



pennsylvania

DEPARTMENT OF ENVIRONMENTAL PROTECTION



Office of Water Resources Planning

Pennsylvania's Water Use Data and Research (WUDR) Projects

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Water Information Management System (WIMS)
Workshop/USGS National Water Use Data Collaboration

Sept. 18, 2019

Tom Wolf, Governor

Patrick McDonnell, Secretary

Pennsylvania's water resources



about 86,000 miles of streams

80 trillion gallons of groundwater

Droughts in PA

severe droughts in
1999 and 2002

legislation passed in
2002 requiring water
use reporting for:

- all public water suppliers
- all hydropower
- all others who withdraw exceeds 10,000 gallons per day



Water Use Program




- water use reports dating back to 1960s
- water use section formed in 2001
- data our section collects is stored in two Oracle databases
 - eFACTS (Environmental Facility Application Compliance Tracking System)
 - WUDS (Water Use Data System)

1st WUDR Grants

- Work Plan (FY 2015)
- Water Use Data Report Viewers (FY 2016)
- Enhancements to Reporting Application (FY 2017)

USGS water use data standards

Category	Tier Levels											
	Tier 1 (baseline)				Tier 2				Tier 3			
	a	b	c	d	a	b	c	d	a	b	c	d
Public Supply	standard met	standard met	standard met	standard not met	standard met	standard met	standard met	standard met	standard met	standard met	standard met	standard not met
Industrial	standard met	standard not met	not applicable	not applicable	standard met	standard met	not applicable	not applicable	standard met	standard met	not applicable	not applicable
Irrigation- Crop	standard met	standard not met	standard met	not applicable	standard met	standard met	standard not met	not applicable	standard not met	standard met	not applicable	not applicable
Thermoelectric	standard met	standard met	not applicable	not applicable	standard met	standard not met	not applicable	not applicable	not applicable	not applicable	not applicable	not applicable
Self-Supplied Domestic	standard met	not applicable	not applicable	not applicable	standard not met	standard met	not applicable	not applicable	not applicable	not applicable	not applicable	not applicable
Irrigation – Golf Courses	standard met	standard met	standard not met	not applicable	standard met	standard not met	not applicable	not applicable	not applicable	not applicable	not applicable	not applicable
Livestock	standard met	not applicable	not applicable	not applicable	standard met	standard not met	not applicable	not applicable	standard not met	standard not met	not applicable	not applicable
Mining	standard met	not applicable	not applicable	not applicable	standard met	standard not met	not applicable	not applicable	standard not met	standard met	not applicable	not applicable
Aquaculture	standard met	not applicable	not applicable	not applicable	standard met	standard not met	not applicable	not applicable	not applicable	not applicable	not applicable	not applicable
Commercial	standard met	standard not met	not applicable	not applicable	standard met	not applicable	not applicable	not applicable	not applicable	not applicable	not applicable	not applicable
Hydroelectric Power	standard met	not applicable	not applicable	not applicable	not applicable	not applicable	not applicable	not applicable	not applicable	not applicable	not applicable	not applicable
Wastewater Treatment	standard met	not applicable	not applicable	not applicable	standard met	not applicable	not applicable	not applicable	not applicable	not applicable	not applicable	not applicable

	standard met
	standard not met
	not applicable

PA's Work Plan

Work Plan had two major objectives/priorities:

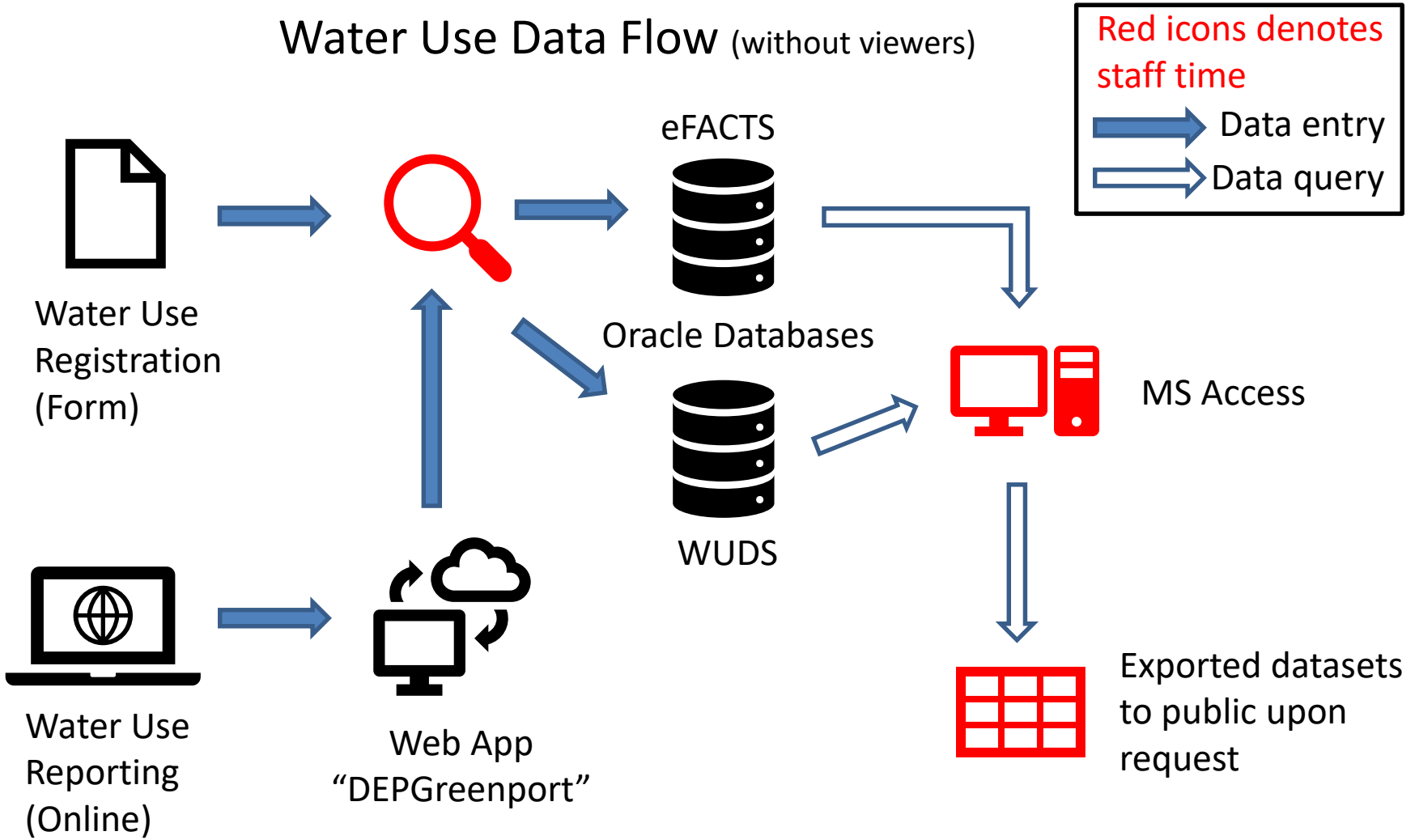
- develop online services for sharing water use data
- improve online quality controls and data collection

2nd WUDR Grant

- Work Plan (FY 2015)
- **Water Use Data Report Viewers (FY 2016)**
- Enhancements to Reporting Application (FY 2017)

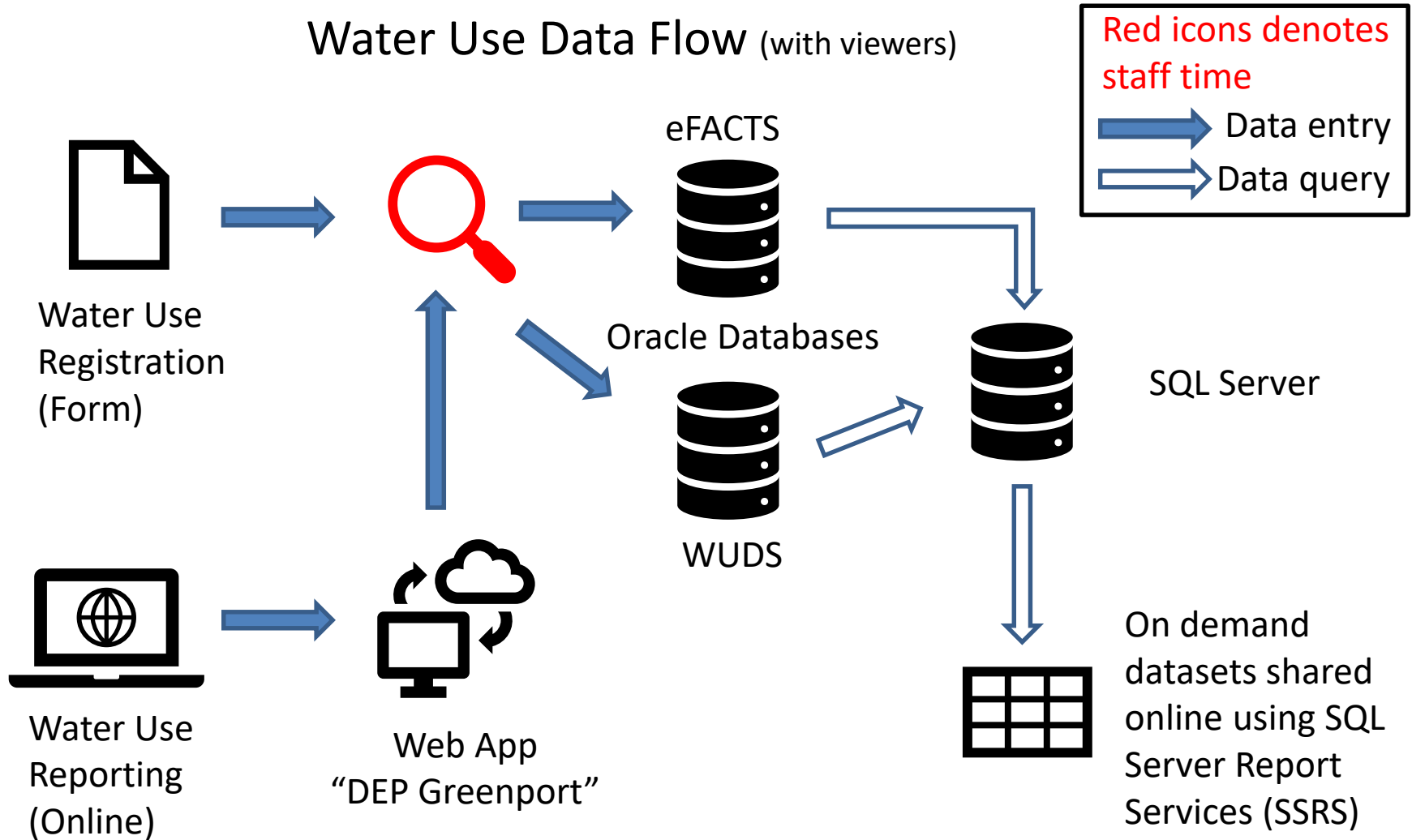
Water Use Data sharing w/o Viewers

Water Use Data Flow (without viewers)



Water Use Data sharing with Viewers

Water Use Data Flow (with viewers)



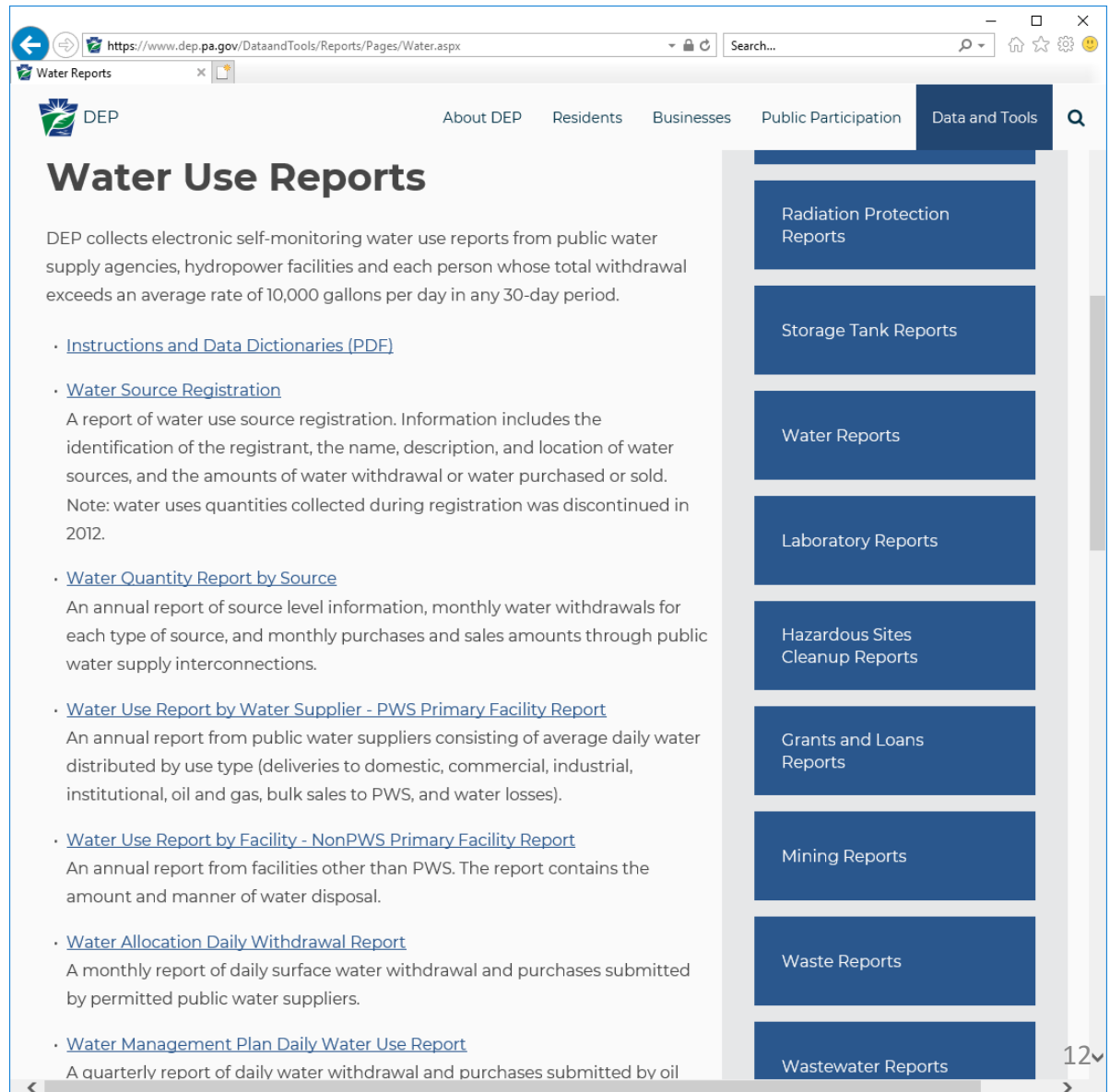
Why we chose SSRS

- Already in use by other programs within PA DEP; no additional cost to program
- Experienced developers on site
- Had all the capabilities we needed such as parameter filtering and file exporting

Water Use Data Report Viewers

(6) separate report viewers were developed

<https://www.dep.pa.gov/DataandTools/Reports/Pages/Water.aspx>



The screenshot shows the DEP website's "Water Use Reports" page. The page title is "Water Use Reports" and the URL is <https://www.dep.pa.gov/DataandTools/Reports/Pages/Water.aspx>. The page content includes a description of DEP's reporting requirements and a list of report viewers. The list of report viewers is as follows:

- Radiation Protection Reports
- Storage Tank Reports
- Water Reports
- Laboratory Reports
- Hazardous Sites Cleanup Reports
- Grants and Loans Reports
- Mining Reports
- Waste Reports
- Wastewater Reports

The page also features a navigation menu with "Data and Tools" selected, and a search bar. The DEP logo is visible in the top left corner.

Report Viewer Filters

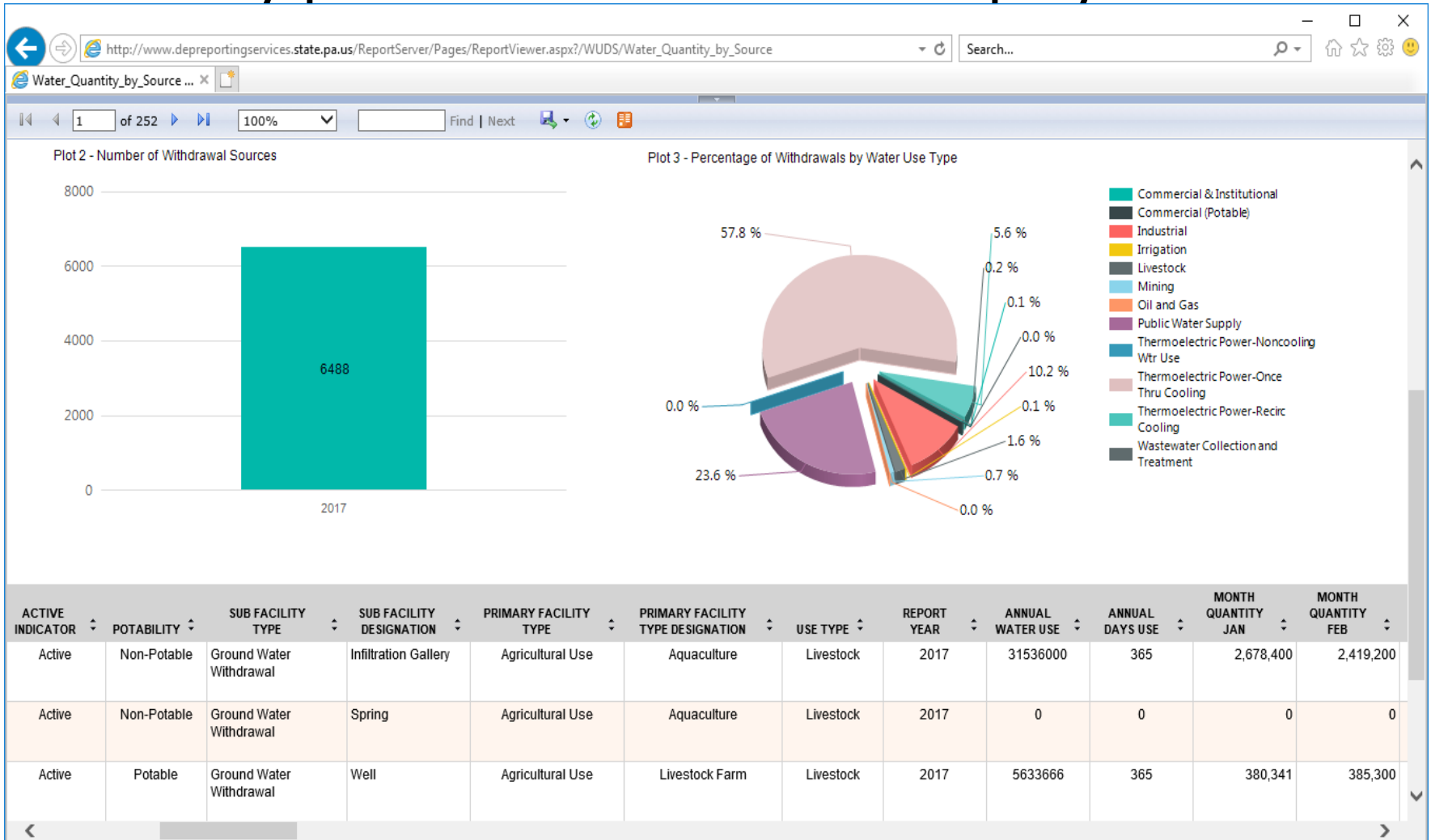
Filter using data fields

The screenshot shows a web browser window with the URL `http://www.depreportingservices.state.pa.us/ReportServer/Pages/ReportViewer.aspx?/WUDS/Water_Quantity_by_Source`. The browser tab is titled "Water_Quantity_by_Source ...". The page content is a filter interface for a report. It features two columns of filters. The left column includes "Water Use Type" (set to "Livestock, Commercial & Institut"), "WUDS PF ID", "eFACTS PF ID", "WUDS SF ID", "eFACTS SF ID", "PWS ID", "Client ID", "Primary Facility Name" (set to "All"), and "Report Year" (set to "2017"). Each of these ID fields has a "NULL" checkbox. The right column includes "SF Type" (set to "Surface Water Withdrawal, Grou"), "SF Status" (set to "Active, Inactive"), "County" (set to "All"), "Municipality" (set to "All"), "Region" (set to "All"), "Sub Region" (set to "All"), "Basin" (set to "All"), "Sub Basin" (set to "All"), and "Watershed" (set to "All"). A "View Report" button is located in the top right corner of the filter area.

Water Use Type	Livestock, Commercial & Institut	SF Type	Surface Water Withdrawal, Grou	View Report
WUDS PF ID	<input type="text"/> <input checked="" type="checkbox"/> NULL	SF Status	Active, Inactive	
eFACTS PF ID	<input type="text"/> <input checked="" type="checkbox"/> NULL	County	All	
WUDS SF ID	<input type="text"/> <input checked="" type="checkbox"/> NULL	Municipality	All	
eFACTS SF ID	<input type="text"/> <input checked="" type="checkbox"/> NULL	Region	All	
PWS ID	<input type="text"/> <input checked="" type="checkbox"/> NULL	Sub Region	All	
Client ID	<input type="text"/> <input checked="" type="checkbox"/> NULL	Basin	All	
Primary Facility Name	All	Sub Basin	All	
Report Year	2017	Watershed	All	

Report Viewer Results

Summary plots and records are displayed



Report Viewer - Exporting

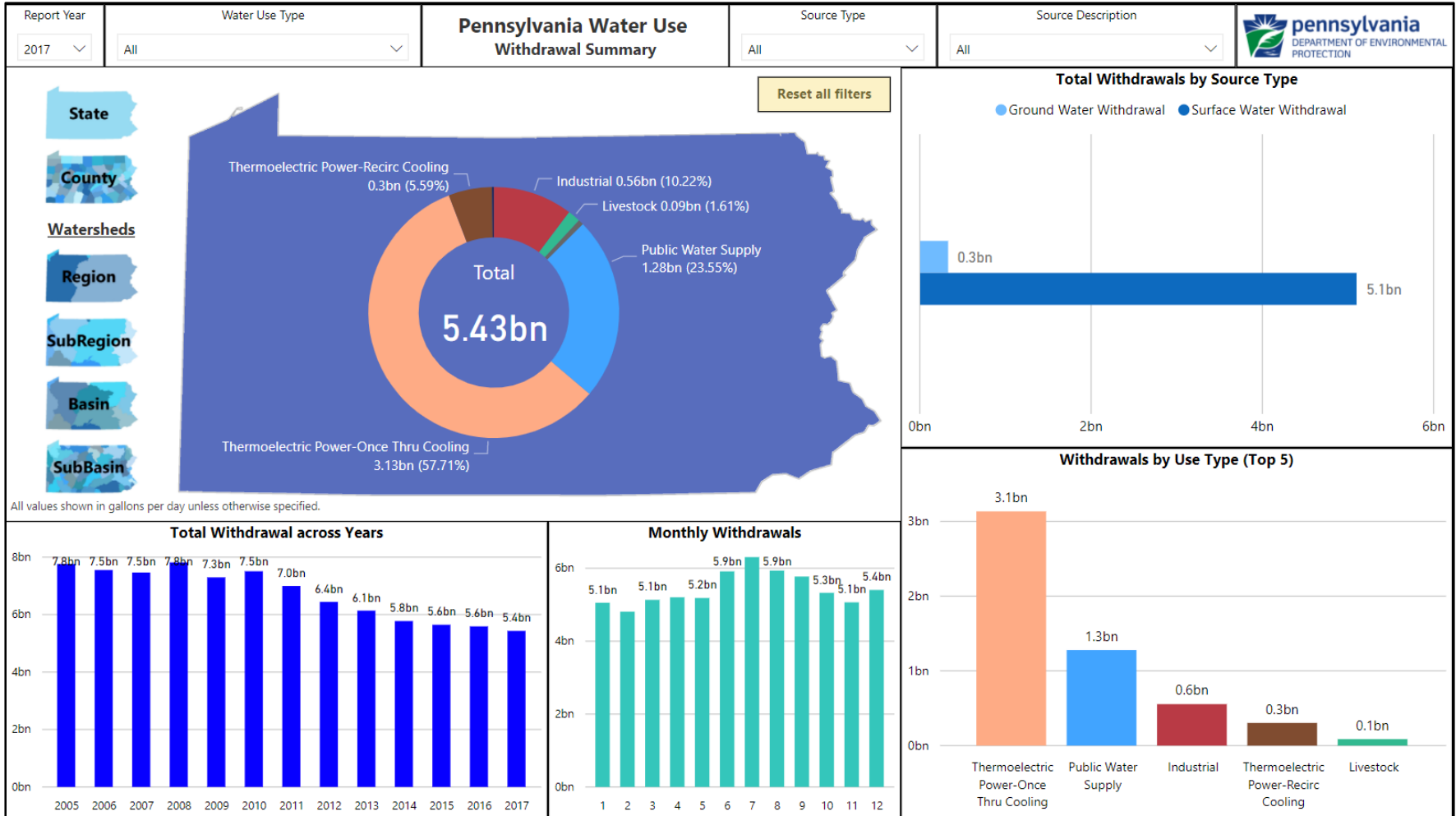
Exporting of dataset to multiple file formats

The screenshot shows a web browser window displaying a report titled "Water Quantity by Source". The browser address bar shows the URL: http://www.depreportingservices.state.pa.us/ReportServer/Pages/ReportViewer.aspx?WUDS/Water_Quantity_by_Source. The report content includes:

- Plot 2 - Number of Withdrawal Sources:** A bar chart showing 6488 withdrawal sources for the year 2017.
- Percentage of Withdrawals by Water Use Type:** A pie chart showing the distribution of water use types. The largest category is "Livestock" at 23.6%, followed by "Public Water Supply" at 7.8%.
- Export Menu:** A red circle highlights a dropdown menu with the following options: XML file with report data, CSV (comma delimited), PDF, MHTML (web archive), Excel, TIFF file, and Word.
- Legend:** A legend on the right side of the pie chart lists 15 water use types with corresponding color swatches.
- Data Table:** A table at the bottom of the report provides detailed data for the first three rows.

ACTIVE INDICATOR	POTABILITY	SUB FACILITY TYPE	SUB FACILITY DESIGNATION	PRIMARY FACILITY TYPE	PRIMARY FACILITY TYPE DESIGNATION	USE TYPE	REPORT YEAR	ANNUAL WATER USE	ANNUAL DAYS USE	MONTH QUANTITY JAN	MONTH QUANTITY FEB
Active	Non-Potable	Ground Water Withdrawal	Infiltration Gallery	Agricultural Use	Aquaculture	Livestock	2017	31536000	365	2,678,400	2,419,200
Active	Non-Potable	Ground Water Withdrawal	Spring	Agricultural Use	Aquaculture	Livestock	2017	0	0	0	0
Active	Potable	Ground Water Withdrawal	Well	Agricultural Use	Livestock Farm	Livestock	2017	5633666	365	380,341	385,300

Power BI



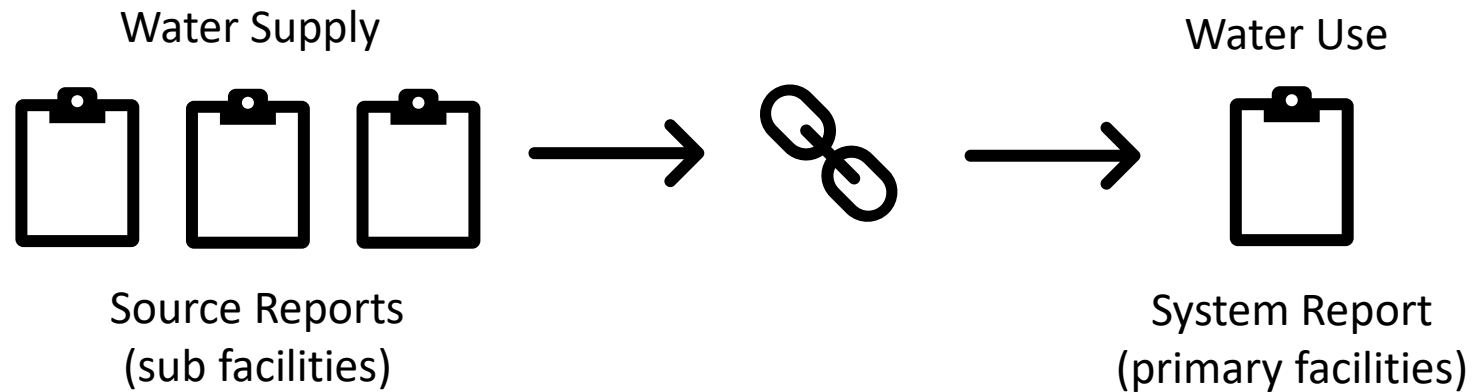
Outcomes from Report Viewers

1. Over 7,000 water use reports in 2018
2. Staff time saved
3. Better service delivery

3rd WUDR Grant

- Work Plan (FY 2015)
- Water Use Data Report Viewers (FY 2016)
- **Enhancements to Reporting Application (FY 2017) completed**

Enhancements to Report Application



source reports needed linking to the system report to:

- automatically populating water use total from source reports to system report
- allowed us to create new quality controls within the system report

Use should equal supply - Example 1

total of water distribution types and water loss should equal supply from all sources

The Totals (from above Types), and the Water Loss do not balance with the Totals (from Sub Facility Reports). If you continue without fixing this discrepancy of 1685, it may result in the report deemed unacceptable and returned.

Ignore

AVERAGE DAILY WATER DISTRIBUTION						
Note: Enter 0 if any value is null						
Type	Metered Connections		Unmetered Connections		Totals (Metered and Unmetered)	
	* Number	* Water Use GPD	* Number	* Water Use GPD	* Number	* Water Use (GPD)
* Domestic	1	29,000	0	0	1	29,000
* Commercial	0	0	0	0	0	0
* Industrial	0	0	0	0	0	0
* Institutional	0	0	0	0	0	0
* Bulk Sales to other PWS	0	0	0	0	0	0
* Oil and Gas	0	0	0	0	0	0
* Other	0	0	0	0	0	0
Totals (from above Types)	1	29,000	0	0	1	29,000
Total (from Sub Facility Reports)						30,685
* Water Loss	Water Loss = Total Water Use (from Sub Facility Reports) -Total Water Use (Metered and Unmetered Conn)					0

Use exceeds supply - Example 2

discharges should not exceed supply from all sources

The Total Discharged Amount must be less than or equal to the Total Gallons Withdrawn calculated from Sub Facility Reports. If you want to continue with these amounts provide a reason for the exceedance in the box below.

SUMMARY OF DISCHARGES		
	Manner of Discharge	Gallons Per Year
Remove	OTHER (crusher cooling)	1,660,500
Remove	OTHER (Office usage/plant)	1,873,600
	Total:	3,534,100
Add New Discharge		
Total Gallons Withdrawn calculated from Sub Facility Reports: 2,534,100		
Reason for exceedance:		
<div style="border: 1px solid gray; height: 100px; width: 100%;"></div>		
<input style="margin-right: 10px;" type="button" value=" << Previous "/> <input style="margin-right: 10px;" type="button" value=" Next >> "/> <input style="margin-right: 10px;" type="button" value=" Save "/> <input style="margin-right: 10px;" type="button" value=" Cancel "/>		

Outcomes from Enhancements

- much less reports are returned for errors
 - before - around 20%
 - after - less than 3%
- data quantity improved
 - errors are discovered by report preparer before submission

Current WUDR Projects for PA

- new online applications for remaining paper forms (FY 2018)
- data sharing with River Basin Commissions, PA DEP, and USGS (FY 2019)



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