# **2015 SWC Innovation Challenge User requirements**

# Innovation Challenge summary

We seek to develop a user-friendly repository/clearinghouse for states to share draft/final ambient water quality criteria, other target values, numeric translators to narrative criteria, and risk assessments, along with supporting technical documentation, for pollutants including critical drinking water contaminants. The tool will help states more easily and efficiently develop Water Quality Criteria for pollutants with no 304(a) recommended criteria and/or drinking water standards. This clearinghouse would reduce duplication of state data collection and risk assessment.

Benefits of the tool will include:

* Assisting states and tribes in developing ambient water quality standards and assessing source waters, driving the development of protective TMDLs and NPDES permits.
* Helping states and tribes interpret existing narrative water quality standards to safeguard source waters.

All information in the tool will be entered by users, who submit information based on the parameters outlined in “Information Contributors” (pg. 2-3) and “Format for submitting information” (pg. 4) below.

# Final Deliverable

The Innovation Challenge will produce the “blueprint” (in coding terms, the “wireframe”) and design the user interface for a tool that will subsequently need to be developed on an organization’s server, and populated by states/other users.

* **Role of the Innovation Challenge (the “solvers”):** Develop the
  1. “Blueprint”/wireframe (i.e., roadmap for development)
  2. Graphical user interface designed to support user requirements.

Upon delivery of these products by the Innovation Challenge, the SWC will identify the appropriate contractor to build the tool. The selected contractor will construct the necessary infrastructure (implement software code, etc.) on a host server.

Appirio, parent company of Top Coder, offers software development, engineering, design, and cloud-based application hosting and computing services. Appirio may be a candidate to develop the final application. **A Collaborative member or group of members will be responsible for administrative oversight and providing a server for the tool.**

# Member Roles (what can you do?)

* **Role of the Collaborative (our members):** 
  1. Conduct outreach to promote the Challenge to any audiences who may be interested in designing or using the tool.\*
  2. Assess Challenge solutions and select wireframe and graphical user interface. DETAILS FORTHCOMING
  3. **Decide where to develop the tool (which organization/server)**
  4. **Conducting outreach to motivate states, and others with CWA regulatory authority, to enter their information into the tool.** Note: the vast majority of information in the tool will be submitted voluntarily by states. The tool will contain several links to external databases such as STORET, but will not automatically import information from external databases via web services, etc..\*
  5. Review tool performance and data quality to ensure tool integrity/function
  6. Conduct periodic assessments to provide feedback on ease of use, data integrity, etc.

Please email Christene Jennings ([christene.jennings@saltermitchell.com](mailto:christene.jennings@saltermitchell.com)) if your organization is interested in helping out with any of these steps.

\* For more information on outreach, please see a draft Outreach Plan attached.

# Tool Requirements

**We would like to refine a set of user requirements for the tool. Subsequently, based on these user requirements, the Innovation Challenge will ask Challenge “solvers”/applicants to submit a concept for how the tool looks, feels, and operates technologically (e.g., data connections).** Key areas to discuss include 1) key audience groups and use cases for the tool; 2) core functions the tool will support; 3) who will populate the tool with information, and how, and 3) additional format specifications.

**What questions will the tool answer?**

*Broad questions*

* What are my state’s critical contaminants of concern to drinking water?
* What are the “state of knowledge,” water quality criteria, or strategic approaches to addressing these contaminants? What information is available on emerging or novel contaminants?

*State audience:*

* Is [X CONTAMINANT] covered by a NRWQC, MCL, Health Advisory (HA) or other benchmark?
* What are the water quality criteria other states have developed for [X CONTAMINANT]?
* What methodology and research did they use to set these criteria?
* How have other states translated narrative water quality criteria into numeric values for [X CONTAMINANT]?
  + In Challenge posting, include examples from states of the types of information the system will house—e.g., criteria, TSDs, and numeric translators. Give information for developers/solvers to use when developing and testing tool.

*Public audience:*

* Is my state addressing [X CONTAMINANT]? How much is allowed in my water?
* What information is available on emerging or novel contaminants?
  + Information on new contaminants (e.g., criteria, methods, etc.) can be added, and subsequently searched, at any time. “Emerging contaminants” won’t be specifically indexed as such in the system.

**Information Consumers (who will view and use information in the shared library?)**

* States and the public will both be able to view information submitted to the tool
* It is not necessary to make any info in the tool private for viewing or downloading

**Information Contributors (who will populate the shared library?)**

* Contributors are limited, except as noted below, to Federal, state, tribal and local agency representatives (with regulatory approval under the CWA or SDWA) submitting data on criteria, standards, and other target values.
* The Collaborative will work together to compile a master list of national benchmarks for tool creators (e.g., Collaborative members) to enter into the system.
  + This information will be manually entered by EPA or core group from Collaborative (ensure that process is in place for core group to re-enter values whenever they are updated).
  + Anybody from state, tribal, or federal government can add or edit benchmarks.
* The tool will include a user authentication process for data submission
  + Use email verification
  + Based on permitted email *patterns* (e.g., “.gov” address)
  + System will also accept unique emails (outside of prescribed pattern) from known users
* Options for leveraging data from large utilities and others include:
  + Providing a link within the tool to the Water Quality Portal, which provides seamless access to data in both EPA STORET and NWIS ([www.waterqualitydata.us](http://www.waterqualitydata.us))
  + The tool should also link to a listserve (see “format specifications” below) where users can request and share additional data.
  + Individual contributions accepted if data rigorously QA/QCd from known source
  + The tool can also link to the Water Quality Portal (provides data from both STORET and NWIS). This could be a vehicle for uploading special data sets on source water contamination compiled by water utilities.
* Most information in the system will rely on regulators’ submissions—though some suggestions for external databases noted below.

**Functionalities and types of information**

The tool should include a focus on Contaminant Candidate List (CCL) contaminants (e.g., “asterisk” CCL contaminants and cross-reference with CCL website) while enabling a wider search for other contaminants that can occur in sources of drinking water.

The system should include information on human health, aquatic life criteria, and other benchmarks/values (MCLs, HAs, etc.).

* The tool should clearly differentiate user entry points to accessing human health (e.g., drinking water) criteria vs. aquatic life criteria.
* For example, information in the system should be searchable by either 1) contaminant type or 2) criteria type (human health criteria, aquatic life criteria, drinking water MCLs, HAs, benchmarks/guidance values). If a user chooses to search by contaminant type, the system should clearly differentiate human health and aquatic life information for that contaminant.

To populate the tool, users will submit information for each contaminant like the following:

* State draft water quality criteria (if issued for public comment) and final criteria (including methodology for deriving criteria)
* State MCLs, benchmarks, HAs, or guidance values
* State procedures/approaches for addressing a particular contaminant (if no criteria)
* Numerical translators for narrative criteria
* Links to databases that might inform what states are trying to do
* Contact information for the program manager for each particular contaminant and the relevant state/local division/office/bureau
* List of references/bibliography, if not referenced in submitted documents

The system might also retrieve information from

* Online open source libraries for scientific literature (links)
* EPA OST website on Nationally Recommended Water Quality Criteria and Health Advisories
* CCL website: for CCL contaminants, users can cross-check info with CCL website

**Format Specifications**

* The tool should have a very simple, intuitive, user-friendly interface for uploading and finding information.
* **Format for searching information:**
  + Recommended approach: User can either search by 1) contaminant name, CAS RN or contaminant group (e.g., “algal toxins” or “perfluorinated compounds”); 2) criteria type (drinking water MCLs, HAs, benchmarks/guidance values, human health criteria, aquatic life criteria); or (3) state or federal body (e.g., find all criteria a given state has developed for any contaminant). If (1), user may “drill down” into a more refined search by criteria type. If (2) or (3), user may “drill down” into a more refined search by contaminant type.
  + Under each contaminant, the tool will show a list of federal, state, etc. criteria in a dropdown menu (e.g., states who have submitted will be listed in dropdown menu)
* **Format for submitting information:**
* User uploads information by filling out a form with the following required fields:
* Contaminant name (dropdown menu to suggest standardized contaminant names and groups).
  + - * Category of information ( i.e., dropdown menu for MCLs, HAs, benchmarks/guidance values, human health criteria, aquatic life criteria)—information nested hierarchically inside search categories.
      * Technical support documents (including information on contaminant occurrence and health effects, or links to databases with these details)
      * Date of information (e.g., date draft criteria completed)
      * State
      * Organization/Department
      * Name and contact information
  + Only people from the same state as the original contributor can edit or delete a submission from that contributor.
* **Format for displaying information:**
  + How should the info from the list above be displayed? Which fields should respond first to a given search? Tools will not show any/all info at once—consider nested display of fields based on importance to audience.
* **Additional information and platform**
  + Tool should link users to a listserve where they can request info from other users if none found for a specific contaminant.
  + The tool needs to be a web app hosted on the cloud, e.g., AWS
  + Appirio recommends Linux hosting on AWS for a low cost and light-weight yet high-performing system.