, EPA evaluated the occurrence of endothall at the possible MCLG of 0.05 mg/L (USEPA, 2009f). Table VI–15 shows the results of the occurrence and exposure analysis for the current MCL and the possible MCLG set equal to 0.05 mg/L based on the new health effects information and the laboratory minimum reporting levels in the Six-Year Review ICR dataset. The occurrence and exposure analysis shows that average concentrations do not exceed the current MCL for any system in the analysis. Note that these results are based on the subset of monitoring data provided in response to the Six-Year Review ICR and do not necessarily reflect MCL violations, which are based on running annual average concentrations at entry points; nevertheless, SDWIS/FED indicates no MCL violations for endothall between 1998 and 2005 (USEPA, 2007g). The average concentration at one of the 14,156 systems (0.007 percent), serving 10,000 people (or 0.008 percent of 119 million people), exceeds the possible MCLG based on new health effects information (0.05 mg/L).

TABLE VI–15—NUMBER AND PERCENT OF SYSTEMS WITH MEAN CONCENTRATIONS EXCEEDING ENDOTHALL THRESHOLDS AND CORRESPONDING ESTIMATES OF POPULATION SERVED

Regulatory or health-based threshold	Systems with mean concentrations that are greater than the regulatory or health-based threshold (percentages based on 14,156 systems with endothall data in the Six-Year Review ICR occurrence dataset)		
	Nondetect values = MRL [1]	Nondetect values = ½ MRL [2]	Nondetect values = 0 [3]
MCL (0.1 mg/L)	0 (0.000%)	0 (0.000%)	0 (0.000%)
Possible MCLG (0.05 mg/L)	1 (0.007%)	1 (0.007%)	1 (0.007%)
Regulatory or health-based threshold	Corresponding population served (percentages based on 118,536,800 people served by the systems with endothall data in the Six-Year Review ICR occurrence dataset)		
	Nondetect values = MRL [1]	Nondetect values = ½ MRL [2]	Nondetect values = 0 [3]
MCL (0.1 mg/L)	0 (0.000%)	0 (0.000%)	0 (0.000%)
Possible MCLG (0.05 mg/L)	10,000 (0.008%)	10,000 (0.008%)	10,000 (0.008%)

[1] Results are based on setting all nondetect results equal to MRL values in the Six-Year Review ICR dataset
[2] Results are based on setting all nondetect results equal to ½ MRL values in the Six-Year Review ICR dataset.
[3] Results are based on setting all nondetect results equal to zero.
Source: USEPA, 2009f.

Since the occurrence analysis indicates that any revision to the MCL is unlikely to provide a meaningful opportunity to improve the level of public health protection, it was not necessary to perform any additional reviews on treatment feasibility or economic considerations.

c. *Review Result.* Although there are new data that support consideration of whether to revise the MCLG/MCL for endothall, EPA does not believe a revision to the NPDWR for endothall is appropriate at this time. In making this decision, the Agency considered whether any possible revision to the NPDWR for endothall is likely to provide a meaningful opportunity for health risk reductions. Taking into consideration the low occurrence of this contaminant, EPA has decided that any revision to the NPDWR would be a low priority activity for the Agency, and, thus, is not appropriate to revise at this time because of:

- Competing workload priorities;
- The administrative costs associated with rulemaking; and
- The burden on States and the regulated community to implement any regulatory change that resulted.

35. Endrin

a. *Background.* EPA published the current NPDWR for endrin on July 17, 1992 (57 FR 31776 (USEPA, 1992)). The NPDWR established an MCLG and an MCL of 0.002 mg/L. EPA based the MCLG on a reference dose of 0.0003 mg/kg-day and a cancer classification of D, not classifiable as to human carcinogenicity.

b. *Technical Reviews.* As part of the Six-Year Review process, EPA conducted a literature search for relevant data on the toxicology of endrin, including its potential developmental and reproductive toxicity. The literature search did not identify any studies that warrant a review of the RfD or the cancer classification (USEPA, 2009b).

A review of analytical or treatment feasibility is not necessary for endrin because changes to the MCLG are not warranted at this time and the current MCL is set at the MCLG. Since EPA did not identify a health or technology basis for revising the endrin NPDWR, the Agency did not conduct a detailed occurrence and exposure analysis.

c. *Review Result.* EPA's review shows that there are no data supporting a change to the endrin NPDWR. As a result, a revision to the NPDWR would not be appropriate at this time.

36. Epichlorohydrin

a. *Background.* EPA published the current NPDWR for epichlorohydrin on January 30, 1991 (56 FR 3526 (USEPA, 1991c)). The NPDWR established an MCLG of zero based on a cancer classification of B2, probable human carcinogen. The NPDWR imposes a TT requirement that limits the allowable level of epichlorohydrin monomer in the polymer that is added to water as a flocculent to remove particulates. Each water system is required to certify, in writing, to the State (using third-party or manufacturer's certification) that the combination (or product) of dose and monomer level does not exceed the following level: 0.01 percent residual epichlorohydrin monomer in polymer products used during water treatment and dosed at 20 mg/L (ppm).

b. *Technical Reviews.* As part of the Six-Year Review process, EPA conducted a literature search for relevant data on the carcinogenicity of epichlorohydrin as well as its potential developmental and reproductive toxicity. EPA has not identified any new information that indicates that it is appropriate to consider revisions to the cancer classification for epichlorohydrin at this time (USEPA, 2009b). Because the MCLG remains at zero, the Agency believes that a further review of the health effects of epichlorohydrin is not warranted at this time.

EPA has identified information that suggests that the residual epichlorohydrin content in water treatment polymers has decreased significantly, likely due to improvements in manufacturing processes and technologies (USEPA, 2009g). NSF International analyses conducted between January 2005 and June 2007 found that, in 84 epichlorohydrin-based polymers/co-polymers submitted for certification under NSF Standard 60, the residual epichlorohydrin content was always below the detection limit of 0.002 percent.

Epichlorohydrin standards in Europe and Australia are also stricter than the NPDWR. Based on the concentration of dose and monomer level in the NPDWR, finished water could contain up to 2 μg/L (ppb) of epichlorohydrin. By contrast, the European Union requires that finished water contain less than 0.1 μg/L (ppb) epichlorohydrin, and Australia requires that the concentration in finished water be less than 0.5 μg/L (ppb). The United Kingdom requires that polymers used in drinking water contain less than 0.002 percent residual epichlorohydrin, and the dose of these polymers be less than 5 mg/L (ppm) at all times, for a maximum finished water concentration of 0.1 μg/L (ppb).

To assess the occurrence of epichlorohydrin in drinking water, EPA sought data on current usage practices for polymers containing it. The Agency is not presently aware of any recent, large-scale studies of polymer usage in drinking water facilities, and therefore cannot fully characterize the occurrence of epichlorohydrin in drinking water. However, cationic polymers used in water treatment often contain epichlorohydrin. The 1996 WATER:\STATS database (described in Levine *et al.,* 2004), based on an AWWA survey, indicates that 13 percent of ground water systems and 66 percent of surface water systems surveyed use a polymer for water treatment. Many of these are cationic polymers, particularly for surface water systems; cationic polymers used to treat drinking water often use epichlorohydrin monomer.

Additional information on the extent of use of epichlorohydrin based polymers/co-polymers in drinking water would further assist the Agency in evaluating the potential public health benefits associated with a revision to the treatment technique for epichlorohydrin. Because most epichlorohydrin-based polymers available today have a significantly lower residual monomer content than that specified in the treatment technique (2009g), EPA believes that the costs of a revision would be minimal and recognizes that benefits may also be small.

c. *Review Result.* The Agency believes it is appropriate to revise the NPDWR for epichlorohydrin. The existing MCLG is zero (based on the current B2 cancer classification) and NSF International data indicate that epichlorohydrin based polymers/copolymers are widely available with lower monomer levels than required by the existing NPDWR. Hence, revisions to the epichlorohydrin NPDWR will provide a meaningful opportunity to maintain the health risk reductions achieved by technological advances in manufacturing. As discussed in Section VII, the Agency solicits public comment on the use of epichlorohydrin-based polymers/co-polymers in drinking water facilities (since this may provide additional information on the occurrence of epichlorohydrin in drinking water) to help inform the regulatory revisions. EPA notes that any changes to the NPDWR for epichlorohydin may also include revisions to the closely related NPDWR for acrylamide.

37. Ethylbenzene

a. *Background.* EPA published the current NPDWR for ethylbenzene on January 30, 1991 (56 FR 3526 (USEPA, 1991c)). The NPDWR established an MCLG and an MCL of 0.7 mg/L. EPA based the MCLG on a reference dose of 0.1 mg/kg-day and a cancer classification of D, not classifiable as to human carcinogenicity.

b. *Technical Reviews.* EPA has initiated a reassessment of the health risks resulting from exposure to ethylbenzene. The revised health effects assessment will consider relevant studies on the toxicity of ethylbenzene, including its potential developmental and reproductive toxicity. The new health effects assessment was not completed by March 1, 2009, the review cutoff date for this notice (USEPA, 2009b). The IRIS Substance Assessment Tracking System Web site (*http://cfpub.epa.gov/iristrac/index.cfm*) has the most up-to-date information on the status of the health effects assessment.

c. *Review Result.* Since the MCL for ethylbenzene is set at its MCLG and a reassessment of the health risks resulting from exposure to ethylbenzene is in progress, the Agency does not believe a revision to the NPDWR is appropriate at this time.

38. Ethylene Dibromide (EDB; 1,2-Dibromoethane)

a. *Background.* EPA published the current NPDWR for EDB on January 30, 1991 (56 FR 3526 (USEPA, 1991c)). The NPDWR established an MCLG of zero based on a cancer classification of B2, probable human carcinogen. The NPDWR also established an MCL of 0.00005 mg/L, based on analytical feasibility.

b. *Technical Reviews.* The Agency updated the health effects assessment for EDB in 2004 and retained the cancer classification on which the 1991 MCLG is based (USEPA, 2004a). As a part of the 2004 assessment, EPA considered relevant studies on the toxicity of EDB, including its potential developmental and reproductive toxicity.

The current MCL for EDB is based on a PQL of 0.00005 mg/L. For the Six-Year Review, the Agency considered whether changes in the analytical feasibility of EDB might lead to a lower MCL. EPA reviewed PE data from the first Six-Year Review cycle and then analyzed more recent PT data to determine if the PQL can be revised (*i.e.,* analytical feasibility). Passing rates for PE data available through late 1999 for EDB are all 75 percent or higher. However, the true concentrations were all higher than the current PQL of 0.00005 mg/L. More

recent PT data from late 1999 through 2004, supplied by a PT provider, likewise show passing rates of 75 percent or higher, but again, all of the true concentrations in the PT data were higher than the current PQL. Because of the lack of data below the PQL, a lowering of the PQL for EDB is not appropriate at this time (USEPA, 2009c).

EPA evaluated two alternative sources of information to determine whether an EQL below the current PQL could be estimated: laboratory MRLs in the Six-Year Review ICR dataset, and the MDLs for approved methods for the detection of EDB (Methods 504.1 and 551.1). While EPA prefers to use laboratory performance data to calculate the PQL, the MRL and MDL information can be valuable for this review to indicate whether it is possible to quantitate at levels below the current PQL. The Six-Year Review ICR dataset contains MRL values for 83,063 samples. Fewer than 80 percent of these values are less than or equal the modal MRL: 26,926 (32 percent) equal the modal MRL of 0.00001 mg/L and an additional 454 (0.5 percent) are lower than 0.00001 mg/L. Therefore, EPA did not set the EQL equal to the modal MRL (USEPA, 2009e). The MDLs of approved methods are 0.00001 and 0.000032 mg/L. Applying a multiplier of 5, which was used to establish the PQL, would give a possible PQL range from 0.00005 to 0.00016 mg/L. The result is higher than or equal to the current PQL and, therefore, EPA did not estimate an EQL (USEPA, 2009e). Based on these varied and unrelated approaches/sources of information, EPA believes that there is no potential to lower the PQL. Since the MCL is constrained by the PQL, and the PQL is unchanged, EPA does not believe it is necessary to conduct an occurrence analysis at this time.

c. *Review Result.* EPA did not identify new data that support consideration of a possibly lower PQL (and therefore a possibly lower MCL). Therefore, EPA does not believe a revision to the NPDWR for EDB is appropriate at this time.

39. Fluoride

a. *Background.* EPA published the current NPDWR for fluoride on April 2, 1986 (51 FR 11396 (USEPA, 1986c)). The NPDWR established an MCLG and an MCL of 4.0 mg/L. The MCLG was developed from a lowest effect level for crippling skeletal fluorosis of 20 mg/day with continuous exposures over a 20-year or longer period. The lowest-observed-adverse-effect level (LOAEL) was divided by an uncertainty factor of 2.5 and a drinking water intake of 2 liters/day (L/day) to obtain the MCLG. Drinking water was considered to be the only source of exposure for the calculation. At the same time, EPA published a secondary maximum contaminant level (SMCL) for fluoride of 2.0 mg/L to protect against dental fluorosis, which was considered to be an adverse cosmetic effect. PWSs exceeding the fluoride SMCL must provide public notification to their customers.

Fluoride is unique because of its beneficial effects at low level exposures, and because it is voluntarily added to some drinking water systems as a public health measure for reducing the incidence of cavities among the treated population. The amount of fluoride added to drinking water for fluoridation ranges from 0.7 to 1.2 mg/L, depending on ambient air temperatures. The decision to fluoridate a water supply is made by the State or local municipality, and is not mandated by EPA or any other Federal entity.

b. *Technical Reviews.* As a result of the first Six-Year Review of the fluoride NPDWR (67 FR 19030 (USEPA, 2002c) (preliminary); 68 FR 42908 (USEPA, 2003e) (final)), EPA requested that the National Research Council (NRC) of the National Academies of Science (NAS) conduct a review of the recent health and exposure data on orally ingested fluoride. In 2006, the NRC published the results of their evaluation in a report entitled, *Fluoride in Drinking Water: A Scientific Review of EPA's Standards.* Based on its review, NRC concluded that severe dental fluorosis is an adverse health effect when it causes confluent thinning and pitting of the enamel, a situation that compromises the function of the enamel in protecting the dentin and eventually the pulp from decay and infection. There was consensus among the committee that severe dental fluorosis is an effect that should be avoided and that "exposure at the MCLG clearly puts children at risk of developing severe enamel fluorosis." In addition, the committee examined the scientific data on the impact of fluoride on the strength and structure of bone and the majority concluded that the MCLG "is not likely to be protective against bone fractures." NRC recommended that EPA use the available dose-response data for the effects of fluoride on severe dental fluorosis and skeletal fractures in combination with data on the relative contribution of drinking water to total fluoride exposure to identify an MCLG that would be protective against these effects.

The NRC also evaluated the impact of fluoride on reproduction and development, neurotoxicity and behavior, the endocrine system, genotoxicity, cancer and other effects. They concluded that the available data were inadequate to determine if a risk for effects on these endpoints exists at an MCLG of 4 mg/L and made recommendations for additional research. After considering the genotoxicity data, cancer studies in humans and animals, and studies of mode of action in cell systems, NRC determined that the evidence on the potential of fluoride to initiate or promote cancers, particularly of the bone, is tentative and mixed. They recommended that EPA await the results and publication of an in-process hospital-based, case-control study of osteosarcoma and fluoride exposure from the Harvard School of Dental Medicine before determining if an Agency update of the cancer risk assessment for fluoride is necessary.[19]

c. *Review Result.* The Agency does not believe a revision to the NPDWR for fluoride is appropriate at this time because the Agency's Office of Water (OW) is in the process of developing its dose-response assessment of the noncancer impacts of fluoride on severe dental fluorosis and the skeletal system. In addition, the OW is updating its evaluation of the relative contribution of drinking water to total fluoride exposure considering the contributions from dental products, foods, pesticide residues, and other sources such as ambient air and medications. Once the Agency completes and publishes peer reviewed versions of these in-process assessments, it will be able to determine the potential impacts on the MCLG, MCL, and/or the SMCL and whether any revisions to these would be appropriate.

40. Glyphosate

a. *Background.* EPA published the current NPDWR for glyphosate on July 17, 1992 (57 FR 31776 (USEPA, 1992)). The NPDWR established an MCLG and an MCL of 0.7 mg/L. EPA based the MCLG on a reference dose of 0.1 mg/kg-day and a cancer classification of D, not classifiable as to human carcinogenicity.

b. *Technical Reviews.* In 2002, the Agency updated its health effects assessment of glyphosate (USEPA, 2002a). The Agency identified a change in this assessment that could lead to a change in the MCLG. This assessment considered relevant studies on the toxicity of glyphosate including developmental and reproductive toxicity. The assessment revised the RfD from 0.1 mg/kg-day to 2 mg/kg-day and

[19] At this time, the results of the osteosarcoma cancer study recommended by NAS have not been published.

concluded that glyphosate has evidence of non-carcinogenicity in humans (USEPA, 2002a). Based on the new OPP assessment and RfD of 2 mg/kg-day, and assuming a 70-kg adult body weight and 2 liters water intake per day, the DWEL could be 70 mg/L. An RSC of 20 percent results in a possible MCLG of 14 mg/L, (USEPA, 2009b).

Analytical feasibility does not pose any limitations for the current MCL and would not be a limiting factor if EPA were to raise the MCLG. EPA evaluated the results of the occurrence and exposure analyses for glyphosate to determine whether a revised MCLG/MCL would be likely to result in a meaningful opportunity to achieve cost savings for PWSs and their customers while maintaining, or improving, the level of public health protection (USEPA, 2009f). Although the Agency obtained and evaluated the finished water occurrence data for glyphosate, its usefulness is limited for determining potential cost savings to PWSs and their customers because the Agency does not know which systems are treating for this contaminant. As an alternative, the Agency evaluated available data on source water quality and conducted a qualitative assessment of treatment cost savings.

Table VI–16 provides summary data for contaminant occurrence based on maximum sample values for the locations included in the STORET and NAWQA data. Although the degree to which these occurrence rates represent national drinking water source occurrence is uncertain, the information shows no to low occurrence at thresholds levels of interest. This information indicates that any resulting NPDWR change would not affect systems that rely on source water at any of the NAWQA or STORET locations.

TABLE VI–16—AMBIENT WATER QUALITY MONITORING OCCURRENCE SUMMARY FOR GLYPHOSATE

Maximum Concentration	Number of locations (% of locations)	
	STORET [1]	NAWQA [2]
Total	241 (100.0%)	41 (100.0%)
Nondetect	180 (74.7%)	37 (90.2%)
Detected	61 (25.3%)	4 (9.8%)
Exceeds current MCLG of 0.7 mg/L	0 (0.0%)	0 (0.0%)
Exceeds alternative value of 14.0 mg/L	0 (0.0%)	0 (0.0%)

[1] STORET database 2002–2007.
[2] NAWQA database 1992–2005.
Source: USEPA, 2009d.

The BAT and small system compliance technologies for glyphosate have other beneficial effects, *e.g.,* pretreatment for other co-occurring contaminants or disinfection. Therefore, if EPA were to consider a higher level, the Agency does not know how many PWSs that are currently treating to comply with the existing MCL of 0.7 mg/L would be likely to discontinue treatment that is already in place (USEPA, 2009d). Also, the Agency does not know to what extent affected systems might be able to reduce costs given that capital costs are not recoverable. However, the Agency recognizes that there may be opportunities to achieve operational cost savings if these systems are able to re-optimize current treatment.

Given these considerations, the Agency believes that any resulting revision is not likely to provide a meaningful opportunity for cost savings. In view of this, any revision would be a low priority activity and not appropriate at this time.

c. *Review Result.* Although there are new data that support consideration of whether to revise the MCLG/MCL for glyphosate, EPA does not believe a revision to the NPDWR for glyphosate is appropriate at this time. In making this decision, the Agency considered whether any possible revision to the NPDWR for glyphosate is likely to provide a meaningful opportunity for cost savings to public water systems and their customers. Taking into consideration the low occurrence of this contaminant in source waters, EPA has decided that any revision to the NPDWR would be a low priority activity for the Agency, and, thus, is not appropriate to revise at this time because of:

- Competing workload priorities;
- The administrative costs associated with rulemaking; and
- The burden on States and the regulated community to implement any regulatory change that resulted.

41. Heptachlor

a. *Background.* EPA published the current NPDWR for heptachlor on January 30, 1991 (56 FR 3526 (USEPA, 1991c)). The NPDWR established an MCLG of zero based on a cancer classification of B2, probable human carcinogen. The NPDWR also established an MCL of 0.0004 mg/L, based on analytical feasibility.

b. *Technical Reviews.* As part of the Six-Year Review process, EPA conducted a literature search for relevant data on the carcinogenicity of heptachlor as well as its potential developmental and reproductive toxicity. EPA has not identified any new information that indicates that it is appropriate to consider revisions to the cancer classification for heptachlor at this time (USEPA, 2009b). Because the MCLG remains at zero, the Agency believes that a further review of the health effects of heptachlor is not warranted at this time.

The current MCL for heptachlor is based on a PQL of 0.0004 mg/L. For the Six-Year Review, the Agency considered whether changes in the analytical feasibility of heptachlor might lead to a lower MCL. EPA reviewed PE data from the first Six-Year Review cycle and then analyzed more recent PT data to determine if the PQL can be revised (*i.e.,* analytical feasibility). Passing rates for PE data available through late 1999 for heptachlor are above 90 percent around the current PQL of 0.0004 mg/L, including three studies with true values below the current PQL. All passing rates in the PE data exceeded 80 percent. More recent PT data from late 1999 through 2004, supplied by a PT provider, show greater than 75 percent passing rates for a majority of studies, but there are no studies with true values below the current PQL. There are three PT studies with passing rates below 75 percent. Despite this variability, most of the laboratory passing rates from PE and PT studies, including three with true values below the PQL, exceeded the 75 percent criterion typically used to derive a PQL. Therefore, a lowering of the PQL for heptachlor might be possible. These results, however, are insufficient to recalculate a revised PQL for heptachlor because not enough data points are available below the current

PQL to derive a value at the 75 percent passing rate (USEPA, 2009c).

EPA evaluated two alternative sources of information to determine whether an EQL below the current PQL could be estimated: laboratory MRLs in the Six-Year Review ICR dataset, and the MDLs for approved methods for the detection of heptachlor (Methods 505, 508, 508.1, 525.2, and 551.1). While EPA prefers to use laboratory performance data to calculate the PQL, the MRL and MDL information can be valuable for this review to indicate whether it is possible to quantitate at levels below the current PQL. The Six-Year Review ICR dataset contains MRL values for 58,758 samples. Fewer than 80 percent of these values are less than or equal the modal MRL: 24,918 (42 percent) equal the modal MRL of 0.00004 mg/L and an additional 7,966 (14 percent) are lower than 0.00004 mg/L. Therefore, EPA did not set the EQL equal to the modal MRL (USEPA, 2009e). The MDLs of approved methods are 0.000003, 0.0000015, 0.000005, 0.00015, and 0.000081 mg/L. Applying a multiplier of 10 would give a possible PQL range from 0.000015 to 0.0015 mg/L. EPA used the median 10×MDL value of 0.00005 mg/L and rounded up to 0.0001 mg/L for the EQL (USEPA, 2009e).

Based on these varied and unrelated approaches/sources of information, EPA believes that there may be potential to lower the PQL for heptachlor. To determine whether any MCL revision is likely to provide a meaningful opportunity to improve public health protection, EPA evaluated the occurrence of heptachlor at the EQL of 0.0001 mg/L and additional threshold of 0.0002 mg/L (USEPA, 2009f). Table VI–17 shows the results of the occurrence and exposure analysis for the current MCL and these thresholds. The occurrence and exposure analysis shows that average concentrations exceed the current MCL for one of 33,020 systems (0.003 percent) serving 325 people (or 0.0002 percent of 184 million people). Note that these results are based on the subset of monitoring data provided in response to the Six-Year Review ICR and do not necessarily reflect MCL violations, which are based on annual average concentrations at entry points; SDWIS/FED indicates no MCL violations for heptachlor between 1998 and 2005 (USEPA, 2007g). Average concentrations at 42 of 33,020 systems (0.127 percent), serving 31,500 people (or 0.017 percent of 184 million people), exceed the EQL of 0.0001 mg/L.

TABLE VI–17—NUMBER AND PERCENT OF SYSTEMS WITH MEAN CONCENTRATIONS EXCEEDING HEPTACHLOR THRESHOLDS AND CORRESPONDING ESTIMATES OF POPULATION SERVED

Regulatory or feasibility-based threshold	Systems with mean concentrations that are greater than the regulatory or feasibility-based threshold (percentages based on 33,020 systems with heptachlor data in the Six-Year Review ICR occurrence dataset)		
	Nondetect values = MRL [1]	Nondetect values = ½ MRL [2]	Nondetect values = 0 [3]
MCL (0.0004 mg/L)	1 (0.003%)	1 (0.003%)	1 (0.003%)
½ MCL (0.0002 mg/L)	1 (0.003%)	1 (0.003%)	1 (0.003%)
EQL (0.0001 mg/L)	42 (0.127%)	42 (0.127%)	42 (0.127%)
	Corresponding population served (percentages based on 184,444,000 people served by the systems with heptachlor data in the Six-Year Review ICR occurrence dataset)		
Regulatory or feasibility-based threshold	Nondetect values = MRL [1]	Nondetect values = ½ MRL [2]	Nondetect values = 0 [3]
MCL (0.0004 mg/L)	325 (0.0002%)	325 (0.0002%)	325 (0.0002%)
½ MCL (0.0002 mg/L)	325 (0.0002%)	325 (0.0002%)	325 (0.0002%)
EQL (0.0001 mg/L)	31,500 (0.017%)	31,500 (0.017%)	31,500 (0.019%)

[1] Results are based on setting all nondetect results equal to MRL values in the Six-Year Review ICR dataset.
[2] Results are based on setting all nondetect results equal to ½ MRL values in the Six-Year Review ICR dataset.
[3] Results are based on setting all nondetect results equal to zero.
Source: USEPA, 2009f.

Since the occurrence analysis indicates that any revision to the MCL is unlikely to provide a meaningful opportunity to improve the level of public health protection, it was not necessary to perform any additional reviews on treatment feasibility or economic considerations.

c. *Review Result.* Although there are new data that support consideration of a possibly lower PQL (and therefore a possibly lower MCL), EPA does not believe a revision to the NPDWR for heptachlor is appropriate at this time. The occurrence and exposure analysis based on possible changes in analytical feasibility indicates that any revision to the MCL is unlikely to provide a meaningful opportunity to improve public health protection. Taking into consideration the low occurrence of this contaminant, EPA has decided that any revision to the NPDWR would be a low priority activity for the Agency, and, thus, is not appropriate to revise at this time because of:

- Competing workload priorities;
- The administrative costs associated with rulemaking; and
- The burden on States and the regulated community to implement any regulatory change that resulted.

42. Heptachlor Epoxide

a. *Background.* EPA published the current NPDWR for heptachlor epoxide on January 30, 1991 (56 FR 3526 (USEPA, 1991c)). The NPDWR established an MCLG of zero based on a cancer classification of B2, probable human carcinogen. The NPDWR also established an MCL of 0.0002 mg/L, based on analytical feasibility.

b. *Technical Reviews.* As part of the Six-Year Review process, EPA conducted a literature search for relevant data on the carcinogenicity of heptachlor epoxide as well as its potential developmental and reproductive toxicity. EPA has not identified any new information that indicates that it is appropriate to consider revisions to the cancer classification for heptachlor epoxide at this time (USEPA, 2009b). Because the MCLG remains at zero, the Agency believes that a further review of the health effects of heptachlor epoxide is not warranted at this time.

The current MCL for heptachlor epoxide is based on a PQL of 0.0002 mg/L. For the Six-Year Review, the Agency

considered whether changes in the analytical feasibility of heptachlor epoxide might lead to a lower MCL. EPA reviewed PE data from the first Six-Year Review cycle and then analyzed more recent PT data to determine if the PQL can be revised (*i.e.,* analytical feasibility). Passing rates for PE data available through late 1999 for heptachlor epoxide are above 85 percent around the current PQL of 0.0002 mg/L, including two studies with true values below the current PQL. All passing rates in the PE data exceeded 80 percent. More recent PT data from late 1999 through 2004, supplied by a PT provider, show greater than 75 percent passing rates for a majority of studies, but there are no studies with true values below the PQL. There are two PT studies with passing rates below 75 percent. Despite this variability, most of the laboratory passing rates from PE and PT studies exceeded the 75 percent criterion typically used to derive a PQL. Therefore, a lowering of the PQL for heptachlor epoxide might be possible. These results, however, are insufficient to recalculate a revised PQL for heptachlor epoxide because not enough data points are available below the current PQL to derive a value at the 75 percent passing rate (USEPA, 2009c).

EPA evaluated two alternative sources of information to determine whether an EQL below the current PQL could be estimated: Laboratory MRLs in the Six-Year Review ICR dataset, and the MDLs for approved methods for the detection of heptachlor epoxide (Methods 505, 508, 508.1, 525.2, and 551.1). While EPA prefers to use laboratory performance data to calculate the PQL, the MRL and MDL information can be valuable for this review to indicate whether it is possible to quantitate at levels below the current PQL. The Six-Year Review ICR dataset contains MRL values for 58,731 samples. Fewer than 80 percent of these values are less than or equal the modal MRL: 26,424 (45 percent) equal the modal MRL of 0.00002 mg/L and an additional 5,969 (10 percent) are lower than 0.00002 mg/L. Therefore, EPA did not set the EQL equal to the modal MRL (USEPA, 2009e). The MDLs of approved methods are 0.000004, 0.0000059, 0.000001, 0.00013, and 0.000202 mg/L. Applying a multiplier of 10 would give a possible PQL range from 0.00001 to 0.00202 mg/L. EPA used the median 10 × MDL value of 0.000059 mg/L and rounded up to 0.0001 mg/L for the EQL (USEPA, 2009e).

Based on these varied and unrelated approaches/sources of information, EPA believes that there may be potential to lower the PQL for heptachlor epoxide. To determine whether any MCL revision is likely to provide a meaningful opportunity to improve public health protection, EPA evaluated the occurrence of heptachlor epoxide at an EQL of 0.0001 mg/L (USEPA, 2009f). Table VI–18 shows the results of the occurrence and exposure analysis for the current MCL and an EQL. The occurrence and exposure analysis shows that average concentrations exceed the current MCL for one of 33,015 systems (0.003 percent) serving 325 people (or 0.0002 percent of 184 million people). Note that these results are based on the subset of monitoring data provided in response to the Six-Year Review ICR and do not necessarily reflect MCL violations, which are based on annual average concentrations at entry points; SDWIS/FED indicates two MCL violations for heptachlor epoxide between 1998 and 2005 (USEPA, 2007g). Average concentrations at three of 33,015 systems (0.009 percent), serving 14,400 people (or 0.008 percent of 184 million people), exceed the EQL of 0.0001 mg/L.

TABLE VI–18—NUMBER AND PERCENT OF SYSTEMS WITH MEAN CONCENTRATIONS EXCEEDING HEPTACHLOR EPOXIDE THRESHOLDS AND CORRESPONDING ESTIMATES OF POPULATION SERVED

Regulatory or feasibility-based threshold	Systems with mean concentrations that are greater than the regulatory or feasibility-based threshold (percentages based on 33,015 systems with heptachlor epoxide data in the Six-Year Review ICR occurrence dataset)		
	Nondetect values = MRL [1]	Nondetect values = ½ MRL [2]	Nondetect values = 0 [3]
MCL (0.0002 mg/L)	1 (0.003%)	1 (0.003%)	1 (0.003%)
EQL (0.0001 mg/L)	3 (0.009%)	3 (0.009%)	3 (0.009%)
	Corresponding population served (percentages based on 184,478,000 people served by the systems with heptachlor epoxide data in the Six-Year Review ICR occurrence dataset)		
Regulatory or feasibility-based threshold	Nondetect values = MRL [1]	Nondetect Values = ½ MRL [2]	Nondetect Values = 0 [3]
MCL (0.0002 mg/L)	325 (0.0002%)	325 (0.0002%)	325 (0.002%)
EQL (0.0001 mg/L)	14,400 (0.008%)	14,400 (0.008%)	14,400 (0.008%)

[1] Results are based on setting all nondetect results equal to MRL values in the Six-Year Review ICR dataset.
[2] Results are based on setting all nondetect results equal to ½ MRL values in the Six-Year Review ICR dataset.
[3] Results are based on setting all nondetect results equal to zero.
Source: USEPA, 2009f.

Since the occurrence analysis indicates that any revision to the MCL is unlikely to provide a meaningful opportunity to improve the level of public health protection, it was not necessary to perform any additional reviews on treatment feasibility or economic considerations.

c. *Review Result.* Although there are new data that support consideration of a possibly lower PQL (and therefore a possibly lower MCL), EPA does not believe a revision to the NPDWR for heptachlor epoxide is appropriate at this time. The occurrence and exposure analysis based on possible changes in analytical feasibility indicates that any revision to the MCL is unlikely to provide a meaningful opportunity to improve public health protection. Taking into consideration the low occurrence of this contaminant, EPA has decided that any revision to the NPDWR would be a low priority activity for the Agency, and, thus, is not appropriate to revise at this time because of:

- Competing workload priorities;
- The administrative costs associated with rulemaking; and
- The burden on States and the regulated community to implement any regulatory change that resulted.

43. Hexachlorobenzene

a. *Background.* EPA published the current NPDWR for hexachlorobenzene on July 17, 1992 (57 FR 31776 (USEPA, 1992)). The NPDWR established an MCLG of zero based on a cancer classification of B2, probable human carcinogen. The NPDWR also established an MCL of 0.001 mg/L, based on analytical feasibility.

b. *Technical Reviews.* As part of the Six-Year Review process, EPA conducted a literature search for relevant data on the carcinogenicity of hexachlorobenzene as well as its potential developmental and reproductive toxicity. EPA has not identified any new information that indicates that it is appropriate to consider revisions to the cancer classification for hexachlorobenzene at this time (USEPA, 2009b). Because the MCLG remains at zero, the Agency believes that a further review of the health effects of hexachlorobenzene is not warranted at this time.

The current MCL for hexachlorobenzene is based on a PQL of 0.001 mg/L. For the Six-Year Review, the Agency considered whether changes in the analytical feasibility of hexachlorobenzene might lead to a lower MCL. EPA reviewed PE data from the first Six-Year Review cycle and then analyzed more recent PT data to determine if the PQL can be revised (*i.e.,* analytical feasibility). Passing rates for PE data available through late 1999 for hexachlorobenzene are above 80 percent around the current PQL of 0.001 mg/L, including eight studies with true values below the current PQL. More recent PT data from late 1999 through 2004, supplied by a PT provider, also show greater than 75 percent passing rates for a majority of studies, including eight out of nine studies with true values below the current PQL. There are two PT studies with passing rates equal to or less than 75 percent, including one with a true value below the PQL. Despite this variability, most of the laboratory passing rates from PE and PT studies—including several with true concentrations below the PQL—exceeded the 75 percent criterion typically used to derive a PQL. Therefore, a lowering of the PQL for hexachlorobenzene might be possible. These results, however, are insufficient to recalculate a revised PQL for hexachlorobenzene because not enough data points are available below the current PQL to derive a value at the 75 percent passing rate (USEPA, 2009c).

EPA evaluated two alternative sources of information to determine whether an EQL below the current PQL could be estimated: Laboratory MRLs in the Six-Year Review ICR dataset, and the MDLs for approved methods for the detection of hexachlorobenzene (Methods 505, 508, 508.1, 525.2, and 551.1). While EPA prefers to use laboratory performance data to calculate the PQL, the MRL and MDL information can be valuable for this review to indicate whether it is possible to quantitate at levels below the current PQL. The Six-Year Review ICR dataset contains MRL values for 58,713 samples. More than 80 percent of these values are less than or equal the modal MRL: 40,791 (69 percent) equal the modal MRL of 0.0001 mg/L and an additional 7,380 (13 percent) are lower than 0.0001 mg/L. Therefore, EPA selected the modal MRL as the EQL (USEPA, 2009e). The MDLs of approved methods are 0.000002, 0.0000077, 0.000001, 0.00013, and 0.000003 mg/L. Applying a multiplier of 10 would give a possible PQL range from 0.00001 to 0.0013 mg/L, which contains the EQL (USEPA, 2009e).

Based on these varied and unrelated approaches/sources of information, EPA believes that there is potential to lower the PQL for hexachlorobenzene. To determine whether any MCL revision is likely to provide a meaningful opportunity to improve public health protection, EPA evaluated the occurrence of hexachlorobenzene at the EQL of 0.0001 mg/L and an additional threshold of 0.0005 mg/L (USEPA, 2009f). Table VI–19 shows the results of the occurrence and exposure analysis for the current MCL and these thresholds. The occurrence and exposure analysis shows that average concentrations exceed the current MCL for three of 32,826 systems (0.009 percent) serving 2,000 people (or 0.001 percent of 184 million people). Note that these results are based on the subset of monitoring data provided in response to the Six-Year Review ICR and do not necessarily reflect MCL violations, which are based on annual average concentrations at entry points; SDWIS/FED indicates two MCL violations for hexachlorobenzene between 1998 and 2005 (USEPA, 2007g). Average concentrations at 9 to 16 of 32,826 systems (0.027 to 0.049 percent), serving approximately 9,000 to 94,000 people (or 0.005 to 0.051 percent of 184 million people), exceed the EQL of 0.0001 mg/L.

TABLE VI–19—NUMBER AND PERCENT OF SYSTEMS WITH MEAN CONCENTRATIONS EXCEEDING HEXACHLOROBENZENE THRESHOLDS AND CORRESPONDING ESTIMATES OF POPULATION SERVED

Regulatory or feasibility-based threshold	Systems with mean concentrations that are greater than the regulatory or feasibility-based threshold (percentages based on 32,826 systems with hexachlorobenzene data in the Six-Year Review ICR occurrence dataset)		
	Nondetect values = MRL [1]	Nondetect values = ½ MRL [2]	Nondetect values = 0 [3]
MCL (0.001 mg/L)	3 (0.009%)	3 (0.009%)	3 (0.009%)
½ MCL (0.0005 mg/L)	4 (0.012%)	4 (0.012%)	4 (0.012%)
EQL (0.0001 mg/L)	not applicable	16 (0.049%)	9 (0.027%)
Regulatory or feasibility-based threshold	Corresponding population served (percentages based on 184,124,800 people served by the systems with hexachlorobenzene data in the Six-Year Review ICR occurrence dataset)		
	Nondetect values = MRL [1]	Nondetect values = ½ MRL [2]	Nondetect values = 0 [3]
MCL (0.001 mg/L)	2,000 (0.001%)	2,000 (0.001%)	2,000 (0.001%)
½ MCL (0.0005 mg/L)	5,000 (0.003%)	5,000 (0.003%)	5,000 (0.003%)
EQL (0.0001 mg/L)	not applicable	94,000 (0.051%)	9,000 (0.005%)

[1] Results are based on setting all nondetect results equal to MRL values in the Six-Year Review ICR dataset. Results are not reported at the EQL of 0.001 mg/L because this is the modal MRL and setting a majority of the results equal to this value results in an upwardly biased estimate of the number of systems with mean concentrations that exceed this value.

[2] Results are based on setting all nondetect results equal to ½ MRL values in the Six-Year Review ICR dataset.

[3] Results are based on setting all nondetect results equal to zero.

Source: USEPA, 2009f.

Since the occurrence analysis indicates that any revision to the MCL is unlikely to provide a meaningful opportunity to improve the level of public health protection, it was not necessary to perform any additional reviews on treatment feasibility or economic considerations.

c. *Review Result.* Although there are new data that support consideration of a possibly lower PQL (and therefore a possibly lower MCL), EPA does not believe a revision to the NPDWR for hexachlorobenzene is appropriate at this time. The occurrence and exposure analysis based on possible changes in analytical feasibility indicates that any revision to the MCL is unlikely to provide a meaningful opportunity to improve public health protection. Taking into consideration the low occurrence of this contaminant, EPA has decided that any revision to the NPDWR would be a low priority activity for the Agency, and, thus, is not appropriate to revise at this time because of:

- Competing workload priorities;
- The administrative costs associated with rulemaking; and
- The burden on States and the regulated community to implement any regulatory change that resulted.

44. Hexachlorocyclopentadiene

a. *Background.* EPA published the current NPDWR for hexachlorocyclopentadiene on July 17, 1992 (57 FR 31776 (USEPA, 1992)). The NPDWR established an MCLG and an MCL of 0.05 mg/L. EPA based the MCLG on a reference dose of 0.007 mg/kg-day and a cancer classification of D, not classifiable as to human carcinogenicity.

b. *Technical Reviews.* In the first Six-Year Review cycle, EPA evaluated new information from a health effects assessment completed in 2001 (USEPA, 2001b). At that time, the Agency could not determine that a revision to the NPDWR would provide a meaningful opportunity for public health protection (67 FR 19030 (USEPA, 2002c)). The 2001 assessment considered relevant studies on the toxicity of hexachlorocyclopentadiene including developmental and reproductive toxicity. The assessment revised the RfD from 0.007 mg/kg-day to 0.006 mg/kg-day (USEPA, 2001b). In the current review cycle, EPA conducted a literature search through June 2007 for relevant data on the toxicology of hexachlorocyclopentadiene, including its potential developmental and reproductive toxicity. The literature search did not identify any new data that would affect the RfD or cancer classification (USEPA, 2009b). Based on the 2001 IRIS assessment and RfD of 0.006 mg/kg-day, and assuming a 70-kg adult body weight and 2 liters water intake per day, the DWEL could be 0.21 mg/L. An RSC of 20 percent results in a possible MCLG of 0.04 mg/L (USEPA, 2009b).

Analytical feasibility does not pose any limitations for the current MCL and would not be a limiting factor for the possible MCLG decrease under consideration.

EPA evaluated the results of the occurrence and exposure analyses for hexachlorocyclopentadiene to determine whether a revised MCLG/MCL would be likely to result in a meaningful opportunity to improve the level of public health protection (USEPA, 2009f). Table VI–20 shows the results of the occurrence and exposure analysis for the current MCL and the possible MCLG. The occurrence and exposure analysis shows that average concentrations do not exceed the current MCL for any systems in the analysis. Note that these results are based on the subset of monitoring data provided in response to the Six-Year Review ICR and do not necessarily reflect MCL violations, which are based on running annual average concentrations at entry points; SDWIS/FED indicates no MCL violations for hexachlorocyclopentadiene between 1998 and 2005 (USEPA, 2007g). The occurrence and exposure analysis shows that average concentration do not exceed the possible MCLG based on health effects information (0.04 mg/L).

TABLE VI–20—NUMBER AND PERCENT OF SYSTEMS WITH MEAN CONCENTRATIONS EXCEEDING HEXACHLOROCYCLOPENTADIENE THRESHOLDS AND CORRESPONDING ESTIMATES OF POPULATION SERVED

Regulatory or health-based threshold	Systems with mean concentrations that are greater than the regulatory or health-based threshold (percentages based on 32,801 systems with hexachlorocyclopentadiene data in the Six-Year Review ICR occurrence dataset)		
	Nondetect values = MRL [1]	Nondetect values = ½ MRL [2]	Nondetect values = 0 [3]
MCL (0.05 mg/L)	0 (0.000%)	0 (0.000%)	0 (0.000%)
Possible MCLG (0.04 mg/L)	0 (0.000%)	0 (0.000%)	0 (0.000%)
	Corresponding population served (percentages based on 184,738,000 people served by the systems with hexachlorocyclopentadiene data in the Six-Year Review ICR occurrence dataset)		
Regulatory or health-based threshold	Nondetect values = MRL [1]	Nondetect values = ½ MRL [2]	Nondetect values = 0 [3]
MCL (0.05 mg/L)	0 (0.000%)	0 (0.000%)	0 (0.000%)
Possible MCLG (0.04 mg/L)	0 (0.000%)	0 (0.000%)	0 (0.000%)

[1] Results are based on setting all nondetect results equal to MRL values in the Six-Year Review ICR dataset.
[2] Results are based on setting all nondetect results equal to ½ MRL values in the Six-Year Review ICR dataset.
[3] Results are based on setting all nondetect results equal to zero.
Source: USEPA, 2009f.

Since the occurrence analysis indicates that any revision to the MCL is unlikely to provide a meaningful opportunity to improve the level of public health protection, it was not necessary to perform any additional reviews on treatment feasibility or economic considerations.

c. *Review Result.* Although there are new data that support consideration of whether to revise the MCLG/MCL for hexachlorocyclopentadiene, EPA does not believe a revision to the NPDWR for hexachlorocyclopentadiene is appropriate at this time. In making this

decision, the Agency considered whether any possible revision to the NPDWR for hexachlorocyclopentadiene is likely to provide a meaningful opportunity for health risk reductions. Taking into consideration the low occurrence of this contaminant, EPA has decided that any revision to the NPDWR would be a low priority activity for the Agency, and, thus, is not appropriate to revise at this time because of:

- Competing workload priorities;
- The administrative costs associated with rulemaking; and
- The burden on States and the regulated community to implement any regulatory change that resulted.

45. Lindane (gamma-Hexachlorocyclohexane)

a. *Background.* EPA published the current NPDWR for lindane on January 30, 1991 (56 FR 3526 (USEPA, 1991c)). The NPDWR established an MCLG and an MCL of 0.0002 mg/L. EPA based the MCLG on a reference dose of 0.0003 mg/kg-day and a cancer classification of C, possible human carcinogen.

b. *Technical Reviews.* In the first Six-Year Review cycle, EPA evaluated new information from a health effects assessment completed in 2002 (USEPA, 2006b). At that time, the Agency could not determine that a revision to the NPDWR would provide a meaningful opportunity for cost savings to public water systems or their customers, and decided that any revision would be a low priority activity for the Agency because of competing workload priorities, the administrative costs associated with rulemaking, and the burden on States and the regulated community to implement any regulatory change (68 FR 42908, July 18, 2003 (USEPA, 2003e)). The 2002 assessment considered relevant studies on the toxicity of lindane including developmental and reproductive toxicity. The assessment revised the RfD from 0.0003 mg/kg-day to 0.0047 mg/kg-day and classified it as "Suggestive evidence of carcinogenicity, but not sufficient to assess human carcinogenic potential" (USEPA, 2006b). During the current review cycle, all uses of lindane were cancelled voluntarily (71 FR 74905, December 13, 2006 (USEPA, 2006e)), effective July 1, 2007. However, lindane is a persistent and bioaccumulative pesticide. Accordingly, EPA conducted a literature search for relevant data on the toxicology of lindane, including its potential developmental and reproductive toxicity. The literature search did not identify any additional new data that would affect the RfD or cancer classification (USEPA, 2009b).The possible revised MCLG is based on the 2002 OPP assessment and RfD of 0.0047 mg/kg-day, a body weight of 70 kg, water intake of 2 L/day, and an RSC of 20 percent. Uncertainty factors related to reproductive and developmental effects, and/or a possible risk management factor based on the suggested evidence of carcinogenicity, could be used in developing a possible revised MCLG. Depending on the choice of uncertainty factors, the MCLG could range between 0.001 mg/L and 0.03 mg/L.

Analytical feasibility does not pose any limitations for the current MCL and would not be a limiting factor if EPA were to raise the MCLG. EPA evaluated the results of the occurrence and exposure analyses for lindane to determine whether a revised MCLG/MCL would be likely to result in a meaningful opportunity to achieve cost savings for PWSs and their customers while maintaining, or improving, the level of public health protection (USEPA, 2009f). Although the Agency obtained and evaluated the finished water occurrence data for lindane, its usefulness is limited for determining potential cost savings to PWSs and their customers because the Agency does not know which systems are treating for this contaminant. As an alternative, the Agency evaluated available data on source water quality and conducted a qualitative assessment of treatment cost savings.

Table VI–21 provides summary data for contaminant occurrence based on maximum sample values for the locations included in the STORET and NAWQA. Although the degree to which these occurrence rates represent national drinking water source occurrence is uncertain, the information shows no to low occurrence at threshold levels of interest. In the upper bound analysis, an NPDWR change would affect systems that rely on source water at less than 0.01 percent of the NAWQA locations and less than 0.3 percent of the STORET locations. Any MCLG/MCL revision to a potentially higher level of 0.001 mg/L (the lower bound) or 0.03 mg/L (the upper bound) would likely affect fewer systems.

TABLE VI–21—AMBIENT WATER QUALITY MONITORING OCCURRENCE SUMMARY FOR LINDANE

Maximum concentration	Number of locations (% of locations)	
	STORET [1]	NAWQA [2]
Total	2,691 (100.0%)	8,195 (100.0%)
Nondetect	2,017 (75%)	8,058 (98.3%)
Detected	674 (25%)	137 (1.7%)
Exceeds current MCLG of 0.0002 mg/L	7 (0.26%)	1 (0.01%)
Exceeds upper bound alternative value of 0.03 mg/L	1 (0.04%)	0 (0.0%)

[1] STORET database 2002–2007.
[2] NAWQA database 1992–2005.
Source: USEPA, 2009d.

The BATs and small system compliance technologies for lindane have other beneficial effects, *e.g.,* reduction of other co-occurring contaminants, precursors for DBPs, or other common impurities. Therefore, if EPA were to consider a higher level, the Agency does not know how many PWSs that are currently treating to comply with the existing MCL of 0.0002 mg/L would be likely to discontinue treatment that is already in place (USEPA, 2009d). Also, the Agency does not know to what extent affected systems might be able to reduce costs given that capital costs are not recoverable. However, the Agency recognizes that there may be opportunities to achieve operational cost savings if these systems are able to re-optimize current treatment.

Given these considerations, the Agency believes that any resulting revision is not likely to provide a meaningful opportunity for cost savings. In view of this, any revision would be

a low priority activity and not appropriate at this time.

c. *Review Result.* Although there are new data that support consideration of whether to revise the MCLG/MCL for lindane, EPA does not believe a revision to the NPDWR for lindane is appropriate at this time. In making this decision, the Agency considered whether any possible revision to the NPDWR for lindane is likely to provide a meaningful opportunity for cost savings to public water systems and their customers. Taking into consideration the low occurrence of this contaminant in source waters, EPA has decided that any revision to the NPDWR would be a low priority activity for the Agency, and, thus, is not appropriate to revise at this time because of:

- Competing workload priorities;
- The administrative costs associated with rulemaking; and
- The burden on States and the regulated community to implement any regulatory change that resulted.

46. Mercury (Inorganic)

a. *Background.* EPA published the current NPDWR for inorganic mercury on January 30, 1991 (56 FR 3526 (USEPA, 1991c)). The NPDWR established an MCLG and an MCL of 0.002 mg/L. The Agency based the MCLG on a DWEL of 0.01 mg/L [20] and a cancer classification of D, not classifiable as to human carcinogenicity.

b. *Technical Reviews.* As part of the Six-Year Review process, EPA conducted a literature search for relevant data on the toxicology of inorganic mercury, including its potential developmental and reproductive toxicity. The literature search did not identify any studies that warrant a review of the RfD or the cancer classification (USEPA, 2009b).

A review of analytical or treatment feasibility is not necessary for inorganic mercury because changes to the MCLG are not warranted at this time and the current MCL is set at the MCLG. Since EPA did not identify a health or technology basis for revising the inorganic mercury NPDWR, the Agency did not conduct a detailed occurrence and exposure analysis.

c. *Review Result.* EPA's review shows that there are no data supporting a change to the inorganic mercury NPDWR. As a result, a revision to the NPDWR would not be appropriate at this time.

[20] The DWEL was recommended by a panel of experts on mercury, and was derived using the weight of evidence from the entire inorganic mercury database. The DWEL was later back-calculated to an RfD of 0.0003 mg/kg-day (USEPA, 1995).

47. Methoxychlor

a. *Background.* EPA published the current NPDWR for methoxychlor on January 30, 1991 (56 FR 3526 (USEPA, 1991c)). The NPDWR established an MCLG and an MCL of 0.04 mg/L. EPA based the MCLG on a reference dose of 0.005 mg/kg-day and a cancer classification of D, not classifiable as to human carcinogenicity.

b. *Technical Reviews.* As part of the Six-Year Review process, EPA conducted a literature search for relevant data on the toxicology of methoxychlor, including its potential developmental and reproductive toxicity. The literature search did not identify any studies that warrant a review of the RfD or the cancer classification (USEPA, 2009b). The Six-Year Review 1 stated that the Agency had initiated a reassessment of the health risks posed by exposure to methoxychlor (67 FR 19030 (USEPA, 2002c)). Since 2002, the Agency has cancelled all product uses and concluded that the database to complete the health effects assessment for methoxychlor was inadequate (USEPA, 2004c). In its Reregistration Eligibility Decision, OPP noted substantive data gaps for methoxychlor, including lack of Guideline studies for chronic systemic toxicity as well as reproductive and developmental toxicity (USEPA, 2004c).

A review of analytical or treatment feasibility is not necessary for methoxychlor because changes to the MCLG are not warranted at this time and the current MCL is set at the MCLG. Since EPA did not identify a health or technology basis for revising the methoxychlor NPDWR, the Agency did not conduct a detailed occurrence and exposure analysis.

c. *Review Result.* EPA's review shows that there are no data supporting a change to the methoxychlor NPDWR. As a result, a revision to the NPDWR would not be appropriate at this time.

48. Monochlorobenzene (Chlorobenzene)

a. *Background.* EPA published the current NPDWR for monochlorobenzene on January 30, 1991 (56 FR 3526 (USEPA, 1991c)). The NPDWR established an MCLG and an MCL of 0.1 mg/L. EPA based the MCLG on a reference dose of 0.02 mg/kg-day and a cancer classification of D, not classifiable as to human carcinogenicity.

b. *Technical Reviews.* As part of the Six-Year Review process, EPA conducted a literature search for relevant data on the toxicology of monochlorobenzene, including its potential developmental and reproductive toxicity. The literature search did not identify any studies that warrant a review of the RfD or the cancer classification (USEPA, 2009b).

A review of analytical or treatment feasibility is not necessary for monochlorobenzene because changes to the MCLG are not warranted at this time and the current MCL is set at the MCLG. Since EPA did not identify a health or technology basis for revising the monochlorobenzene NPDWR, the Agency did not conduct a detailed occurrence and exposure analysis.

c. *Review Result.* EPA's review shows that there are no data supporting a change to the monochlorobenzene NPDWR. As a result, a revision to the NPDWR would not be appropriate at this time.

49. Nitrate (as N)

a. *Background.* EPA published the current NPDWR for nitrate on January 30, 1991 (56 FR 3526 (USEPA, 1991c)). The NPDWR established an MCLG and an MCL of 10 mg/L (as N). EPA based the MCLG on a survey of epidemiologic studies of infant methemoglobinemia in populations exposed to nitrate contaminated water. No cancer classification is currently available for nitrate (USEPA, 2009b).

b. *Technical Reviews.* The health effects technical review identified new information on developmental effects of nitrate, as well as data regarding its carcinogenicity, that may indicate the need to update the Agency's health effects assessment (USEPA, 2009b). Several studies suggest that nitrate in drinking water can have adverse effects on the thyroid (Mukhopadhyay *et al.,* 2005; Tajtakova *et al.,* 2006; Zaki *et al.,* 2004). Nitrate has long been known as a competitive inhibitor of iodide uptake in the thyroid (Wolff and Maury, 1963). Inhibition of iodide uptake can lead to alteration in thyroid hormone levels including decreases in levothyroxine (T4) levels. NAS (1995) stated that it is likely that the motor changes reported by Markel *et al.* (1989) when the animals were young were not a direct effect of nitrate, but were secondary to effects on learning behavior. Based on these considerations, a new assessment of the noncancer effects of nitrate may be warranted, including consideration of whether methemoglobinemia in infants, which is an acute effect, is still the most appropriate basis for the chronic exposure limit for nitrate. In addition, recent information may suggest the consideration of separate acute and chronic values for nitrate.

The health effects review identified a number of relevant new studies that may warrant a review of the cancer

classification for nitrate. These studies include a number of new epidemiology studies (Cocco *et al.,* 2003; Coss *et al.,* 2004; de Roos *et al.,* 2003; Mueller *et al.,* 2004; Volkmer *et al.,* 2005; Ward *et al.,* 2003; Ward *et al.,* 2005a; Ward *et al.,* 2005b; Ward *et al.,* 2006; Yang *et al.,* 2007; Zeegers *et al.,* 2006), as well as a recent report from an International Agency for Research on Cancer (IARC) Working group (Grosse *et al.,* 2006). This latter report concluded that, under conditions that result in endogenous nitrosation, ingested nitrate or nitrite is probably carcinogenic to humans.

In light of this information, EPA considers nitrate as a potential candidate for a new health effects assessment. The Agency solicits feedback on its plans to reassess health risks resulting from exposure to nitrate. The Agency also welcomes any scientific information related to nitrate health risks from the public. Because EPA considers nitrate as a candidate for a new assessment, EPA does not believe it is appropriate to consider any possible revisions to the MCLG (as well as the MCL) at this time.

A review of analytical or treatment feasibility is not necessary for nitrate because changes to the MCLG are not warranted at this time and the current MCL is set at the MCLG. Since EPA did not identify a health or technology basis for revising the nitrate NPDWR, the Agency did not conduct a detailed occurrence and exposure analysis.

c. *Review Result.* The Agency is considering whether to initiate a new health assessment for nitrate and therefore does not believe a revision to the NPDWR is appropriate at this time.

As discussed in Section VII, the Agency is asking for input and information about several implementation issues related to nitrate (*see* section V.B.6).

50. Nitrite (as N)

a. *Background.* EPA published the current NPDWR for nitrite on January 30, 1991 (56 FR 3526 (USEPA, 1991c)). The NPDWR established an MCLG and an MCL of 1 mg/L (as N). EPA based the MCLG on extrapolation from nitrate, assuming the conversion of 10 percent of nitrate-nitrogen to nitrite-nitrogen. No cancer classification is currently available for nitrite (USEPA, 2009b).

b. *Technical Reviews.* The health effects technical review identified new information on developmental effects of nitrite, as well as data regarding its carcinogenicity, that may indicate the need to update the Agency's health effects assessment (USEPA, 2009b). Several studies suggest that nitrate in drinking water can have adverse effects on the thyroid (Mukhopadhyay *et al.,* 2005; Tajtakova *et al.,* 2006; Zaki *et al.,* 2004). Since nitrite is formed from nitrate, and the current nitrite RfD is based on nitrate data, the impact of these new data on a nitrite noncancer assessment should be evaluated. Nitrite has long been known as a competitive inhibitor of iodide uptake in the thyroid; although it is a weaker inhibitor than nitrate (Wolff and Maury, 1963). Inhibition of iodide uptake can lead to alteration in thyroid hormone levels including decreases in T4. A developmental toxicity study in rats (Vorhees *et al.,* 1984) observed statistically significant delays in swimming development in addition to pup mortality and body weight changes. Based on these considerations, a new assessment of the noncancer effects of nitrite may be warranted, including consideration of whether methemoglobinemia in infants, which is an acute effect, is still the most appropriate basis for the chronic exposure limit for nitrite. In addition, recent information may suggest the consideration of separate acute and chronic values for nitrite.

The health effects review identified a number of relevant new studies that may warrant a review of the cancer classification for nitrate. These studies include a number of new epidemiology studies (Cocco *et al.,* 2003; Coss *et al.,* 2004; de Roos *et al.,* 2003; Mueller *et al.,* 2004; Volkmer *et al.,* 2005; Ward *et al.,* 2003; Ward *et al.,* 2005a; Ward *et al.,* 2005b; Ward *et al.,* 2006; Yang *et al.,* 2007; Zeegers *et al.,* 2006). In addition, a recent report from an International Agency for Research on Cancer (IARC) Working group (Grosse *et al.,* 2006) concluded that, under conditions that result in endogenous nitrosation, ingested nitrate or nitrite is probably carcinogenic to humans.

In light of this information, EPA considers nitrite as a potential candidate for a new health effects assessment. The Agency solicits feedback on its plans to reassess health risks resulting from exposure to nitrite. The Agency also welcomes any scientific information related to nitrite health risks from the public. Because EPA considers nitrite as a candidate for a new assessment, EPA does not believe it is appropriate to consider any possible revisions to the MCLG (as well as the MCL) at this time.

A review of analytical or treatment feasibility is not necessary for nitrite because changes to the MCLG are not warranted at this time and the current MCL is set at the MCLG. Since EPA did not identify a health or technology basis for revising the nitrite NPDWR, the Agency did not conduct a detailed occurrence and exposure analysis.

c. *Review Result.* The Agency is considering whether to initiate a new health assessment for nitrite and therefore does not believe a revision to the NPDWR is appropriate at this time.

As discussed in Section VII, the Agency is requesting input and information about several implementation issues related to nitrite (*see* section V.B.6).

51. Oxamyl (Vydate)

a. *Background.* EPA published the current NPDWR for oxamyl on July 17, 1992 (57 FR 31776 (USEPA, 1992)). The NPDWR established an MCLG and an MCL of 0.2 mg/L. EPA based the MCLG on a reference dose of 0.025 mg/kg-day and a cancer classification of E, evidence of non-carcinogenicity for humans.

b. *Technical Reviews.* In 2000, the Agency updated its health effects assessment of oxamyl (USEPA, 2000a). The Agency identified a change in this assessment that could lead to a change in the MCLG. This assessment considered relevant studies on the toxicity of oxamyl including developmental and reproductive toxicity. The assessment revised the RfD from 0.025 mg/kg-day to 0.001 mg/kg-day and concluded that there is evidence that oxamyl is noncarcinogenic to humans (USEPA, 2000a). Based on the new OPP assessment and RfD of 0.001 mg/kg-day, and assuming a 10-kg child body weight and 1 liter water intake per day, the DWEL could be 0.01 mg/L.[21] An RSC of 20 percent was selected based on the actual food dietary exposure (81 percent) for children who are 1 to 6 years old (USEPA, 2000a); this RSC results in a possible MCLG of 0.002 mg/L (USEPA, 2009b).

Because of a possible change in the MCLG for oxamyl, EPA considered whether analytical feasibility is likely to be a limitation if the Agency were to consider lowering the MCL to 0.002 mg/L (the possible MCLG). EPA reviewed PE data from the first Six-Year Review cycle and then analyzed more recent PT data to determine if it might be possible to recalculate the PQL, which is 0.02 mg/L and might be a limit to a possible MCLG of 0.002 mg/L (*i.e.,* analytical feasibility). Passing rates for PE data available through late 1999 for oxamyl are below 75 percent for most studies with true concentrations below the

[21] A child's body weight and drinking water intake were used to calculate the DWEL because children are the population with the highest risk from dietary exposure.

current PQL of 0.02 mg/L. More recent PT data from late 1999 through 2004, supplied by a PT provider, show no results below the current PQL but had most passing rates above 75 percent with true values at or above the current PQL. Given the variable results from the PE and PT studies, and the lack of PT data below the current PQL, PE and PT data are insufficient to support a PQL reduction (USEPA, 2009c).

While the PT data are not sufficient to support a lowering of the PQL for oxamyl at this time, the present PQL of 0.02 mg/L is greater than the possible MCLG. It would therefore limit a possible revision to the MCL. EPA evaluated two alternative sources of information to determine whether they indicate any potential to quantitate at levels as low as the possible MCLG: laboratory minimum reporting levels in the Six-Year Review ICR dataset, and the MDLs for approved methods for the detection of oxamyl (Methods 531.1 and 531.2). While EPA prefers to use laboratory performance data to calculate the PQL, the MRL and MDL information can be valuable for this review to indicate whether it is possible to quantitate at levels below the current PQL. The Six-Year Review ICR dataset contains MRL values for 52,201 samples. Of these, 45,290 (87 percent) have an MRL value of 0.002 mg/L or lower. Because more than 80 percent of the MRL values are at or below the possible MCLG of 0.002 mg/L, EPA selected that value as the minimum threshold for the occurrence and exposure analysis (USEPA, 2009e). Method 531.1 has an MDL of 0.00086 mg/L, and Method 532.2 has a detection limit (DL) of 0.000065 mg/L. Applying a multiplier of 10 would give a possible PQL range from 0.00065 to 0.0086 mg/L, which contains the possible MCLG (USEPA, 2009e).

Based on these varied and unrelated approaches/sources of information, there is evidence of a potential to lower the PQL for oxamyl even though the PE and PT data are insufficient to support a PQL reduction. To determine whether any MCL revision is likely to provide a meaningful opportunity to improve public health protection, EPA evaluated the occurrence of oxamyl at the possible MCLG of 0.002 mg/L (USEPA, 2009f). Table VI–22 shows the results of the occurrence and exposure analysis for the current MCL and the possible MCLG. The analysis uses single sample or peak results instead of system average results because the health endpoint is associated with acute exposure.[22] The occurrence and exposure analysis shows that individual sample concentrations exceed the current MCL of 0.2 mg/L for one of 30,876 systems (0.003 percent) serving 200 people (or 0.000 percent of 167 million people). Note that these results are based on the subset of monitoring data provided in response to the Six-Year Review ICR and do not necessarily reflect MCL violations, which are based on running annual average concentrations at entry points; SDWIS/FED indicates no MCL violations for oxamyl between 1998 and 2005 (USEPA, 2007g). Individual sample concentrations at 18 of 30,876 systems (0.058 percent), serving fewer than 0.3 million people (0.177 percent), exceeded the possible MCLG of 0.002 mg/L at least one time between 1998 and 2005.

TABLE VI–22—NUMBER AND PERCENT OF SYSTEMS WITH PEAK CONCENTRATIONS EXCEEDING OXAMYL THRESHOLDS AND CORRESPONDING ESTIMATES OF POPULATION SERVED

Regulatory or health-based threshold	Systems with any sample that is greater than the regulatory or health-based threshold (Percentages based on 30,876 systems with oxamyl data in the six-year review ICR occurrence dataset)
MCL (0.2 mg/L)	1 (0.003%)
Possible MCLG (0.002 mg/L)	18 (0.058%)
Regulatory or health-based threshold	**Corresponding population served (Percentages based on 167,378,400 people served by the systems with oxamyl data in the Six-Year Review ICR occurrence dataset)**
MCL (0.2 mg/L)	200 (0.0001%)
Possible MCLG (0.002 mg/L)	297,000 (0.177%)

Source: USEPA, 2009f.

Since the occurrence analysis indicates that any revision to the MCL is unlikely to provide a meaningful opportunity to improve the level of public health protection, it was not necessary to perform any additional reviews on treatment feasibility or economic considerations.

c. *Review Result.* Although there are new data that support consideration of whether to revise the MCLG/MCL for oxamyl, EPA does not believe a revision to the NPDWR for oxamyl is appropriate at this time. In making this decision, the Agency considered whether any possible revision to the NPDWR for oxamyl is likely to provide a meaningful opportunity for health risk reductions. Taking into consideration the low occurrence of this contaminant, EPA has decided that any revision to the NPDWR would be a low priority activity for the Agency, and, thus, is not appropriate to revise at this time because of:

- Competing workload priorities;
- The administrative costs associated with rulemaking; and
- The burden on States and the regulated community to implement any regulatory change that resulted.

52. Pentachlorophenol

a. *Background.* EPA published the current NPDWR for pentachlorophenol on July 1, 1991 (56 FR 30266 (USEPA, 1991b)). The NPDWR established an MCLG of zero based on a cancer classification of B2, probable human carcinogen. The NPDWR also established an MCL of 0.001 mg/L, based on analytical feasibility.

b. *Technical Reviews.* EPA has initiated a reassessment of the health risks resulting from exposure to pentachlorophenol. The revised health effects assessment will consider relevant

[22] The Six-Year Review ICR occurrence data are based on the Standardized Monitoring Framework for synthetic organic compounds, which is designed to evaluate long-term exposure to contaminants with chronic exposure health endpoints. As a result, EPA recognizes that short-term seasonal peaks, which correspond to oxamyl application as a pesticide, cannot be readily detected in this dataset. Nonetheless and as noted, EPA used the peak concentrations to evaluate occurrence for oxamyl because the health endpoint is associated with acute exposure.

studies on the toxicity of pentachlorophenol, including its potential developmental and reproductive toxicity. The new health effects assessment was not completed by March 1, 2009, the review cutoff date for this notice (USEPA, 2009b). The IRIS Substance Assessment Tracking System Web site (*http://cfpub.epa.gov/iristrac/index.cfm*) has the most up-to-date information on the status of the health effects assessment.

Although a risk assessment is in process for pentachlorophenol, the existing MCLG is zero and the current MCL of 0.001 mg/L is based on the PQL. Therefore, EPA reviewed whether there is potential to revise the PQL. EPA reviewed PE data from the first Six-Year Review cycle and then analyzed more recent PT data to determine if the PQL can be revised (*i.e.,* analytical feasibility). Several passing rates in the PE data for pentachlorophenol available through late 1999 are below 75 percent, and none of the true concentrations were below the current PQL. There are six PE studies with passing rates equal to or less than the 75 percent criterion, and only one of 16 true values in the PE data is below the current PQL. More recent PT data from late 1999 through 2004, supplied by a PT provider, show passing rates below the 75 percent criterion for eight studies, and all of the true concentrations in the PT data were higher than the current PQL. Because of the variability in passing rates and the lack of data points below the current PQL, a lowering of the PQL for pentachlorophenol is not appropriate at this time (USEPA, 2009c).

EPA evaluated two alternative sources of information to determine whether an EQL below the current PQL could be estimated: Laboratory MRLs in the Six-Year Review ICR dataset, and the MDLs for approved methods for the detection of pentachlorophenol (Methods 515.1, 515.2, and 525.2). While EPA prefers to use laboratory performance data to calculate the PQL, the MRL and MDL information can be valuable for this review to indicate whether it is possible to quantitate at levels below the current PQL. The Six-Year Review ICR dataset contains MRL values for 59,594 samples. Fewer than 80 percent of these values are less than or equal to the modal MRL: 26,666 (45 percent) equal the modal MRL of 0.00004 mg/L and an additional 2,399 (4 percent) are lower than 0.00004 mg/L. Therefore, EPA did not set the EQL equal to the modal MRL (USEPA, 2009e). The MDLs of approved methods are 0.000032, 0.00016, and 0.001 mg/L. EPA selected the median value, applied a multiplier of 10, and rounded up to 0.002 mg/L. The result is higher than the current PQL and, therefore, EPA did not estimate an EQL (USEPA, 2009e). Based on these varied and unrelated approaches/sources of information, EPA believes that there is no potential to lower the PQL for pentachlorophenol. Since the MCL is constrained by the PQL, and the PQL is unchanged, EPA does not believe it is necessary to conduct an occurrence analysis at this time.

c. *Review Result.* The Agency does not believe a revision to the NPDWR for pentachlorophenol is appropriate at this time because a reassessment of the health risks resulting from exposure to pentachlorophenol is in progress (USEPA, 2009b). Furthermore, a review of analytical feasibility did not identify a potential to revise the MCL, which is limited by feasibility.

53. Picloram

a. *Background.* EPA published the current NPDWR for picloram on July 17, 1992 (57 FR 31776 (USEPA, 1992)). The NPDWR established an MCLG and an MCL of 0.5 mg/L. EPA based the MCLG on a reference dose of 0.07 mg/kg-day and a cancer classification of D, not classifiable as to human carcinogenicity.

b. *Technical Reviews.* In the first Six-Year Review cycle, EPA evaluated new information from a health effects assessment completed in 1995 (USEPA, 1995b). At that time, the Agency could not determine that a revision to the NPDWR would provide a meaningful opportunity for cost savings to public water systems or their customers, and decided that any revision would be a low priority activity for the Agency because of competing workload priorities, the administrative costs associated with rulemaking, and the burden on States and the regulated community to implement any regulatory change (67 FR 19030 (USEPA, 2002c); 68 FR 42908 (USEPA, 2003e)). The 1995 assessment considered relevant studies on the toxicity of picloram including developmental and reproductive toxicity. The assessment revised the RfD from 0.07 mg/kg-day to 0.2 mg/kg-day and classified picloram as Group E, evidence of noncarcinogenicity (USEPA, 1995b). In the current review cycle, EPA conducted a literature search through June 2007 for relevant data on the toxicology of picloram, including its potential developmental and reproductive toxicity. The literature search did not identify any new data that would affect the RfD or cancer classification (USEPA, 2009b). Based on the 1995 OPP assessment and RfD of 0.2 mg/kg-day, and assuming a 70-kg adult body weight and 2 liters water intake per day, the DWEL could be 7 mg/L. An RSC of 20 percent results in a possible MCLG of 1 mg/L (USEPA, 2009b).

Analytical feasibility does not pose any limitations for the current MCL and would not be a limiting factor if EPA were to raise the MCLG. EPA evaluated the results of the occurrence and exposure analyses for picloram to determine whether a revised MCLG/MCL would be likely to result in a meaningful opportunity to achieve cost savings for PWSs and their customers while maintaining, or improving, the level of public health protection (USEPA, 2009f). Although the Agency obtained and evaluated the finished water occurrence data for picloram, its usefulness is limited for determining potential cost savings to PWSs and their customers because the Agency does not know which systems are treating for this contaminant. As an alternative, the Agency evaluated available data on source water quality and conducted a qualitative assessment of treatment cost savings.

Table VI–23 provides summary data for contaminant occurrence based on maximum sample values for the locations included in the STORET and NAWQA data. Although the degree to which these occurrence rates represent national drinking water source occurrence is uncertain, the information shows no to low occurrence at threshold levels of interest. This information indicates that any resulting NPDWR change would not affect systems that rely on source water at any of the NAWQA or STORET locations.

TABLE VI–23—AMBIENT WATER QUALITY MONITORING OCCURRENCE SUMMARY FOR PICLORAM

Maximum concentration	Number of locations (% of locations)	
	STORET [1]	NAWQA [2]
Total	870 (100%)	5,772 (100.0%)
Nondetect	745 (85.6%)	5,733 (99.3%)
Detected	125 (14.4%)	39 (0.7%)

TABLE VI–23—AMBIENT WATER QUALITY MONITORING OCCURRENCE SUMMARY FOR PICLORAM—Continued

Maximum concentration	Number of locations (% of locations)	
	STORET [1]	NAWQA [2]
Exceeds current MCLG of 0.5 mg/L	0 (0%)	0 (0.0%)
Exceeds alternative value of 1.0 mg/L	0 (0%)	0 (0.0%)

[1] STORET database 2002–2007.
[2] NAWQA database 1992–2005.
Source: USEPA, 2009d.

The BATs and small system compliance technologies for picloram have other beneficial effects, *e.g.,* reduction of other co-occurring contaminants, precursors for DBPs, or other common impurities. Therefore, if EPA were to consider a higher level, the Agency does not know how many PWSs that are currently treating to comply with the existing MCL of 0.5 mg/L would be likely to discontinue treatment that is already in place (USEPA, 2009d). Also, the Agency does not know to what extent affected systems might be able to reduce costs given that capital costs are not recoverable. However, the Agency recognizes that there may be opportunities to achieve operational cost savings if these systems are able to re-optimize current treatment.

Given these considerations, the Agency believes that any resulting revision is not likely to provide a meaningful opportunity for cost savings. In view of this, any revision would be a low priority activity and not appropriate at this time.

c. *Review Result.* Although there are new data that support consideration of whether to revise the MCLG/MCL for picloram, EPA does not believe a revision to the NPDWR for picloram is appropriate at this time. In making this decision, the Agency considered whether any possible revision to the NPDWR for picloram is likely to provide a meaningful opportunity for cost savings to public water systems and their customers. Taking into consideration the low occurrence of this contaminant in source waters, EPA has decided that any revision to the NPDWR would be a low priority activity for the Agency, and, thus, is not appropriate to revise at this time because of:

- Competing workload priorities;
- The administrative costs associated with rulemaking; and
- The burden on States and the regulated community to implement any regulatory change that resulted.

54. Polychlorinated Biphenyls (PCBs)

a. *Background.* EPA published the current NPDWR for PCBs on January 30, 1991 (56 FR 3526 (USEPA, 1991c)). The NPDWR established an MCLG of zero based on a cancer classification of B2, probable human carcinogen. The NPDWR also established an MCL of 0.0005 mg/L, based on analytical feasibility.

b. *Technical Reviews.* EPA has initiated a reassessment of the cancer health risks resulting from exposure to PCBs. The revised health effects assessment will consider relevant studies on the toxicity of PCBs, including its potential developmental and reproductive toxicity. The new health effects assessment was not completed by March 1, 2009, the review cutoff date for this notice (USEPA, 2009b). On December 21, 2007 (72 FR 72715 (USEPA, 2007c)), the Agency noted that the health effects assessment for PCBs is in process.

Although a risk assessment is in process for PCBs, the existing MCLG is zero and the current MCL of 0.0005 mg/L is based on the PQL. Therefore, EPA reviewed whether there is potential to revise the PQL. EPA reviewed PE data from the first Six-Year Review cycle and then analyzed more recent PT data to determine if the PQL can be revised (*i.e.,* analytical feasibility). The PE data for PCBs available through late 1999 includes only one true concentration below the current PQL, and the passing rate for that concentration is below 75 percent. The passing rates for studies above the PQL are above 75 percent. More recent PT data from late 1999 through 2004, supplied by a PT provider, show passing rates above 75 percent for all studies, but includes no studies below the current PQL. Because of the lack of data points below the current PQL, a lowering of the PQL for PCBs is not appropriate at this time (USEPA, 2009c).

EPA evaluated two alternative sources of information to determine whether an EQL below the current PQL could be estimated: laboratory MRLs in the Six-Year Review ICR dataset, and the MDL for the approved method for the detection of PCBs (Method 508A). While EPA prefers to use laboratory performance data to calculate the PQL, the MRL and MDL information can be valuable for this review to indicate whether it is possible to quantitate at levels below the current PQL. The Six-Year Review ICR dataset contains MRL values for 35,178 samples. Fewer than 80 percent of these values are less than or equal the modal MRL: 23,785 (68 percent) equal the modal MRL of 0.0001 mg/L and an additional 2,355 (7 percent) are lower than 0.0001 mg/L. Therefore, EPA did not set the EQL equal to the modal MRL (USEPA, 2009e). The MDL of approved method is 0.00008 mg/L. Applying a multiplier of 10 would give a possible PQL of 0.0008 mg/L. The result is higher than the current PQL, and therefore, EPA did not estimate an EQL (USEPA, 2009e). Based on these varied and unrelated approaches/sources of information, EPA believes that there is no potential to lower the PQL for PCBs. Since the MCL is constrained by the PQL, and the PQL is unchanged, EPA does not believe it is necessary to conduct an occurrence analysis at this time.

c. *Review Result.* The Agency does not believe a revision to the NPDWR for PCBs is appropriate at this time because a reassessment of the health risks resulting from exposure to PCBs is in progress (USEPA, 2009b). Furthermore, a review of analytical feasibility did not identify a potential to revise the MCL, which is limited by feasibility.

55. Combined Radiums (226 and 228)

a. *Background.* EPA published an interim NPDWR and set an MCL of 5 pCi/L for combined radium 226 and 228 on July 9, 1976 (41 FR 28402 (USEPA, 1976)). As noted in the August 14, 1975 proposal (40 FR 34324 (USEPA, 1975)) and a subsequent September 30, 1986 FR notice, EPA considered the feasibility of treatment techniques, analytical methods and monitoring when establishing the MCL of 5 pCi/L. EPA also considered the risks associated with exposure to radium 226 and 228, which generally fell within the Agency's acceptable risk range of 10^{-4} to 10^{-6} at the MCL of 5 pCi/L. On December 7, 2000 (65 FR 76708 (USEPA, 2000c)), EPA established an MCLG of zero based on a cancer classification of A (known

human carcinogen) and finalized the NPDWR by retaining the MCL of 5 pCi/L. EPA noted in the December 7, 2000 FR notice that new risk estimates from Federal Guidance Report 13 reaffirmed that the 5 pCi/L MCL was appropriate and protective.[23] EPA also tightened the monitoring requirements for combined radiums by requiring that systems monitor for radium 226 and 228 separately.

b. *Technical Reviews.* EPA has initiated a reassessment of the health risks resulting from exposure to radiums. The revised health effects assessment will consider relevant studies on the toxicity of radiums, including its potential developmental and reproductive toxicity. The new health effects assessment was not completed by March 1, 2009, the review cutoff date for this notice (USEPA, 2009b).

Although there is an ongoing health effects assessment, the MCLG is zero and the current MCL is higher than the MCLG. Therefore, EPA reviewed whether there is potential to revise the MCL based on new information regarding analytical and treatment feasibility for radiums. EPA promulgated detection limits of 1 pCi/L for both radium 226 and radium 228 in 1976 (41 FR 28402 (USEPA, 1976)) and retained the use of a detection limit as the required measure of sensitivity for radiochemical analysis in lieu of an MDL or PQL in the final rule (65 FR 76708, December 7, 2000 (USEPA, 2000c)). EPA did not identify new analytical methods during the current review that would feasibly lower the detection limits. In addition, since the December 7, 2000, regulation, there is no new information regarding treatment feasibility. Since there is no new information regarding analytical or treatment feasibility that suggests changes to the MCL, EPA does not believe it is necessary to conduct an occurrence analysis at this time.

c. *Review Result.* The Agency does not believe a revision to the NPDWR for combined radiums is appropriate at this time because a reassessment of the health risks resulting from exposure to radium is in progress (USEPA, 2009b). Furthermore, there is no new information regarding analytical or treatment feasibility that would warrant reconsideration of the MCL.

56. Selenium

a. *Background.* EPA published the current NPDWR for selenium on January 30, 1991 (56 FR 3526 (USEPA, 1991c)). The NPDWR established an MCLG and an MCL of 0.05 mg/L. EPA based the MCLG on a maximum safe intake[24] of 0.4 mg/person/day and a cancer classification of D, not classifiable as to human carcinogenicity.

b. *Technical Reviews.* The health effects technical review identified new data that relate to the biological properties of selenium in mammalian species, as well as data regarding its cancer and anticancer properties, that may indicate the need to update the Agency's health effects assessment (USEPA, 2009b). Hawkes and Keim (2003) reported thyroid hormone and related metabolism changes in subjects treated with deficient, sufficient, and excess dietary selenium. The excess selenium dose was associated with a slight decrease in triiodothyronine (T3) levels, a thyrotropin increase, and an increase in body weight compared to the selenium-sufficient subjects. The opposite responses occurred in the selenium-deficient subjects. Several studies identified changes in sperm parameters and fertility in mice fed either selenium-deficient or excess-selenium diets compared to diets with adequate selenium. In addition, new information about the metabolism of selenium since the IRIS review (USEPA, 1991a, 1993a) suggests that it may be appropriate to differentiate between inorganic selenium and organic selenium in the form of selenoproteins and selenoaminoacids for an assessment that applies to drinking water. Although selenium is not a candidate for an MCLG of zero because of its status as a micronutrient, new data relevant to the cancer assessment are now available (*e.g.,* Duffield-Lillico *et al.,* 2003; Su *et al.,* 2005) and may need further evaluation.

In light of this information, EPA considers selenium as a potential candidate for a new health effects assessment. The Agency solicits general feedback on its plans to reassess health risks resulting from exposure to selenium. The Agency also welcomes any scientific information related to selenium health risks from the public. Because EPA considers selenium as a candidate for a new assessment, EPA does not believe it is appropriate to consider any revisions to the MCLG (as well as the MCL) at this time.

A review of analytical or treatment feasibility is not necessary for selenium because changes to the MCLG are not warranted at this time and the current MCL is set at the MCLG. Since EPA did not identify a health or technology basis for revising the selenium NPDWR, the Agency did not conduct a detailed occurrence and exposure analysis.

c. *Review Result.* The Agency is considering whether to initiate a new health assessment for selenium and therefore does not believe a revision to the NPDWR is appropriate at this time.

57. Simazine

a. *Background.* EPA published the current NPDWR for simazine on July 17, 1992 (57 FR 31776 (USEPA, 1992)). The NPDWR established an MCLG and an MCL of 0.004 mg/L. EPA based the MCLG on a reference dose of 0.005 mg/kg-day and a cancer classification of C, possible human carcinogen.

b. *Technical Reviews.* In 2006, the Agency finalized a health effects assessment for the reregistration of simazine as a pesticide (USEPA, 2006i). Because the database for simazine's potential neuroendocrine effects is less robust than the atrazine database, and because simazine and atrazine share a common neuroendocrine mechanism of toxicity, the atrazine data were used as bridging data for simazine. Thus, the 2006 assessment established a new RfD of 0.018 mg/kg-day for simazine, based on the attenuation of pre-ovulatory LH surge from atrazine exposure. Similarly, simazine was reclassified in 2006 as "not likely to be carcinogenic to humans" based on weight-of-evidence that it is not genotoxic and because the tumor response in the Sprague-Dawley rats was determined to be a strain specific mechanism which is not relevant to humans.

c. *Review Result.* The Agency believes it is not appropriate to consider revisions to the NPDWR for simazine at this time and has placed simazine in the emerging information/data gap category because of an impending re-evaluation of the Agency's risk assessment for atrazine and the assessment for simazine is based on atrazine data. *See* section VI.7 (atrazine) for additional information.

[23] After the December 7, 2000 final regulation, two trade associations and several municipal water systems challenged EPA's standard for combined radiums by claiming that the Agency did not use the best available science when finalizing the standard. In February of 2003, the DC Circuit Court of Appeals upheld EPA's regulation for combined radiums (as well as beta and photon emitters and uranium).

[24] The 0.4 mg/day safe level was based on data (Yang *et al.,* 1989a, 1989b) that extrapolated from blood selenium levels to estimated dietary intake in the studied population. As described in the January 30, 1991 FR (56 FR 3526 (USEPA, 1991c)), the Agency partially considered selenium's status as a nutrient and did not use the typical procedure for deriving the MCLG. Hence, there is no specific reference to an RfD for selenium in the 1991 FR notice. After the publication of the regulation, IRIS (USEPA, 1991a) posted an RfD of 0.005 mg/kg-day for selenium using the same data that are the basis of the regulation.

58. Styrene

a. *Background.* EPA published the current NPDWR for styrene on January 30, 1991 (56 FR 3526 (USEPA, 1991c)). The NPDWR established an MCLG and an MCL of 0.1 mg/L. EPA based the MCLG on a reference dose of 0.2 mg/kg-day and a cancer classification of C, possible human carcinogen.

b. *Technical Reviews.* EPA has initiated a reassessment of the health risks resulting from exposure to styrene. The revised health effects assessment will consider relevant studies on the toxicity of styrene, including its potential developmental and reproductive toxicity. The new health effects assessment was not completed by March 1, 2009, the review cutoff date for this notice (USEPA, 2009b). The IRIS Substance Assessment Tracking System Web site (*http://cfpub.epa.gov/iristrac/index.cfm*) has the most up-to-date information on the status of the health effects assessment.

c. *Review Result.* Since the MCL for styrene is set at its MCLG and a reassessment of the health risks resulting from exposure to styrene is in progress, the Agency does not believe a revision to the NPDWR is appropriate at this time.

59. 2,3,7,8-TCDD (Dioxin)

a. *Background.* EPA published the current NPDWR for dioxin on July 17, 1992 (57 FR 31776 (USEPA, 1992)). The NPDWR established an MCLG of zero based on a cancer classification of B2, probable human carcinogen. The NPDWR also established an MCL of 3×10^{-8} mg/L, based on analytical feasibility.

b. *Technical Reviews.* In 2003, the Agency prepared a draft human health reassessment for dioxin and its related compounds (USEPA, 2003c) that underwent external review by the National Academy of Science. In their peer review report (NAS, 2006), NAS recommended that EPA reevaluate its conclusions regarding the carcinogenicity of dioxin based on the criteria set out in the 2005 cancer guidelines; that EPA should consider developing more information on the noncancer effects of dioxin; and that EPA evaluate new dose-response data released by the NTP. The Agency is currently considering the NAS recommendations. The Agency does not expect any new health effects assessment to be completed in the time frame of the current Six-Year Review cycle (USEPA, 2009b). The IRIS Substance Assessment Tracking System Web site (*http://cfpub.epa.gov/iristrac/index.cfm*) has the most up-to-date information on the status of the health effects assessment.

Although a health effects assessment is in process for dioxin, the existing MCLG is still zero and the current MCL is based on a PQL of 3×10^{-8} mg/L. Therefore, EPA reviewed whether there is potential to revise the PQL. The PT data currently available for dioxin are not sufficient to evaluate the potential for PQL revision (USEPA, 2009c).

EPA evaluated two alternative sources of information to determine whether an EQL below the current PQL could be estimated: Laboratory MRLs in the Six-Year Review ICR dataset, and the MDL for the approved method for the detection of dioxin (Method 1613). While EPA prefers to use laboratory performance data to calculate the PQL, the MRL and MDL information can be valuable for this review to indicate whether it is possible to quantitate at levels below the current PQL. The Six-Year Review ICR dataset contains dioxin data for fewer than 2,500 systems, which is an insufficient sample size to derive an EQL based on MRL data. The MDL of the approved method is 1×10^{-8} mg/L. Applying a multiplier of 5 would yield an EQL of 5×10^{-8} mg/L. The result is slightly higher than the current PQL and, therefore, EPA did not estimate an EQL. Based on these varied and unrelated approaches/sources of information, EPA believes that a PQL reduction for dioxin is not appropriate at present. Since the MCL is constrained by the PQL, and the PQL is unchanged, EPA does not believe it is necessary to conduct an occurrence analysis at this time.

c. *Review Result.* The Agency does not believe a revision to the NPDWR for dioxin is appropriate at this time because a reassessment of the health risks resulting from exposure to dioxin is in progress (USEPA, 2009b). Furthermore, a review of analytical feasibility did not identify a potential to revise the MCL, which is limited by feasibility.

60. Tetrachloroethylene

a. *Background.* EPA published the current NPDWR for tetrachloroethylene on January 30, 1991 (56 FR 3526 (USEPA, 1991c)). The NPDWR established an MCLG of zero based on a cancer classification of B2, probable human carcinogen. The NPDWR also established an MCL of 0.005 mg/L, based on analytical feasibility.

b. *Technical Reviews.* EPA has initiated a reassessment of the health risks resulting from exposure to tetrachloroethylene. The revised health effects assessment will consider relevant studies on the toxicity of tetrachloroethylene, including its potential developmental and reproductive toxicity. The new health effects assessment was not completed by March 1, 2009, the review cutoff date for this notice (USEPA, 2009b). The IRIS Substance Assessment Tracking System Web site (*http://cfpub.epa.gov/iristrac/index.cfm*) has the most up-to-date information on the status of the health effects assessment and indicates that tetrachloroethylene is currently undergoing review by NAS.

Although a risk assessment is in process for tetrachloroethylene, the existing MCLG is zero and the current MCL of 0.005 mg/L is based on the PQL. Therefore, EPA reviewed whether there is potential to revise the PQL. EPA reviewed PE data from the first Six-Year Review cycle and then analyzed more recent PT data to determine if the PQL could be revised (*i.e.,* analytical feasibility). Passing rates for PE data available through late 1999 for tetrachloroethylene are above 95 percent at the lowest concentrations. However, the true concentrations were all higher than the current PQL of 0.005 mg/L. More recent PT data from late 1999 through 2004, supplied by a PT provider, also show greater than 90 percent passing rates for studies around the current PQL, including 13 with true values below the PQL. Because most of the laboratory passing rates from PE and PT studies exceeded the 75 percent criterion typically used to derive a PQL, including several with true values below the PQL, a lowering of the PQL for tetrachloroethylene might be possible. These results, however, are insufficient to recalculate a revised PQL for tetrachloroethylene because not enough data points are available below the current PQL to derive a value at the 75 percent passing rate (USEPA, 2009c).

EPA evaluated two alternative sources of information to determine whether an EQL below the current PQL could be estimated: Laboratory MRLs in the Six-Year Review ICR dataset, and the MDLs for approved methods for the detection of tetrachloroethylene (Methods 502.2, 524.2, and 551.1). While EPA prefers to use laboratory performance data to calculate the PQL, the MRL and MDL information can be valuable for this review to indicate whether it is possible to quantitate at levels below the current PQL. EPA also noted that the State of New Jersey uses a PQL of 0.001 mg/L, based on a 1987 study of laboratory performance at low concentrations that used criteria similar to those in the PT data (NJDWQI, 1987). The Six-Year Review ICR dataset contains MRL values for 138,348 samples. More than 80 percent of these values are less than

or equal the modal MRL: 117,033 (85 percent) equal the modal MRL of 0.0005 mg/L and an additional 15,848 (11 percent) are lower than 0.0005 mg/L. Therefore, EPA selected the modal MRL as the EQL (USEPA, 2009e). The MDLs of approved method are 0.00005, 0.00014, and 0.000008 mg/L. Applying a multiplier of 10 would give a possible PQL range from 0.00008 to 0.0014 mg/L, which contains the EQL (USEPA, 2009e).

Based on these varied and unrelated approaches/sources of information, EPA believes that there is potential to lower the PQL for tetrachloroethylene. To determine whether any MCL revision is likely to provide a meaningful opportunity to improve public health protection, EPA evaluated the occurrence of tetrachloroethylene at the EQL of 0.0005 mg/L and additional thresholds of 0.001 and 0.0025 mg/L. Table VI–24 shows the results of the occurrence and exposure analysis for the current MCL and these thresholds. The occurrence and exposure analysis shows that average concentrations exceed the current MCL for 23 to 25 out of 50,436 systems (0.046 to 0.050 percent) serving approximately 630, 000 to 1.1 million people (or 0.277 to 0.473 percent of 227 million people). Note that these results are based on the subset of monitoring data provided in response to the Six-Year Review ICR and do not necessarily reflect MCL violations, which are based on annual average concentrations at entry points; SDWIS/FED indicates 174 MCL violations for tetrachloroethylene between 1998 and 2005, with annual violations ranging from 10 to 33 (USEPA, 2007g). Average concentrations at 412 to 519 of 50,436 systems (0.817 to 1.029 percent), serving 12.4 to 14.6 million people (or 5.466 to 6.419 percent of 227 million people), exceed the lowest EQL of 0.0005 mg/L. While these systems are widely distributed and located in most of the States providing data, a few large systems (serving 500,000 or more people) account for almost half of the exposed population.

TABLE VI–24—NUMBER AND PERCENT OF SYSTEMS WITH MEAN CONCENTRATIONS EXCEEDING TETRACHLOROETHYLENE THRESHOLDS AND CORRESPONDING ESTIMATES OF POPULATION SERVED

Regulatory or feasibility-based threshold	Systems with mean concentrations that are greater than the regulatory or feasibility-based threshold (Percentages based on 50,436 systems with tetrachloroethylene data in the Six-Year Review ICR occurrence dataset)		
	Nondetect values = MRL[1]	Nondetect values = ½ MRL[2]	Nondetect values = 0[3]
MCL (0.005 mg/L)	25 (0.050%)	23 (0.046%)	23 (0.046%)
1/2 MCL (0.0025 mg/L)	75 (0.149%)	71 (0.141%)	68 (0.135%)
2xEQL (0.001 mg/L)	286 (0.568%)	251 (0.498%)	220 (0.437%)
EQL (0.0005 mg/L)	not applicable	519 (1.030%)	412 (0.818%)
Regulatory or feasibility-based threshold	Corresponding population served (Percentages based on 227,009,000 people served by the systems with tetrachloroethylene data in the Six-Year Review ICR occurrence dataset)		
	Nondetect values = MRL[1]	Nondetect values = ½ MRL[2]	Nondetect values = 0[3]
MCL (0.005 mg/L)	1,074,000 (0.473%)	628,000 (0.277%)	628,000 (0.277%)
½ MCL (0.0025 mg/L)	1,706,000 (0.752%)	1,692,000 (0.745%)	1,647,000 (0.726%)
2xEQL (0.001 mg/L)	10,706,000 (4.716%)	10,177,000 (4.483%)	9,625,000 (4.240%)
EQL (0.0005 mg/L)	not applicable	14,572,000 (6.419%)	12,408,000 (5.466%)

[1] Results are based on setting all nondetect results equal to MRL values in the Six-Year Review ICR dataset. Results are not reported at the EQL of 0.0005 mg/L because this is the modal MRL and setting a majority of the results equal to this value results in an upwardly biased estimate of the number of systems with mean concentrations that exceed this value.
[2] Results are based on setting all nondetect results equal to ½ MRL values in the Six-Year Review ICR dataset.
[3] Results are based on setting all nondetect results equal to zero.
Source: USEPA, 2009f.

Since the occurrence analysis indicates that a revision to the MCL may provide a meaningful opportunity to improve the level of public health protection, EPA considered whether treatment feasibility is likely to pose any limitations if the MCL were lowered (USEPA, 2009g). The current BATs for tetrachloroethylene are packed tower aeration (PTA) and granular activated carbon (GAC). Small system compliance technologies (SSCTs) for tetrachloroethylene include GAC and several aeration technologies. EPA's assessment shows that PTA and GAC are effective enough to achieve concentrations as low as the EQL.

EPA is not currently able to assess the potential health benefits from a revised MCL for tetrachloroethylene, because the revised health effects assessment is not yet available. However, based on its B2 cancer classification (MCLG of zero) and the occurrence and exposure analysis at possible MCL values, the Agency believes that a revision to the MCL may provide a meaningful opportunity to reduce public health risks.

c. *Review Result.* The Agency believes it is appropriate to revise the NPDWR for tetrachloroethylene although a health effects assessment is currently in progress. The existing MCLG is zero (based on the current B2 cancer classification) and the current MCL is based on a PQL (*i.e.,* analytical feasibility) of 0.005 mg/L. The Agency's review indicates that analytical feasibility could be as much as 10 times lower (~ 0.0005 mg/L) and occurrence at this level appears to be relatively widespread. Hence, revisions to the tetrachloroethylene NPDWR may provide a meaningful opportunity for health risk reduction. If the updated health effects assessment is completed in time to consider for the regulatory revision of tetrachloroethylene, the Agency will consider this assessment in its evaluation of public health benefits associated with any revision. As discussed in Section VII, the Agency solicits public comment and/or relevant information that may inform the regulatory revision for tetrachloroethylene. EPA is also requesting that stakeholders provide information/data about the lowest level of quantitation (including the analytical method used) that laboratories can reliably and consistently achieve.

61. Thallium

a. *Background.* EPA published the current NPDWR for thallium on July 17, 1992 (57 FR 31776 (USEPA, 1992)). The NPDWR established an MCLG of 0.0005 mg/L. EPA based the MCLG on a reference dose of 0.00007 mg/kg-day and a cancer classification of D, not classifiable as to human carcinogenicity. The NPDWR also established an MCL of 0.002 mg/L, based on analytical feasibility.

b. *Technical Reviews.* EPA completed the risk reassessment for thallium in September of 2009 (USEPA, 2009k). Because the new health effects assessment was not completed by March 1, 2009, the review cutoff date for this notice (USEPA, 2009b), the outcome of this assessment has not been included in the current review effort. EPA will consider the updated assessment in the next review cycle.

The current MCL is based on a PQL of 0.002 mg/L. Therefore, EPA reviewed whether there is potential to revise the PQL. EPA reviewed PE data from the first Six-Year Review cycle and then analyzed more recent PT data to determine if the PQL can be revised (*i.e.,* analytical feasibility). Passing rates for PE data available through late 1999 for thallium are above 80 percent around the current PQL of 0.002 mg/L, including one study with a true concentration less than the current PQL. More recent PT data from late 1999 through 2004, supplied by a PT provider, show passing rates at or above 75 percent, but tending to fall below 80 percent as the true concentration approaches the current PQL. No studies had true concentrations below the current PQL. Given the lack of data points below the current PQL and the low PT passing rates close to the PQL, a lowering of the PQL for thallium is not appropriate at this time (USEPA, 2009c).

EPA evaluated two alternative sources of information to determine whether an EQL below the current PQL could be estimated: laboratory MRLs in the Six-Year Review ICR dataset, and the MDLs for approved methods for the detection of thallium (Methods 200.8 and 200.9). While EPA prefers to use laboratory performance data to calculate the PQL, the MRL and MDL information can be valuable for this review to indicate whether it is possible to quantitate at levels below the current PQL. The Six-Year Review ICR dataset contains MRL values for 73,409 samples. Fewer than 80 percent of these values are less than or equal the modal MRL: 46,273 (63 percent) equal the modal MRL of 0.001 mg/L and an additional 11,032 (15 percent) are lower than 0.001 mg/L. Therefore, EPA did not set the EQL equal to the modal MRL (USEPA, 2009e). The MDLs of approved methods range from 0.0003 to 0.0007 mg/L. Applying a multiplier of 10 would give a possible PQL range from 0.003 to 0.007 mg/L. The result is higher than the current PQL and, therefore, EPA did not estimate an EQL (USEPA, 2009e). Based on these varied and unrelated approaches/sources of information, EPA believes that there is no potential to lower the PQL for thallium. Since the MCL is constrained by the PQL, and the PQL is unchanged, EPA does not believe it is necessary to conduct an occurrence analysis at this time.

c. *Review Result.* The Agency does not believe a revision to the NPDWR for thallium is appropriate at this time because a reassessment of the health risks resulting from exposure to thallium was in progress (USEPA, 2009k) and did not meet the March 1, 2009 cutoff date for this review. Furthermore, a review of analytical feasibility did not identify a potential to revise the MCL, which is limited by feasibility.

62. Toluene

a. *Background.* EPA published the current NPDWR for toluene on January 30, 1991 (56 FR 3526 (USEPA, 1991c)). The NPDWR established an MCLG and an MCL of 1 mg/L. EPA based the MCLG on a reference dose of 0.2 mg/kg-day and a cancer classification of D, not classifiable as to human carcinogenicity.

b. *Technical Reviews.* In 2005, the Agency updated its health effects assessment of toluene (USEPA, 2005b). The change in this assessment could lead to a change in the MCLG. This assessment considered relevant studies on the toxicity of toluene including developmental and reproductive toxicity. The assessment revised the RfD from 0.2 mg/kg-day to 0.08 mg/kg-day and concluded that there is inadequate information to assess the carcinogenic potential of toluene (USEPA, 2005b). Although there were no changes in the critical study or effect, there were changes in the toxicity database that increase concern for immunotoxicity and neurotoxicity via the oral exposure route and justified the higher uncertainty factor for the revised RfD (USEPA, 2005b). Based on the new IRIS assessment and RfD of 0.08 mg/kg-day, and assuming a 70-kg adult body weight and 2 liters water intake per day, the DWEL could be 2.8 mg/L. An RSC of 20 percent results in a possible MCLG of 0.6 mg/L.

Analytical feasibility does not pose any limitations for the current MCL and would not be a limiting factor for the possible MCLG decrease under consideration. EPA evaluated the results of the occurrence and exposure analyses for toluene to determine whether a revised MCLG/MCL would be likely to result in a meaningful opportunity to improve the level of public health protection (USEPA, 2009f). Table VI–25 shows the results of the occurrence and exposure analysis for the current MCL and the possible MCLG set equal to 0.6 mg/L based on the new health effects information. The occurrence and exposure analysis shows that average concentrations exceed the current MCL for one system out of 50,451 (0.002 percent) serving approximately 500 people (0.0002 percent of 227 million people). Note that these results are based on the subset of monitoring data provided in response to the Six-Year Review ICR and do not necessarily reflect MCL violations, which are based on annual average concentrations at entry points; SDWIS/FED indicates MCL violations for toluene at only one system in one year between 1998 and 2005 (USEPA, 2007g). Average concentrations at two of 50,451 systems (0.004 percent), serving 800 people (or 0.0004 percent of 227 million people), exceed the possible MCLG based on new health effects information (0.06 mg/L).

TABLE VI–25—NUMBER AND PERCENT OF SYSTEMS WITH MEAN CONCENTRATIONS EXCEEDING TOLUENE THRESHOLDS AND CORRESPONDING ESTIMATES OF POPULATION SERVED

Regulatory or health-based threshold	Systems with mean concentrations that are greater than the regulatory or health-based threshold (percentages based on 50,451 systems with toluene data in the Six-Year Review ICR occurrence dataset)		
	Nondetect values = MRL [1]	Nondetect values = ½ MRL [2]	Nondetect values = 0 [3]
MCL (1 mg/L)	1 (0.002%)	1 (0.002%)	1 (0.002%)
Possible MCLG (0.6 mg/L)	2 (0.004%)	2 (0.004%)	2 (0.004%)
Regulatory or health-based threshold	Corresponding population served (percentages based on 226,955,000 people served by the systems with toluene data in the Six-Year Review ICR occurrence dataset)		
	Nondetect values = MRL [1]	Nondetect values = ½ MRL [2]	Nondetect values = 0 [3]
MCL (1 mg/L)	500 (0.0002%)	500 (0.0002%)	500 (0.0002%)
Possible MCLG (0.6 mg/L)	800 (0.0004%)	800 (0.0004%)	800 (0.0004%)

[1] Results are based on setting all nondetect results equal to MRL values in the Six-Year Review ICR dataset
[2] Results are based on setting all nondetect results equal to ½ MRL values in the Six-Year Review ICR dataset.
[3] Results are based on setting all nondetect results equal to zero.
Source: USEPA, 2009f.

Since the occurrence analysis indicates that any revision to the MCL is unlikely to provide a meaningful opportunity to improve the level of public health protection, it was not necessary to perform any additional reviews on treatment feasibility or economic considerations.

c. *Review Result.* Although there are new data that support consideration of whether to revise the MCLG/MCL for toluene, EPA does not believe a revision to the NPDWR for toluene is appropriate at this time. In making this decision, the Agency considered whether any possible revision to the NPDWR for toluene is likely to provide a meaningful opportunity for health risk reductions. Taking into consideration the low occurrence of this contaminant, EPA has decided that any revision to the NPDWR would be a low priority activity for the Agency, and, thus, is not appropriate to revise at this time because of:

- Competing workload priorities;
- The administrative costs associated with rulemaking; and
- The burden on States and the regulated community to implement any regulatory change that resulted.

63. Toxaphene

a. *Background.* EPA published the current NPDWR for toxaphene on January 30, 1991 (56 FR 3526 (USEPA, 1991c)). The NPDWR established an MCLG of zero based on a cancer classification of B2, probable human carcinogen. The NPDWR also established an MCL of 0.003 mg/L, based on analytical feasibility.

b. *Technical Reviews.* As part of the Six-Year Review process, EPA conducted a literature search for relevant data on the carcinogenicity of toxaphene as well as its potential developmental and reproductive toxicity. EPA has not identified any new information that indicates that it is appropriate to consider revisions to the cancer classification for toxaphene at this time (USEPA, 2009b). Because the MCLG remains at zero, the Agency believes that a further review of the health effects of toxaphene is not warranted at this time.

The current MCL for toxaphene is based on a PQL of 0.003 mg/L. For the Six-Year Review, the Agency considered whether changes in the analytical feasibility of toxaphene might lead to a lower MCL. EPA reviewed PE data from the first Six-Year Review cycle and then analyzed more recent PT data to determine if the PQL can be revised (*i.e.,* analytical feasibility). Passing rates for PE data available through late 1999 for toxaphene are generally above 90 percent around the current PQL of 0.003 mg/L, including three studies with true values below the current PQL. All passing rates in the PE data exceeded 80 percent. More recent PT data from late 1999 through 2004, supplied by a PT provider, show greater than 80 percent passing rates for a majority of studies, but there are no studies with true values below the current PQL. There are two PT studies with passing rates equal to or below 75 percent, at true values well above the current PQL. Despite this variability, most of the laboratory passing rates from PE and PT studies exceeded the 75 percent criterion typically used to derive a PQL, including three with true values below the PQL. Therefore, a lowering of the PQL for toxaphene might be possible. These results, however, are insufficient to recalculate a revised PQL for toxaphene because not enough data points are available below the current PQL to derive a value at the 75 percent passing rate (USEPA, 2009c).

EPA evaluated two alternative sources of information to determine whether an EQL below the current PQL could be estimated: laboratory MRLs in the Six-Year Review ICR dataset, and the MDLs for approved methods for the detection of toxaphene (Methods 505, 508.1, and 525.2). While EPA prefers to use laboratory performance data to calculate the PQL, the MRL and MDL information can be valuable for this review to indicate whether it is possible to quantitate at levels below the current PQL. The Six-Year Review ICR dataset contains MRL values for 54,529 samples. More than 80 percent of these values are less than or equal the modal MRL: 36,763 (67 percent) equal the modal MRL of 0.001 mg/L and an additional 8,525 (16 percent) are lower than 0.001 mg/L. Therefore, EPA selected the modal MRL as the EQL (USEPA, 2009e). The MDLs of approved methods are 0.0017, 0.001, and 0.00013 mg/L. Applying a multiplier of 10 would give a possible PQL range from 0.0013 to 0.017 mg/L, which is above the EQL, but includes values below the PQL (USEPA, 2009e).

Based on these varied and unrelated approaches/sources of information, EPA believes that there may be potential to lower the PQL for toxaphene. To determine whether any MCL revision is likely to provide a meaningful opportunity to improve public health protection, EPA evaluated the occurrence of toxaphene at the EQL of 0.001 mg/L and an additional threshold of 0.0015 mg/L (USEPA, 2009f). Table VI–26 shows the results of the occurrence and exposure analysis for the current MCL and these thresholds. The occurrence and exposure analysis

shows that average concentrations exceed the current MCL for three to four of 30,387 systems (0.010 to 0.013 percent) serving 23,000 people (or 0.014 percent of 160 million people). Note that these results are based on the subset of monitoring data provided in response to the Six-Year Review ICR and do not necessarily reflect MCL violations, which are based on annual average concentrations at entry points; SDWIS/FED indicates three MCL violations for toxaphene between 1998 and 2005 (USEPA, 2007g). Average concentrations at five of 30,387 systems (0.016 percent), serving 23,000 people (or 0.015 percent of 160 million people), exceed the EQL of 0.001 mg/L.

TABLE VI–26—NUMBER AND PERCENT OF SYSTEMS WITH MEAN CONCENTRATIONS EXCEEDING TOXAPHENE THRESHOLDS AND CORRESPONDING ESTIMATES OF POPULATION SERVED

Regulatory or feasibility-based threshold	Systems with mean concentrations that are greater than the regulatory or feasibility-based threshold (percentages based on 30,387 systems with toxaphene data in the Six-Year Review ICR occurrence dataset)		
	Nondetect values = MRL [1]	Nondetect values = ½ MRL [2]	Nondetect values = 0 [3]
MCL (0.003 mg/L)	4 (0.013%)	3 (0.010%)	3 (0.010%)
½ MCL (0.0015 mg/L)	5 (0.016%)	5 (0.016%)	5 (0.016%)
EQL (0.001 mg/L)	not applicable	5 (0.016%)	5 (0.016%)
Regulatory or feasibility-based threshold	Corresponding population served (percentages based on 160,012,000 people served by the systems with toxaphene data in the Six-Year Review ICR occurrence dataset)		
	Nondetect values = MRL [1]	Nondetect values = ½ MRL [2]	Nondetect values = 0 [3]
MCL (0.003 mg/L)	23,000 (0.014%)	23,000 (0.014%)	23,000 (0.014%)
½ MCL (0.0015 mg/L)	23,000 (0.014%)	23,000 (0.014%)	23,000 (0.014%)
EQL (0.001 mg/L)	not applicable	23,000 (0.014%)	23,000 (0.014%)

[1] Results are based on setting all nondetect results equal to MRL values in the Six-Year Review ICR dataset. Results are not reported at the EQL of 0.001 mg/L because this is the modal MRL and setting a majority of the results equal to this value results in an upwardly biased estimate of the number of systems with mean concentrations that exceed this value.
[2] Results are based on setting all nondetect results equal to ½ MRL values in the Six-Year Review ICR dataset.
[3] Results are based on setting all nondetect results equal to zero.
Source: USEPA, 2009f.

Since the occurrence analysis indicates that any revision to the MCL is unlikely to provide a meaningful opportunity to improve the level of public health protection, it was not necessary to perform any additional reviews on treatment feasibility or economic considerations.

c. *Review Result.* Although there are new data that support consideration of a possibly lower PQL (and therefore a possibly lower MCL), EPA does not believe a revision to the NPDWR for toxaphene is appropriate at this time. The occurrence and exposure analysis based on possible changes in analytical feasibility indicates that any revision to the MCL is unlikely to provide a meaningful opportunity to improve public health protection. Taking into consideration the low occurrence of this contaminant, EPA has decided that any revision to the NPDWR would be a low priority activity for the Agency, and, thus, is not appropriate to revise at this time because of:

- Competing workload priorities;
- The administrative costs associated with rulemaking; and
- The burden on States and the regulated community to implement any regulatory change that resulted.

64. 2,4,5-TP (Silvex; 2,4,5-Trichlorophenoxypropionic Acid)

a. *Background.* EPA published the current NPDWR for 2,4,5-TP on January 30, 1991 (56 FR 3526 (USEPA, 1991c)). The NPDWR established an MCLG and an MCL of 0.05 mg/L. EPA based the MCLG on a reference dose of 0.008 mg/kg-day and a cancer classification of D, not classifiable as to human carcinogenicity.

b. *Technical Reviews.* As part of the Six-Year Review process, EPA conducted a literature search for relevant data on the toxicology of 2,4,5-TP, including its potential developmental and reproductive toxicity. The literature search did not identify any studies that warrant a review of the RfD or the cancer classification (USEPA, 2009b).

A review of analytical or treatment feasibility is not necessary for 2,4,5-TP because changes to the MCLG are not warranted at this time and the current MCL is set at the MCLG. Since EPA did not identify a health or technology basis for revising the 2,4,5-TP NPDWR, the Agency did not conduct a detailed occurrence and exposure analysis.

c. *Review Result.* EPA's review shows that there are no data supporting a change to the 2,4,5-TP NPDWR. As a result, a revision to the NPDWR would not be appropriate at this time.

65. 1,2,4-Trichlorobenzene

a. *Background.* EPA published the current NPDWR for 1,2,4-trichlorobenzene on July 17, 1992 (57 FR 31776 (USEPA, 1992)). The NPDWR established an MCLG and an MCL of 0.07 mg/L. EPA based the MCLG on a reference dose of 0.01 mg/kg-day and a cancer classification of D, not classifiable as to human carcinogenicity.

b. *Technical Reviews.* The health effects technical review identified information regarding the carcinogenicity of 1,2,4-trichlorobenzene, as well as its noncancer effects, that may indicate the need to update the Agency's health effects assessment (USEPA, 2009b). Two chronic carcinogenicity studies of 1,2,4-trichlorobenzene, one in mice (Moore, 1994a) and one in rats (Moore, 1994b), reported liver effects in both mice and rats, as well as kidney effects in rats. Mice appeared more sensitive than rats for noncancer effects, and mice also demonstrated a significant treatment-related increase in the incidence of hepatocellular carcinomas. No increased incidence of any tumor type was observed in rats. These health effect data could have implications for the 1,2,4-trichlorobenzene MCLG because they identify effect levels for noncancer effects in the liver and kidney, as well as evidence of carcinogenicity in mice.

In light of this information, EPA considers 1,2,4-trichlorobenzene as a potential candidate for a new health effects assessment. The Agency solicits general feedback on its plans to reassess health risks resulting from exposure to 1,2,4-trichlorobenzene. The Agency also welcomes any scientific information related to 1,2,4-trichlorobenzene health risks from the public. Because EPA considers 1,2,4-trichlorobenzene as a candidate for a new assessment, EPA does not believe it is appropriate to consider revisions to the MCLG (as well as the MCL) at this time.

A review of analytical or treatment feasibility is not necessary for 1,2,4-trichlorobenzene because changes to the MCLG are not warranted at this time and the current MCL is set at the MCLG. Since EPA did not identify a health or technology basis for revising the 1,2,4-trichlorobenzene NPDWR, the Agency did not conduct a detailed occurrence and exposure analysis.

c. *Review Result.* The Agency is considering whether to initiate a new health assessment for 1,2,4-trichlorobenzene and therefore does not believe a revision to the NPDWR is appropriate at this time.

66. 1,1,1-Trichloroethane

a. *Background.* EPA published the current NPDWR for 1,1,1-trichloroethane on July 8, 1987 (52 FR 25690 (USEPA, 1987)). The NPDWR established an MCLG and an MCL of 0.20 mg/L. EPA based the MCLG on a reference dose of 0.035 mg/kg-day and a cancer classification of D, not classifiable as to human carcinogenicity.

b. *Technical Reviews.* In 2007, the Agency updated its health effects assessment of 1,1,1-trichloroethane (USEPA, 2007d). The Agency identified a change in this assessment that could lead to a change in the MCLG. This assessment considered relevant studies on the toxicity of 1,1,1-trichloroethane including developmental and reproductive toxicity. The assessment revised the RfD from 0.035 mg/kg-day to 2 mg/kg-day and concluded that there is inadequate information to assess the carcinogenic potential of 1,1,1-trichloroethane (USEPA, 2007d). Based on the new IRIS assessment and RfD of 2 mg/kg-day, and assuming a 70-kg adult body weight and 2 liters water intake per day, the DWEL could be 70 mg/L. An RSC of 20 percent results in a possible MCLG of 14 mg/L (USEPA, 2009b).

Analytical feasibility does not pose any limitations for the current MCL and would not be a limiting factor if EPA were to raise the MCLG. EPA evaluated the results of the occurrence and exposure analyses for 1,1,1-trichloroethane to determine whether a revised MCLG/MCL would be likely to result in a meaningful opportunity to achieve cost savings for PWSs and their customers while maintaining, or improving, the level of public health protection (USEPA, 2009f). Although the Agency obtained and evaluated the finished water occurrence data for 1,1,1-trichloroethane, its usefulness is limited for determining potential cost savings to PWSs and their customers because the Agency does not know which systems are treating for this contaminant. As an alternative, the Agency evaluated available data on source water quality and conducted a qualitative assessment of treatment cost savings.

Table VI–27 provides summary data for contaminant occurrence based on maximum sample values for the locations included in the STORET and NAWQA data. Although the degree to which these occurrence rates represent national drinking water source occurrence is uncertain, the information shows no to low occurrence at threshold levels of interest. This information indicates that any resulting NPDWR change would affect systems that rely on source water at none of the NAWQA locations and at less than 0.1 percent of the STORET locations.

TABLE VI–27—AMBIENT WATER QUALITY MONITORING OCCURRENCE SUMMARY FOR 1,1,1-TRICHLOROETHANE

Maximum concentration	Number of locations (% of locations)	
	STORET [1]	NAWQA [2]
Total	3,429 (100.0%)	5,788 (100.0%)
Nondetect	2,304 (67.2%)	5,290 (91.4%)
Detected	1,125 (32.8%)	498 (8.6%)
Exceeds current MCLG of 0.2 mg/L	5 (0.1%)	0 (0.0%)
Exceeds alternative value of 14 mg/L	0 (0.0%)	0 (0.0%)

[1] STORET database 2002–2008.
[2] NAWQA database 1992–2008.
Source: USEPA, 2009d.

The BATs and small system compliance technologies for 1,1,1-trichloroethane have other beneficial effects, *e.g.,* reduction of other co-occurring contaminants, precursors for DBPs, or other common impurities. Therefore, if EPA were to consider a higher level, the Agency does not know how many PWSs that are currently treating to comply with the existing MCL of 0.2 mg/L would be likely to discontinue treatment that is already in place (USEPA, 2009d). Also, the Agency does not know to what extent affected systems might be able to reduce costs given that capital costs are not recoverable. However, the Agency recognizes that there may be opportunities to achieve operational cost savings if these systems are able to re-optimize current treatment.

Given these considerations, the Agency believes that any resulting revision is not likely to provide a meaningful opportunity for cost savings. In view of this, any revision would be a low priority activity and not appropriate at this time.

c. *Review Result.* Although there are new data that support consideration of whether to revise the MCLG/MCL for 1,1,1-trichloroethane, EPA does not believe a revision to the NPDWR for 1,1,1-trichloroethane is appropriate at this time. In making this decision, the Agency considered whether any possible revision to the NPDWR for 1,1,1-trichloroethane is likely to provide a meaningful opportunity for cost savings to public water systems and their customers. Taking into consideration the low occurrence of this contaminant in source waters, EPA has decided that any revision to the NPDWR would be a low priority activity for the Agency, and, thus, is not appropriate to revise at this time because of:

- Competing workload priorities;
- The administrative costs associated with rulemaking; and

• The burden on States and the regulated community to implement any regulatory change that resulted.

67. 1,1,2-Trichloroethane

a. *Background.* EPA published the current NPDWR for 1,1,2-trichloroethane on July 17, 1992 (57 FR 31776 (USEPA, 1992)). The NPDWR established an MCLG of 0.003 mg/L. EPA based the MCLG on a reference dose of 0.004 mg/kg-day and a cancer classification of C, possible human carcinogen. The NPDWR also established an MCL of 0.005 mg/L, based on analytical feasibility.

b. *Technical Reviews.* As part of the Six-Year Review process, EPA conducted a literature search for relevant data on the toxicology of 1,1,2-trichloroethane, including its potential developmental and reproductive toxicity. The literature search did not identify any studies that warrant a review of the RfD or the cancer classification (USEPA, 2009b).

The current MCL for 1,1,2-trichloroethane is based on a PQL of 0.005 mg/L. For the Six-Year Review, the Agency considered whether changes in the analytical feasibility of 1,1,2-trichloroethane might lead to a lower MCL. EPA reviewed PE data from the first Six-Year Review cycle and then analyzed more recent PT data to determine if the PQL can be revised (*i.e.,* analytical feasibility). Passing rates for PE data available through late 1999 for 1,1,2-trichloroethane are above 95 percent near the current PQL of 0.005 mg/L, but there were no PE studies with true values below the current PQL. More recent PT data from late 1999 through 2004, supplied by a PT provider, show greater than 90 percent passing rates around the current PQL, including twelve studies with true values below the PQL. Because most of the laboratory passing rates from PT studies—including several with true concentrations below the PQL—exceeded the 75 percent criterion typically used to derive a PQL, a lowering of the PQL for 1,1,2-trichloroethane might be possible. These results, however, are insufficient to recalculate a revised PQL for 1,1,2-trichloroethane because not enough data points are available below the current PQL to derive a value at the 75 percent passing rate (USEPA, 2009c).

EPA evaluated two alternative sources of information to determine whether they indicate any potential to quantitate at levels as low as the current MCLG: laboratory MRLs in the Six-Year Review ICR dataset, and the MDLs for approved methods for the detection of 1,1,2-trichloroethane (Methods 502.2 and 524.2). While EPA prefers to use laboratory performance data to calculate the PQL, the MRL and MDL information can be valuable for this review to indicate whether it is possible to quantitate at levels below the current PQL. The Six-Year Review ICR dataset contains MRL values for 139,672 samples. Of these, 117,788 (84 percent) equal the modal MRL of 0.0005 mg/L. An additional 17,142 (12 percent) are lower than 0.0005 mg/L. Because more than 80 percent of the of MRLs are equal to or less than the current MCLG of 0.003 mg/L, EPA selected that value as the minimum threshold for the occurrence and exposure analysis (USEPA, 2009e). The MDLs of approved methods range from 0.00004 to 0.0001 mg/L. Applying a multiplier of 10 would give a possible PQL range from 0.0004 to 0.001 mg/L, which is below the current MCLG (USEPA, 2009e).

Based on these varied and unrelated approaches/sources of information, EPA believes that there is potential to lower the PQL for 1,1,2-trichloroethane. To determine whether any MCL revision is likely to provide a meaningful opportunity to improve public health protection, EPA evaluated the occurrence of 1,1,2-trichloroethane at the current MCLG of 0.003 mg/L (USEPA, 2009f). Table VI–28 shows the results of the occurrence and exposure analysis for the current MCL and the current MCLG of 0.003 mg/L. The occurrence and exposure analysis shows that average concentrations do not exceed the current MCL for any system in the analysis. Note that these results are based on the subset of monitoring data provided in response to the Six-Year Review ICR and do not necessarily reflect MCL violations, which are based on annual average concentrations at entry points; SDWIS/FED indicates six MCL violations for 1,1,2-trichloroethane between 1998 and 2005 (USEPA, 2007g). The average concentration at one out of 50,195 systems (0.002 percent), serving approximately 700 people (or 0.0003 percent of 227 million people), exceeds the current MCLG of 0.003 mg/L.

TABLE VI–28—NUMBER AND PERCENT OF SYSTEMS WITH MEAN CONCENTRATIONS EXCEEDING 1,1,2-TRICHLOROETHANE THRESHOLDS AND CORRESPONDING ESTIMATES OF POPULATION SERVED

Regulatory or health-based threshold	Systems with mean concentrations that are greater than the regulatory or health-based threshold (percentages based on 50,195 systems with 1,1,2-trichloroethane data in the Six-Year Review ICR occurrence dataset)		
	Nondetect values = MRL [1]	Nondetect values = ½ MRL [2]	Nondetect values = 0 [3]
MCL (0.005 mg/L)	0 (0.000%)	0 (0.000%)	0 (0.000%)
Current MCLG (0.003 mg/L)	1 (0.002%)	1 (0.002%)	1 (0.002%)
Regulatory or health-based threshold	Corresponding population served (Percentages based on 226,852,000 people served by the systems with 1,1,2-trichloroethane data in the Six-Year Review ICR occurrence dataset)		
	Nondetect values = MRL [1]	Nondetect values = ½ MRL [2]	Nondetect values = 0 [3]
MCL (0.005 mg/L)	0 (0.000%)	0 (0.000%)	0 (0.000%)
Current MCLG (0.003 mg/L)	700 (0.0003%)	700 (0.0003%)	700 (0.0003%)

[1] Results are based on setting all nondetect results equal to MRL values in the Six-Year Review ICR dataset.
[2] Results are based on setting all nondetect results equal to ½ MRL values in the Six-Year Review ICR dataset.
[3] Results are based on setting all nondetect results equal to zero.
Source: USEPA, 2009f.

Since the occurrence analysis indicates that any revision to the MCL is unlikely to provide a meaningful opportunity to improve the level of public health protection, it was not necessary to perform any additional reviews on treatment feasibility or economic considerations.

c. *Review Result.* Although there are new data that support consideration of a possibly lower PQL (and therefore a possibly lower MCL), EPA does not believe a revision to the NPDWR for 1,1,2-trichloroethane is appropriate at this time. The occurrence and exposure analysis based on possible changes in analytical feasibility indicates that any revision to the MCL is unlikely to provide a meaningful opportunity to improve public health protection. Taking into consideration the low occurrence of this contaminant, EPA has decided that any revision to the NPDWR would be a low priority activity for the Agency, and, thus, is not appropriate to revise at this time because of:

- Competing workload priorities;
- The administrative costs associated with rulemaking; and
- The burden on States and the regulated community to implement any regulatory change that resulted.

68. Trichloroethylene

a. *Background.* EPA published the current NPDWR for trichloroethylene on July 8, 1987 (52 FR 25690 (USEPA, 1987)). The NPDWR established an MCLG of zero based on a cancer classification of B2, probable human carcinogen. The NPDWR also established an MCL of 0.005 mg/L, based on analytical feasibility.

b. *Technical Reviews.* EPA has initiated a reassessment of the health risks resulting from exposure to trichloroethylene. The revised health effects assessment will consider relevant studies on the toxicity of trichloroethylene, including its potential developmental and reproductive toxicity. The new health effects assessment was not completed by March 1, 2009, the review cutoff date for this notice (USEPA, 2009b). The IRIS Substance Assessment Tracking System Web site (*http://cfpub.epa.gov/iristrac/index.cfm*) has the most up-to-date information on the status of the health effects assessment.

Although a risk assessment is in process for trichloroethylene, the existing MCLG is zero and the current MCL of 0.005 mg/L is based on the PQL. Therefore, EPA reviewed whether there is potential to revise the PQL. EPA reviewed PE data from the first Six-Year Review cycle and then analyzed more recent PT data to determine if the PQL can be revised (*i.e.,* analytical feasibility). Passing rates for PE data available through late 1999 for trichloroethylene are above 95 percent at the lowest concentrations. However, the true concentrations were all higher than the current PQL of 0.005 mg/L. More recent PT data from 1999 to 2004, supplied by a PT provider, also show greater than 95 percent passing rates for studies around the current PQL, including 6 with true values below the PQL. Because most of the laboratory passing rates from PE and PT studies exceeded the 75 percent criterion typically used to derive a PQL, including several with true values below the PQL, a lowering of the PQL for trichloroethylene might be possible. These results, however, are insufficient to recalculate a revised PQL for trichloroethylene because not enough data points are available below the current PQL to derive a value at the 75 percent passing rate (USEPA, 2009c).

EPA evaluated two alternative sources of information to determine whether an EQL below the current PQL could be estimated: laboratory MRLs in the Six-Year Review ICR dataset, and the MDLs for approved methods for the detection of trichloroethylene (Methods 502.2, 524.2, and 551.1). While EPA prefers to use laboratory performance data to calculate the PQL, the MRL and MDL information can be valuable for this review to indicate whether it is possible to quantitate at levels below the current PQL. EPA also noted that the State of New Jersey uses a PQL of 0.001 mg/L, based on a 1987 study of laboratory performance at low concentrations that used criteria similar to those in the PT data (NJDWQI, 1987). The Six-Year Review ICR dataset contains MRLs for 138,439 samples. More than 80 percent of these values are less than or equal the modal MRL: 118,193 (85 percent) equal the modal MRL of 0.0005 mg/L and an additional 17,057 (12 percent) are lower than 0.0005 mg/L. Therefore, EPA selected the modal MRL as the EQL (USEPA, 2009e). The MDLs of approved methods range are 0.00006, 0.00019, and 0.000042 mg/L. Applying a multiplier of 10 would give a possible PQL range from 0.00042 to 0.0019 mg/L, which contains the EQL (USEPA, 2009e).

Based on these varied and unrelated approaches/sources of information, EPA believes that there is potential to lower the PQL for trichloroethylene. To determine whether any MCL revision is likely to provide a meaningful opportunity to improve public health protection, EPA evaluated the occurrence of trichloroethylene at the EQL of 0.0005 mg/L and additional thresholds of 0.0010 and 0.0025 mg/L (USEPA, 2009f). Table VI–29 shows the results of the occurrence and exposure analysis for the current MCL and these thresholds. The occurrence and exposure analysis shows that average concentrations exceed the current MCL for 25 out of 50,432 systems (0.050 percent) serving approximately 410,000 people (or 0.181 percent of 227 million people). Note that these results are based on the subset of monitoring data provided in response to the Six-Year Review ICR and do not necessarily reflect MCL violations, which are based on annual average concentrations at entry points; SDWIS/FED indicates 191 MCL violations for trichloroethylene between 1998 and 2005 (USEPA, 2007g), with annual violations ranging from 12 to 31. Average concentrations at 310 to 388 of 50,432 systems (0.615 to 0.769 percent), serving approximately 12.0 to 13.0 million people (or 5.237 to 5.670 percent of 227 million people), exceed the EQL of 0.0005 mg/L. While these systems are widely distributed and located in most of the States providing data, a few large systems (serving 500,000 or more people) account for almost half of the exposed population.

TABLE VI–29—NUMBER AND PERCENT OF SYSTEMS WITH MEAN CONCENTRATIONS EXCEEDING TRICHLOROETHYLENE THRESHOLDS AND CORRESPONDING ESTIMATES OF POPULATION SERVED

Regulatory or feasibility-based threshold	Systems with mean concentrations that are greater than the regulatory or feasibility-based threshold (percentages based on 50,432 systems with trichloroethylene data in the Six-Year Review ICR occurrence dataset)		
	Nondetect values = MRL [1]	Nondetect values = ½ MRL [2]	Nondetect values = 0 [3]
MCL (0.005 mg/L)	25 (0.050%)	25 (0.050%)	25 (0.050%)
½ MCL (0.0025 mg/L)	70 (0.139%)	68 (0.135%)	64 (0.127%)
2xEQL (0.001 mg/L)	239 (0.474%)	208 (0.412%)	182 (0.361%)
EQL (0.0005 mg/L)	not applicable	388 (0.769%)	310 (0.615%)
	Corresponding population served (percentages based on 226,908,000 people served by the systems with trichloroethylene data in the Six-Year Review ICR occurrence dataset)		
Regulatory or feasibility-based threshold	Nondetect Values = MRL [1]	Nondetect values = ½ MRL [2]	Nondetect values = 0 [3]
MCL (0.005 mg/L)	410,000 (0.181%)	410,000 (0.181%)	410,000 (0.181%)
½ MCL (0.0025 mg/L)	4,765,000 (2.100%)	4,691,000 (2.067%)	4,598,000 (2.026%)
2xEQL (0.001 mg/L)	10,367,000 (4.569%)	8,282,000 (3.650%)	7,399,000 (3.261%)
EQL (0.0005 mg/L)	not applicable	12,866,000 (5.670%)	11,884,000 (5.237%)

[1] Results are based on setting all nondetect results equal to MRL values in the Six-Year Review ICR dataset. Results are not reported at the EQL of 0.0005 mg/L because this is the modal MRL and setting a majority of the results equal to this value results in an upwardly biased estimate of the number of systems with mean concentrations that exceed this value.
[2] Results are based on setting all nondetect results equal to ½ MRL values in the Six-Year Review ICR dataset.
[3] Results are based on setting all nondetect results equal to zero.
Source: USEPA, 2009f.

Since the occurrence analysis indicates that a revision to the MCL may provide a meaningful opportunity to improve the level of public health protection, EPA considered whether treatment feasibility is likely to pose any limitations if the MCL were lowered (USEPA, 2009g). The current BATs for trichloroethylene are packed tower aeration (PTA) and granular activated carbon (GAC). Small system compliance technologies for trichloroethylene include GAC and several aeration technologies. EPA's assessment shows that PTA and GAC are effective enough to achieve concentrations as low as the EQL.

EPA is not currently able to assess the potential health benefits from a revised MCL for trichloroethylene, because the revised health effects assessment is not yet available. However, based on its B2 cancer classification (MCLG of zero) and the occurrence and exposure analysis at possible MCL values, the Agency believes that a revision to the MCL may provide a meaningful opportunity to reduce public health risks.

c. *Review Result.* The Agency believes it is appropriate to revise the NPDWR for trichloroethylene although a health effects assessment is currently in progress. The existing MCLG is zero (based on the current B2 cancer classification) and the current MCL is based on a PQL (*i.e.,* analytical feasibility) of 0.005 mg/L. The Agency's review indicates that analytical feasibility could be as much as 10 times lower (~ 0.0005 mg/L) and occurrence at this level appears to be relatively widespread. Hence, revisions to the trichloroethylene NPDWR may provide a meaningful opportunity for health risk reduction. If the updated health effects assessment is completed in time to consider for the regulatory revision of trichloroethylene, the Agency will consider this assessment in its evaluation of public health benefits associated with any revision. As discussed in Section VII, the Agency solicits public comment and/or relevant information that may inform the regulatory revision for trichloroethylene. EPA is also requesting that stakeholders provide information/data about the lowest level of quantitation (including the analytical method used) that laboratories can reliably and consistently achieve.

69. Uranium

a. *Background.* EPA published the current NPDWR for uranium on December 7, 2000 (65 FR 76708 (USEPA, 2000c)). The NPDWR established an MCLG of zero based on a cancer classification of A, known human carcinogen. As noted in the December 2000 FR, uranium has also been identified as a nephrotoxic metal (kidney toxicant) and EPA derived a drinking water equivalent level of 20 μg/L as a noncancer health endpoint for kidney toxicity. The NPDWR also established an MCL of 30 μg/L, which is higher than the feasible level of 20 μg/L and the level associated with kidney toxicity. In December 2000, EPA exercised its discretionary authority to set an MCL at a level higher than feasible (SDWA Section 1412(b)(6)), based on the finding that "benefits do not justify the costs at the feasible level (20 μg/L) and that the net benefits are maximized at a level (30 μg/L) that is still protective of health with an adequate margin of safety" (65 FR 76708 (USEPA, 2000c)) [25].

b. *Technical Reviews.* EPA has initiated a reassessment of the health risks resulting from exposure to uranium. The revised health effects assessment will consider relevant studies on the toxicity of uranium, including its potential developmental and reproductive toxicity. The new health effects assessment was not completed by March 1, 2009, the review cutoff date for this notice (USEPA, 2009b). The IRIS Substance Assessment Tracking System Web site (*http://cfpub.epa.gov/iristrac/index.cfm*) has the most up-to-date information on the status of the health effects assessment.

c. *Review Result.* The Agency does not believe a revision to the NPDWR for uranium is appropriate at this time because a reassessment of the health risks resulting from exposure to

[25] After the December 7, 2000 final regulation, two trade associations and several municipal water systems challenged EPA's standard for uranium by claiming that the Agency did not use the best available science when finalizing the standard. In February of 2003, the DC Circuit Court of Appeals upheld EPA's regulation for uranium (as well as combined radiums, and beta particle and photon emitters).

uranium is ongoing (USEPA, 2009b). As noted previously, the uranium MCL is based on the SDWA cost benefit provision (Section 1412(b)(6)) and the health effects assessment is important for reviewing the benefits associated with the basis of the MCL.

70. Vinyl Chloride

a. *Background.* EPA published the current NPDWR for vinyl chloride on July 8, 1987 (52 FR 25690 (USEPA, 1987)). The NPDWR established an MCLG of zero based on a cancer classification of A, known human carcinogen. The NPDWR also established an MCL of 0.002 mg/L, based on analytical feasibility.

b. *Technical Reviews.* As part of the Six-Year Review process, EPA conducted a literature search for relevant data on the carcinogenicity of vinyl chloride as well as its potential developmental and reproductive toxicity. EPA has not identified any new information that indicates that it is appropriate to consider revisions to the cancer classification for vinyl chloride at this time (USEPA, 2009b). Because the MCLG remains at zero, the Agency believes that a further review of the health effects of vinyl chloride is not warranted at this time.

The current MCL for vinyl chloride is based on a PQL of 0.002 mg/L. For the Six-Year Review, the Agency considered whether changes in the analytical feasibility of vinyl chloride might lead to a lower MCL. EPA reviewed PE data from the first Six-Year Review cycle and then analyzed more recent PT data to determine if the PQL can be revised (*i.e.,* analytical feasibility). Passing rates for PE data available through late 1999 for vinyl chloride are generally in the 75 to 80 percent range near the current PQL of 0.002 mg/L, but there were no results for PE studies with true values below the current PQL. More recent PT data from late 1999 through 2004, supplied by a PT provider, also show greater than 80 percent passing rates for studies around the current PQL, including two studies with true values below the PQL. Despite the limited data below the PQL, most of the laboratory passing rates from PE and PT studies—including two with true concentrations below the PQL—exceeded the 75 percent criterion usually used to derive a PQL. Therefore, a lowering of the PQL for vinyl chloride might be possible (USEPA, 2009c).

EPA evaluated two alternative sources of information to determine whether an EQL below the current PQL could be estimated: laboratory MRLs in the Six-Year Review ICR dataset, and the MDLs for approved methods for the detection of vinyl chloride (Methods 502.2 and 524.2). While EPA prefers to use laboratory performance data to calculate the PQL, the MRL and MDL information can be valuable for this review to indicate whether it is possible to quantitate at levels below the current PQL. The Six-Year Review ICR dataset contains MRL values for 139,494 samples. More than 80 percent of these values are less than or equal the modal MRL: 105,410 (76 percent) equal the modal MRL of 0.0005 mg/L and an additional 25,723 (18 percent) are lower than 0.0005 mg/L. Therefore, EPA selected the modal MRL as the EQL (USEPA, 2009e). The MDLs of approved methods range from 0.00017 to 0.00018 mg/L. Applying a multiplier of 10 would give a possible PQL range from 0.0017 to 0.0018 mg/L, which is higher than the EQL, but below the current PQL (USEPA, 2009e).

Based on these varied and unrelated approaches/sources of information, EPA believes that there may be potential to lower the PQL for vinyl chloride. To determine whether any MCL revision is likely to provide a meaningful opportunity to improve public health protection, EPA evaluated the occurrence of vinyl chloride at the EQL of 0.0005 mg/L and an additional threshold of 0.001 mg/L (USEPA, 2009f). Table VI–30 shows the results of the occurrence and exposure analysis for the current MCL and these thresholds. The occurrence and exposure analysis shows that average concentrations exceed the current MCL for 8 to 11 of 50,411 systems (0.016 to 0.022 percent) serving fewer than 14,000 people (or 0.003 to 0.006 percent of 226 million people). Note that these results are based on the subset of monitoring data provided in response to the Six-Year Review ICR and do not necessarily reflect MCL violations, which are based on annual average concentrations at entry points; SDWIS/FED indicates 25 MCL violations for vinyl chloride between 1998 and 2005 (USEPA, 2007g). Average concentrations at 32 to 49 of 50,411 systems (0.063 to 0.097 percent), serving 483,000 to 766,000 people (or 0.213 to 0.338 percent of 226 million people), exceed the EQL of 0.0005 mg/L.

TABLE VI–30—NUMBER AND PERCENT OF SYSTEMS WITH MEAN CONCENTRATIONS EXCEEDING VINYL CHLORIDE THRESHOLDS AND CORRESPONDING ESTIMATES OF POPULATION SERVED

Regulatory or feasibility-based threshold	Systems with mean concentrations that are greater than the regulatory or feasibility-based threshold (percentages based on 50,411 systems with vinyl chloride data in the Six-Year Review ICR occurrence dataset)		
	Nondetect values = MRL [1]	Nondetect values = ½ MRL [2]	Nondetect values = 0 [3]
MCL (0.002 mg/L)	11 (0.022%)	10 (0.020%)	8 (0.016%)
½ MCL (0.001 mg/L)	21 (0.042%)	18 (0.037%)	15 (0.030%)
EQL (0.0005 mg/L)	not applicable	49 (0.097%)	32 (0.063%)
	Corresponding Population Served (Percentages based on 226,464,000 people served by the systems with vinyl chloride data in the Six-Year Review ICR occurrence dataset)		
Regulatory or feasibility-based threshold	Nondetect values = MRL [1]	Nondetect values = ½ MRL [2]	Nondetect values = 0 [3]
MCL (0.002 mg/L)	14,000 (0.006%)	12,000 (0.005%)	6,000 (0.003%)
½ MCL (0.001 mg/L)	56,000 (0.025%)	23,000 (0.010%)	18,000 (0.008%)
EQL (0.0005 mg/L)	not applicable	766,000 (0.338%)	483,000 (0.213%)

[1] Results are based on setting all nondetect results equal to MRL values in the Six-Year Review ICR dataset. Results are not reported at the EQL of 0.0005 mg/L because this is the modal MRL and setting a majority of the results equal to this value results in an upwardly biased estimate of the number of systems with mean concentrations that exceed this value.

[2] Results are based on setting all nondetect results equal to ½ MRL values in the Six-Year Review ICR dataset.

[3] Results are based on setting all nondetect results equal to zero.

Source: USEPA, 2009f.

Since the occurrence analysis indicates that any revision to the MCL is unlikely to provide a meaningful opportunity to improve the level of public health protection, it was not necessary to perform any additional reviews on treatment feasibility or economic considerations.

c. *Review Result.* Although there are new data that support consideration of a possibly lower PQL (and therefore a possibly lower MCL), EPA does not believe a revision to the NPDWR for vinyl chloride is appropriate at this time. The occurrence and exposure analysis based on possible changes in analytical feasibility indicates that any revision to the MCL is unlikely to provide a meaningful opportunity to improve public health protection. Taking into consideration the low occurrence of this contaminant, EPA has decided that any revision to the NPDWR would be a low priority activity for the Agency, and, thus, is not appropriate to revise at this time because of:

- Competing workload priorities;
- The administrative costs associated with rulemaking; and
- The burden on States and the regulated community to implement any regulatory change that resulted.

71. Xylenes (Total)

a. *Background.* EPA published the current NPDWR for total xylenes on January 30, 1991 (56 FR 3526 (USEPA, 1991c)). The NPDWR established an MCLG and an MCL of 10 mg/L. EPA based the MCLG on a reference dose of 2 mg/kg-day and a cancer classification of D, not classifiable as to human carcinogenicity.

b. *Technical Reviews.* In 2003, the Agency updated its health effects assessment of xylenes (USEPA, 2003d). The change in this assessment could lead to a change in the MCLG. This assessment considered relevant studies on the toxicity of xylenes including developmental and reproductive toxicity. The assessment revised the RfD from 2 mg/kg-day to 0.2 mg/kg-day and concluded that there is inadequate information to assess the carcinogenic potential of xylenes (USEPA, 2003d). Based on the new IRIS assessment and RfD of 0.2 mg/kg-day, and assuming a 70-kg adult body weight and 2 liters water intake per day, the DWEL could be 7 mg/L. An RSC of 20 percent results in a possible MCLG of 1 mg/L.

Analytical feasibility does not pose any limitations for the current MCL and would not be a limiting factor for the possible MCLG decrease under consideration. EPA evaluated the results of the occurrence and exposure analyses for total xylenes to determine whether a revised MCLG/MCL would be likely to result in a meaningful opportunity to improve the level of public health protection (USEPA, 2009f). Table VI–31 shows the results of the occurrence and exposure analysis for the current MCL and the possible MCLG set equal to 1 mg/L based on the new health effects information. The occurrence and exposure analysis shows that average concentrations do not exceed the current MCL for any system in the analysis. Note that these results are based on the subset of monitoring data provided in response to the Six-Year Review ICR and do not necessarily reflect MCL violations, which are based on annual average concentrations at entry points; SDWIS/FED indicates two MCL violations for xylene between 1998 and 2005 (USEPA, 2007g). The occurrence and exposure analysis shows that average concentrations do not exceed the possible MCLG based on new health effects information (1 mg/L).

TABLE VI–31—NUMBER AND PERCENT OF SYSTEMS WITH MEAN CONCENTRATIONS EXCEEDING XYLENE THRESHOLDS AND CORRESPONDING ESTIMATES OF POPULATION SERVED

Regulatory or health-based threshold	Systems with mean concentrations that are greater than the regulatory or health-based threshold (percentages based on 47,698 systems with xylene data in the Six-Year Review ICR occurrence dataset)		
	Nondetect values = MRL [1]	Nondetect values = ½ MRL [2]	Nondetect values = 0 [3]
MCL (10 mg/L)	0 (0.000%)	0 (0.000%)	0 (0.000%)
Possible MCLG (1 mg/L)	0 (0.000%)	0 (0.000%)	0 (0.000%)
	Corresponding population Served (percentages based on 218,072,000 people served by the systems with xylene data in the Six-Year Review ICR occurrence dataset)		
Regulatory or health-based threshold	Nondetect values = MRL [1]	Nondetect values = ½ MRL [2]	Nondetect values = 0 [3]
MCL (10 mg/L)	0 (0.000%)	0 (0.000%)	0 (0.000%)
Possible MCLG (1 mg/L)	0 (0.000%)	0 (0.000%)	0 (0.000%)

[1] Results are based on setting all nondetect results equal to MRL values in the Six-Year Review ICR dataset
[2] Results are based on setting all nondetect results equal to ½ MRL values in the Six-Year Review ICR dataset.
[3] Results are based on setting all nondetect results equal to zero.
Source: USEPA, 2009f.

Since the occurrence analysis indicates that any revision to the MCL is unlikely to provide a meaningful opportunity to improve the level of public health protection, it was not necessary to perform any additional reviews on treatment feasibility or economic considerations.

c. *Review Result.* Although there are new data that support consideration of whether to revise the MCLG/MCL for total xylenes, EPA does not believe a revision to the NPDWR for total xylenes is appropriate at this time. In making this decision, the Agency considered whether any possible revision to the NPDWR for total xylenes is likely to provide a meaningful opportunity for health risk reductions. Taking into consideration the low occurrence of this contaminant, EPA has decided that any revision to the NPDWR would be a low priority activity for the Agency, and, thus, is not appropriate to revise at this time because of:

- Competing workload priorities;
- The administrative costs associated with rulemaking; and
- The burden on States and the regulated community to implement any regulatory change that resulted.

VII. EPA's Request for Comments

A. Request for Comment and/or Information on the Candidates for Revision

EPA invites commenters to submit any new, relevant peer-reviewed data or information pertaining to the four

NPDWRs identified in today's action as candidates for revision (*i.e.,* acrylamide, epichlorohydrin, tetrechloroethylene and trichloroethylene). This information will inform EPA's evaluation as the Agency moves forward with the regulatory revisions for these four NPDWRs. Peer reviewed data are studies/analyses that have been reviewed by qualified individuals (or organizations) who are independent of those who performed the work, but who are collectively equivalent in technical expertise (*i.e.,* peers) to those who performed the original work. A peer review is an in-depth assessment of the assumptions, calculations, extrapolations, alternate interpretations, methodology, acceptance criteria, and conclusions pertaining to the specific major scientific and/or technical work products and of the documentation that supports them (USEPA, 2000d). Relevant data include studies/analyses pertaining to analytical feasibility, treatment feasibility, and occurrence/exposure related to the four NPDWRs candidates for revision listed in today's action.[26] Table VII–1 provides a list of the specific items for which EPA is requesting comment and/or information for the four candidates for revision. It also provides a cross-reference to the section addressing the issue.

TABLE VII–1—ITEMS FOR WHICH EPA IS REQUESTING COMMENT AND/OR INFORMATION FOR THE FOUR CANDIDATES FOR REVISION

Issue	Notice section
Any new, relevant peer-reviewed data or information that would inform the revision of the NPDWR for acrylamide, including information pertaining to extent of use of polyacrylamide in drinking water facilities.	Section VI.B.1.
Any new, relevant peer-reviewed data or information that would inform the revision of the NPDWR for epichlorohydrin, including information pertaining to extent of use of epichlorohydrin-based polymers/co-polymers in drinking water facilities.	Section VI.B.36.
Any new, relevant peer-reviewed data or information that would inform the revision of the NPDWR for tetrachloroethylene, including information/data about the lowest level of quantitation (and analytical method used) that laboratories can reliably and consistently achieve.	Section VI.B.60.
Any new, relevant peer-reviewed data or information that would inform the revision of the NPDWR for trichloroethylene, including information/data about the lowest level of quantitation (and the analytical method used) that laboratories can reliably and consistently achieve.	Sections VI.B.65.

B. Request for Information/Data on Other Review Topics

EPA also invites commenters to submit new, relevant information on several other review topics referenced in this notice and listed in Table VII–2.

TABLE VII–2—ISSUES FOR WHICH EPA IS REQUESTING PUBLIC INPUT AND/OR INFORMATION

Issue	Notice section
Location for nitrate and nitrite monitoring	Section V.B.6.
Monitoring frequency for ground water systems with low nitrate and nitrite concentrations	Section V.B.6.
Monitoring requirements for non-community water systems	Section V.B.6.
Detection limits that serve as triggers to determine compliance monitoring frequency for SOCs	Section V.B.6.
New, relevant health effects information that will help the Agency decide whether to initiate a new health effects assessment for chromium.	Section VI.B.17.
New, relevant health effects information that will help the Agency decide whether to initiate or nominate nitrate and nitrite for a new health effects assessment.	Sections VI.B.49 and VI.B.50.
New, relevant health effects information that will help the Agency decide whether to initiate or nominate selenium for a new health effects assessment.	Sections VI.B.56.
New, relevant health effects information that will help the Agency decide whether to initiate or nominate 1,2,4-trichlorobenzene for a new health effects assessment.	Sections VI.B.65.

C. Requests for Information on the Impacts of Climate Change on Water Quality

The Agency recognizes that changes in global climate can impacttemperature, rainfall patterns, and snow and ice cover. Changes in these climate indicators can impact water quantity and water quality. In an effort to assess the impacts of climate change on water quality, EPA is asking if public water systems and/or States have any information or data that illustrates the impact of climate change (*e.g.,* changes in rainfall, drought, temperature, and snow/ice cover) on the occurrence of contaminants in drinking water, both in source water and in finished water. EPA also requests data on changes in the variability of occurrence and impacts on drinking water treatment to address occurrence or variability changes.

VIII. EPA's Next Steps

EPA will consider the public comments and/or any new, relevant, peer-reviewed data submitted for the four NPDWRs listed as candidates for revision as the Agency proceeds with the regulatory revisions for these regulations. The announcement that the Agency intends to revise an NPDWR (pursuant to SDWA section 1412(b)(9)) is not a regulatory decision. Instead, it initiates a regulatory process that will involve more detailed analyses of health effects, analytical and treatment feasibility, occurrence, benefits, costs, and other regulatory matters relevant to deciding whether an NPDWR should be revised. The Six-Year Review results do not obligate the Agency to revise an NPDWR in the event that EPA determines during the regulatory process that revisions are no longer

[26] Note that new health effects studies/information for acrylamide, PCE and TCE are being considered as part of the IRIS update to these health assessments.

appropriate and discontinues further efforts to revise an NPDWR. Similarly, the fact that an NPDWR has not been selected for revision means only that EPA believes that regulatory changes to a particular NPDWR are not appropriate at this time for the reasons given in today's action; future reviews may identify information that leads to an initiation of the revision process.

IX. References

ATSDR (Agency for Toxic Substances and Disease Registry). 2007. Toxicological profile for benzene. Atlanta, GA: Agency for Toxic Substances and Disease Registry, Public Health Service, U.S. Department of Health and Human Services. Available on the Internet at: *http://www.atsdr.cdc.gov/toxprofiles/tp3.html.*

Cocco, P, G. Broccia, *et al.* 2003. Nitrate in community water supplies and incidence of non-Hodgkin's lymphoma in Sardinia, Italy. Journal of Epidemiology and Community Health. v. 57, pp. 510–511.

Coss, A., K.P. Cantor, *et al.* 2004. Pancreatic cancer and drinking water and dietary sources of nitrate and nitrite. American Journal of Epidemiology. v. 159, pp. 693–701.

de Roos, A.J., M.H. Ward, *et al.* 2003. Nitrate in public water supplies and the risk of colon and rectum cancers. Epidemiology. v. 14, pp. 640–649.

Duffield-Lillico, A.J., E.H. Slate, *et al.* 2003. Selenium supplementation and secondary prevention of nonmelanoma skin cancer in a randomized trial. Journal of the National Cancer Institute. v. 95, pp. 1477–1481.

Gianessi, L. and N. Reigner. 2006. Pesticide Use in U.S. Crop Production: 2002 With Comparison to 1992 and 1997—Fungicides & Herbicides. Washington, DC: CropLife Foundation.

Gilliom, R.J., J.E. Barbash, C.G. Crawford, P.A. Hamilton, J.D. Martin, N. Nakagaki, L.H. Nowell, J.C. Scott, P.E. Stackelberg, G.P. Thelin, and David M. Wolock. 2006. The Quality of Our Nation's Waters: Pesticides in the Nation's Streams and Ground Water, 1992–2001. U.S. Geological Survey Circular 1291.

Grosse, Y., R. Baan, *et al.* 2006. Carcinogenicity of nitrate, nitrite, and cyanobacterial peptide toxins. The Lancet Oncology. v. 7, pp. 628–629.

Hawkes, W.C., and N.L. Keim. 2003. Dietary selenium intake modulates thyroid hormone and energy metabolism in men. Journal of Nutrition. v. 133, pp. 3443–3448.

Lan, Q., L. Zhang, *et al.* 2004. Hematotoxicity in workers exposed to low levels of benzene. Science. v. 306, pp. 1774–1776.

Levine, Audrey D., Brian A. Bolto, and David R. Dixon. 2004. *Reactions of Polyelectrolytes With Other Water Treatment Chemicals.* AwwaRF Report #2509.

MacKenzie, R.D., R.U. Byerrum, C.F. Decker, *et al.* 1958. Chronic toxicity studies. II. Hexavalent and trivalent chromium administered in drinking water to rats. American Medical Association Archives of Industrial Health. v. 18, pp. 232–234.

Markel, E, C. Nyakas, and S. Ormai. 1989. Nitrate induced changes in sensorimotor development and learning behavior in rats. Acta Physiologica Hungarica. v. 74, pp. 69–75.

Moore, M. 1994a. *104-week dietary carcinogenicity study with 1,2,4-trichlorobenzene in mice.* Hazleton Washington, Inc. Rockville, Maryland. HWA 2603–102. EPA/OTS Doc #88–930000429.

Moore, M. 1994b. *Final report—104-week dietary carcinogenicity study with 1,2,4-trichlorobenzene in rats.* Hazleton Washington, Inc. Rockville, Maryland. HWA 2603–103. OTS0558832. OPPTS–44612.

Moran, M.J. 2006. Occurrence And Implications Of Selected Chlorinated Solvents In Ground Water And Source Water In The United States And In Drinking Water In 12 Northeast And Mid-Atlantic States, 1993–2002. U.S. Geological Survey Scientific Investigations Report 2005–5268. Reston, VA: U.S. Geological Survey.

Mueller, B.A., S.S. Nielsen, *et al.* 2004. Household water source and the risk of childhood brain tumours: results of the SEARCH International Brain Tumor Study. International Journal of Epidemiology. v. 33, pp. 1209–1216.

Mukhopadhyay, S., D. Ghosh, *et al.* 2005. Evaluation of possible goitrogenic and anti-thyroidal effect of nitrate, a potential environmental pollutant. Indian Journal of Physiology & Pharmacology. v. 49, pp. 284–288.

NAS (National Academy of Sciences). 1995. Nitrate and nitrite in drinking water. Committee on Toxicology, Subcommittee on Nitrate and Nitrite in Drinking Water. National Academy Press, Washington, DC.

NAS. 2006. Health Risks from Dioxin and Related Compounds: Evaluation of the EPA Reassessment. Committee on EPA's Exposure and Human Health Reassessment of TCDD and Related Compounds, National Research Council.

NCFAP (National Center for Food and Agricultural Policy). 2000. Pesticide Use in U.S. Crop Production: 1997. National Summary Report. Washington, DC: NCFAP.

NDWAC (National Drinking Water Advisory Council). 2000. Recommended Guidance for Review of Existing National Primary Drinking Water Regulations. November 2000. Available on the Internet at: *http://www.epa.gov/safewater/ndwac/guidfnl.pdf.*

NTP (National Toxicology Program). 2007. Draft Report. Toxicology and carcinogenesis studies of chromium picolinate monohydrate (CAS # 27882–76–4) in F344 rats and B6C3F1 mice (feed studies). TR–556.

NTP. 2008. Technical report on the toxicology and carcinogenesis studies of sodium dichromate dihydrate (CAS # 7789–12–0) in F344 rats and B6C3F1 mice (drinking water studies). TR–546. July 2008.

Sedman, R.M., J. Beaumont, *et al.* 2006. Review of the evidence regarding the carcinogenicity of hexavalent chromium in drinking water. Journal of Environmental Science and Health, Part C, Environmental Carcinogenesis and Ecotoxicology Reviews. v. 24, pp. 155–182.

Su, Y.P., J.M. Tang, *et al.* 2005. Histological and ultrastructural changes induced by selenium in early experimental gastric carcinogenesis. World Journal of Gastroenterology. v. 11, pp. 4457–4460.

Tajtakova, M., Z. Semanova, *et al.* 2006. Increased thyroid volume and frequency of thyroid disorders signs in schoolchildren from nitrate polluted area. Chemosphere. v. 62, pp. 559–564.

USDA (U.S. Department of Agriculture). 2004. Pesticide Data Program Annual Summary Calendar Year 2004. Available on the Internet at: *http://www.ams.usda.gov/AMSv1.0/getfile?dDocName=PDP2004Summary.*

USDA. 2005. Pesticide Data Program Annual Summary Calendar Year 2005. Available on the Internet at: *http://www.ams.usda.gov/AMSv1.0/getfile?dDocName=STELPRDC5049946.*

USDA. 2006. Pesticide Data Program Annual Summary Calendar Year 2006. Available on the Internet at: *http://www.ams.usda.gov/AMSv1.0/getfile?dDocName=STELPRDC5064786.*

USEPA (U.S. Environmental Protection Agency). 1975. Interim Primary Drinking water Regulations; Radionuclides; Proposed Rule. **Federal Register**. Vol. 40. No. 158. p. 34324, August 14, 1975.

USEPA. 1976. Interim Primary Drinking Water Regulations; Radionuclides; Final Rule. **Federal Register**. Vol. 41. No. 133. p. 28402, July 9, 1976.

USEPA. 1985. National Primary Drinking Water Regulations: Volatile Synthetic Organic Chemicals; Final Rule and Proposed Rule. **Federal Register**. Vol. 50, No. 219. p. 46880, November 13, 1985.

USEPA. 1986a. National Primary Drinking Water Regulations; Radionuclides. **Federal Register**. Vol. 51, No. 189. p. 34836, September 30, 1986.

USEPA 1986b. Guidelines for carcinogen risk assessment. **Federal Register**. Vol. 51, No.185. p. 33992, September 24, 1986.

USEPA. 1986c. National Primary and Secondary Drinking Water Regulations; Fluoride; Final Rule. **Federal Register**. Vol. 51, No. 63. p. 11396, April 2, 1986.

USEPA. 1987. National Primary Drinking Water Regulations—Synthetic Organic Chemicals; Monitoring for Unregulated Contaminants; Final Rule. **Federal Register**. Vol. 52, No. 130. p. 25690, July 8, 1987.

USEPA. 1989a. National Primary Water Regulations, Filtration, Disinfection, Turbidity, Giardia Lamblia, Viruses, Legionella, Helterotrophic Bacteria Final Rule. **Federal Register**. Vol. 54, No. 124. p. 27485, June 29, 1989.

USEPA. 1989b. National Primary and Secondary Drinking Water Regulations:

Proposed Rule. **Federal Register**. Vol. 54, No. 97.
p. 22062, May 22, 1989.

USEPA. 1991a. IRIS, Selenium. Oral RfD. Available on the Internet at: *http://www.epa.gov/ncea/iris/subst/0472.htm#reforal.*

USEPA. 1991b. Drinking Water; National Primary Drinking Water Regulations; Monitoring for Volatile Organic Chemicals; MCLGs and MCLs for Aldicarb, Aldicarb Sulfoxide, Aldicarb Sulfone, Pentachlorophenol, and Barium; Final Rule. **Federal Register**. Vol. 56, No. 126. p. 30266, July 1, 1991.

USEPA. 1991c. National Primary Drinking Water Regulations—Synthetic Organic Chemicals and Inorganic Chemicals; Monitoring for Unregulated Contaminants; National Primary Drinking Water Regulations Implementation; National Secondary Drinking Water Regulations; Final Rule. **Federal Register**. Vol. 56, No. 30. p. 3526, January 30, 1991.

USEPA. 1992. Drinking Water; National Primary Drinking Water Regulations—Synthetic Organic Chemicals and Inorganic Chemicals; National Primary Drinking Water Regulations Implementation; Final Rule. **Federal Register**. Vol. 57, No. 138. p. 31776, July 17, 1992.

USEPA. 1993a. IRIS, Selenium. Cancer assessment. Available on the Internet at: *http://www.epa.gov/ncea/iris/subst/0472.htm#carc.*

USEPA. 1993b. Reregistration Eligibility Decision (RED): Glyphosate. EPA 738–R–93–014. September.

USEPA. 1995a. *Reregistration Eligibility Decision (RED)—Diquat Dibromide.* EPA Report 738–R–95–016. Washington, DC: Office of Prevention, Pesticides and Toxic Substances. July 1995. Available on the Internet at: *http://www.epa.gov/oppsrrd1/REDs/0288.pdf.*

USEPA. 1995b. *Reregistration Eligibility Decision (RED)—Picloram.* EPA Report 738–R95–019. Washington, DC: Office of Prevention, Pesticides, and Toxic Substances. August 1995. Available on the Internet at: *http://www.epa.gov/oppsrrd1/REDs/0096.pdf.*

USEPA. 1998a. *Reregistration Eligibility Decision: Alachlor.* Office of Prevention, Pesticides, and Toxic Substances. EPA 738–R–98–020. December.

USEPA. 1998b. Small System Compliance Technology List for the Non-Microbial Contaminants Regulated before 1996. Office of Water. EPA 815–R–98–002. September.

USEPA 1998c. IRIS: Beryllium and Compounds. Available on the Internet at: *http://www.epa.gov/iris/subst/0012.htm.*

USEPA. 1998d. Toxicological review of Hexavalent Chromium in support of summary information on the Integrated Risk Information System (IRIS). Washington, DC: Office of Research and Development, National Center for Environmental Assessment. August 1998. Available on the Internet at: *http://www.epa.gov/ncea/iris/toxreviews/0144-tr.pdf.*

USEPA. 1998e. Toxicological review of Trivalent Chromium in support of summary information on the Integrated Risk Information System (IRIS). Washington, DC: Office of Research and Development, National Center for Environmental Assessment. August 1998. Available on the Internet at: *http://www.epa.gov/ncea/iris/toxreviews/0028-tr.pdf.*

USEPA. 2000a. *Interim reregistration eligibility decision (IRED)—Oxamyl.* EPA Report 738–R–00–015. Washington, DC: Office of Prevention, Pesticides and Toxic Substances. October 2000. Available on the Internet at: *http://www.epa.gov/pesticides/reregistration/REDs/0253ired.pdf.*

USEPA. 2000b. IRIS, Benzene. Available on the Internet at: *http://www.epa.gov/ncea/iris/subst/0276.htm.*

USEPA. 2000c. National Primary Drinking Water Regulations; Radionuclides; Final Rule. **Federal Register**. Vol. 65, No. 236. p. 76707, December 7, 2000.

USEPA. 2000d. *Science Policy Council Handbook: Peer Review, 2nd Edition.* EPA Report 100–B–00–001. Washington, DC: Office of Science Policy, Office of Research and Development. December 2000. Available on the Internet at: *http://www.epa.gov/OSA/spc/pdfs/prhandbk.pdf.*

USEPA. 2001a. HED Toxicology Chapter for Diquat Dibromide. Washington, DC: Office of Prevention, Pesticides and Toxic Substances.

USEPA. 2001b. IRIS, Hexachlorocyclopentadiene. Available on the Internet at: *http://www.epa.gov/ncea/iris/subst/0059.htm.*

USEPA. 2001c. National Primary Drinking Water Regulation; Arsenic and Clarifications to Compliance and New Source Contaminants Monitoring; Final Rule. **Federal Register**. Vol. 66, No. 14. p. 6975, January 22, 2001.

USEPA. 2001d. Public Health and Environmental Radiation Protection Standards for Yucca Mountain, NV; Final Rule. **Federal Register**. Volume 66, Number 114. p. 32073, June 13, 2001.

USEPA. 2002a. Glyphosate in/on pasture and rangeland grasses, Roundup Ready® wheat, and non-grass animal feeds. Health Effects Division (HED) Risk Assessment. PP#s 0F06130, 0F06195, and 0F06273. Barcode D280831. PC Codes 103601 & 417300. Case 292955. Submission S579658. Washington, DC: Office of Prevention, Pesticides, and Toxic Substances.

USEPA. 2002b. IRIS, 1,1-Dichloroethylene. Available on the Internet at: *http://www.epa.gov/ncea/iris/subst/0039.htm.*

USEPA. 2002c. National Primary Drinking Water Regulations—Announcement of the Results of EPA's Review of Existing Drinking Water Standards and Request for Public Comment; Proposed Rule. **Federal Register**. Vol. 67, No. 74. p. 19030, April 17, 2002.

USEPA. 2002d. Report of the Food Quality Protection Act (FQPA) Tolerance Reassessment Progress and Risk Management Decision (TRED): Diquat Dibromide. Washington, DC: Office of Prevention, Pesticides and Toxic Substances. April 2002. Available on the Internet at: *http://www.epa.gov/oppsrrd1/REDs/diquat_tred.pdf.*

USEPA. 2003a. Analytical Feasibility Support Document for the Six-Year Review of Existing National Primary Drinking Water Regulations (Reassessment of Feasibility for Chemical Contaminants). EPA 815–R–03–003. March 2003.

USEPA. 2003b. *EPA Protocol for Review of Existing National Primary Drinking Water Regulations.* EPA Report 815–R–03–002. Washington, DC: Office of Ground Water and Drinking Water. June 2003. Available on the Internet at: *http://www.epa.gov/safewater/standard/review/pdfs/support_6yr_protocal_final.pdf.*

USEPA. 2003c. Exposure and Human Health Reassessment of 2,3,7,8-Tetrachlorodibenzo-p-Dioxin (TCDD) and Related Compounds. Preliminary Review Draft. National Center for Environmental Assessment, Research and Development.

USEPA. 2003d. IRIS, Xylenes. Available on the Internet at: *http://www.epa.gov/ncea/iris/subst/0270.htm.*

USEPA. 2003e. National Primary Drinking Water Regulations; Announcement of Completion of EPA's Review of Existing Drinking Water Standards; Notice. **Federal Register**. Vol. 68, No. 138. p. 42908, July 18, 2003.

USEPA. 2004a. IRIS, 1,2-Dibromoethane. Available on the Internet at: *http://www.epa.gov/ncea/iris/subst/0361.htm.*

USEPA. 2004b. National Primary Drinking Water Regulations: Minor Corrections and Clarification to Drinking Water Regulations; National Primary Drinking Water Regulations for Lead and Copper. **Federal Register**. Volume 69, Number 124. p. 38850, June 29, 2004.

USEPA. 2004c. *Reregistration Eligibility Decision (RED)—Methoxychlor.* EPA Report 738–R–04–010. Washington, DC: Office of Prevention, Pesticides, and Toxic Substances. June 2004. Available on the Internet at: *http://www.epa.gov/oppsrrd1/REDs/methoxychlor_red.htm.*

USEPA. 2005a. IRIS, Barium. Available on the Internet at: *http://www.epa.gov/ncea/iris/subst/0010.htm.*

USEPA. 2005b. IRIS, Toluene. Available on the Internet at: *http://www.epa.gov/ncea/iris/subst/0118.htm.*

USEPA. 2005c. *Reregistration Eligibility Decision (RED)—2,4–D.* EPA Report 738–R–05–002. Office of Prevention, Pesticides, and Toxic Substances. June 2005. Available on the Internet at: *http://www.epa.gov/oppsrrd1/REDs/24d_red.pdf.*

USEPA. 2005d. *Reregistration Eligibility Decision (RED) for Endothall.* EPA Report 738–R–05–008. Office of Prevention, Pesticides and Toxic Substances. September 2005. Available on the Internet at: *http://www.epa.gov/oppsrrd1/reregistration/REDs/*

endothall_red.pdf.
USEPA. 2006a. Acetochlor/Alachlor: Cumulative Risk Assessment for the Chloroacetanilides. Washington, DC: Office of Pesticide Programs. March 8, 2006. Available on the Internet at: *http://www.epa.gov/oppsrrd1/cumulative/chloro_cumulative_risk.pdf.*
USEPA. 2006b. *Addendum to the 2002 Lindane Reregistration Eligibility Decision (RED).* EPA Report 738–R–06–028. Washington, DC: Office of Prevention, Pesticides, and Toxic Substances. July 2006. Available on the Internet at: *http://www.epa.gov/oppsrrd1/REDs/lindane_red_addendum.pdf.*
USEPA. 2006c. Finalization of Atrazine IRED, and Completion of Tolerance Reassessment and Reregistration Eligibility Process. Washington, DC: Office of Prevention, Pesticides, and Toxic Substances. April 2006. Available on the Internet at: *http://www.epa.gov/oppsrrd1/REDs/atrazine_combined_docs.pdf.*
USEPA. 2006d. *Interim Reregistration Eligibility Decision (IRED)—Carbofuran.* EPA Report 738–R–06–031. Office of Prevention, Pesticides, and Toxic Substances. August 2006. Available on the Internet at: *http://www.epa.gov/oppsrrd1/reregistration/REDs/carbofuran_ired.pdf.*
USEPA. 2006e. Lindane; Cancellation Order. **Federal Register.** Vol. 71, No. 239. p. 74905, December 13, 2006.
USEPA. 2006f. National Primary Drinking Water Regulations: Ground Water Rule; Final Rule. **Federal Register.** Vol. 71, No. 216. p. 65574, November 8, 2006.
USEPA. 2006g. National Primary Drinking Water Regulations: Long Term 2 Enhanced Surface Water Treatment Rule; Final Rule. **Federal Register.** Vol. 71, No. 3. p. 654, January 5, 2006.
USEPA. 2006h. National Primary Drinking Water Regulations: Stage 2 Disinfectants and Disinfection Byproducts Rule; Final Rule. **Federal Register.** Vol. 71, No. 2. p. 388, January 4, 2006.
USEPA. 2006i. *Reregistration Eligibility Decision (RED)—Simazine.* EPA Report 738–R–06–008. Washington, DC: Office of Prevention, Pesticides, and Toxic Substances. April 2006. Available on the Internet at: *http://www.epa.gov/oppsrrd1/REDs/simazine_red.pdf.*
USEPA. 2007a. Advisory on EPA's Assessments of Carcinogenic Effects of Organic and Inorganic Arsenic: A Report of the U.S. EPA Science Advisory Board (SAB). EPA–SAB–07–008. June 2007. Available on the Internet at: *http://yosemite.epa.gov/sab/sabproduct.nsf/EADABBF40DED2A0885257308006741EF/$File/sab-07-008.pdf.*
USEPA. 2007b. Draft Toxicological Review of Acrylamide: In Support of Summary Information on the Integrated Risk Information System (IRIS). **Federal Register.** Vol. 72, No. 248. p. 73813, December 28, 2007.
USEPA. 2007c. Integrated Risk Information System (IRIS); Announcement of 2008 Program; Notice. **Federal Register.** Vol. 72, No. 245. p. 72715, December 21, 2007.
USEPA. 2007d. IRIS, 1,1,1-Trichloroethane. Available on the Internet at: *http://www.epa.gov/ncea/iris/subst/0197.htm.*
USEPA. 2007e. Unregulated Contaminant Monitoring Regulation (UCMR) for Public Water Systems; Revisions; Final Rule. **Federal Register.** Vol. 72, No, 2. p. 367, January 4, 2007.
USEPA. 2007f. National Primary Drinking Water Regulations for Lead and Copper: Short-Term Regulatory Revisions and Clarifications; Final Rule. **Federal Register.** Vol. 72, No. 195. p. 57782, October 10, 2007.
USEPA. 2007g. Safe Drinking Water Information System/Federal version (SDWIS/FED) FY2006 Inventory Data. Available online at *http://www.epa.gov/ogwdw000/databases/pivottables.html.*
USEPA. 2008a. Carbofuran; Proposed Tolerance Revocations; Proposed Rule. **Federal Register.** Vol. 73, No. 87. p. 44864, July 31, 2008.
USEPA. 2009a. EPA Protocol for the Second Review of Existing National Primary Drinking Water Regulations (Updated). EPA Report 815–B–09–002. October 2009.
USEPA. 2009b. Six-Year Review 2– Health Effects Assessment—Summary Report. EPA Report 822–R–09–006. October 2009.
USEPA. 2009c. Analytical Feasibility Support Document for the Second Six-Year Review of Existing National Primary Drinking Water Regulations. EPA Report 815–B–09–003. October 2009.
USEPA. 2009d. Occurrence Analysis for Potential Source Waters for the Second Six-Year Review of National Primary Drinking Water Regulations. EPA Report 815–B–09–004. October 2009.
USEPA. 2009e. Development of Estimated Quantitation Levels for the Second Six-Year Review of National Primary Drinking Water Regulations. EPA Report 815–B–09–005. October 2009.
USEPA. 2009f. Analysis of Occurrence Data from the Second Six-Year Review of Existing National Primary Drinking Water Regulations. EPA Report 815–B–09–006. October 2009.
USEPA. 2009g. Water Treatment Technology Feasibility Support Document for Chemical Contaminants for the Second Six-Year Review of National Primary Drinking Water Regulations. EPA Report 815–B–09–007. October 2009.
USEPA. 2009h. Consideration of Other Regulatory Revisions in Support of the Second Six-Year Review of the National Primary Drinking Water Regulations. EPA Report 815–B–09–008. October 2009.
USEPA. 2009i. Carbofuran; Final Tolerance Revocations; Final Rule. **Federal Register.** Vol. 4, No. 93. p. 23046, May 15, 2009.
USEPA. 2009j. Carbofuran; Product Cancellation Order; Notice. **Federal Register.** Vol. 74, No. 51. p. 11551, March 18, 2009.
USEPA. 2009k. Toxicological Review of Thallium and Compounds. In Support of Summary Information on the Integrated Risk Information System (IRIS). September 30, 2009. Available at *http://www.epa.gov/ncea/iris/toxreviews/1012-tr.pdf.*
USEPA. 2009l. Drinking Water Contaminant Candidate List 3—Notice. **Federal Register.** Vol. 74, No. 194. p. 51850, October 8, 2009.
USGS (U.S. Geological Survey). No date. Pesticide National Synthesis Project: 2002 Pesticide Use Map—Diquat. Available on the Internet at: *http://water.usgs.gov/nawqa/pnsp/usage/maps/show_map.php?year=02&map=m1950.* Accessed March 2008.
Volkmer, B.G., B. Ernst, *et al.* 2005. Influence of nitrate levels in drinking water on urological malignancies: A community-based cohort study. BJU International. v. 95, pp. 972–976.
Vorhees, C.V., R.E. Butcher, R.L. Bnunner, and V. Wootlen. 1984. Developmental toxicity and psychotoxicity of sodium nitrite in rats. Food and Chemical Toxicology. v. 22, p. 116.
Ward, M.H., E.F. Heineman, *et al.* 2005a. Drinking water and dietary sources of nitrate and nitrite and risk of glioma. Journal of Occupational and Environmental Medicine. v. 47, pp. 1260–1267.
Ward, M.H., J.R. Cerhan, *et al.* 2006. Risk of non-Hodgkin lymphoma and nitrate and nitrite from drinking water and diet. Epidemiology. v. 17, pp. 375–382.
Ward, M.H., K.P. Cantor, *et al.* 2003. Nitrate in public water supplies and risk of bladder cancer. Epidemiology. v. 14, pp. 183–190.
Ward, M.H., T.M. de Kok, *et al.* 2005b. Workgroup report: Drinking-water nitrate and health—recent findings and research needs. Environmental Health Perspectives. v. 113, pp. 1607–1614.
Wolff, J. and J.R. Maury. 1963. Thyroidal iodide transport. IV. The role of ion size. Biochimica et Biophysica Acta. v. 69, pp. 58–67.
Yang, C.Y., D.C. Wu, *et al.* 2007. Nitrate in drinking water and risk of death from colon cancer in Taiwan. Environment International. v. 33, pp. 649–653.
Yang, G., *et al.* 1989a. Studies of safe maximal daily selenium intake in a seleniferous area in China. Part I. Journal of Trace Elements and Electrolytes in Health and Disease. v. 3, pp. 77–87.
Yang, G.Q., *et al.* 1989b. Studies of safe maximal daily selenium intake in a seleniferous area in China. Part II. Journal of Trace Elements and Electrolytes in Health and Disease. v. 3, pp. 123–130.
Zaki, A., A. Ait Chaoui, *et al.* 2004. Impact of nitrate intake in drinking water on the thyroid gland activity in male rat. Toxicology Letters. v. 147, pp. 27–33.
Zeegers, M.P., R.F. Selen, *et al.* 2006. Nitrate intake does not influence bladder cancer risk: The Netherlands cohort study. Environmental Health Perspectives. v. 114, pp. 1527–1531.
Zhang, J. and X. Li. 1987. Chromium

Journal of Chinese Preventive Medicine. v. 21, pp. 262–264.

Dated: December 17, 2009.

Lisa P. Jackson,

Administrator.

[FR Doc. 2010–6624 Filed 3–26–10; 8:45 am]

BILLING CODE 6560–50–P