



# PHOENIX Annual Groundwater Report Edition

PNNL-Hanford On-line Environmental Information Exchange

<http://phoenix.pnnl.gov/>

## Functions and usage guide

**PNNL-SA-98504**

Rev.0, 09/23/2013

The PHOENIX 2012 Hanford Annual Groundwater Report On-line Edition is an interactive map-based viewer developed by Pacific Northwest National Laboratory (PNNL) to provide quick and easy access to the Hanford Annual Groundwater Report content.

The data, interpretive text, figures and tables were packaged and produced by the Groundwater Science group at CH2M Hill Plateau Remediation Company (CHPRC). The on-line viewer contains identical content to the printed version of the annual groundwater report, but allows the user to explore the data in ways not possible through a printed report.

The PHOENIX development team wants to make the On-Line Annual Groundwater Report as useful to the Hanford community as possible. If you have any questions, ideas, suggestions or comments please contact:

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Groundwater interest area menu filter (Fig.2)

Groundwater interest area menu (Fig. 2)

Interactive Map

Basemap selection control

Information, legend and feedback buttons (fig. 4)

### 2012 Hanford Annual Groundwater Report

Home  
All 100-BC 100-KR 100-NR 100-HR-D 100-HR-H 100-FR 300-FF 1100-EM 200-BP 200-PO 200-UP 200-ZP



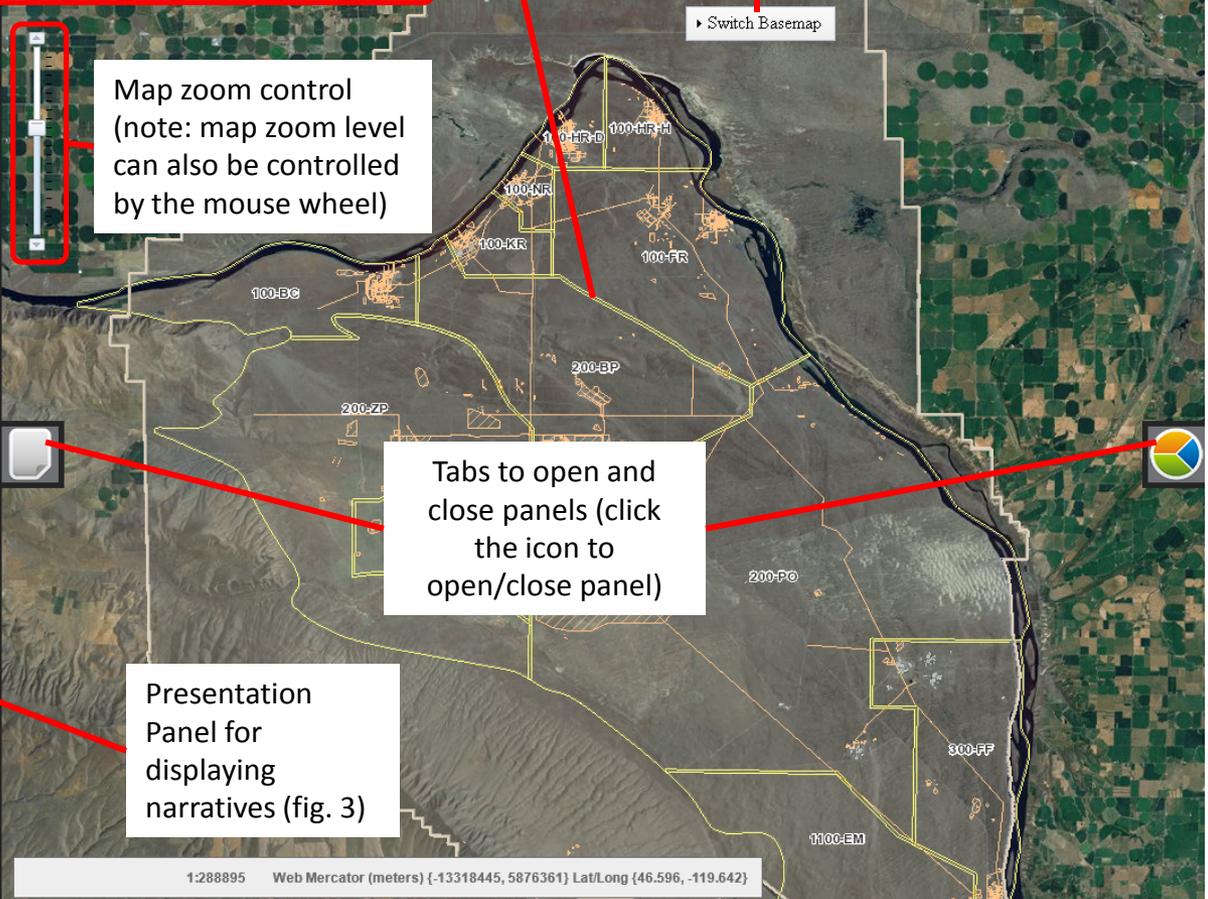
## Introduction to 2012 Annual Groundwater Monitoring Report

Groundwater monitoring was reported in a variety of ways over the history of Hanford Site operations. While descriptions of groundwater monitoring predated the 1980s, the "modern" annual groundwater monitoring report originated in 1996. The format of the report was a written document, although much of the distribution in recent years has been via electronic files.

The groundwater monitoring report for 2012 is the first of a new, online reporting format that includes interactive features not previously available. For example, users can "zoom in" on areas of interest and interactively explore groundwater data.

This report focuses on 2012 monitoring results and changes from the previous year. However, long term trends are considered and discussed. Details of previous studies (e.g. remedial investigations) are published in separate reports that are provided via internet links in this report. As in previous reports, the 2012 report provides the primary means to report monitoring results for *Resource Conservation and Recovery Act of 1976* (RCRA) treatment, storage, and disposal units; for *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA) groundwater operable units where no active remediation is currently taking place; and the *Atomic Energy Act of 1954* (AEA) as required by DOE orders. Results of groundwater remediation in CERCLA groundwater operable units are summarized here, and links to separate annual reports are provided. Supporting information on CERCLA, RCRA, aquifer tube monitoring, and quality control is provided in [SGW-539-02](#).

Groundwater monitoring objectives of RCRA, CERCLA, and AEA often differ slightly, and the contaminants monitored are not always the same. For RCRA-regulated units, monitoring focuses on nonradioactive dangerous waste constituents. While radionuclides (source, special nuclear, and byproduct materials) may be monitored in some RCRA unit wells to support objectives of monitoring under AEA and/or CERCLA, they are not subject to RCRA regulation. Pursuant to RCRA, the source, special nuclear, and byproduct material components of radioactive mixed waste are not regulated under RCRA but are instead regulated by DOE, acting pursuant to its AEA authority.



Map zoom control (note: map zoom level can also be controlled by the mouse wheel)

Tabs to open and close panels (click the icon to open/close panel)

Presentation Panel for displaying narratives (fig. 3)

Figure 1. Initial view highlighting basic application controls



Figure 2. Menu controls.

“Breadcrumb trail” shows the current location within the narrative. Clicking any entry goes to that section

Home > 200-PO > CERCLA Monitoring > Iodine-129

All

100-BC 100-KR 100-NR 100-HR-D 100-HR-H 100-FR 300-FF 1100-EM 200-BP 200-PO 200-UP 200-ZP

CERCLA Monitoring	CERCLA Remedies	AEA Monitoring	RCRA Monitoring	WAC Monitoring
Tritium		400-Area	B Pond	TEDF
Iodine-129		IDF	IDF	SWL
Nitrate			NRDWL	
Strontium-90			WMA A AX	
Technetium-99			216-A-29 Ditch	
Uranium			216-A-36B Crib	
			216-A-37-1 Crib	

Menu filter box controls which groundwater interest areas are shown in the menu. Options are: River Corridor, Central Plateau or all groundwater interest areas

Drop-down menu shows available “sections” for each GW interest area.



Figure 3. Presentation panel features and controls.

The presentation panel presents the narrative associated with the selected menu item. This narrative is identical to that found on the corresponding page of the printed version of the report. This text interprets the data and is prepared by CHPRC.

Text size control. Click one of the letters to change the size of the text in the presentation panel.

Click the green arrow to open the text in a separate window.

**Introduction to 2012 Annual Groundwater Monitoring Report**

Groundwater monitoring was reported in a variety of ways over the history of Hanford Site operations. While descriptions of groundwater monitoring predated the 1980s, the "modern" annual groundwater monitoring report originated in 1996. The format of the report was a written document that included interactive elements. In recent years has been via electronic files.

The groundwater monitoring report includes interactive elements that includes interactive elements "in" on areas of interest. The reporting format users can "zoom in" on areas of interest.

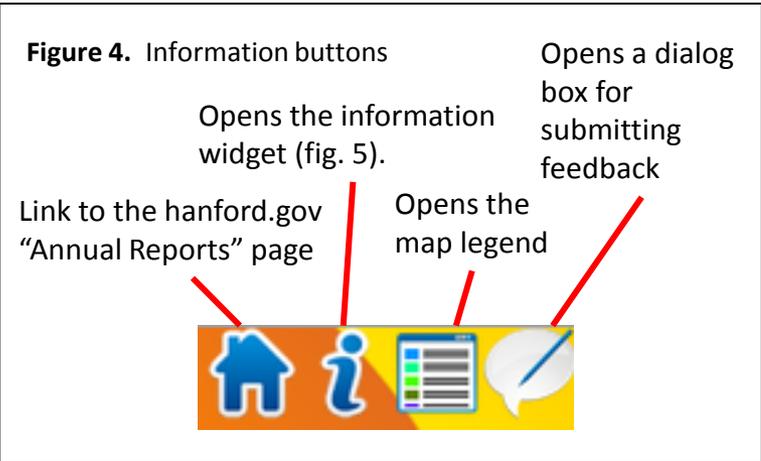
This report focuses on 2012 monitoring results and changes from the previous year. However, long term trends are considered and discussed. Details of previous studies (e.g. remedial investigations) are published in separate reports that are provided via internet links in this report. As in previous reports, the 2012 report provides the primary means to report monitoring results for [Resource Conservation and Recovery Act of 1976 \(RCRA\)](#) treatment, storage, and disposal units; for [Comprehensive Environmental Response, Compensation, and Liability Act of 1980 \(CERCLA\)](#) groundwater operable units where no active remediation is currently taking place; and the [Atomic Energy Act of 1954 \(AEA\)](#) as required by DOE orders. Results of groundwater remediation in CERCLA groundwater operable units are summarized here, and links to separate annual reports are provided. Supporting information on CERCLA, RCRA, aquifer tube monitoring, and quality control is provided in [SGW-53548](#).

Groundwater monitoring objectives of RCRA, CERCLA, and AEA often differ slightly, and the contaminants monitored are not always the same. For RCRA-regulated units, monitoring focuses on nonradioactive dangerous waste constituents. While radionuclides (source, special nuclear, and byproduct materials) may be monitored in some RCRA unit wells to support objectives of monitoring under AEA and/or CERCLA, they are not subject to RCRA regulation. Pursuant to RCRA, the source, special nuclear, and byproduct material components of radioactive mixed waste are not regulated under RCRA but are instead regulated by DOE, acting pursuant to its AEA authority.



Blue text are hyperlinks which will open the appropriate reference in a separate window

Scroll bar



**Figure 5.** Information widget features

Welcome statement and basic layout

Map Legend

Description of data sources used in report

Download the complete data package used in the report (caution: large file size)

Complete list of hyperlinked references used in the report

**2012 Hanford Annual Groundwater Report**  
Online Edition

**Welcome**

**Welcome to...**

**PHOENIX Annual Groundwater Report Edition**, an interactive map-based viewer developed by Pacific Northwest National Laboratory (PNNL). This website provides quick and easy access to annual groundwater report content.

Content is organized by ground water interest area (GWIA). Three panels present the narrative, map, and data for each topic. All content was prepared by CH2M Hill Plateau Remediation Contractor (CHPRC).

**Narratives**      **Map**      **Data**

1      2      3

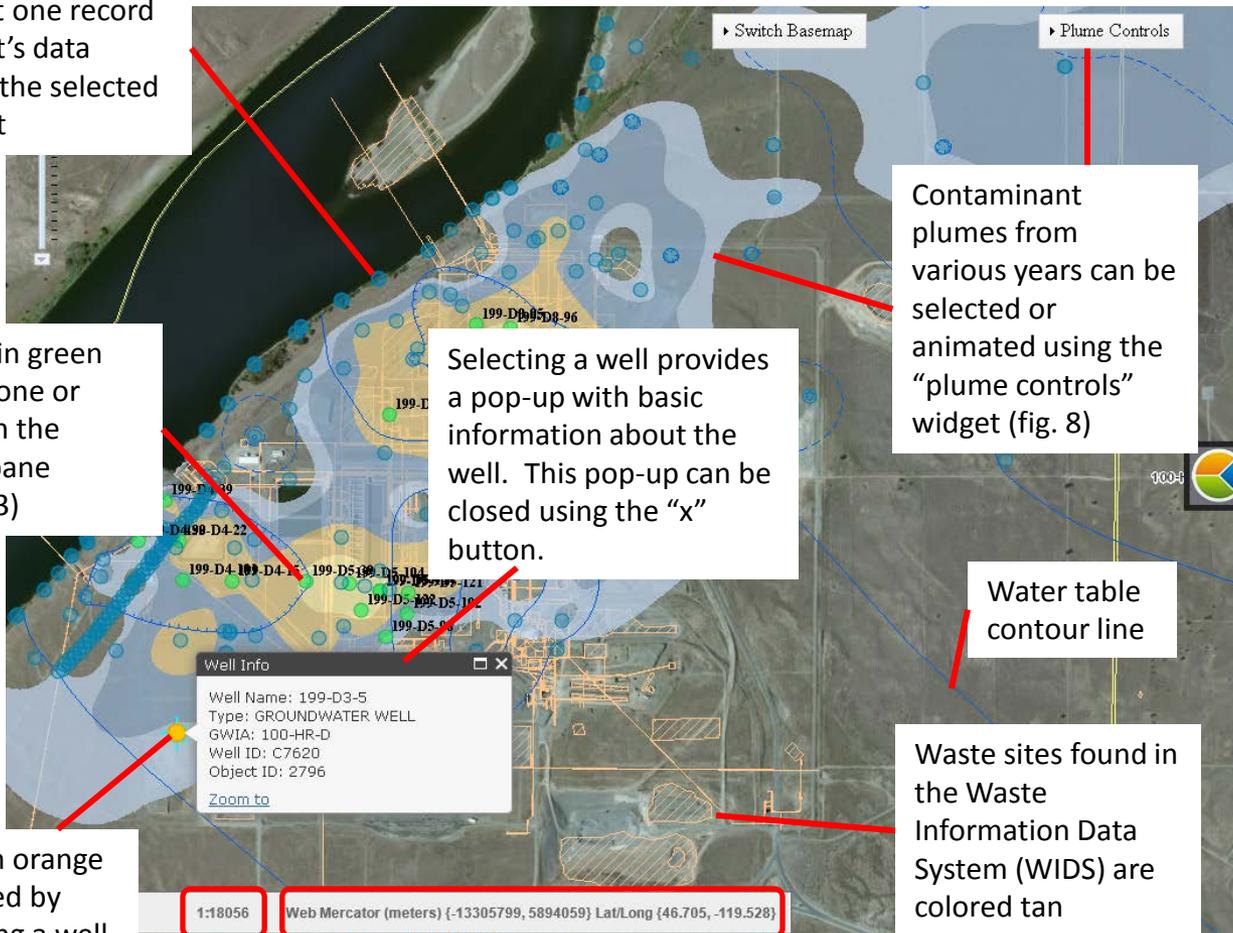
Close button

Figure 6. Map controls and features

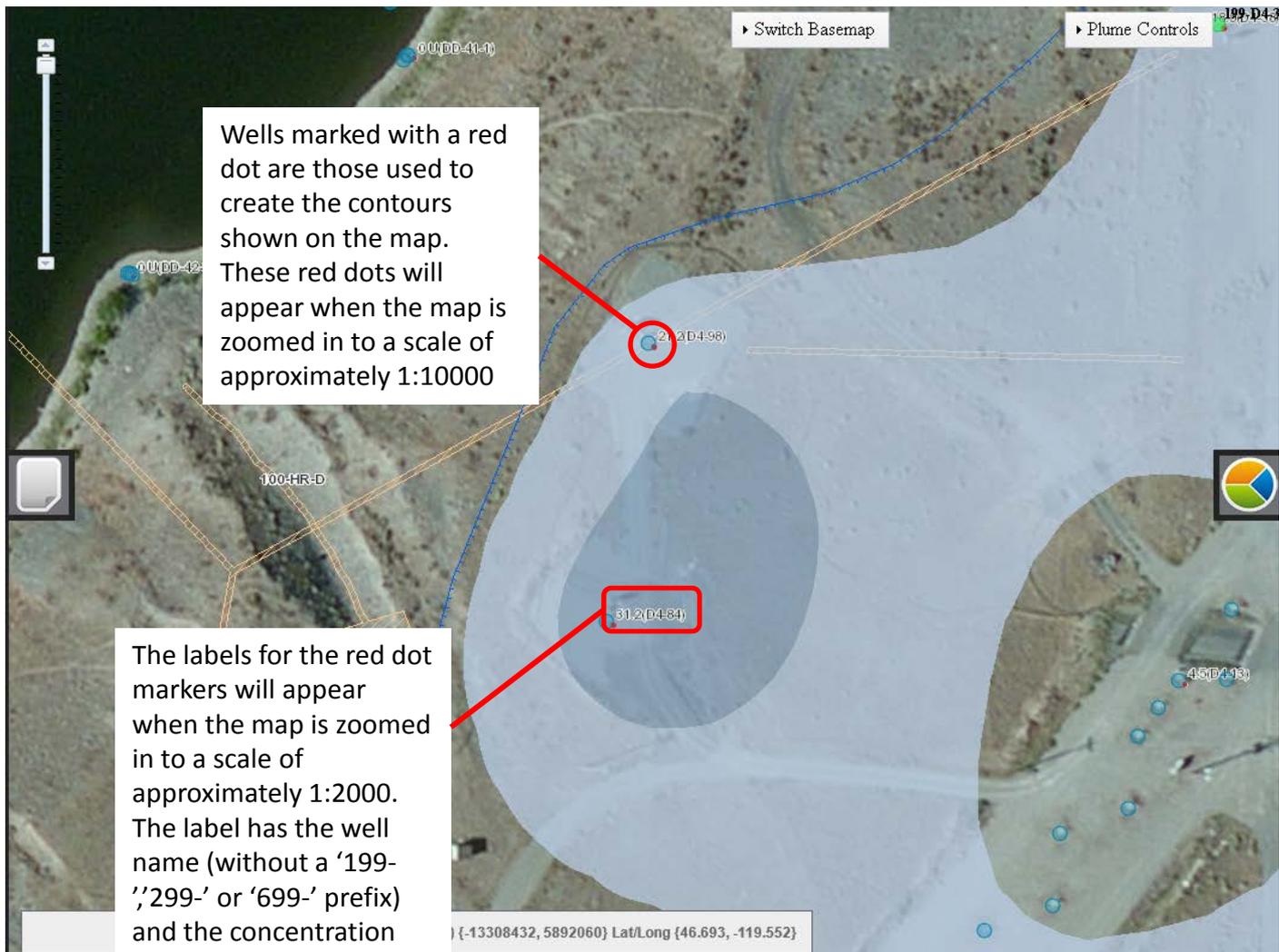
Wells marked in blue have at least one record in the report's data package for the selected contaminant

Wells marked in green are plotted in one or more figures in the presentation pane narrative (fig. 3)

A well marked in orange has been selected by clicking. Selecting a well populates the exploration panel with its data (fig. 9)



**Figure 7.** Contaminant plume contour features



Wells marked with a red dot are those used to create the contours shown on the map. These red dots will appear when the map is zoomed in to a scale of approximately 1:10000

The labels for the red dot markers will appear when the map is zoomed in to a scale of approximately 1:2000. The label has the well name (without a '199-', '299-' or '699-' prefix) and the concentration value used in creating the contours

**Figure 8.** Contaminant plume control widget

Move plume display forward or backward by one year

Unchecking this box removes the plumes from the map

Dropdown menu to select a plume for a particular year

Click to start plume animation. The plumes will start at the earliest available year and continue to 2012.

Toggle for repeating the animation

Dropdown menu for selecting time interval between plumes in animation

Opens and closes the legend

**Legend**

**Cr+6 LRS (2012) wells**

- Well

**Cr+6 LRS (2012) plume**

- <10 µg/L
- ≥10 and <20 µg/L
- ≥20 and <48 µg/L
- ≥48 and <480 µg/L
- ≥480 µg/L

The legend is dynamic and updates when a new plume is shown during the animation. Note that the plume contour intervals may change between plumes.

**Figure 9.** Exploration Panel details

Number of wells in the Groundwater interest area that have at least one sample result in the report's data package for the selected analyte, and are marked with a blue or green circle ("visible")

Clicking the green arrow opens a new window containing the well names for the wells in the Groundwater interest area that are marked with a blue or green circle ("visible")

Checking this box keeps the selected analyte for every subsequent well click (if sample results are available). When the box is unchecked, the default is to display results for the analyte in the selected section.

The default view is the chart. Clicking this tab shows a table of the data used in the chart

**Well Graphics Summary**

Total Wells: 108

Visible Wells: 90

Apply Menu Filter

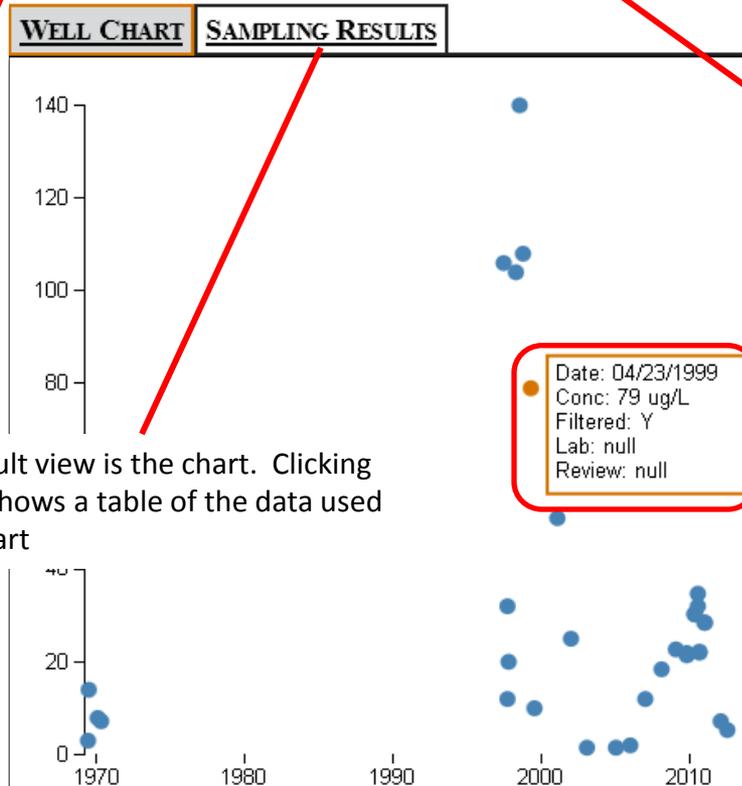
View Visible Well List

**Active Well: 199-B5-1**

**Analyte**

Hexavalent Chromium

Remember Analyte Selection



Only non-rejected results are displayed

Number of wells in the Groundwater interest area that have at least one sample result in the report's data package (all analytes)

Unchecking this box shows all the wells regardless of whether they have results for the selected analyte or not.

This is the selected well (highlighted orange on the map [figure 6])

This drop down list contains all the analytes that have been sampled for in the selected well. Selecting an analyte from this list will update the chart and table.

Hovering the mouse cursor over a data point will produce a pop-up with detailed information about it

**Figure 10.** Nearby Wells selection feature

If two or more wells are too close together (as shown below), it may be difficult to click on both. Clicking on any of the wells will produce a list of “nearby wells” in the explorer panel (right)



The online annual groundwater report will list wells within a certain radius of the selected well in a drop down box. This allows easy selection of wells whose symbols are overlapped. If there are no wells within the pre-defined radius of the selected well, this drop-down selection will not appear.

**Well Graphics Summary**  
 Total Wells: 108  
 Visible Wells: 90  
 Apply Menu Filter   
[View Visible Well List](#) ➔

**Active Well: 199-B5-6**

**Nearby Wells**

199-B4-14	▼
199-B5-6	
199-B4-14	

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Hexavalent Chromium