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Mr. Mark Gordon
Washington State Department of Ecology
300 Desmond Drive SE
Lacey, WA 98503

Subject: **Comments on Draft Guidance for Investigating and Remediating PFAS Contamination in Washington State (Publication No. 22-09-058)**

Dear Mr. Gordon:

Integral Consulting Inc. (Integral) has reviewed the December 2022 *Draft Guidance for Investigating and Remediating PFAS Contamination in Washington State* (Draft Guidance) prepared by The Toxics Cleanup Program, Washington State Department of Ecology (Ecology). Please find attached Integral's comments on the Draft Guidance for Ecology's consideration.

Sincerely,

A handwritten signature in black ink, appearing to read "D. Livermore", written over a light grey rectangular background.

David Livermore, R.G., L.H.G.
Principal

A handwritten signature in black ink, appearing to read "Shannon Ashurst", written over a light grey rectangular background.

Shannon Ashurst
Consultant

Enclosure

Comments on Draft Ecology PFAS Guidance

No.	Document Location	Comment for Consideration
1	<i>PFAS Guidance Document (General Comment)</i>	How will Ecology respond to unknown sources of PFAS or third-party impacts to a property owner (fire response is dictated by the responder), including use of AFFF outside of intended purpose on a property?
2	<p><i>Section 2.0 Potential human health effects, first paragraph</i></p> <p>To date, the potential human health effects of PFOS and PFOA have been the most intensively studied of the PFAS chemicals, but there is also considerable toxicological information on PFNA, PFHxS, PFBS, and the GenX chemical hexafluoropropylene oxide dimer acid (HFPO-DA; also known as (GenX).</p>	Consider rewording: To date, the potential human health effects of PFOS and PFOA have been the most intensively studied of the PFAS chemicals, but there is also considerable toxicological information on PFNA, PFHxS, PFBS, and hexafluoropropylene oxide dimer acid (HFPO-DA), also known as GenX.
3	<i>Chapter 3.0 Advisory, Action, and Cleanup Levels, and Historical Investigatory Levels (General Comment)</i>	How will Ecology address background levels of PFAS, which have been shown in numerous studies to be ubiquitous?
4	<i>Chapter 4.0 Sampling for PFAS (General Comment)</i>	There is no discussion in this section regarding the use of data validation to evaluate laboratory performance. As new methods are approved/used, evaluating laboratory performance will be a critical step to identify laboratory conformance issues and also to assess cross-contamination or sample logging errors from the laboratory.

No.	Document Location	Comment for Consideration
5	<i>Chapter 4.0 Sampling for PFAS (General Comment)</i>	The draft document contains active links to ITRC- or other state-developed guidance. Will Ecology update this guidance when the referenced documents are updated? Maintaining active links and recognizing changes to key referenced documents will ensure that this is a working guidance document and not a one-time issuance.
6	<i>Section 4.1.1 Assemble a complete PFAS analytical list</i>	<p>Ecology recommends analyzing for a comprehensive set of PFAS so that future assessment of the site can be completed once screening/cleanup levels are established. Will this result in a reopening of cases that have closed? Will Ecology reject data from sites that report only the currently regulated compounds (or those regulated at the time of the investigation)? How will this be addressed throughout the course of the project?</p> <p>In addition, not all PFAS have screening/cleanup levels. If the full list of PFAS compounds is reported, there is a risk that the public will be confused about how the compounds lacking screening/cleanup levels will be used or evaluated. We recommend that Ecology clearly state what the intent is with respect to non-regulated compounds.</p>

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7	<i>Section 4.1.2 Use accredited laboratory analytical methods</i>	This section summarizes the currently available analytical methods. It is expected that EPA will issue updated methods for PFAS in solid/chemical materials and non-potable water this year (Method 1633). We recommend that a statement along the following lines be added to this section: "If a laboratory method is accredited at the time of use and is later superseded, additional sampling to confirm non-detect results and/or establish the boundaries of exceedances above the screening/cleanup levels is not required, unless a new release has been identified."
8	<p><i>4.2 Approved methods and compound list for drinking water</i></p> <p>When analyzing the PFAS compounds that are found in both methods, Method 533 is generally preferred over 537.1 because it uses a more robust method of quantitation (isotope dilution).</p>	This statement conflicts with Section 4.5.2 where Ecology recommends both Method 533 and 537.1 be used. Further, the use of both methods is unnecessary and expensive. It is recommended that the statement in Section 4.5.2 be revised to recommend analysis of drinking water using Method 533 only.
9	<i>Section 4.4.4 Future Analytical Options (General Comment)</i>	It is recommended that this section regarding Method 1633 move to the top of the list given that many laboratories have already moved to certify for this method.

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10	<i>Section 4.4.3 Recommended sampling procedures to minimize cross-contamination (General Comment)</i>	The recommended field quality control is excessive. We recommend that a field duplicate, field equipment blank, and field (ambient) blank be required, and that all other field quality assurance sampling be optional. We further recommend that field quality assurance sampling can be modified (20 percent vs. 10 percent) as sampling events progress and field procedures are documented to demonstrate that decontamination of field equipment and cross-contamination in the field has been eliminated or is not an issue.
11	<i>Section 4.5.2 Recommendations for obtaining comprehensive PFAS data (General Comment)</i>	We suggest that the statement in Section 4.5.2 be revised to recommend analysis of drinking water using Method 533.
12	<i>5.1.1 Applicable Regulatory Authority</i>	
12a	WAC 173-340-730(3)(b)(ii)74 Environmental effects. For hazardous substances for which environmental effects-based concentrations have not been established under applicable state or federal laws, concentrations that are estimated to result in no adverse effects on the protection and propagation of wildlife, fish, and other aquatic life.	This statement appears incomplete
12b	Whole effluent toxicity testing using the protocols described in Chapter 173-205 WAC75 may be used to make this demonstration for fish and aquatic life.	How does/will Ecology propose to remove or address confounding chemicals from such an analysis?

No.	Document Location	Comment for Consideration
12c	These protective values should be used when establishing an environmental-effects-based water concentration for sites with PFAS contamination in surface water or for groundwater with the potential to discharge to surface water.	An important limitation applying the surface water “protective values” from Table 7 to groundwater discharging to surface water is that these values will be overly conservative for fish (but not benthic invertebrates). Fish that live in a lentic or lotic habitat are not exposed to 100 percent groundwater emerging in those habitats because the groundwater quickly dilutes out into the surrounding surface water occupied by fish. Benthic invertebrates would be exposed to 100 percent groundwater as it emerges through the sediment layer into the overlying surface water. So, while it may be appropriate to use the Table 7 values for selecting surface water COPECs based on groundwater analytical data, one would have to apply a site-specific dilution factor when assessing the potential ecological risk of that groundwater to fish.
13	<i>Chapter 6: Treatment Technologies (General Comment)</i>	All of the options presented are remedies, which will be cost prohibitive for some responsible parties. Elimination of a direct contact exposure pathway through capping and also limiting the migration of contaminants to groundwater with a monitoring program should be considered as appropriate remedies for some sites.
14	<i>6.2.2 Excavation and off-site management</i>	Has Ecology identified facilities that are permitted to accept PFAS-impacted soils?
15	<i>List of Acronyms</i>	AFFF is Aqueous Film Forming Foam , not Aqueous Film Forming Form