

A Message from the IRIS Program June 2021

The IRIS Program is committed to producing assessments in a timely and transparent manner. Table 1 describes assessments that are currently in development and their projected deliverable dates. The IRIS Program is providing this information for stakeholders to be aware of upcoming products, and to allow the public and research community an opportunity to communicate relevant research to EPA. Projected dates are based on factors such as size of a chemical's evidence base and staff availability. Nearer-term activities are estimated using Fiscal Year (FY) and Quarters. Milestones that are further out are projected at the FY-level only due to greater uncertainties regarding timing. While projected dates reflect the IRIS Program's best estimate based on available information, they are subject to change. Changes to these estimates are typically the result of addressing new data or responding to internal, public, and/or peer review comments on the scientific challenges unique to each chemical assessment, and the availability of staff with the appropriate expertise to address those challenges. The IRIS Program Outlook will be updated at least three times each calendar year (February, June, October). The previously suspended IRIS assessments of naphthalene, ethylbenzene, and uranium have been nominated for assessment in FY21. Therefore, these assessments have been unsuspended and are included in this Outlook. Additional information regarding other pertinent products and activities is included in Tables 2 and 3.

Table 1. IRIS Assessment Products – June 2021

| Assessment | Public Product(s) | Projected Deliverable Date |
|-----------------------------------|----------------------------|--|
| Arsenic, Inorganic | Systematic Review Protocol | Released on May 28, 2019. NAS review meeting July 16, 2019 |
| | Public Comment Draft | FY22 |
| | External Peer Review | FY23 |
| Chloroform (Inhalation) | IRIS Assessment Plan | Released on September 18, 2017. Public Science Meeting on September 27, 2017 |
| | Systematic Review Protocol | Released on January 31, 2018 |
| | Public Comment Draft | FY22 |
| | External Peer Review | FY22 |
| Chromium VI | Systematic Review Protocol | Released on March 15, 2019. Public Science Meeting on April 24, 2019 |
| | Public Comment Draft | FY22 |
| | External Peer Review | FY22 |
| Ethyl tertiary butyl ether (ETBE) | Final | FY21 – Q4 |
| Ethylbenzene ¹ | IRIS Assessment Plan | Released on September 18, 2017 |
| | Systematic Review Protocol | TBD |
| | Public Comment Draft | TBD |
| | External Peer Review | TBD |
| Formaldehyde | Public Comment Draft | FY22 |
| | External Peer Review | FY22 |
| Inorganic Mercury salts | IRIS Assessment Plan | Released on October 8, 2019. Public Science Meeting on December 5, 2019 |
| | Systematic Review Protocol | Released on March 11, 2021 |
| | Public Comment Draft | FY23 |

| Assessment | Public Product(s) | Projected Deliverable Date |
|--|----------------------------|---|
| | External Peer Review | FY23 |
| Methylmercury | IRIS Assessment Plan | Released on April 4, 2019. Public Science Meeting on May 15, 2019 |
| | Systematic Review Protocol | Released on May 26, 2020 |
| | Public Comment Draft | FY23 |
| | External Peer Review | FY24 |
| Naphthalene ¹ | IRIS Assessment Plan | Released on July 5, 2018 |
| | Systematic Review Protocol | TBD |
| | Public Comment Draft | TBD |
| | External Peer Review | TBD |
| Perfluorobutyrate (PFBA) ² | Systematic Review Protocol | Released on November 8, 2019 |
| | Public Comment Draft | FY21 – Q4 |
| | External Peer Review | FY21 – Q4 |
| Perfluorodecanoate (PFDA) ² | Systematic Review Protocol | Released on November 8, 2019 |
| | Public Comment Draft | FY22 |
| | External Peer Review | FY22 |
| Perfluorohexanoic acid (PFHxA) ² | Systematic Review Protocol | Released on November 8, 2019 |
| | Public Comment Draft | FY22 |
| | External Peer Review | FY22 |
| Perfluorohexane Sulfonic Acid (PFHxS) ² | Systematic Review Protocol | Released on November 8, 2019 |
| | Public Comment Draft | FY22 |
| | External Peer Review | FY22 |

| Assessment | Public Product(s) | Projected Deliverable Date |
|---|----------------------------|--|
| Perfluorononanoate (PFNA) ² | Systematic Review Protocol | Released on November 8, 2019 |
| | Public Comment Draft | FY22 |
| | External Peer Review | FY22 |
| Polychlorinated Biphenyls (PCBs; noncancer) | Systematic Review Protocol | Released on December 19, 2019 |
| | Public Comment Draft | FY24 |
| | External Peer Review | FY24 |
| tert-Butyl Alcohol | Final | FY21 – Q4 |
| Uranium ¹ | IRIS Assessment Plan | Released on January 31, 2018. Public Science Meeting on March 22, 2018 |
| | Systematic Review Protocol | TBD |
| | Public Comment Draft | TBD |
| | External Peer Review | TBD |
| Vanadium and Compounds (Oral) | IRIS Assessment Plan | Released on July 24, 2020. Public Science Meeting on August 19, 2020 |
| | Systematic Review Protocol | Released on April 26, 2021 |
| | Public Comment Draft | FY23 |
| | External Peer Review | FY23 |
| Vanadium and Compounds (Inhalation) | IRIS Assessment Plan | Released on May 28, 2021. Public Science Meeting scheduled for July 14, 2021 |
| | Systematic Review Protocol | FY22 |
| | Public Comment Draft | FY23 |
| | External Peer Review | FY24 |

¹The previously suspended IRIS assessments of naphthalene, ethylbenzene, and uranium have been nominated in FY21 and are therefore, unsuspended.

²Per- and polyfluoroalkyl Substances (PFAS) assessments under development are in support of [EPA's PFAS Action Plan](#): <https://www.epa.gov/pfas/epas-pfas-action-plan>. The release of draft PFBA, PFHxA, PFHxS, PFNA, and PFDA assessments for public comment addresses a Priority Action in [EPA's PFAS Action Plan](#).

Table 2. Other IRIS Products and Activities

| Product or Activity | Next Anticipated Public Step(s) | Projected Deliverable Date |
|--|---------------------------------|---|
| ORD Staff Handbook for Developing IRIS Assessments (“IRIS Handbook”) | Final | FY22 |
| Vanadium and Compounds (Inhalation) – IRIS Assessment Plan (IAP) | Public Meeting | Scheduled for July 14, 2021 |
| NAS Workshop - Advances Made During Application of Artificial Intelligence and Open Data Practices in Chemical Hazard Assessment | Public Workshop | FY21 – Q4 |
| NAS Workshop - Triangulation of Evidence in Environmental Epidemiology | Public Workshop | FY21 – Q4 |
| PCB Mixtures/Modelling and Tool Workshop | Public Workshop | FY22 |

Table 3. Select Publications Related to IRIS Assessment Activities

| Assessment | Citation | Publication Date |
|---|---|---|
| Polychlorinated Biphenyls (PCBs; noncancer) | Weitekamp, C.A., Phillips, L.J., Carlson, L.M., DeLuca, N.M., Cohen Hubal, E.A., Lehmann, G.M. (2021). A state-of-the-science review of polychlorinated biphenyl exposures at background levels: Relative contributions of exposure routes, <i>Science of the Total Environment</i> , 776(1). 145912. https://doi.org/10.1016/j.scitotenv.2021.145912 | Published February 2021 |
| Polychlorinated Biphenyls (PCBs; noncancer) | Christensen, K., Carlson, L.M., Lehmann, G.M. (2020). The role of epidemiology studies in human health risk assessment of polychlorinated biphenyls. <i>Environmental Research</i> , 194, 110662. https://doi.org/10.1016/j.envres.2020.110662 | Published December 2020 |
| Inorganic Arsenic | Allen, B., Shao, K., Hobbie, K., Mendez Jr., W., Lee, J.S., Cote, I., Druwe, I.L., Gift, J.S., Davis, J.A. (2020). Bayesian hierarchical dose-response meta-analysis of epidemiological studies: Modeling and target population prediction methods. <i>Environment International</i> , 145, 106111. https://doi.org/10.1016/j.envint.2020.106111 | Published December 2020 |
| Inorganic Arsenic | Hobbie, K., Shao, K., Henning, C., Mendez Jr., W., Lee, J.S., Cote, I., Druwe, I.L., Davis, J.A., Gift, J.S. (2020). Use of study-specific MOE-like estimates to prioritize health effects from chemical exposure for analysis in human health assessments. <i>Environment International</i> , 144, 105986. | Published November 2020 |

| Assessment | Citation | Publication Date |
|-------------------|--|--|
| | https://doi.org/10.1016/j.envint.2020.105986 | |
| Inorganic Arsenic | Mendez Jr., W., Shao, K., Lee, J.S., Cote, I., Druwe, I.L., Davis, J.A., Gift, J.S. (2020). Model averaging methods for the evaluation of dose-response model uncertainty when assessing the suitability of studies for estimating risk. <i>Environment International</i> , 143, 105857. https://doi.org/10.1016/j.envint.2020.105857 | Published October 2020 |
| Inorganic Arsenic | Allen, B., Shao, K., Hobbie, K., Mendez Jr., W., Lee, J.S., Cote, I., Druwe, I.L., Gift, J.S., Davis, J.A. (2020). Systematic dose-response of environmental epidemiologic studies; Dose and Response pre-analysis. <i>Environment International</i> , 142, 105810. https://doi.org/10.1016/j.envint.2020.105810 | Published September 2020 |
| Methylmercury | Wells, E.M. Kopylev, L., Nachman, R. Radke, E.G., Segal, D. (2020). Seafood, wine, rice, vegetables and other food items associated with mercury biomarkers among seafood and non-seafood consumers: NHANES 2011-2012. <i>Journal of Exposure Science and Environmental Epidemiology</i> , 30(3). 10.1038/s41370-020-0206-6 | Published February 2020 |