

## **Advanced ECHO Webinar: Drinking Water**

**April 13<sup>th</sup>, 2021 1:30 – 2:30 pm ET**

### **Introduction**

Good afternoon and welcome to today's presentation. Before we get started, let's review a few housekeeping items.

Audio is available for this presentation through your computer's mic and speakers or by telephone. Your call-in number as well as your access code is in the control panel box on the right-hand side of your screen. All attendees have been muted to minimize background noise.

If you are interested in following along with the script for this webinar, please go to the "Handouts" tab on your toolbar. You will then be able to download and read the script. Closed Captioning for today's Webinar is available using the Stream Text link in the chat box. A recording of the webinar will be available on the ECHO website in the next week. EPA will also post the presentation slides and a transcript.

If you have a question during the presentation, please type it in to the questions box on the upper right-hand side of your screen. We will have dedicated time to answer questions during the presentation. If you're experiencing any technical difficulties, please contact us and we'll try to troubleshoot the issues.

Lastly, a survey will appear on your web browser at the end of the webinar, so please make sure to provide your comments and feedback to us. And with that, I'll pass it on to our first speaker Amanda Speciale.

Hi everyone, my name is Amanda Speciale and I work for Eastern Research Group, supporting the ECHO website. I'd like to welcome you to the Advanced ECHO series of webinars. The purpose of today's training is to demonstrate tools available in ECHO to access and interpret data about drinking water quality and compliance with the Safe Drinking Water Act.

Now, I would like to take a few moments to introduce everyone to ECHO to make sure we are all beginning from the same starting point. The U.S. Environmental Protection Agency (EPA) provides public access to its regulatory compliance and enforcement data through the Enforcement and Compliance History Online website, which we call ECHO.

Data included in ECHO indicate how a facility is regulated, when an inspection occurred, whether violations were found and whether any enforcement actions were taken.

ECHO presents the compliance history for more than one million EPA-regulated facilities. This includes three-year compliance status history and five-year inspection and enforcement history for Clean Air Act stationary sources, Clean Water Act permitted dischargers, and Resource Conservation and Recovery Act hazardous waste handlers in addition to Safe Drinking Water Act public water systems which are the focus of today's webinar.

Data are reported by EPA and state and local agencies.

ECHO itself is not a data system of record. ECHO pulls data weekly from several EPA program data systems, such as the Integrated Compliance Information System, the Resource Conservation and

Recovery Act Information System, the Safe Drinking Water Information System, and the Facility Registry System. It also pulls select data from EPA's Envirofacts, including pollutant release data from the Toxics Release Inventory and Greenhouse Gas Reporting Program. The About the Data page on the ECHO website provides links to the data sources themselves, as well as specific information on when data are refreshed.

ECHO provides a number of features to help you access and understand environmental data, such as the Facility Search and Enforcement Case Search. You can use these tools to search for facilities that match specific characteristics of interest and then choose specific reports to view detailed environmental information.

Now let's focus on the topic of today's demonstrations: compliance information about public drinking water systems regulated under the Safe Drinking Water Act (SDWA).

It is important to note is that drinking water data displayed on ECHO are not refreshed in real-time. Violation and enforcement data are reported quarterly to the federal Safe Drinking Water Information System (SDWIS). ECHO then pulls the data from SDWIS-Federal to display to the public.

For this webinar, we will present five case studies. Through these case studies, we will highlight relevant search criteria in the Drinking Water System Search, including information about sanitary surveys and the Lead and Copper Rule. Next, we will demonstrate how to use web services, followed by demonstrating how to use the Drinking Water Dashboard. Lastly, we'll show you how to download a nationwide dataset.

We would like to remind you to enter any questions you have into the question box. We will have a question and answer session at the end of the presentation.

### [Case Study 1: Drinking Water System Search - Sanitary Surveys](#)

For our first example, let's start on the Drinking Water System Search.

The Drinking Water System Search returns data on public drinking water systems regulated under the Safe Drinking Water Act and draws data from the federal program database, SDWIS.

The search form is split up into four sections: geographic location, system characteristics, enforcement and compliance, and pollutant. As ECHO users, we may be interested in using this search to identify a set of drinking water systems for research or planning purposes. Note that we may refer to public water systems simply as "systems" during this training.

For our first example, we will focus on Sanitary Surveys. Primacy agencies conduct sanitary surveys of a system to assess their capability to supply safe drinking water. EPA delegates primary enforcement responsibility, also called primacy, to states and Native American Tribes if they meet certain requirements. Currently, all states and territories except Wyoming and the District of Columbia have primacy. The Navajo Nation is the only Native American tribe to have sought and received Primacy. We've provided links to additional resources in the presentation slides if you are interested in learning more about primacy.

All public water systems are required to be evaluated by a sanitary survey every three to five years.

So, how can we use the Drinking Water System Search to determine which systems have had a sanitary survey completed in the past 5 years? Of those systems, which had deficiencies found during sanitary surveys?

To answer this question, let's specify our search criteria. We'll run a nationwide search.

Let's search for systems serving large populations. In the System Characteristics section, for Population Served, let's select two values: 100,001 – 1,000,000 and 1,000,000 or greater.

In the Enforcement and Compliance section, let's select Sanitary Surveys Completed Within 5 years.

Additionally, let's look for public water systems that have significant deficiencies found during a sanitary survey during the same time period.

Now let's click Search.

On the results page, we can see that there are 61 systems that meet this search. Let's use Customize Columns to display more information on the table about sanitary surveys.

Under the "Compliance Status" section, we can see there are four columns relevant to sanitary surveys:

- Sanitary Surveys Completed (5 years),
- Date of Last Survey,
- Significant Deficiencies Found (5 years), and
- Significant Deficiencies Found in Last Survey.

Let's add all four of these columns and return to the table.

For example, on the system MOA Municipality of Anchorage, we can see that there have been 2 sanitary surveys completed within the past five years. During the last survey, in September 2019, the State agency found three significant deficiencies. The State found six significant deficiencies over the past five years.

Let's click on the system name to view the Detailed Facility Report. The Detailed Facility Report will show us a more detailed picture of the enforcement and compliance history of this public water system.

Using the navigation bar, we will select the "Enforcement and Compliance" heading to jump to the section. Now let's scroll down to the SDWA Sanitary Survey Results table.

In the table, we can see the date each sanitary survey was completed within the past 5 years, the type of sanitary survey completed, and the agency who completed the sanitary survey (in this case, the State).

Additionally, there are 11 columns that display the elements of a public water system (PWS) operation in which a system is evaluated on. This includes an on-site review of the system's water source, treatment, distribution system, storage, pumps, monitoring and reporting, management and operation, and operator compliance.

The results are recorded using the following codes shown on this slide. For example, S represents Significant Deficiencies found, and N indicates No Deficiencies or Recommendations.

The descriptions of codes are also listed below the table.

For this example, we can see that in the most recent sanitary survey completed in 2019, there were three significant deficiencies found, aligning with what we saw in the results table. These significant deficiencies are indicated by the letter “S”, and were found when evaluating for Management Operation, Finished Water Storage, and Treatment. Additionally, no significant deficiencies were identified for the water source after 2016.

If you have questions about what the data in the Detailed Facility Report means, you may view the Data Dictionary by clicking on the book icon. Additionally, if you would like more information on the results of a sanitary survey, we recommend contacting the primacy agency.

Let’s return to the Drinking Water System Search.

### Case Study 2: Drinking Water System Search - Action Level Exceedances (Lead and Copper Rule)

For our second example, let’s search for systems with action level exceedances for lead or copper. Before we run the search, let’s review some background about the lead and copper drinking water regulations.

The Lead and Copper Rule was established by EPA in 1991 and is used to control lead and copper in drinking water. Systems must monitor drinking water at customer taps. If the concentration of lead or copper exceeds a certain threshold, called an “action level”, the system must take additional steps to limit exposure to lead and copper by controlling corrosion, educating the public about how to protect their health, and taking other actions. The current action level value for lead is 0.015 mg/L, and for copper is 1.3 mg/L.

It is important to note that exceedances of action levels are not violations, but systems can be assessed violations if they do not perform certain required actions after an action level is exceeded.

ECHO provides public access to data about public water system action level exceedances and compliance with the Lead and Copper Rule.

Now we’re ready for an example search in ECHO. Let’s search for systems that have had action level exceedances, as well as systems with lead and copper violations within the last 5 years.

In the Geographic Location section, we will specify our State = Maryland.

Under the Pollutant section, we will search for Action Level Exceedances in the past five years for Lead only.

and select Lead and Copper for Violations.

Now click search.

Our search returned 40 systems. For context, there are over 3,000 active water systems in Maryland.

We can add columns to our table. Under Customize Columns, lets add Lead Action Level Exceedances and Lead and Copper Violations.

These columns will show us the number of exceedances and violations for each system within the past 5 years. We can select the column header to sort on Lead and Copper Violations and see the systems that have the highest number of violations.

As a note - if you would like descriptions of any of the columns, select the Results Guide at the top of the table.

Let's take a look at an example system, Crossroads Station. We can see from the table that there is one Lead Action Level Exceedance, and three Lead and Copper Violations for this system. This column counts the open health-based violations in the last five years. However, we cannot tell if the lead exceedance and violations are related. To find more information, select the system name to go to the Detailed Facility Report.

There are three tables in the DFR that we can view detailed information about the Lead and Copper Rule: the Three-Year Compliance History by Quarter table, the SDWA Violations and Enforcement Actions table, and the SDWA Lead and Copper table.

The Three-Year Compliance History table displays compliance status data over the last three years of available data for each program or source ID. We can see that there is Lead and Copper Rule compliance data under the Facility-Level Status column. The table shows that on June 1, 2018, a Lead and Copper Violation occurred. The arrows indicate that a violation has not had a resolving enforcement action.

So, we know the facility has had violations identified, but how can we find what specific types of violation occurred?

Let's scroll down to the SDWA Violations and Enforcement Actions table.

For each Federal rule, drinking water violations are grouped broadly as either health-based, monitoring and reporting, public notice, or other violations. Health-based violations are violations of treatment technique rules, maximum contaminant levels, or maximum residual disinfectant levels. Looking at the status column, we can see that there are two compliance periods that the system violation was unresolved for the Lead and Copper Rule. In addition to the June 2018 unaddressed monitoring and reporting violation, we can see there is a second unaddressed violation for the compliance period 04/01/2019.

Both of these instances indicated a monitoring and reporting violation, meaning there was a failure to conduct regular monitoring of drinking water quality, as required by SDWA, or to submit monitoring results in a timely fashion to the primacy agency for this system. We can see in the Category column there are three informal enforcement actions taken against this system that are State Violation/Reminder Notices.

Now, let's move to the Pollutant section to view the SDWA Lead and Copper (Last 5 Years) table.

This table presents the last five years of Lead and Copper water monitoring data. The Source ID is the unique identifier for this public water system in SDWIS, and the Contaminant column indicates if we are looking at lead or copper data. The next two columns show the date range when the tap water samples

were collected, and the 90<sup>th</sup> Percentile of the concentrations measured in the samples. Bolded values indicate that the action level was exceeded, and for this example we can see that for lead, the action level was exceeded during 2018.

The SDWA Violations and Enforcement Actions table also shows that there were three open health-based violations for both lead and copper, which matches the count of Lead and Copper violations in the search results table.

A lead and copper violation is a count of open health-based violations over the past five years. This refers to the three violations with no return to compliance date.

As we can see in this table, all of the open health-based violations are treatment technique violations.

As a note, EPA plans to adjust the logic for counting health-based violations in ECHO to be more consistent with the drinking water program, by removing the term “open” and counting health-based lead and copper rule violations for which the system was out of compliance at any time during the last 5 years.

We also would like to show you a preview of upcoming changes to how data are displayed in the Drinking Water Three-Year Compliance History table.

The enhancements are shown in the bottom table. First, the term “Serious Violator” will be changed to “Enforcement Priority”. While the definition remains the same, the term is more consistent with the Enforcement Response Policy. The term “Undetermined” in Quarter 13 will be changed to “In Progress”.

Next, there is more granular information about violations. Each row in the table represents a Federal Rule and violation type, so we can distinguish the monitoring and reporting and treatment technique violations for this system.

Lastly, notice that the dates in the table are hyperlinks. When a user clicks on a date in this table, they will be taken to the corresponding row in the SDWA Violations and Enforcement Actions table.

### Case Study 3: Drinking Water REST Services

Another way we can retrieve data on public water systems in ECHO is by using web services. These may be of particular interest to web developers and data scientists. The SDWA web services can be accessed by going to the Data Services tab on the ECHO homepage and selecting ECHO Web Services.

Web services allow developers to design custom applications utilizing a live feed of data from ECHO. A collection of "GET" or query-only REST-like services are provided through a simple URL link with outputs in different formats. On the Web Services page, let's scroll down and select the Drinking Water System Search REST Services link.

These services provide multiple endpoints to search and retrieve data on public water systems regulated under the Safe Drinking Water Act (SDWA). This is an alternative way to retrieve data from the Drinking Water System Search, rather than using the search interface.

Let's use similar criteria as we did in the first example of the tutorial on sanitary surveys. First, expand the Safe Drinking Water section, and click on the first endpoint “GET for SDWA Systems Search Service”.

We'll specify our data output format as JSON for this example, but you may also choose from JSONP or XML.

Now, let's specify our search criteria, which we'll call input values. We will enter in the Population Served, or parameter `p_popsv = IN100K_1M, GT1M` to search for systems serving populations over 100,000.

We will also specify the Sanitary Surveys Completed field, or parameter `p_ss5yr = Y` to indicate that we are looking for systems that had sanitary surveys completed within the past 5 years.

Now let's run the search.

In the response section below, we can see that a Request URL is generated.

Let's copy this URL into a separate browser tab.

Now, we are able to see the number of Query Rows, which represents the number of systems matching our search criteria. Additionally, we can see the PWS Name column and corresponding data fields for each system. These results are similar to what we would be able to view in the Drinking Water System Search results.

So, how do we know what the outputs represent? Let's use the metadata service to understand the structure and types of fields in our service outputs. The Metadata service describes the data fields, but does not include the drinking water data itself.

We generated a second Request URL. We can see the column names, types and lengths of each column, and the order or ColumnID. This information will help developers set up appropriate database tables to call and store the drinking water data in the GET SYSTEMS service.

#### Case Study 4: Drinking Water Dashboard

Let's look at Drinking Water data in another way. In addition to the Drinking Water System Search, ECHO offers a Drinking Water Dashboard that visually depicts enforcement and compliance data over time.

The Dashboard can be accessed from the ECHO homepage by selecting "Analyze Trends" from the navigation menu.

The Drinking Water dashboard presents interactive charts describing Public Water Systems, Site Visits, Violations, Serious Violators, Enforcement Actions, and Systems Returned to Compliance. The charts display a summary of different metrics, while offering access to the underlying data.

This dashboard has two different views. The Activity View presents statistics on inspections, violations, and enforcement actions. The Performance View presents rates of activity, state-level statistics, and comparisons to national averages.

Let's do an example search using the Performance view to compare state metrics to national averages.

The dashboard initially shows nationwide metrics. Let's select "Advanced" from the "View Search Criteria" dropdown, to see more options to filter the data, such as EPA Region, Public Water System (PWS) Size, Water Source, and PWS Type.

First, let's look at all systems in the state of Virginia.

Next we will select our PWS = Community Water System.

A Community Water System is a system that serves at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents (for example, homes, apartments, or condominiums that are occupied as primary residence).

Like the first case study in this webinar, we are interested in systems with Sanitary Surveys. Let's select this option using the drop-down on the Site Visits chart.

Now let's look closer at this chart.

We can see that in FY2020, the percent of systems in Virginia with Sanitary Surveys was almost twice the national average.

In the Public Water Systems chart to the left, we can see that of the roughly 1,100 community water systems in Virginia, 130 systems are out of compliance, and 16 systems are serious violators.

A serious violator in this dashboard is a public water system with unresolved serious, multiple, and/or continuing violations, as defined by EPA's Drinking Water Enforcement Response Policy. The system must either return to compliance or be addressed by a formal enforcement action within six months of being designated a serious violator. EPA designates serious violators so that the drinking water system and the primacy agency will act quickly to resolve the most significant drinking water violations. As we mentioned previously, this terminology will soon change to "Enforcement Priority".

We can compare the percent of PWSs with Serious Violators national average to our specified location, in this case, Virginia, by looking at the Serious Violators chart in the bottom row.

We can see that the percentage of PWSs with Serious Violators in this state has decreased since FY2011 and has consistently been below the national average.

The sixteen systems represent 1% of community water systems in Virginia.

Let's select the PWSs with Health-based Violations chart type, using the drop down under the Violations chart. As we can see, all the charts have updated to reflect this selection.

The percentage of Public Water Systems with health-based violations was lower than the national average for FY2020. We can drill down to take a closer look at the data by double clicking on the bar.

This brings us to a table with information about the drinking water systems in Virginia that have a health-based violation in FY2020. From this page, we can access the Detailed Facility Report. Let's click on the link in the Facility Reports column for "Bellavista Estates".

Now that we are on the Detailed Facility Report for this system, let's jump down to the Enforcement and Compliance section and look at the SDWA Violations and Enforcement Actions table.

We can see that there is a health-based violation in the February 2020 compliance period, under the federal stage 1 disinfectants and disinfection byproducts rule. We know this is a health-based violation because it is categorized as a Treatment Technique Violation.

Looking at the columns on the right side of this table, we can see that the State environmental agency filed an informal enforcement action in July.

If you have any questions about the dashboards, you may click the Help button at the top right of the page.

This links to detailed documentation about how to use and interpret data in this dashboard. As a note, EPA is currently working on a modernized Drinking Water Dashboard and we expect it will be available in the coming months. It will have a similar look and feel as the Air, Water, and Hazardous Waste Dashboards, and enhanced features to interact with the charts.

### Case Study 5: Drinking Water Data Downloads

For our final example, let's look at another useful feature that ECHO provides, which are downloadable datasets of drinking water data. The Drinking Water Data Downloads provide a National download of Safe Drinking Water Act data supporting the Drinking Water Dashboard and compiled from EPA's SDWIS database for public water systems.

We can access the data downloads in two ways. The first is to click the link for the "SDWA Data Download" in the Key Links box on the top of the Drinking Water Dashboard page.

Or we can return to the ECHO homepage and go to the Data Services tab.

Select the "National Datasets" link.

On this page, scroll down to the Drinking Water Data Downloads table.

The SDWA dataset includes monitoring, enforcement, and violation data related to requirements established by SDWA so users can perform custom data analyses.

There are seven CSV files that make up the download zip file. You may notice that each file corresponds to a chart type on the Drinking Water Dashboard. The data is collected from the last 10 federal fiscal years. In the Dashboard example we did previously in this webinar, we looked at community water systems in the state of Virginia that had a Sanitary Survey Completed. Let's open up the SDWA Site Visits file within the zip file.

As we can see in this table, many of the column headers correlate to the filters on the dashboard. To match our previous search, let's specifically take a look at the State Name and Sanitary Survey columns.

Let's enable filtering in Excel by clicking the Sort and Filter button.

Now we can filter on the State of Virginia, and also filter on systems that have had a Sanitary Survey completed, so select "Y" in the Sanitary Survey column.

In our Dashboard example, we identified a specific system, Bellavista Estates, that had a Sanitary Survey completed. Let's filter down to see what data is available for this system.

Now we can see Sanitary Survey data from federal fiscal year 2011 to 2020 for this system. We can also see there were several site visits completed for this time period.

We recommend that you review the help documentation to learn more about how to use this dataset.

This help page provides guidance on the downloads, file structure, and a data element dictionary. Users may find this helpful for joining tables and relating data between files.

## Conclusion

ECHO provides a number of help resources for users. If you would like more information about the ECHO data sources and refresh dates, you may visit the [About the Data](#) page.

Here, you are able to view the date the data was extracted from SDWIS, and the date of the next data extraction.

Additionally, if you have a more specific questions that the help pages do not answer, you may use the [Contact Us](#) link at the top right of any screen to submit a question to the ECHO help desk.

A recording of this webinar, as well as the presentation slides and transcript, will be posted to the [ECHO Training](#) page. In addition, we recommend viewing our short video tutorials. We have included links to these help pages and to various other guidance pages in today's webinar slides.

Additionally, we have provided links to [Drinking Water](#) resources we mentioned during this webinar on these slides.

Now, let's take your questions.

Thanks Amanda. Our first question relates to the first case study. It is, When I select more than one population, it switches between the choices rather than searching for both?

Ok. So, on the Search Form, when you are selecting multiple values for search criteria, if you hold down Control and click the two values you can select more than one. So, Control and click.

Thank you. Our next question is, What is the completeness of state sanitary survey information in ECHO? Are there states that do not use or input sanitary surveys into SDWIS-state? Are actual surveys uploaded in ECHO?

So, ECHO is pulling in information from SDWIS-federal, and some states report data into state systems, which then flows into the federal system. I can't speak to the completeness of that data, but any data that is in SDWIS-federal, we are pulling into ECHO. In terms of sanitary surveys, the actual surveys are not uploaded into ECHO, what we are getting is that information about what categories of, when a sanitary survey was completed and the results of the categories of each survey.

Ok, thank you. Our next question is, Can you include a comma or semicolon in searches with multiple PSID numbers?

Yes. If you would like to search for more than one public water system ID, you can enter that into the Search Form. You can separate them by commas or separate the IDs by a hard return. And for any of the fields—on the Search Criteria, if you click the question mark on the page, there's information about how to input your search criteria properly and what the fields mean.

Our next question is, Is there a way to look at connected corrective actions required by sanitary survey significant deficiencies through ECHO?

No, ECHO does not have that information.

Ok, thank you. The next question is, What does it mean if a sanitary survey element result is blank? Would that record be considered a complete sanitary survey?

I believe this was referring to looking at the results of the sanitary survey on the Detailed Facility Report, and if a cell in the table is blank, that's also equivalent to two dashes, which would indicate the data was not reported to EPA. So, we don't have the information.

Ok. The next question is, Are other parameters such as nitrates, stage one and stage 2 disinfectant, byproduct violation status available through ECHO's characteristic facility search?

Yes. One way, you can use different search criteria to find violations related to other drinking water parameters, and one way to do that is to, if we're on the Search page, go down to the Pollutant section, and you can use the Contaminant(s) in Violation search criteria and enter in there "nitrates" or other keywords to find matching parameters. And that will return systems that have had a violation related to that contaminant, and once you open the Detailed Facility Report, you'll see the tables that we covered in this demo. You'll see rows for that specific contaminant, or whatever your specific search criteria are.

Ok, thank you. Our next question is, is it possible view EJSCREEN information or demographics for public water systems and/or their service areas? And, is there a plan to determine or add this information?

Currently ECHO does not provide EJSCREEN or demographic information related to public water systems, but EPA is looking into it as a future enhancement.

Ok, thank you. Our next question is, How do you obtain data that goes past 10 years from SDWIS, and, another question, to confirm, the ECHO SDWIS data will have all records, not max out by records?

So, obtaining data older than 10 years from SDWIS, currently that data download is the data download that we demonstrated, which shows the past 10 federal fiscal years, but EPA is working on another dataset that should have additional years of data. It is not yet available, but I expect it to be available in the next few months. And in terms of... I guess could the user clarify what maxing out by records would mean? We don't limit the data by the number of records. Certainly some of the datasets can be rather large, but we'd be showing any records that are available for a public water system.

Ok, thank you. The user wrote in, before the downloads were so large, records were missing.

Ok. If a CSV file or a download is too large, it may be too large to open in Excel. You may have to use a database software to open that file, because Excel has limits on the size of the file that can be opened. That's typically, that's a common issue we run into when we are previewing large datasets.

Ok, thank you. It looks like that's all the time that we have for questions today.

Great, thank you Olivia, Amanda and Eva. Hi everyone, my name is Madeline LaPatra and I conduct training and outreach for ECHO at the EPA. On behalf of all of us involved with this training, we want to thank you for participating in this webinar. If you do think of any additional questions about using ECHO, please feel free to contact us using the contact us link in the top right of any ECHO page. I also wanted to remind you that a brief survey will open up as soon as this webinar ends. We would really appreciate your feedback. Thank you again and I hope you have a great week.