



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON D.C. 20460

OFFICE OF THE ADMINISTRATOR
SCIENCE ADVISORY BOARD

EPA-SAB-20-xxx

The Honorable Andrew R. Wheeler
Administrator
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, D.C. 20460

Subject: Commentary on the Proposed Rule Defining the Scope of Waters Federally
Regulated Under the Clean Water Act

Dear Administrator Wheeler:

Establishing a sound, consistent, scientifically supported and clear definition of “waters of the United States” (WOTUS) is a critical component of implementing the United States Federal Water Pollution Control Act (1972), more commonly known as the Clean Water Act (CWA). The Act itself does not provide such a definition. Achievement of the Act’s overall objective “to restore and maintain the chemical, physical and biological integrity of the Nation’s waters” requires a clear definition of the geographic and hydrologic scope of these waters. On February 14, 2019, the EPA and the Department of the Army, Corps of Engineers published a new proposed rule defining the scope of waters federally regulated under the Clean Water Act (84 FR 4154)¹. At the EPA Science Advisory Board (SAB) meeting on June 5-6, 2019, the SAB discussed the scientific and technical underpinnings of the proposed WOTUS rule. The Board concluded that the proposed WOTUS rule does not incorporate best available science and as such we find that a scientific basis for the proposed Rule, and its consistency with the objectives of the Clean Water Act, is lacking. The SAB voted to provide a commentary to the Agency outlining the nature of this inconsistency.

Process Used by the SAB to Develop This Commentary

The SAB established a WOTUS Work Group to develop an initial draft of this commentary. The draft commentary was then reviewed and approved by the full SAB at a public teleconference held on [insert date]. The SAB WOTUS Work Group consisted of Drs. Alison Cullen (chair), Bob Blanz, John Guckenheimer, Michael Honeycutt, Clyde Martin, Robert Merritt, Robert Puls,

¹ Available at: <https://www.govinfo.gov/content/pkg/FR-2019-02-14/pdf/2019-00791.pdf>

1 and Tara Sabo-Attwood. The SAB Work Group considered the proposed rule’s content,
2 supporting materials and documents, a previous fact-finding teleconference with EPA, comments
3 from EPA staff at the June 5-6, 2019 SAB meeting, and the deliberation of the entire chartered
4 SAB at this meeting in developing the draft commentary.

5
6 **Commentary on Revised Definition of “Waters of the United States” (84 FR 4154)**
7

8 The SAB finds that the proposed revised definition of WOTUS (84 FR 4154) (hereafter, the
9 proposed Rule) decreases protection for our Nation’s waters and does not provide a scientific
10 basis in support of its consistency with the objective of restoring and maintaining “the chemical,
11 physical and biological integrity” of these waters. At the June 5-6, 2019 SAB meeting, the Board
12 offered to support EPA in the application of more recent scientific advances to increase clarity
13 and consistency for CWA needs. EPA representatives responded that the agency has chosen to
14 interpret the CWA and subsequent case law as constraining them to limiting the definition of
15 WOTUS to the language of the proposed Rule. The SAB acts under no such constraint in its
16 advisory capacity and is in fact obligated by statute to communicate the best available science on
17 this topic. The following key elements amplify this finding.

- 18
19 - The proposed Rule does not fully incorporate the body of science on connectivity of
20 waters reviewed previously by the SAB and found to represent a scientific justification
21 for including functional connectivity in rule making: EPA’s 2015 Connectivity Report
22 (U.S. EPA 2015)², Rains (2011)³, and Rains et al. (2016)⁴. The EPA’s 2015 Connectivity
23 Report emphasizes that functional connectivity is more than a matter of surface
24 geography. The report illustrates that a systems approach is imperative when defining the
25 connectivity of waters, and that functional relationships must be the basis of determining
26 adjacency. The proposed Rule offers no comparable body of peer reviewed evidence, and
27 no scientific justification for disregarding the connectivity of waters accepted by current
28 hydrological science.
29
30 - In the proposed Rule the EPA and Department of the Army specifically requested
31 comment on “if and under what circumstances subsurface water connections between
32 wetlands and jurisdictional waters could be used to determine adjacency.” The SAB
33 submits that there is a solid body of scientific evidence regarding the existence of these
34 connections documented in EPA’s 2015 Connectivity Report, and reviewed by the SAB,
35 which provide a basis for answering this request for comment.
36
37 - There is no scientific justification for excluding ground water from WOTUS if spring-fed
38 creeks are considered to be jurisdictional. The proposed Rule neglects the connectivity of
39 ground water to wetlands and adjacent major bodies of water with no acknowledgement
40 of watershed systems and processes discussed in EPA’s 2015 Connectivity Report. The

²U.S. EPA. 2015. *Connectivity of streams and wetlands to downstream waters: a review and synthesis of the scientific evidence technical report*. EPA/600/R-14/475F. U.S. Environmental Protection Agency, Washington, D.C.

³ Rains, M.C. 2011. Water Sources and Hydrodynamics of Closed-Basin Depressions, Cook Inlet Region, Alaska. *Wetlands* 31:377-387.

⁴ Rains, M.C., S.G. Leibowitz, M. J. Cohen, I.F. Creed, H.E. Golden, J.W. Jawitz, P. Kalla, C.R. Lane, M.W. Lang, and D.L. McLaughlin. 2016. Geographically isolated wetlands are part of the hydrological landscape. *Hydrological Processes* 30:153-160.

1 SAB’s previous review found a scientific justification for the conclusion that chemical or
2 biological contamination of ground water may lead to contamination of functionally
3 connected surface water. Ground water may also contribute to intermittent flow of
4 jurisdictional tributaries. Further, shallow ground water may directly connect wetlands to
5 adjacent major bodies of water. Thus, the scientific importance of ground water
6 connections supports the inclusion of ground waters in the jurisdictional definition. These
7 scientific considerations also pertain to those bodies of water that only occasionally flow,
8 such as the arroyos of the Southwest United States.

- 9
- 10 - The proposed Rule excludes irrigation canals from the definition of WOTUS. Biological
11 and chemical contamination of large-scale irrigation canals presents a documented and
12 serious risk to public health and safety (Allende and Monaghan 2015)⁵. The presence of
13 *E. coli* in leafy vegetables is often traceable to irrigation water contaminated by animals
14 in feed lots or pastures adjacent to the canals. Water associated with confined animal
15 feeding operations has also been shown to contain chemical contaminants, such as
16 steroids, that are associated with public health concerns (Allende and Monaghan 2015;
17 Bartelt-Hunt et al. 2011; Gall et al. 2014).^{6,7,8}
 - 18
 - 19 - The definition of jurisdictional waters in the proposed Rule excludes adjacent wetlands
20 that do not abut or have a direct hydrologic surface connection to otherwise jurisdictional
21 waters. This definition is inconsistent with previous SAB review which justified
22 scientifically the inclusion of these wetlands (U.S. EPA Science Advisory Board 2014)⁹.
23 No new body of peer reviewed scientific evidence has been presented to support an
24 alternative conclusion.
 - 25
 - 26 - The proposed Rule does not present a scientific basis for adopting a surface water based
27 definition of Waters of the U.S. The proposed definition is inconsistent with the body of
28 science previously reviewed by the SAB, while no new science has been presented. Thus
29 the approach neither rests upon science, nor provides long term clarity.
 - 30

31 In summary, current scientific understanding of the connectivity of surface and ground water,
32 which has been reviewed by the SAB previously, is not reflected in the proposed Rule.
33 Specifically, the proposed definition of WOTUS excludes groundwater, ephemeral streams, and
34 wetlands which connect to navigable waters below the surface. The proposed Rule does not
35 present new science to support this definition, thus the SAB finds that the proposed Rule lacks a

⁵ Allende, A. and J. Monaghan. 2015. Irrigation Water Quality for Leafy Crops: A Perspective of Risks and Potential Solutions. *International Journal of Environmental Research and Public Health*, 2015 Jul. 12(7): 7457-7477.

⁶ Ibid.

⁷ Bartelt-Hunt, S., D.D. Snow, T. Damon-Powel, and D. Miesbach. 2010. Occurrence of steroid hormones and antibiotics in shallow groundwater impacted by livestock waste control facilities. *Journal of Contaminant Hydrology* 123(3-4):94-103. doi: 10.1016/j.jconhyd.2010.12.010. Epub 2011 Jan 4.

⁸ Gall, H.E., S.A. Sassman, B. Jenkinson, L.S. Lee, and C.T. Jafvert. 2015. Comparison of export dynamics of nutrients and animal-borne estrogens from a tile-drained Midwestern agroecosystem. *Water Research* 72:162-73. doi: 10.1016/j.watres.2014.08.041. Epub 2014 Sep 6.

⁹U.S. EPA Science Advisory Board. 2014. *Science Advisory Board (SAB) Consideration of the Adequacy of the Scientific and Technical Basis of the EPA’s Proposed Rule titled “Definition of Waters of the United States under the Clean Water Act.”* EPA-SAB-14-007. U.S. EPA Science Advisory Board, Washington, D.C.

Science Advisory Board (SAB) Draft Commentary (1/20/20) – Do Not Cite or Quote.
This draft has not been reviewed or approved by the chartered SAB and does not represent EPA policy.

1 scientific justification, while potentially introducing new risks to human and environmental
2 health.

3

4

Dr. Michael Honeycutt, Chair

5

6

7

8

Science Advisory Board

9

10

11 Enclosure

12

13 1) Roster, EPA Science Advisory Board

NOTICE

1
2
3 This report has been written as part of the activities of the EPA Science Advisory Board (SAB),
4 a public advisory group providing extramural scientific information and advice to the
5 Administrator and other officials of the Environmental Protection Agency. The SAB is
6 structured to provide balanced, expert assessment of scientific matters related to problems facing
7 the Agency. This report has not been reviewed for approval by the Agency and, hence, the
8 contents of this report do not necessarily represent the views and policies of the Environmental
9 Protection Agency, nor of other agencies in the Executive Branch of the Federal government, nor
10 does mention of trade names of commercial products constitute a recommendation for use.
11 Reports of the SAB are posted on the EPA Web site at <http://www.epa.gov/sab>.

**U.S. Environmental Protection Agency
Science Advisory Board**

CHAIR

Dr. Michael Honeycutt, Division Director, Toxicology Division, Texas Commission on Environmental Quality, Austin, TX

MEMBERS

Dr. Rodney Andrews, Director, Center for Applied Energy Research, UK Research, University of Kentucky, Lexington, KY

Dr. Hugh A. Barton, Independent Consultant, Mystic, CT

Dr. Barbara Beck, Principal, Gradient Corp., Cambridge, MA

Dr. Deborah Hall Bennett, Professor, Environmental and Occupational Health Division, Department of Public Health Sciences, School of Medicine, University of California, Davis, Davis, CA

Dr. Frederick Bernthal, President Emeritus and Senior Advisor to the Board of Trustees, Universities Research Association, Washington, DC

Dr. Bob Blanz, Associate Director, Office of Water Quality, Division of Environmental Quality, Arkansas Department of Energy and Environment, North Little Rock, AR

Dr. Todd Brewer, Senior Manager, Partnership Programs, American Water Works Association, Denver, CO

Dr. Joel G. Burken, Curator's Professor and Chair, Civil, Architectural, and Environmental Engineering, College of Engineering and Computing, Missouri University of Science and Technology, Rolla, MO

Dr. Janice E. Chambers, William L. Giles Distinguished Professor and Director, Center for Environmental Health and Sciences, College of Veterinary Medicine, Mississippi State University, Mississippi State, MS

Dr. John R. Christy, Distinguished Professor of Atmospheric Science and Director of Earth System Science Center, University of Alabama in Huntsville, Huntsville, AL

Dr. Samuel Cohen, Professor, Pathology and Microbiology, University of Nebraska Medical Center, Omaha, NE

Dr. Louis Anthony (Tony) Cox, Jr., President, Cox Associates, Denver, CO

1 **Dr. Alison C. Cullen**, Interim Dean and Professor, Daniel J. Evans School of Public Policy and
2 Governance, University of Washington, Seattle, WA

3
4 **Dr. Otto C. Doering III**, Emeritus Professor, Department of Agricultural Economics, Purdue
5 University, W. Lafayette, IN

6
7 **Dr. Susan P. Felter**, Research Fellow, Global Product Stewardship, Procter & Gamble, Mason,
8 OH

9
10 **Dr. Joseph A. Gardella**, SUNY Distinguished Professor of Chemistry, Department of
11 Chemistry, College of Arts and Sciences, University at Buffalo, Buffalo, NY

12
13 **Dr. John D. Graham**, Dean, School of Public and Environmental Affairs, Indiana University,
14 Bloomington, IN

15
16 **Dr. John Guckenheimer**, Professor Emeritus and Interim Director, Center for Applied
17 Mathematics, Cornell University, Ithaca, NY

18
19 **Dr. Margaret M. MacDonell**, Department Head, Argonne National Laboratory, Lemont, IL

20
21 **Dr. Robert E. Mace**, Interim Executive Director, Chief Water Policy Officer, Professor of
22 Practice, The Meadows Center for Water and the Environment, Texas State University, San
23 Marcos, TX

24
25 **Dr. Clyde F. Martin**, Horn Professor of Mathematics, Emeritus, Department of Mathematics
26 and Statistics, Texas Tech University, Crofton, MD

27
28 **Dr. Sue Marty**, Senior Toxicology Leader, Toxicology & Environmental Research, The Dow
29 Chemical Company, Midland, MI

30
31 **Mr. Robert W. Merritt**, Independent Consultant, Houston, TX

32
33 **Dr. Larry Monroe**, Independent Consultant, Braselton, GA

34
35 **Dr. Thomas F. Parkerton**, Senior Environmental Scientist, Toxicology & Environmental
36 Science Division, ExxonMobil Biomedical Science, Spring, TX

37
38 **Dr. Robert Phalen**, Professor, Air Pollution Health Effects Laboratory, School of Medicine,
39 University of California-Irvine, Irvine, CA

40
41 **Dr. Kenneth M. Portier**, Independent Consultant, Athens, GA

42
43 **Dr. Robert Puls**, Owner/Principal, Robert Puls Environmental Consulting, Bluffton, SC

44
45 **Dr. Kenneth Ramos**, Executive Director, Institute of Biosciences and Technology, Texas A&M
46 University, Houston, TX

1
2 **Dr. Tara L. Sabo-Attwood**, Associate Professor and Chair, Department of Environmental and
3 Global Health, College of Public Health and Health Professionals, University of Florida,
4 Gainesville, FL

5
6 **Dr. Mara Seeley**, Unit Chief – Exposure Assessment, Environmental Toxicology Program,
7 Bureau of Environmental Health, Massachusetts Department of Public Health, Boston, MA

8
9 **Dr. Anne Smith**, Managing Director, NERA Economic Consulting, Washington, DC

10
11 **Dr. Richard Smith**, Professor, Department of Statistics and Operations Research, University of
12 North Carolina, Chapel Hill, NC

13
14 **Dr. Jay Turner**, Professor and Vice Dean for Education, Department of Energy, Environmental
15 and Chemical Engineering, McKelvey School of Engineering, Washington University, St. Louis,
16 MO

17
18 **Dr. Brant Ulsh**, Principal Health Physicist, M.H. Chew & Associates, Cincinnati, OH

19
20 **Dr. Donald van der Vaart**, Senior Fellow, John Locke Foundation, Raleigh, NC

21
22 **Ms. Carrie Vollmer-Sanders**, Director, Agriculture Engagement Strategy, Efromyson
23 Conservation Center, The Nature Conservancy, Indianapolis, IN

24
25 **Dr. Kimberly White**, Senior Director, Chemical Products and Technology Division, American
26 Chemistry Council, Washington, DC

27
28 **Dr. Mark Wiesner**, Professor, Department of Civil and Environmental Engineering, Director,
29 Center for the Environmental Implications of NanoTechnology (CEINT), Pratt School of
30 Engineering, Nicholas School of the Environment, Duke University, Durham, NC

31
32 **Dr. Peter J. Wilcoxon**, Laura J. and L. Douglas Meredith Professor for Teaching Excellence,
33 Director, Center for Environmental Policy and Administration, The Maxwell School, Syracuse
34 University, Syracuse, NY

35
36 **Dr. Richard A. Williams**, Retired Economist (Food and Drug Administration), Independent
37 Consultant, McLean, VA

38
39 **Dr. S. Stanley Young**, Chief Executive Officer, CGStat, Raleigh, NC

40
41 **Dr. Matthew Zwiernik**, Professor, Department of Animal Science, Institute for Integrative
42 Toxicology, Michigan State University, East Lansing, MI

43
44 **SCIENCE ADVISORY BOARD STAFF**

45 **Dr. Thomas Armitage**, Designated Federal Officer, U.S. Environmental Protection Agency,
46 Washington, DC