
San Francisco Bay Regional Water Quality Control Board

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SUBJECT: Update to Environmental Screening Levels (ESLs)

Water Board staff have completed an update to the Environmental Screening Levels (ESLs), which consists of this cover memo in addition to three main elements:

1. ESL Workbook (Microsoft Excel Office 365 Workbook) – includes the following:
 - a. Tier 1 and Summary Tables
 - b. Tier 2 Interactive Tool
 - c. Screening Level Calculation Tables
 - d. Input Parameter Tables
2. Summary Tables of Groundwater, Soil, and Vapor (Soil Gas and Indoor Air) ESLs and Short-Term Exposure Levels (Adobe Acrobat PDF)
3. User's Guide: Compilation and Application of Environmental Screening Levels (Adobe Acrobat PDF) – The Frequently Asked Questions are included as an appendix, instead of a separate document.

All three elements were previously updated in 2019. This cover memo provides a high-level summary of changes made to the Workbook and User's Guide during this latest major update. The [ESL Status Sheet](#), available in the *Screening Levels and Guidance* section of the San Francisco Bay Regional Water Board's [Site Cleanup Program Webpage](#), provides the date of the most current version of the ESL documents and will be updated to identify any minor revisions to the ESLs by listing the revision number, date of the revision, and a description of changes. You may sign up for electronic notifications regarding the ESLs on the Water Board's website (or from the Water Board's home page, click "Subscribe"). Once there, click the ESL box under the "General" category.

Overview of ESL Updates

The primary changes to the ESL Workbook and User's Guide:

A. Updated and New Per- and Polyfluoroalkyl Substances (PFAS) ESLs

The previous ESLs for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) have been updated and added to the ESL Workbook and User's Guide. In addition, new ESLs for 14 other PFAS have been added. There are now ESLs for the following 16 PFAS:

1. Perfluoropropanoic acid (PFPrA)
2. Perfluorobutanoic acid (PFBA)
3. Perfluoropentanoic acid (PFPeA)
4. Perfluorohexanoic acid (PFHxA)
5. Perfluoroheptanoic acid (PFHpA)
6. perfluorooctanoic acid (PFOA)
7. Perfluorononanoic acid (PFNA)
8. Perfluorodecanoic acid (PFDA)
9. Perfluoroundecanoic acid (PFUDA)
10. Perfluorododecanoic acid (PFDoDA)
11. Perfluorotetradecanoic acid (PFTeDA)
12. Perfluorooctadecanoic acid (PFODA)
13. Perfluorobutane sulfonic acid (PFBS)
14. Perfluorohexane sulfonic acid (PFHxS)
15. perfluorooctane sulfonic acid (PFOS)
16. Hexafluoropropylene oxide dimer acid (HFPO-DA)

B. Updated Values for Physical and Chemical Properties

The physical and chemical properties found on input Table IP-1 in the ESL Workbook were updated to be consistent with the latest USEPA Regional Screening Level (RSL) values (November 2024).

C. Updated Human Health Toxicity Values

The toxicity value input Table IP-2 in the ESL Workbook has been expanded to show all toxicity values that were considered and the final selected toxicity value. In general, toxicity values are selected following the California Code of Regulations, Title 22, Division 4.5, sections 68400.5, 69020-69022 (California Toxics Rule), effective September 4, 2018. The values are also consistent with the Department of Toxic Substances Control (DTSC) Human Health Risk Assessment Note 10 (Toxicity Criteria).

D. Updated Exposure Factors

The following updates were made to the exposure factors:

- The relative bioavailability factor of 0.6 for arsenic is included in Table IP-3 of the ESL Workbook and applied in the calculation of the soil ingestion screening levels, following procedures discussed in the USEPA RSL User's Guide.
- The construction worker soil to skin adherence factor, air dispersion factor, and soil particulate emission factor were updated in Table IP-3 of the Workbook and applied to the soil ESL calculations to be consistent with USEPA guidance. The updated Section 3.4.2 of the ESL User's Guide discusses the updated construction work exposure scenario.

E. Updated Aquatic Habitat Input Values

New goals for the protection of aquatic habitats have been included in this ESL update from the State Water Resources Control Board California Ocean Plan (State Criteria) and USEPA National Recommended Water Quality Criteria (National Criteria). Specifically, State Criteria for the protection of marine life were added to Tables IP-5 and both State and National Criteria for the protection of human health (via consumption of aquatic organisms) were added to Table IP-7 in the ESL Workbook.

F. Updated Petroleum Fractions

The surrogates for Petroleum Fraction 5 (aromatic medium) in Table IP-9 of the ESL Workbook were updated to 1,3,5-trimethylbenzene, 1,2,4-trimethylbenzene, and 1,2,3-trimethylbenzene, consistent with the latest RSLs (November 2024). The reference dose (RfD), reference concentration (RfC), and Henry's Law Constant (H') for Petroleum Fraction 5 were calculated by averaging the values for the three trimethylbenzene isomers. Information regarding these changes has been added to Section 4.2.3 of the updated ESL User's Guide.

In addition, screening levels for the Petroleum Fractions have now been calculated and are included in the direct exposure human health risk tables (Tables GW-1, S-1, SG-1, and IA-1) in the ESL Workbook for each media. The updated Section 4.3 of the ESL User's Guide discusses these new screening levels and how they could be used in site-specific risk assessments in conjunction with TPH fractionation analyses. They are not intended for use with bulk TPH analyses (e.g., TPH-gasoline or gasoline range organics).

G. Updated Tier 2 Site-Specific ESL Tool (Soil Leaching)

The Tier 2 Site-Specific ESL Tool on tabs T2-1, T2-2, and T2-3 of the ESL Workbook have been updated with respect to the leaching ESLs. Previously, only two different leaching scenario values were calculated, for areas with "Drinking Water Sources" and "Non-Drinking Water Sources". This meant that the previous Tier 2 tool did not provide specific leaching values for all the potential scenarios that could be selected within the tool. Therefore, the Soil Leaching Table S-4 has been updated to include leaching

values for all the current possible scenarios and those values are now incorporated into the Tier 2 Tool.

H. Reduced Vapor Intrusion Guidance Duplication

To reduce duplication, vapor intrusion (VI) information in Chapter 5 of the 2019 ESL User's Guide that is now available in either of the following guidance documents, has been removed from the current version of the ESL User's Guide:

- DTSC and Water Board's [2023 Supplemental Guidance: Screening and Evaluating Vapor Intrusion Final Draft \(SVIG\)](#); or
- San Francisco Bay Regional Water Board's [2022 Vapor Intrusion Mitigation Guidance](#).

For example, the site-specific petroleum VI guidance information can now be found in Attachment 2 (Petroleum-Specific Considerations) of the SVIG.

I. New Short-Term Exposure Levels for Elemental Mercury

Short-Term Exposure Levels for elemental mercury have been added to the ESL Workbook and are discussed in the expanded short-term exposure chapter of the ESL User's Guide (Chapter 6).

Questions and Comments

Please refer to our "Frequently Asked Questions" section in Appendix B of the ESL User's Guide. For further information or to make suggestions for future updates, please contact the ESL Team at RB2-ESLs@waterboards.ca.gov. Water Board staff continue to track developments in risk assessment and maintain a list of topics to be addressed in future ESL updates.