



Geotech
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Data Management and
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Advancements in Environmental Data Management and Display



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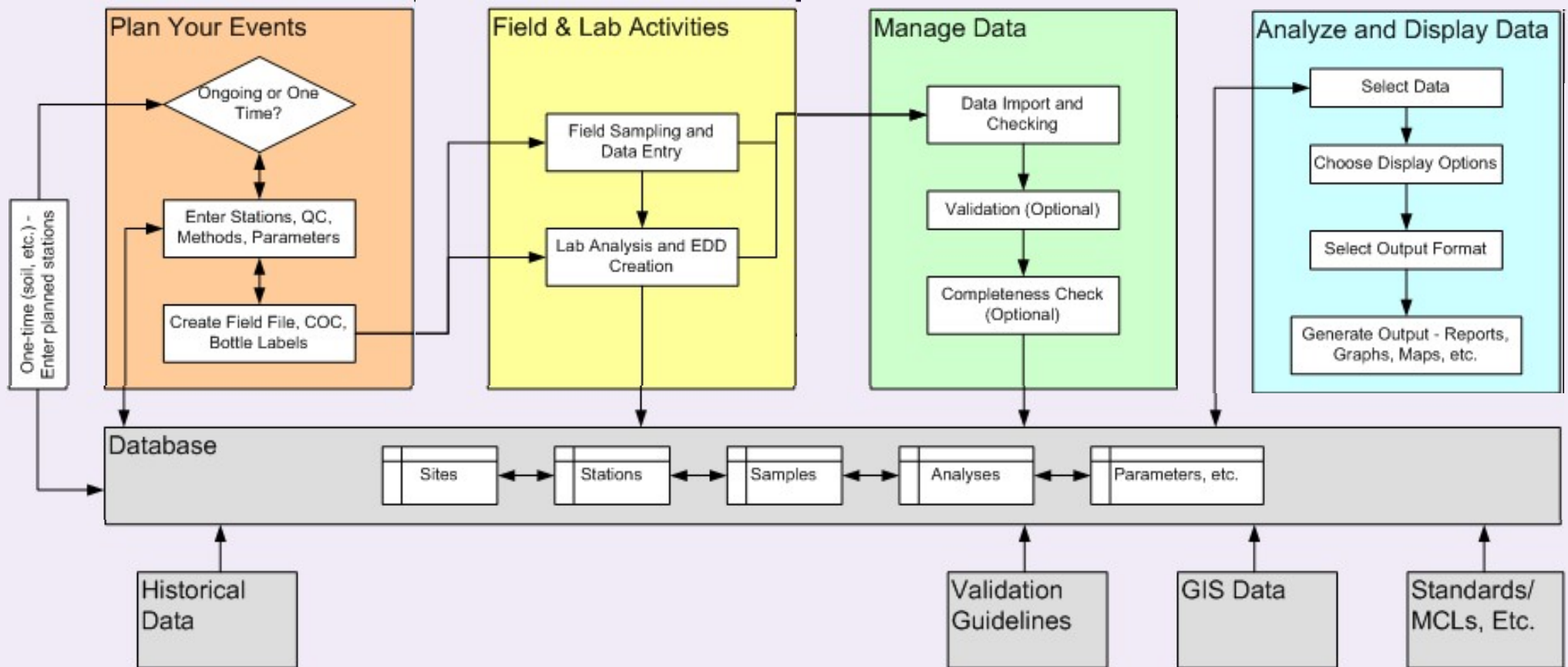
Remediation Partners



- ① High level view of the process
- ① Setting up the database
- ① Managing field events
- ① Importing lab and other data
- ① Data review and validation
- ① Data selection
- ① Formatting
- ① Displays
- ① Mapping and GIS
- ① Data Portals
- ① Business justification

High level view of the process

3/31



Plan your sample events

Manage field and lab activities

Manage data and quality

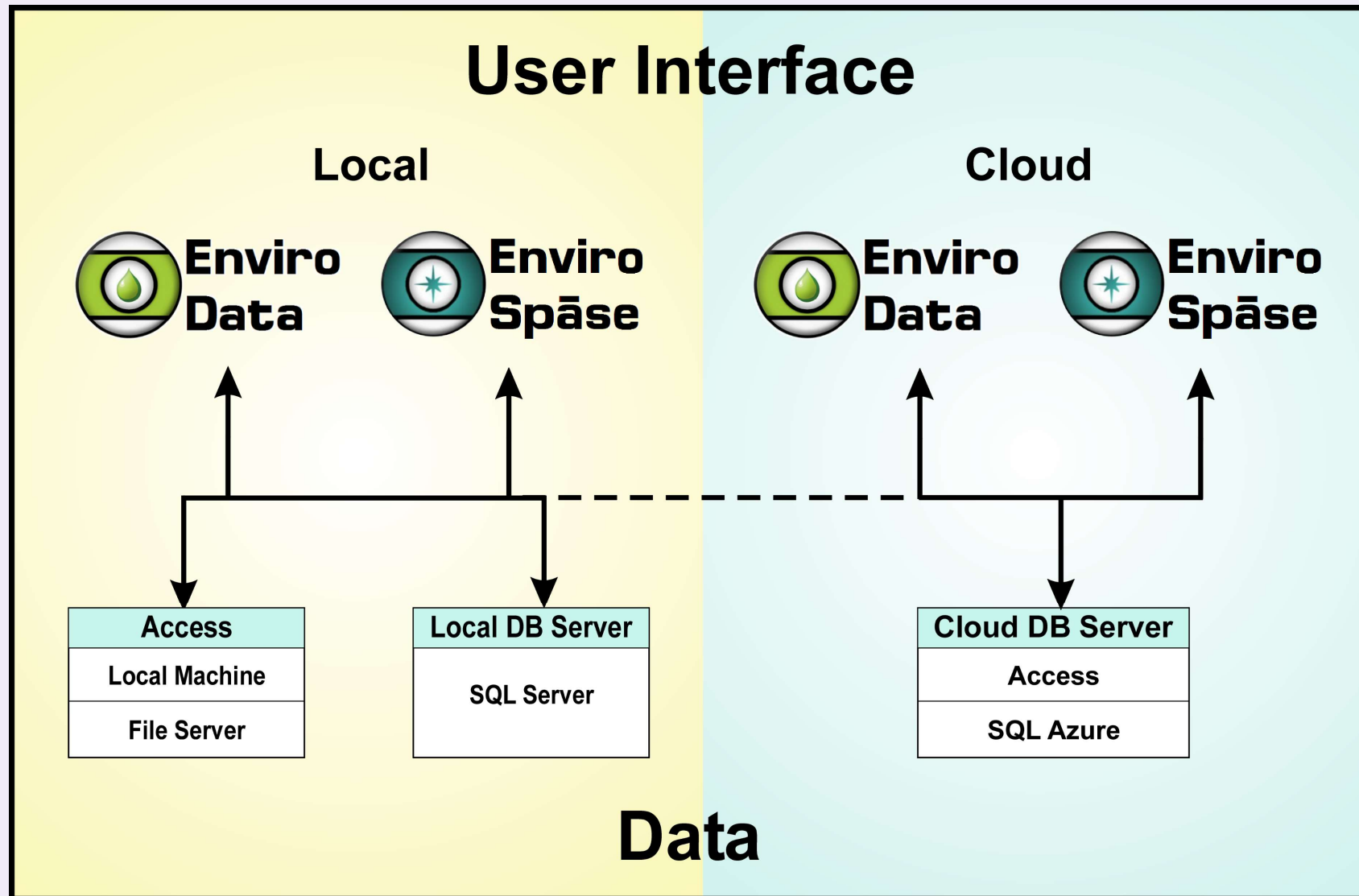
Store in a robust repository

Analyze and display data

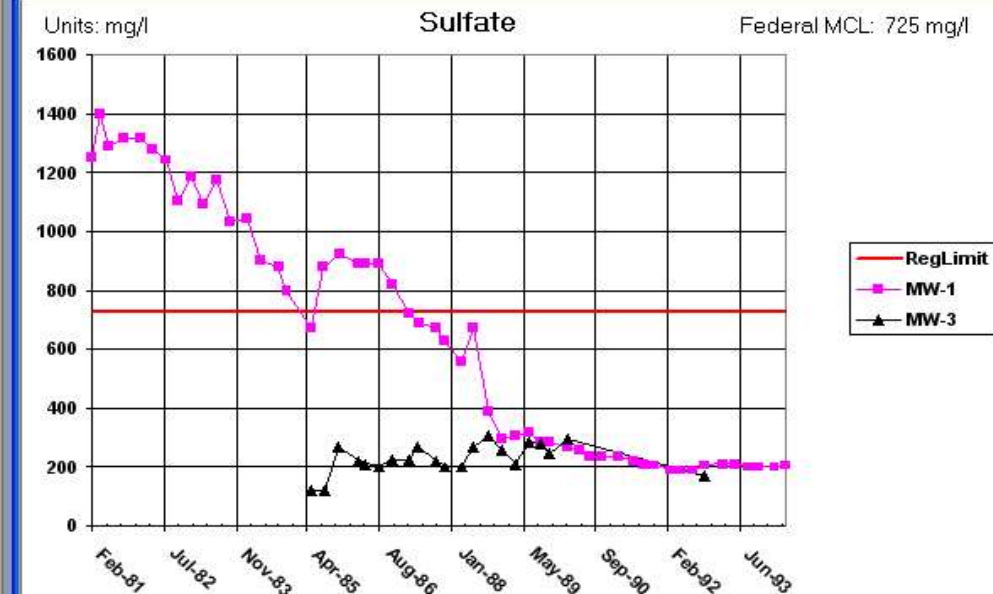
It's all in one location



Implementation Options



Graph Display



Tree View

- Rad Industries
 - A2 - Soil boring
 - AA1 - Soil boring
 - AA2 - Soil boring
 - AA3 - Soil boring
 - Soil - Date: 9/1/1995 - Depth: 725.96;724.46
 - Ra-226 - soil: 2.3 pCi/g - Flag: v
 - Th-232 - soil: 1.4 pCi/g - Flag: v
 - Total Radium-soil: 3.7 pCi/g - Flag: v
 - U-238: 2 pCi/g - Flag: u
 - Soil - Date: 9/1/1995 - Depth: 730.96;729.46
 - Soil - Date: 9/1/1995 - Depth: 735.96;734.46
 - Soil - Date: 9/1/1995 - Depth: 740.96;739.46
 - B1 - Soil boring
 - B2 - Soil boring
 - B3 - Soil boring
 - B4 - Soil boring
 - B5 - Soil boring
 - B6 - Soil boring
 - BB1 - Soil boring
 - BB2 - Soil boring
 - BB3 - Soil boring
 - Blank - Unknown
 - C2 - Soil boring
 - D4 - Soil boring
 - D4A - Soil boring

Map

Base Map:
 C:\EnviroData2008\RadInd.dwg
 Image:
 C:\EnviroData2008\envdata.bmp
 Parameter:
 Ra-226 - soil (Max.)

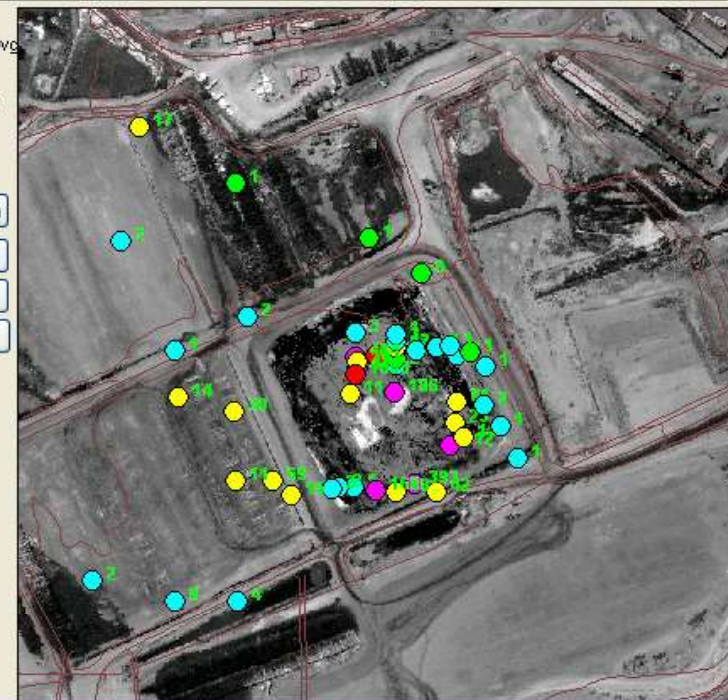
Legend:
 1 (Green circle)
 10 (Cyan circle)
 100 (Yellow circle)
 1000 (Magenta circle)
 10000 (Red circle)

Buttons: Clear, Refresh, Full Extent, Draw Stations, Draw Image

☐ Show Sta. Name

Min X: -420
 Max X: 4116
 Min Y: 278
 Max Y: 2898

Export to Clipboard ☐ BMP ☐ EMF



Site: Rad Industries

Deep						Deep	Deep	Station Group ->	Deep	Deep	10/1
						Sample ID ->			Date ->		
						Depth ->			5/20/1982	7/27/1982	10/1
Analyte	Units	Federal MCL	Primary	Safe Drinking Water	State Drinking Water Levels						
Metals											
Calcium	mg/l	NA	NA	NA	NA	150	170	180			
Iron (Ferrous)	mg/l	NA	0.1	NA	NA	2.6	0.074	0.95			
Potassium	mg/l	NA	NA	NA	NA	4.2	3.2	3.8			
Sodium	mg/l	NA	NA	NA	NA	120	86	110			
Inorganics											
Chloride	mg/l	NA	NA	NA	NA	230	190	200			
Nitrate	mg/l	NA	2	NA	NA	1	<1	<1			
Sulfate	mg/l	725	800	350	1000	370	280	350			
Field Param											
Field pH	su	NA	NA	NA	8.4	7.2	7	7.7			
Other											
Total Dissolved Solids	mg/l	NA	NA	NA	NA	1120	1020	1060			

Manage Lookups

Sites

Site Owners

Labs & Contr.

Show More

Stations

Current Status

Station Alias

Station Groups

Station Types

Samples

Sample Groups

Sample Matrix

Sample Method

Sample Types

Sample Purpose

Analyses

Analytic Flags

Analytic Methods

Analytic Probs

Parameters

Parm. Groups

Sum. Categories

Validation Flags

Reg Limits

Reg. Limits

Reg Limit Groups

RegLimGrps/Type

Reg Limit Types

Bulk Data

Instruments

Survey

Multiple Tables

Documents

Filtered

Geol. Units

Lithology

QC Codes

Reporting Units

Unit Conversion

Close

Edit Regulatory Limits

Filter Limits by... *Regulatory Limit Type:* [Dropdown] *Actions:* [Dropdown] **Show All** *Regulatory Type Group:* [Dropdown] **Go** *Sample Matrix:* [Dropdown]

All Sites Site-Specific

Parameter	Matrix	Limit	FilterCode	Lower Lir
Arsenic (As)	Water	25	Z	ug
Arsenic (As)	Water	100	Z	ug
Arsenic (As)	Water	2	Z	ug
Arsenic (As)	Water	30	Z	ug
Benzene	Water	0.5	Z	ug
Benzene	Soil	10	Z	ug
Benzo(a)pyrene	Water	0.1	Z	ug
Chromium	Water	10	Z	ug
Chromium	Water	10	Z	ug
Copper	Water	50	Z	ug
Copper	Water	50	Z	ug
Fluoride	Water	0.1	Z	mC
Fluoride	Water	0.1	Z	mC
Gross Alpha	Water	1	Z	pC
Iron (Ferrous)	Water	100	Z	ug
Lead (Pb)	Water	1	Z	ug
Lead (Pb)	Water	1	Z	ug

Record: [Navigation Icons] No Filter Search

Import Regulatory Limit Records from Parameters: **Delete Regulatory Limit Records:** **Export Reg.Limits** **Export Reg.Limits** **Close**

[One Site] [Global] confirm each record? ☐ [One Site] [Global] One Site Global

Record: [Navigation Icons] 1 of 3 No Filter Search

[illegible][illegible]

Import Wizard - Select File and Format for Import

This wizard will guide you through selecting, checking, cleaning up, and importing a data file. It will help you document what you did, and allow you to roll back an import later if necessary. To begin, choose a file type and format below, then type in or select the file path and name.

File Type and Format: DTS 2012 Excel

File Path and Name: DTS 2012 Excel

Enviro Data Crosstab

EQUIS Excel Import

EQUIS Text Import

EQUISR4

ERPIMS Lab Data (Lab Submission File)

ERPIMS Text Import

Field File Excel

Gas Data Excel

Geoscience Excel Import

Groundwater Data Import

Historical Data Import

IHS Oil Production Data Import

IHS Oil Well Data Import

Import By Field Sample ID

Meteorological Data Import

Delivery Group Project

Select

Manage Multiple Files

Or Use one of these choices to edit the import table, resume the most recent import, or undo any previous one.

Edit ImportFile Table

Resume Last Import

Undo A Previous Import

Next >

Finish

Close

Quality control - consistency checking during import

10/31

Import Wizard - Match Station Names

This screen will help you match station names in the import file with those in the database.

Site in Import File	Station in Import File	Change To
Refining Inc.	MW14	CRK 15.0 EFK 6.3 EFK 13.8 EFK 18.2 EFK 23.4 EFK 24.2 K720SLOUGH KAP 0.2 KBP 0.1 MIK 0.2 MW-14 MW-15 MW-16 PCK 1.6 WCK 2.3 WCK 2.9

Record: 1 of 1 | No Filter | Search

Import Results

All of your data was handled successfully.

ImportFile records: 18
Deleted records: 0

Imported records: 18
Imported to Samples table only: 0

Highest duplicate: 1
Highest superseded: 3

Activity Log

Name: drdave Activity Date: 5/31/2018

Site Modified: Refining Inc.

Please Describe What You Did:

Imported 18 out of 18 Water Data Analyses records for sample dates 6/15/1999 to 6/16/1999 from file UnsuccessfulImport2012.xls. Imported by DRDAVEDESKTOP on 5/31/2018 8:37:59 PM

Project Validation Data
Delivery Grp SDG-43417
Analytic Method
Analytical Batch
Validation Program NFG

Select Data
QC Tasks
Validated Analyses
Validation Checklist
Reports and Other Tasks

QC Task	Run	Completed	DetectCode	NonDetectCode	Reason Code
Field Duplicate RPDs	☒	☐	J	UJ	Field Duplicate RPD
Headspace not achieved	☒	☐	J	UJ	Air bubble present
Holding Times (Extract to Analysis Date)	☒	☐	J	UJ	past the hold time
Holding Times (Sample to Analysis Date)	☒	☐	J	UJ	past the hold time
Holding Times (Sample to Extract Date)	☒	☐	J	UJ	past the hold time
LCS / LCSD Exceeds Rejection Limits	☒	☐	J	UJ	LCS %R less than 10%
LCS / LCSD Recovery < LCL	☒	☐	J	UJ	LCS %R below the LCL
LCS / LCSD Recovery > UCL	☒	☐	J		LCS %R above the UCL
LCS/LCSD RPDs	☒	☐	J	UJ	LCSD RPD >CL
MDL Dilution Results in ND	☒	☐		UJ	Dilution results in MDL detection
MDL/LOD Exceeds Reg Limit	☒	☐		UJ	MDL >= Primary MCL
Method Blank Detections (MULTIPLIER=10)	☒	☐	B		Method Blank > Reporting Limit
MS / MSD < LCL	☒	☐	J	UJ	MS/MSD %R below the LCL
MS / MSD Recovery >UCL	☒	☐	J		MS/MSD %R above the UCL
MS/MSD RPDs	☒	☐	J	UJ	MS/MSD RPD >CL
Rinsate Blank > ReportingLimit (U-flag Result < RL)	☒	☐	J		Equipment Blank > Reporting Limit

Record: 12 of 19
No Filter
Search

View Task Details

Acceptance Criteria
☐ EDD
☐ Control Limits Table
☒ Strictest

Validation Notes

Detection Limit Exceeds Reg Limit
Detection Limit Type Detect
Reg Limit Type

☐ Replace Existing Validation Codes

Choose which tests to run

Project	Validation Data	Delivery Grp	SDG-43417	Analytic Method		Analytical Batch		Validation Program	NFG
Select Data	QC Tasks	Validated Analyses	Validation Checklist	Reports and Other Tasks					
AnalyticMethod	Analytical Batch	QCSampleCode	LabSampleID	LongName	Temp Validation Code	Reason	DetectedResul		
16	442648	MS	2429639	Selenium (Dissolved)	J	MS_LCL(%R=53)	Y		
16	442648	MSD	2429640	Selenium (Dissolved)	J	MS_LCL(%R=52)	Y		
16	442648	MSD	2429640	Molybdenum (Dissolved)	J	MS_LCL(%R=48)	Y		
16	442651	MSD	2429674	Fluoride	J	MS_RPD(RPD=27.7);(%R=113)	Y		
16	442482	MS	2428774	Arsenic	J	MS_UCL(%R=321)	Y		
16	442651	MS	2429673	Fluoride	J	MS_UCL(%R=147)	Y		
16	442653	MS	2429684	Fluoride	J	MS_UCL(%R=123)	Y		
16	442651	MS	2429673	Sulfate	J	MS_UCL(%R=117)	Y		
16	442653	MSD	2429687	Sulfate	J	MS_UCL(%R=117)	Y		
16	442651	MS	2429673	Chloride	J	MS_UCL(%R=116)	Y		
16	442653	MSD	2429687	Chloride	J	MS_UCL(%R=116)	Y		
16	442653	MSD	2429685	Fluoride	J	MS_UCL(%R=114)	Y		
16	442653	MS	2429686	Sulfate	J	MS_UCL(%R=113)	Y		
16	442653	MS	2429686	Chloride	J	MS_UCL(%R=113)	Y		
16	442651	MSD	2429676	Chloride	J	MS_UCL(%R=111)	Y		
16	442651	MSD	2429676	Sulfate	J	MS_UCL(%R=111)	Y		
16	442651	O	92407161004	Chloride	J	MS_UCL	Y		
16	442651	O	92407161004	Sulfate	J	MS_UCL	Y		
16	442625	MSD	2429445	Chromium, Hexavalent	J	MS_LCL(%R=89)	Y		
16	442625	MS	2429442	Chromium, Hexavalent	J	MS_LCL(%R=88)	Y		
16	442625	MSD	2429443	Chromium, Hexavalent	J	MS_LCL(%R=84)	Y		
16	442653	MS	2429684	Chloride	J	MS_LCL(%R=83)	Y		

Review the flagged data

Laboratory Report Data Review e-Checklist					
Laboratory Report ID:					
Laboratory Name:	Phoenix	Report Package Date:			
Project Name:		Review Date:			
SDG:	GBV16132				
Reviewer Name:		No. of Environ. Sples?			
Parameters:	Hydrocarbon, MA VPH, Metals, Other, PCBs, Pesticides, Semi-VOCs,	No. of QC Sples?			
Method IDs:	CTETPH 8015D, MA VPH 5/2004, SW6010C, SW7470A, SW7471B,	Rejected Results?			
Matrix:					
*Attach copy of lab report showing sample IDs and corresponding lab IDs (Att 1)		Yes	No	N/A	Comment
Laboratory Method Blanks and Field Blanks					
1 Were appropriate types of laboratory method blanks analyzed?		X			
2 Were the laboratory method blanks analyzed at the appropriate frequency?					
3 Was the method blank free of contamination (i.e., less than the MDL or RL)?			X		
4 Did the method blank contamination affect the final results? If so, note on page 2.			X		
5 Was a trip blank required and submitted with the samples?				X	
6 Was the trip blank free of contamination (i.e., less than the MDL or RL)?				X	
7 Did the trip blank contamination affect the final results? If so, note on page 2.				X	
8 Was an equipment blank required and submitted with the samples?				X	
9 Was the equipment blank free of contamination (i.e., less than the MDL or RL)?				X	
10 Did the equipment blank contamination affect the final results? If so, note on page 2.				X	
11 Were Continuous Calibration Blanks (CCBs) analyzed?			X		
12 Were CCBs within the control window?					
13 Did the CCB contamination affect the final results? If so, note on page 2.					
Surrogates					
1 Were surrogates added prior to extraction for all appropriate methods?		X			
2 Were surrogate percent recoveries within laboratory control limits?		X			
3 Did the surrogate percent recoveries affect the final results? If so, note on page 2.			X		
Laboratory Control Samples					
1 Were Laboratory Control Sample (LCS) analyzed at a frequency of one per batch?		X			
2 Were LCSs spiked with appropriate list of target compounds?			X		
3 Were LCS percent recoveries within laboratory control limits?			X		
4 Did the LCS percent recoveries affect the final results? If so, note on page 2.		X			
5 If performed, was LCS Duplicate data provided?		X			
6 Were the LCS/LCSD RPD values within laboratory control limits?				X	
Matrix Spikes					
1 Were MS/MSDs analyzed at a frequency of one per batch?		X			
Sample used/methods: B-113 6-6.7 MSD, B-114 0.5-2 MS, B-121 0-2 MS, B-121 0-2 MSD, B-125 5-6.5 MS,					
2 Were MS/MSDs performed on a project sample selected by the laboratory?		X			
Sample used/methods: B-113 6-6.7 MS, B-113 6-6.7 MSD, B-114 0.5-2 MS, B-121 0-2 MS, B-121 0-2					
3 Were MS/MSDs spiked with appropriate list of target compounds?			X		
4 Were MS/MSD percent recoveries within laboratory control limits?			X		
5 Did the MS/MSD percent recoveries affect the final results? If yes, narrate			X		
Output a quality control e-Checklist					
1 Was a field duplicate submitted with this SDG?			X		

Select Data

Analytic Flags Help

Display Options

Back

Refresh Selected Data

Reset

Clear

Sites

Name

Rad Industries

State

Type

Owner

Stations

General

Location Info.

Regulatory Info.

Station Group

Name

Type

Type2

Geologic Unit

Station Status

QC Type

PRP

Enviro. Status

Land Use

Water Use

Samples

Sample Group

Sample Event

Date

Top Depth

Base Depth

Type

Purpose

Matrix

Filtered

Geologic Unit

Lithology

Duplicate

Field ID

QC

Collect. Agency

Task Number

Taxonomy

Gender

Life Stage

Tissue Type

Weight Volume

Analyses

General

Additional Data

* Display All Results *

Parameter Group

Parameter

Alt Param ID

Param Type

Lab

Value

Flags

Problems

Superseded

Value Code

Filtered

Method

Detected?

Reportable?

Validation Cd

QC

Batch

Sum Category

Analysis Group

Delivery Grp

Extracted?

Report. Agency

Update

Number of Analyses: 5

Auto Update

Dynamic Filtering

Output

Save/Load

Modify

Other Options

List

Report

Export

Graph

Map

Enviro Spase

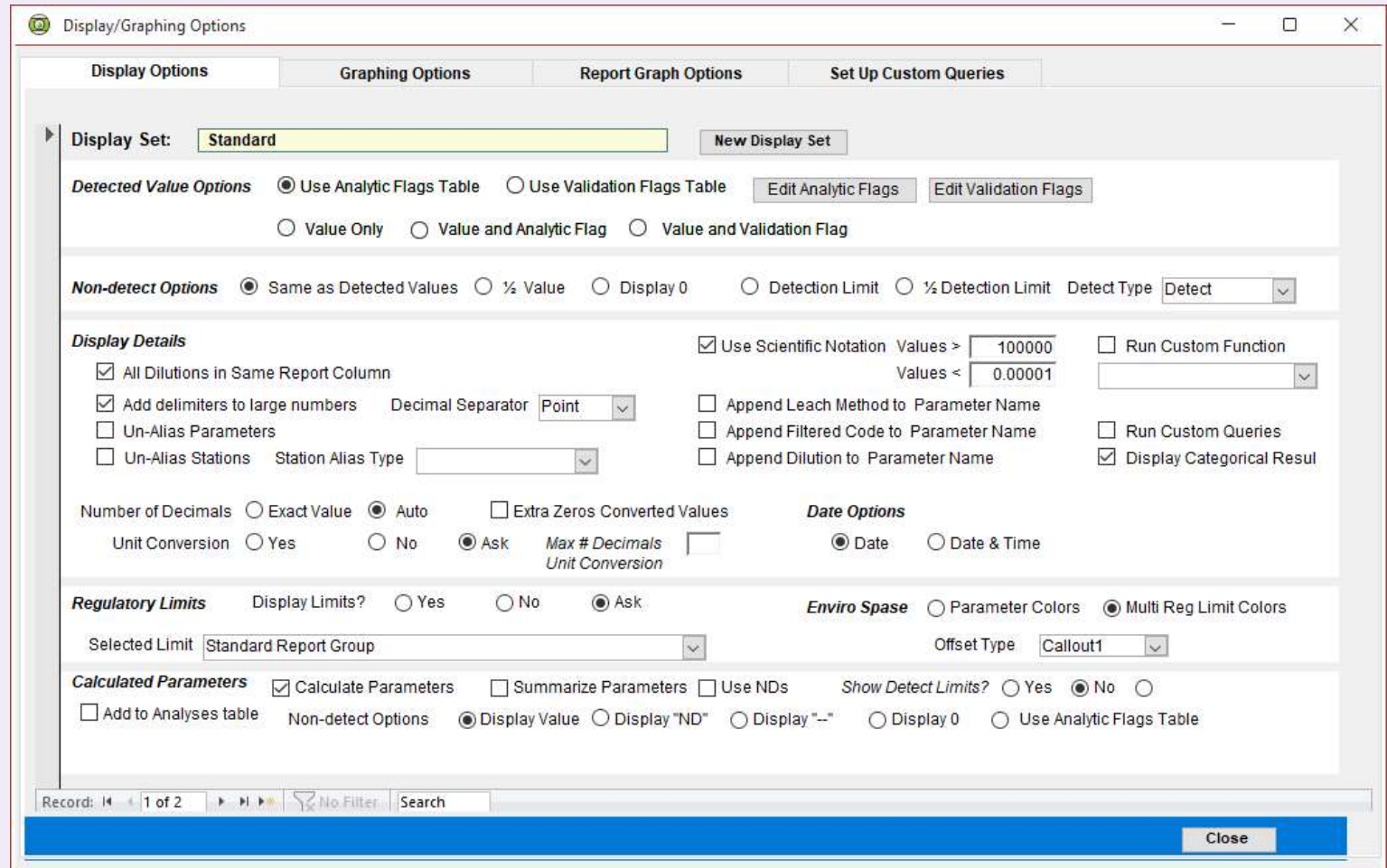
Close

Display options determine how your results are displayed

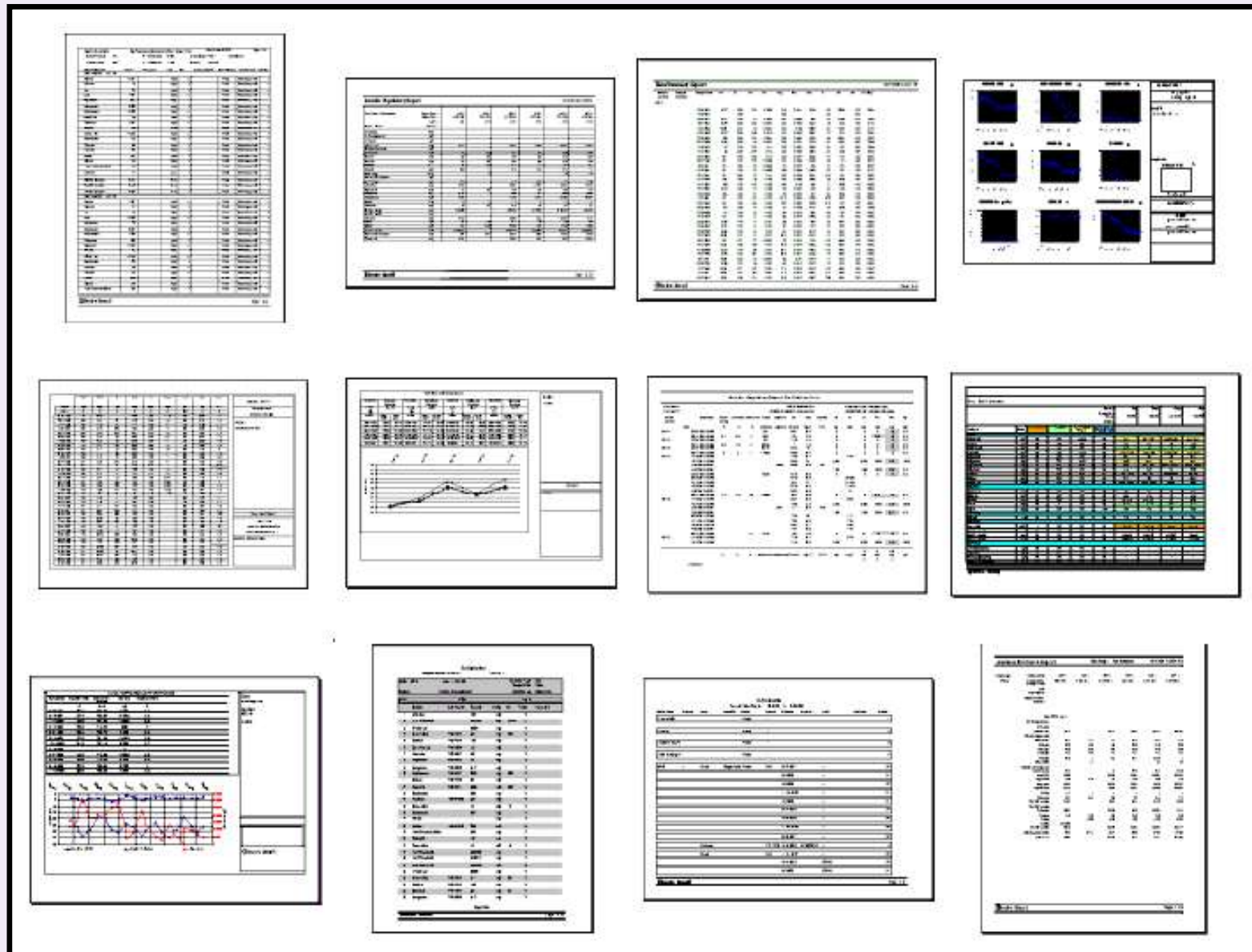
15/31

Example options:

- ➊ Regulatory limits
- ➋ Values and flags
- ➌ Unit conversion
- ➍ Date display
- ➎ Calculated parameters
- ➏ Non-detects
- ➐ Significant figures
- ➑ Graph display options
- ➒ Custom queries



The screenshot shows the 'Display/Graphing Options' dialog box with the 'Display Options' tab selected. The 'Display Set' is 'Standard'. Under 'Detected Value Options', 'Use Analytic Flags Table' is selected. Under 'Non-detect Options', 'Same as Detected Values' is selected. In 'Display Details', 'All Dilutions in Same Report Column' and 'Add delimiters to large numbers' are checked. 'Regulatory Limits' shows 'Display Limits?' set to 'Ask'. 'Calculated Parameters' shows 'Calculate Parameters' checked. The 'Close' button is at the bottom right.



Export Crosstab

Sites: 1 # Samples: 5 [Go to a Crosstab Format](#)

Stations: 2 # Analyses: 5 **Crosstab format name**: Stations Across - Parameters Down

Crosstab Data **Grouping / Formatting** **Instructions**

Enviro Data Column	Display Column Name	Order
StationName	Station Name	1
SampleDate_D	Sample Date	2
*		0

Record: 1 of 2 No Filter Search

Value Fields

Enviro Data Column	Display Column Name	Order
ValueAndFlag	Result	0
*		0

Record: 1 of 1 No Filter Search

Row Fields

Enviro Data Column	Display Column Name	Order	Form
LongName	Parameter	1	
ReportingUnits	Units	2	
*		0	

Record: 1 of 2 No Filter Search

Worksheet Fields ☐ Enable grouping data by worksheet

Enviro Data Column	Order
*	0

Record: 1 of 1 No Filter Search

Report Title: Crosstab Report

☐ Show SQL

Progress:

Start: End:

Record: 1 of 6 No Filter Search



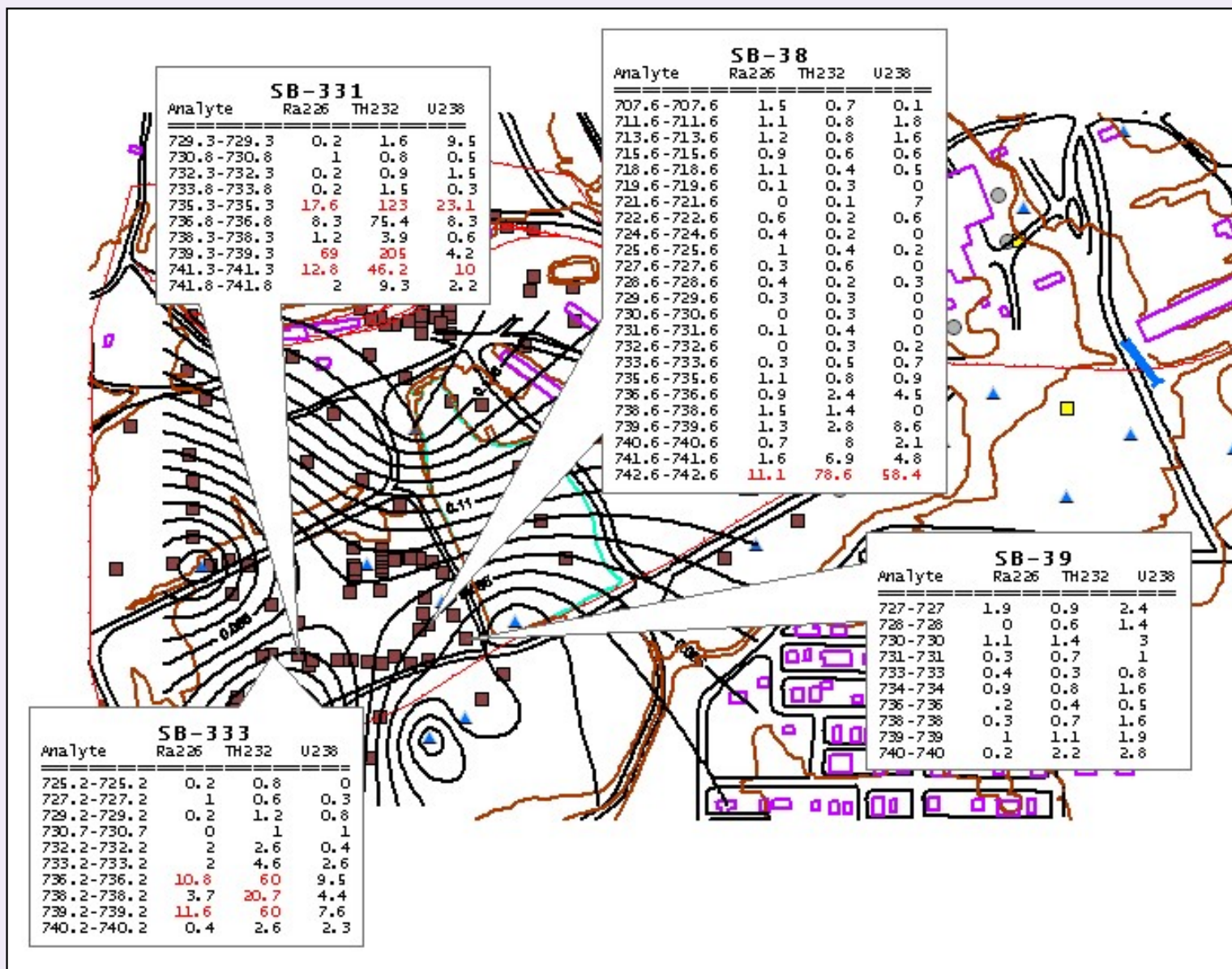
Crosstab Report

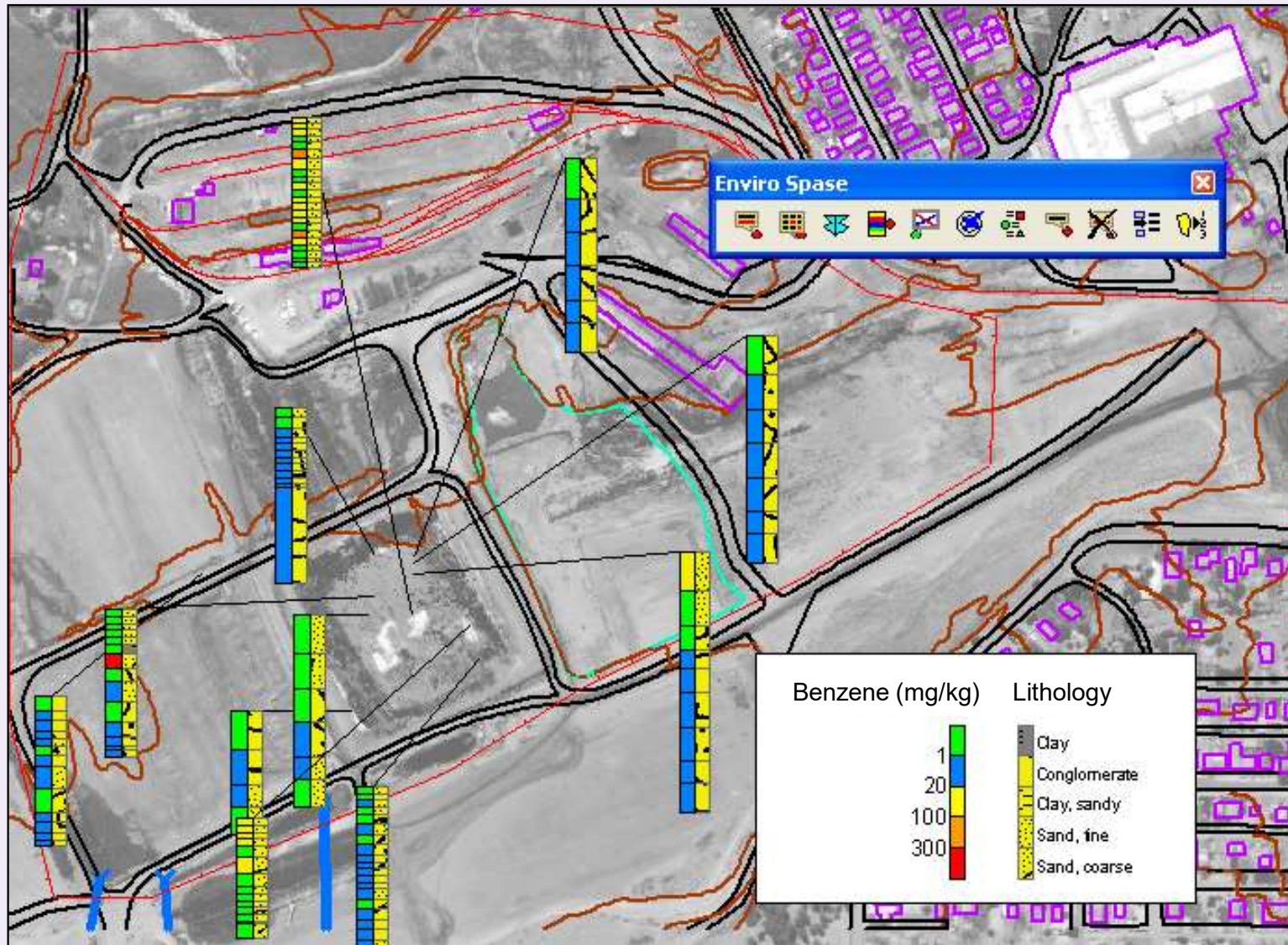
Station Name	Reporting Units	Federal MCL	Primary	Safe Drinking Water Standards	State Drinking Water Levels	MW-1	MW-1	MW-1	MW-1	Summary Statistics				
Sample Date						2/8/1984	5/10/1984	9/14/1984	11/13/1984					
QC Code						0	0	0	0	Results	Non-Detects	Minimum	Maximum	Mean**
Field Param														
Field pH	s.u.				7.1-8.4	7.70	7.10	7.10	7.20	4	0	7.1	7.7	7.2
Inorganics														
Bicarbonate	mg/l					520	550	470	560	4	0	470	560	525
Chloride	mg/l					250	260	230	190	4	0	190	260	232.5
Fluoride	mg/l					<1.00	<1.00	<1.00	<1.00	4	4	<1	<1	<1
Nitrate	mg/l		2			<1.00	2.00	2.00	<1.00	4	2	<1	2	1.2
Sulfate	mg/l	725	800	350	1000	1040	900	880	800	4	0	800	1040	905
Metals														
Arsenic (As)	mg/l	0.025	0.1	0.002	0.03	<0.11	<0.11	<0.11	<0.06	4	4	<0.06	<0.11	<0.11
Calcium	mg/l					180	170	203	180	4	0	170	203	183.2
Iron (Ferrous)	mg/l		0.1			0.2	3.2	3.7	4.8	4	0	0.2	4.8	2.9
Lead (Pb)	mg/l	0.001	0.004	0.005	0.0025	<0.068	<0.068	0.14	<0.08	4	3	<0.068	0.14	0.06
Magnesium	mg/l					94	100	107	100	4	0	94	107	100.2
Manganese	mg/l	0.0105	0.015	0.02	0.00225	0.077	0.066	0.076	0.086	4	0	0.066	0.086	0.07
Molybdenum	mg/l					0.02	<0.018	0.034	0.008	4	1	<0.018	0.034	0.01
Potassium	mg/l					5.20	6.20	5.61	20	4	0	5.2	20	9.2
Selenium	mg/l					<0.10	<0.10	<0.10	<0.08	4	4	<0.08	<0.1	<0.1
Sodium	mg/l					390	430	390	460	4	0	390	460	417.5
UTotal - sol	mg/l					0.003	0.01	0.003	0.003	4	0	0.003	0.01	0.004
Other														
Total Dissolved Solids	mg/l					2220	2230	2220	2200	4	0	2200	2230	2217.5
Radiologic														
Gross Alpha	pCi/l	1				<10.00	<10.00	<10.00	<10.00	4	4	<10	<10	<10
Ra-226 - soluble	mg/l			0.4375		0.32		0.035	0.0525	3	0	0.035	0.32375	0.1
Ra-228 - soluble	mg/l										0	0.27125	0.595	0.3
Th-230 - soluble	mg/l										0	0.025375	0.35175	0.1

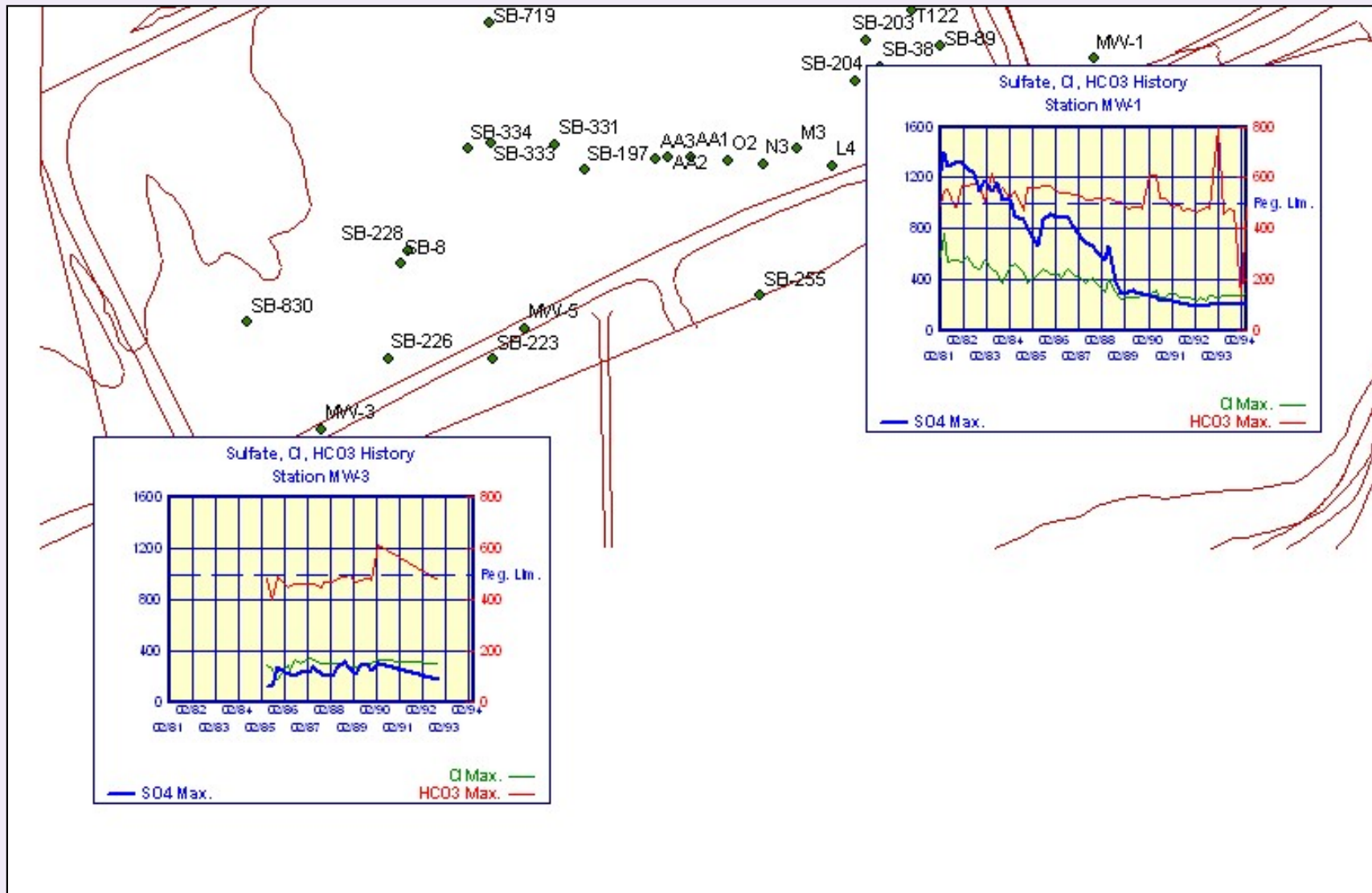
Crosstab Wizard output

** 1/2 RL used to calculate the mean wherer non-detect data occurred.

- You need a base map or image
- Sample locations must have coordinates
- And both have to match
- GIS software like ArcGIS makes the maps
- Specialized software can make environmental-specific displays
- Integration between the EDMS and the GIS can save time and improve quality







- ➊ Sometimes it's helpful to distribute data to a large number of users
- ➋ This could be the public, or individuals within an organization
- ➌ Start by building a database for the project
- ➍ Set up a website for data selection and display
- ➎ Arrange for appropriate security
- ➏ Provide the data from the database to the website

Select Data

Site
Select
MEDLEY LANDFILL
NORTH DADE LF
SOUTH DADE LF

Sample Date
Date Range:
Ex: 1/1/1980:12/31/1985,
or single date

Parameter
WATER LEVEL RELATIVE TO ME
Water Temp. (FIELD)
XYLENES
ZINC

Stations
MW15I
MW-15IR
MW15S
MW-15SSR

Sample Top
Select
0

Summary Category
Select
Dioxins
Field Param
Herbicides

Station Group
Select
Background
Compliance
Detection

Sample Base
Select
0

Value

can use >,<,<=,>=
Display the data as:
List Map Chart

Save this search? Save Or use a saved search: Del Search Delete

MW-15SSR and MW-1DR2 with Zinc

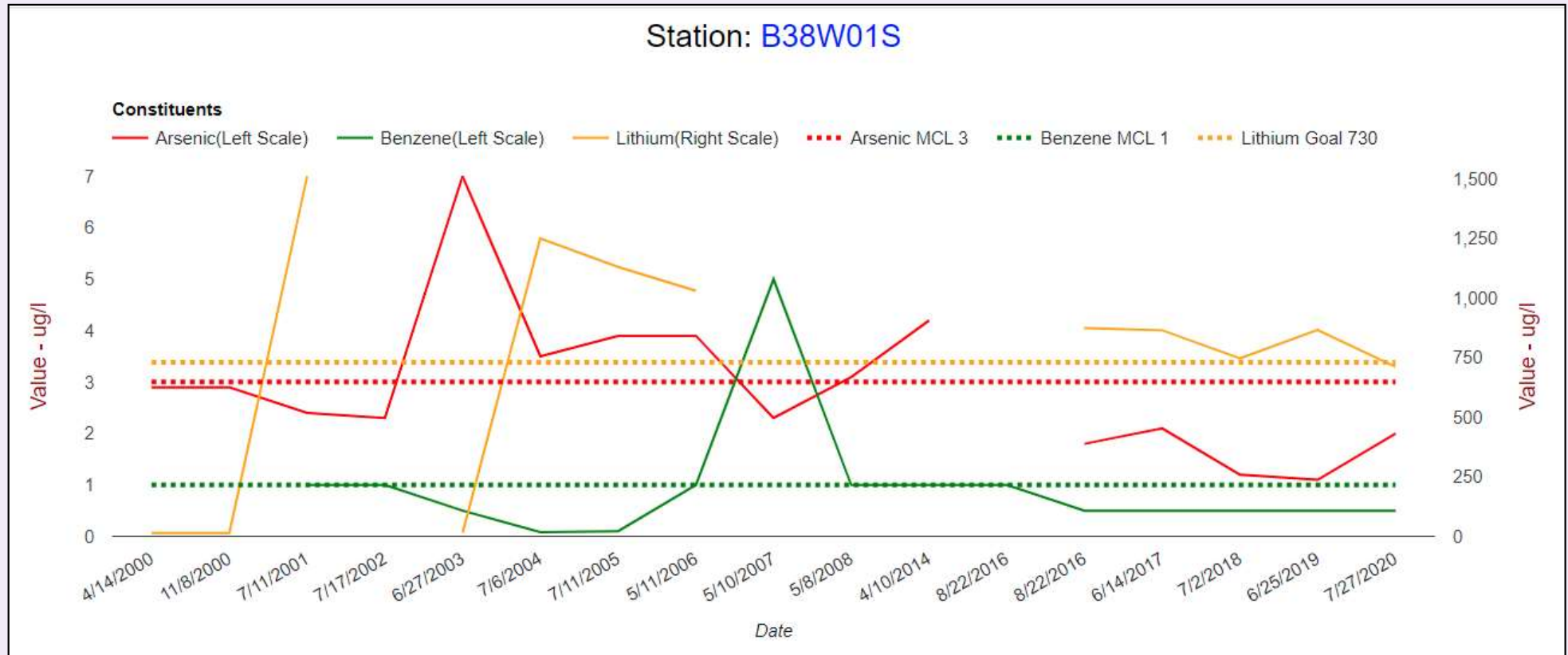
Instructions:
Select the options for the data that you would like to retrieve.
One example that will show some flags on the map is:
Select in Sites Medley Landfill, in stations scroll down to and select MW-15SSR and a few stations after (hold the shift key to multi-select).
Click List or Map.

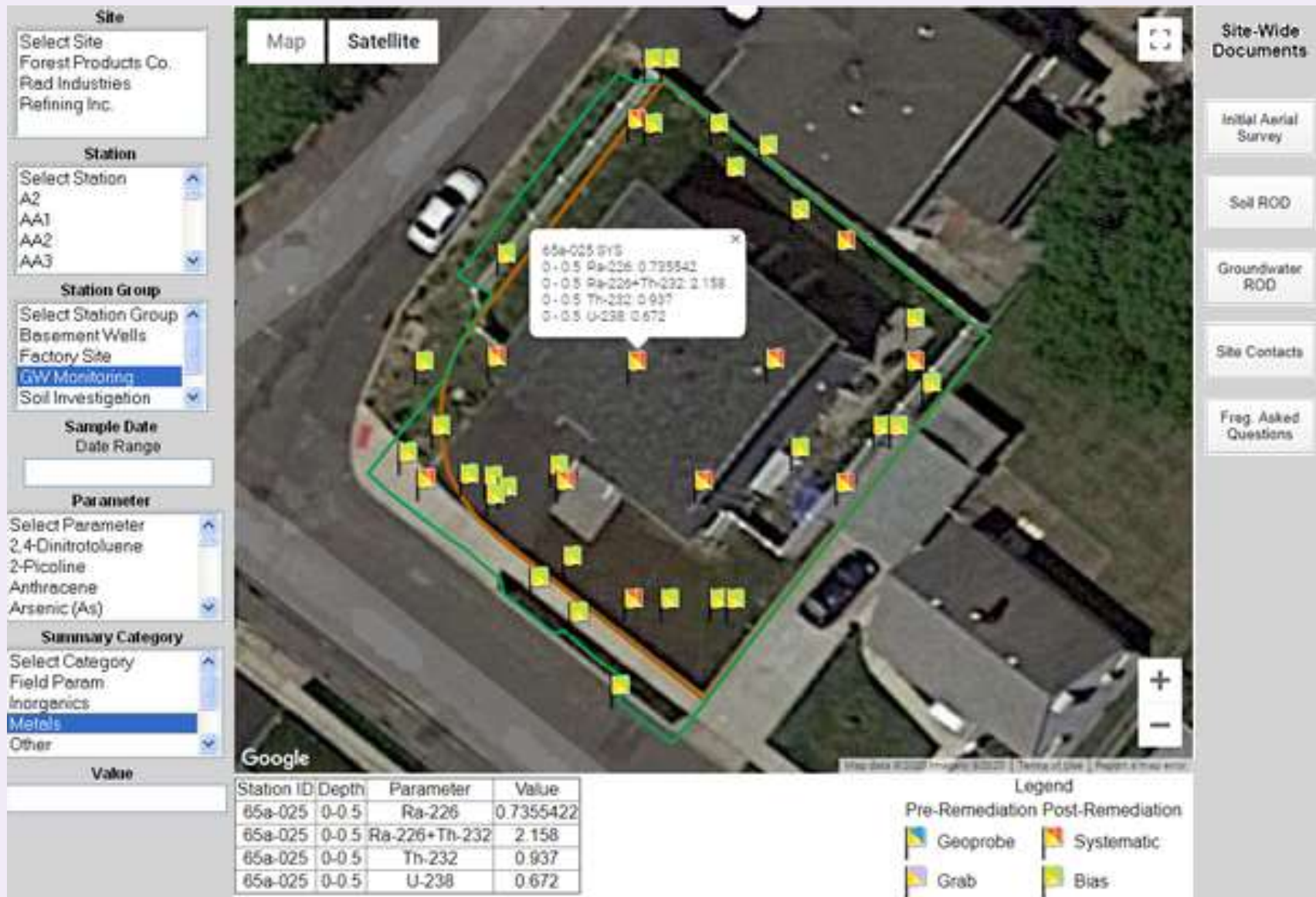
Tree View
This option displays the data in a hierarchical view. You can expand the nodes by clicking on the line. Unlike the other output options, the Tree View displays all the data in the database, not just the data you have selected with the filter criteria. This can be handy to quickly find the results of one sample or analysis.

Tree

Selection Results

Site Name	Station Name	Sample Date	Parameter	Value	Units	Det. Lim	Flag	Dup.	Sup.	Dilution
MEDLEY LANDFILL	MW-15SSR	4/9/2019	PH, FIELD	11.26	PSI		D	0	0	1
MEDLEY LANDFILL	MW-15SSR	10/8/2019	PH, FIELD	11.24	PSI		D	0	0	1
MEDLEY LANDFILL	MW-15SSR	10/8/2019	SPEC. CONDUCTANCE (FIELD)	543	umhos/cm		D	0	0	1
MEDLEY LANDFILL	MW-15SSR	4/9/2019	SPEC. CONDUCTANCE (FIELD)	950	umhos/cm		D	0	0	1
MEDLEY LANDFILL	MW-15SSR	4/9/2019	TURBIDITY, FIELD	5.21	NTUs		D	0	0	1
MEDLEY LANDFILL	MW-15SSR	10/8/2019	TURBIDITY, FIELD	7.22	NTUs		D	0	0	1
MEDLEY LANDFILL	MW-15SSR	10/8/2019	Water Temp. (FIELD)	30.7	Deg C		D	0	0	1
MEDLEY LANDFILL	MW-15SSR	4/9/2019	Water Temp. (FIELD)	30	Deg C		D	0	0	1
MEDLEY LANDFILL	MW1DR2	4/8/2015	PH, FIELD	7.13	PSI		D	0	0	1
MEDLEY LANDFILL	MW1DR2	10/8/2015	PH, FIELD	7.29	PSI		D	0	0	1
MEDLEY LANDFILL	MW1DR2	4/7/2016	PH, FIELD	7.01	PSI		D	0	0	1
MEDLEY LANDFILL	MW1DR2	10/20/2016	PH, FIELD	7.17	PSI		D	0	0	1
MEDLEY LANDFILL	MW1DR2	4/6/2017	PH, FIELD	7.12	PSI		D	0	0	1
MEDLEY LANDFILL	MW1DR2	10/9/2017	PH, FIELD	7.58	PSI		D	0	0	1
MEDLEY LANDFILL	MW22WT	10/21/2016	WATER LEVEL RELATIVE TO MEAN SEA LEVEL (FEET)	3.9	ft		D	0	0	1
MEDLEY LANDFILL	MW22WT	4/5/2017	Water Temp. (FIELD)	27.8	Deg C		D	0	0	1
MEDLEY LANDFILL	MW22WT	10/21/2016	Water Temp. (FIELD)	26.4	Deg C		D	0	0	1
MEDLEY LANDFILL	MW22WT	4/7/2016	Water Temp. (FIELD)	28.8	Deg C		D	0	0	1
MEDLEY LANDFILL	MW22WT	10/5/2018	Water Temp. (FIELD)	27.4	Deg C		D	0	0	1
MEDLEY LANDFILL	MW22WT	4/5/2018	Water Temp. (FIELD)	26.9	Deg C		D	0	0	1
MEDLEY LANDFILL	MW22WT	10/10/2017	Water Temp. (FIELD)	27.7	Deg C		D	0	0	1
MEDLEY LANDFILL	MW22WT	10/7/2019	Water Temp. (FIELD)	28	Deg C		D	0	0	1
MEDLEY LANDFILL	MW22WT	4/5/2019	Water Temp. (FIELD)	27	Deg C		D	0	0	1
MEDLEY LANDFILL	MW22WT	10/12/2015	Water Temp. (FIELD)	29.3	Deg C		D	0	0	1





Decrease overhead - One industrial company was able to save \$12,000 per year on just one project by moving the data management tasks to a much less expensive clerical person.

Lower operating cost - Another used data management to get their regulator to approve less-frequent sampling intervals for about two of their wells per year, resulting in a savings of \$9,000 each year, cumulative from year to year.

Increase efficiency – For one organization, the time to process an electronic deliverable decreased from an average of 30 minutes to 5 minutes, resulting in an annual savings of \$5,000 per year on each project.

A Native American tribe needed to make nine hundred graphs/year for their EPA PM. With Excel, it took 3 months. With a database with integrated graphing, it took 10 minutes.

Increase revenue - A consulting company client was able to use their Enviro Data software and expertise to land a \$300,000 data management task from one of their clients.

Return on Investment

Cost Items	Example	Your company
Software - 1 eData Single Use	\$4,800	
Maintenance, 3 years	2,880	
GCS training, one day	1,440	
Staff learning curve, 3 days	2,400	
Total Cost	\$11,520	
Cost Savings		
Data loading - 180 hours @ \$125/hour	\$22,500	
Analysis - 180 hours	\$22,500	
Reporting - 180 hours	\$22,500	
Total Savings	\$67,500	
Payback	\$67500/11520	5.86:1
Plus intangibles		
Work quality		
Client satisfaction		
Staff morale		

Assumptions

Basic implementation (shown): One user, Access back end. Software use 10 hours/week at @125 per hour gives a return of 5.86:1.

Comprehensive implementation: Three administrative users plus five read-only project staff, similar assumptions, gives a return of 6.9:1.

- ❶ Environmental investigation and remediation are inherently complex
- ❷ Implementing a centralized data management system makes sense for most environmental projects
- ❸ Environmental data management software continues to improve, providing greater value over time
- ❹ Integrating validation with data management can greatly reduce cost and improve quality
- ❺ Is it time to retire your spreadsheet?



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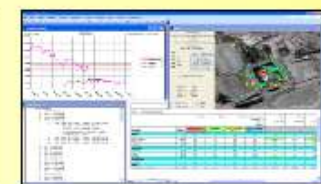
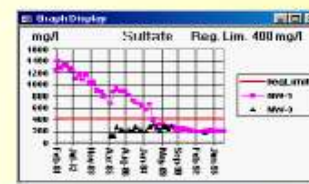
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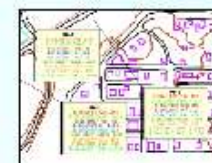
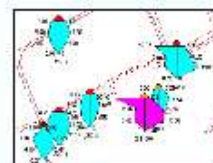
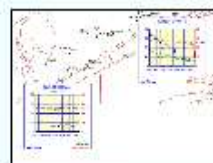
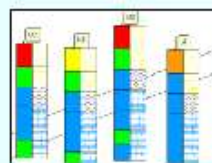
Enviro Data

**Relational Management of
Site Environmental Data**



Enviro Spāse

**Display and Analysis of
Site Environmental Data**



Enviro Cloud

**Enviro Software
As a Service**



Enviro Portal

**Show Your Data
in a Browser**

