

KML_WritePoints—An Excel application for creating a KML file from a coverage of points

Wells, precipitation, and other sites can be mapped with ancillary information in a KML file with the KML_WritePoints.v3.xlsm workbook (Figure 1). Sites can be grouped in folders to control visibility and ancillary information can be accessed through the descriptive balloon for each site. Ancillary information can include hyperlinks, images, two-column data tables, and descriptive text (Figure 1). Order and type of ancillary information are user defined.

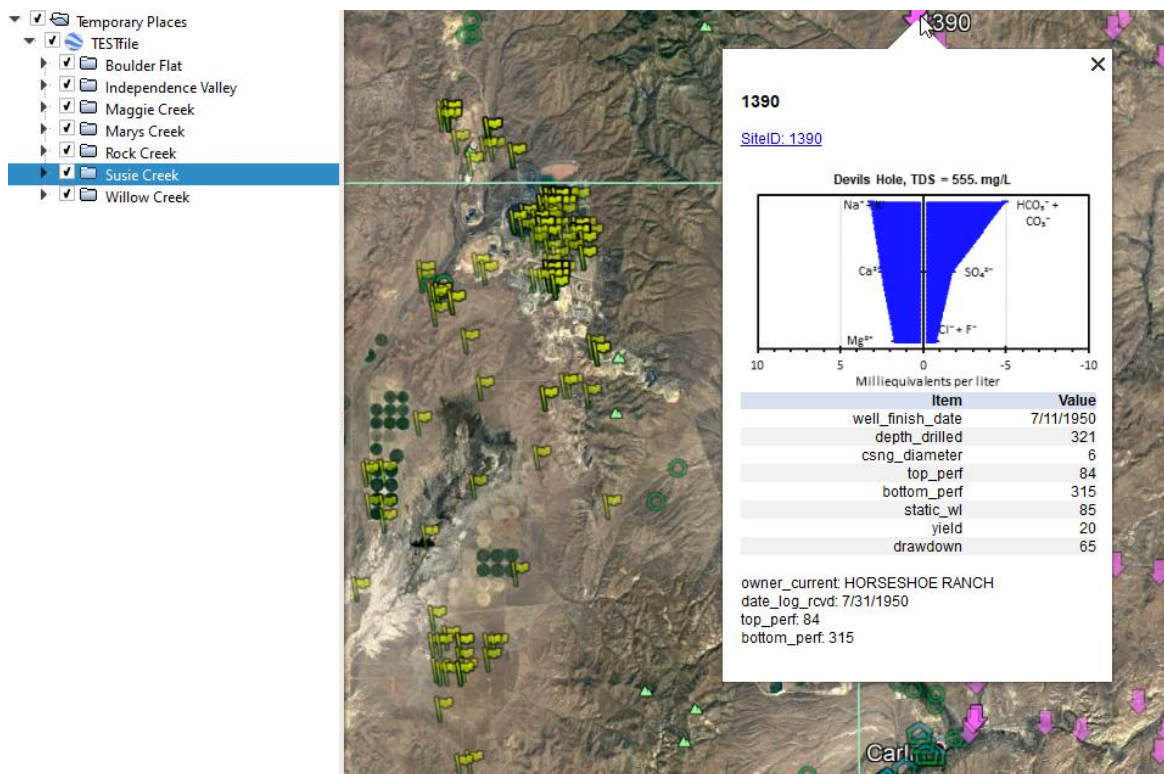


Figure 1.— Example description balloon of a selected site in a KML file that was created with the KML_WritePoints.v3.xlsm workbook.

KML_WritePoints.v3.xlsm, KML_WritePointsPrecip.v3.xlsm, and explanatory PDF can be downloaded with the following link.

Revisions

August 5, 2021—Revisions in version 2 include the following. Examples and explanation files created.

August 23, 2022—Revisions in version 3 include the following. Error in functions sRGB and sAlphaBGR corrected so that hexadecimal color codes are written correctly in KML files.

KML_WritePoints.v3.xlsm Workbook

The workbook consists of three pages, DATA, SYMB, and CONTROL. Site name, location, and ancillary information are specified on the DATA page. KML file name, symbol assignments, and contents of description balloons are specified on the SYMB page. The CONTROL page contains lookup tables and code for calculating results. This page can be hidden because users should not need to edit the page.

DATA page

Site name, location, and ancillary information are specified on the DATA page, where locations can be specified as decimal longitude-latitude or UTM easting-northing (Figure 2).

	A	B	C	D	E	F	G	H
1								
2								
4	SiteNAME	Decimal Longitude.NAD83	Decimal Latitude.NAD83	Altitude.ft	well_log	date_log_rcvd	ha	owner_current
5	514	-116.4933333	40.79416667		514	06/08/1948	061	T S RANCH
6	515	-116.4466667	40.82111111		515	06/08/1948	061	TS RANCH
7	516	-116.4138889	40.84666667		516	06/08/1948	061	T S RANCH
8	517	-116.4091667	40.89666667		517	06/08/1948	061	T S RANCH
9	541	-116.5683333	40.80861111		541	06/25/1948	061	HILLS T S RANCH
10	542	-116.5352778	40.7725		542	06/25/1948	061	HILLS T S RANCH
11	558	-116.4369444	40.73333333		558	07/13/1948	061	HILLS T S RANCH
12	559	-116.4416667	40.77972222		559	07/13/1948	061	HILLS T S RANCH
13	48	-116.1161111	41.42		48	08/02/1947	036	ELLISON RANCHING CO
14	49	-116.1158333	41.40527778		49	08/02/1947	036	ELLISON RANCHING CO
15	590	-116.1063889	40.83722222		590	08/07/1948	050	HORSESHOE RANCH
16	592	-116.155838	41.37805557		592	08/07/1948	036	BEHN, WM

Figure 2.—DATA page in the KML_WritePoints.v3.xlsm workbook where sites to be posted and descriptive information are specified.

DATA page

Site name and location (columns A:D) must be specified on the DATA page, Ancillary information (column E+) is optional.

	A	B	C	D	E	F
1						
2			MANDATORY		OPTIONAL	
4	SiteNAME	Decimal Longitude.NAD83	Decimal Latitude.NAD83	Altitude.ft	well_log_date_log_rcvd	
5	514	-116.4933333	40.79416667		514	06/08/1948
6	515	-116.4466667	40.82111111		515	06/08/1948
7	516	-116.4120000	40.84666667		516	06/08/1948

Site locations (columns B:C) can be specified as either,

Decimal longitude-latitude or

UTM easting-northing, m.

	A	B	C
1			
2			
4	SiteNAME	Decimal Longitude.NAD83	Decimal Latitude.NAD83
5	514	Decimal Longitude.NAD83	40.79416667
6	515	UTM_Easting.m	40.82111111

If UTM easting-northing are specified, hemisphere and UTM zone also must be specified.

	A	B	C
1		Hemisphere: North	
2		UTM zone = 11	
4	SiteNAME	UTM_Easting.m	UTM_Northing.m
5	514	Decimal Longitude.NAD83	40.79416667
6	515	UTM_Easting.m	40.82111111

Altitude (column D) must exist but data entry is optional.

Units of feet or meters should be specified in column D header if altitudes are entered.

	C	D	E
1	North		
2	11		
4	UTM_Northing.m	Altitude.ft	well_log_date
5	4	Altitude.ft	514
6	40.82111111	Altitude.m	515

Headers in column E and left are user defined and supply fields for labels and description balloons.

	E	F	G	H
4	well_log_date_log_rcvd	ha	owner_current	
5	514	06/08/1948	061	T S RANCH
6	515	06/08/1948	061	TS RANCH
7	516	06/08/1948	061	T S RANCH
8	517	06/08/1948	061	T S RANCH

Rows can be added to the data page if inserted rows include row 1 in the selection.

Selected Rows:

	A	B	C	D
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				

Inserted Rows:

	A	B	C	D
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14	SiteNAME	Decimal Longitude.NAD83	Decimal Latitude.NAD83	Altitude.ft we
15	514	-116.4933333	40.79416667	
16	515	-116.4466667	40.82111111	
17	516	-116.4138889	40.84666667	

SYMB page

KML file name, symbol assignments, and contents of description balloons are specified on the SYMB page (Figure 3).

	A	B	C	D	E	F	G	H	I	J	K
1				KML file name: TESTfile							
2		Assign Symbols		DescriptiveTEXT delimiter: :			HTTPaddress_Prefix: SiteID:				
3				Symbol Magnify= 1.4			Figure_max-width: 300				
4											
5		Write KML		LABEL_KOL	LABEL_Size		TableFORMAT:	Item	Value		
6				Normal:	60%	0%		1st Item Name	1		
7		<input type="checkbox"/> Save symbol settings		Highlighted:	100%	100%		2nd Item Name	2		
8											
9	SYMB	HA_NAME	Symbol	SYMB_KOL	SYMB_Size	PointDescriptor	Field1	Field2	Field3	Field4	
10		Boulder Flat	flag.png	60%	0.8	Folders	HA_NAME	DepthClass			
11		Independence Valley	forbidden.png	60%	0.8	Label	SiteNAME				
12		Maggie Creek	donut.png	60%	0.8	HTTPaddress	HTTP address	well_log			
13		Marys Creek	homegardenbusiness.png	60%	0.8	Figure	FigureADDRESS				
14		Rock Creek	donut.png	60%	0.8	TableDATA	well_finish_date	drawdown			
15		Susie Creek	arrow.png	60%	0.8	DescriptiveTEXT	owner_current	date_log_rcvd	top_perf	bottom_perf	
16		Willow Creek	donut.png	60%	0.9						
17											
18											

Figure 3.—Controls for assigning symbols to a field (column on DATA page) and fields to be displayed in a symbol description balloon.

File Naming and Symbol Assignment

KML file name without extension is specified in cell D1 of SYMB page.

	C	D
1		KML file name: TESTfile

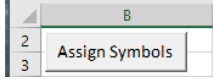
Symbols are assigned by unique entries in a selected field on the DATA page from row 10 down.

For example, HA_NAME (B9) has seven unique entries (B10:B16). Corresponding symbols, colors, and sizes are assigned in range C10:E16. Symbol label color and size are assigned in range D6:E7.

	A	B	C	D	E
2		Assign Symbols		DescriptiveTEXT delimiter: :	
3				Symbol Magnify= 1.4	
4					
5		Write KML		LABEL_KOL	LABEL_Size
6				Normal:	60%
7		<input type="checkbox"/> Save symbol settings		Highlighted:	100%
8					
9	SYMB	HA_NAME	Symbol	SYMB_KOL	SYMB_Size
10		Boulder Flat	flag.png	60%	0.8
11		Independence Valley	forbidden.png	60%	0.8
12		Maggie Creek	donut.png	60%	0.8
13		Marys Creek	homegardenbusiness.png	60%	0.8
14		Rock Creek	donut.png	60%	0.8
15		Susie Creek	arrow.png	60%	0.8
16		Willow Creek	donut.png	60%	0.9

Field for assigning symbols to sites is selected with pull-down menu in cell B9.

A	B	C	D
9	SYMB DepthClass	Symbol	SYMB_KOL
10	static_wl	g.png	60%
11	yield	bidden.png	60%
12	drawdown	nut.png	60%
13	hours_pumped	megardenbusiness.png	60%
14	DepthClass	nut.png	60%
15	HTTP address		
16	HA_NAME		
17	FigureADDRESS		

Clicking  refreshes list of symbol assignments.

Corresponding symbol, color, and size entries are paired by copying stored attributes from the CONTROL page or deleting excess attributes.

A	B	C	D	E
9	SYMB	DepthClass	Symbol	SYMB_KOL
10	1_to_500	flag.png		60%
11	1000_to_3K	forbidden.png		60%
12	3K_to_7K	donut.png		60%
13	500_to_1000	homegardenbusiness.png		60%
14	lt_1	donut.png		60%

Symbol file name is selected with pull-down menu in column C, cell C9 in this example.

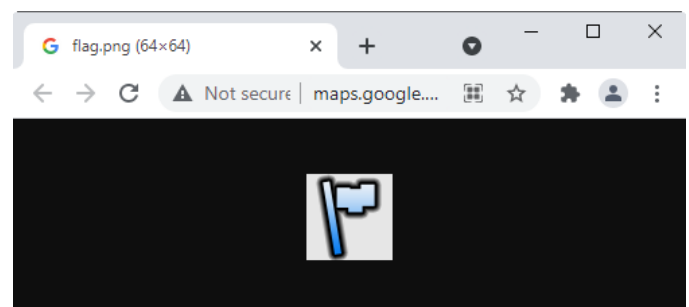
B	C	D
9	HA_NAME	Symbol
10	Boulder Flat	flag.png
11	Independence Valley	flag.png
12	Maggie Creek	forbidden.png
13	Marys Creek	homegardenbusiness.png
14	Rock Creek	info_circle.png
15	Susie Creek	info-i.png
16		mountains.png
17		open-diamond.png
18		parking_lot.png

Selected symbol in column C can be viewed in a browser by clicking the hyperlink in column A.

Cell A9 shows the flag icon in this example.

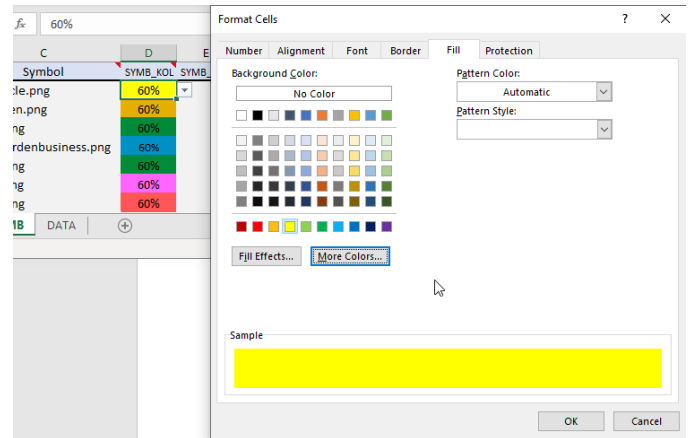
A	B	C	D
9	SYMB	HA_NAME	Symbol
10	Boulder Flat	flag.png	
11	Independence Valley	forbidden.png	

Shows,



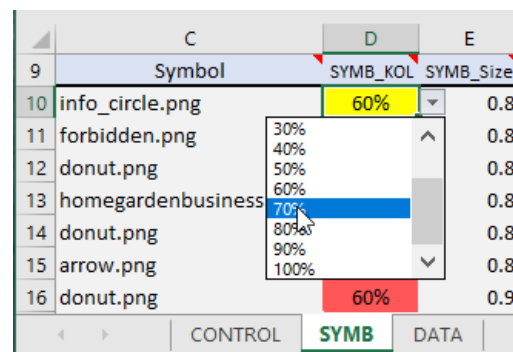
Symbol color is specified by fill color of cell in column D.

For example, cell D10 is formatted and a yellow fill is assigned.



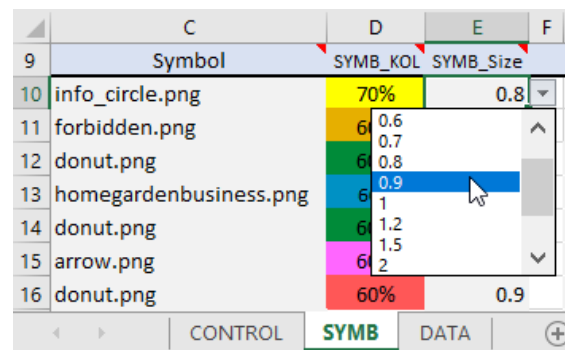
Symbol opacity is specified with pull-down menus in column D, where opacity ranges from 0% (invisible) to 100% (nothing visible beneath symbol).

For example, D10 currently is 60% and will change to 70% after selection.

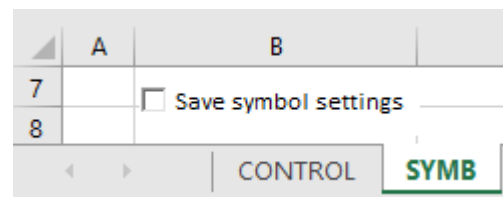


Symbol size is specified with pull-down menus in column E, where sizes range from 0.0 (invisible) to 5.0 (really big).

Size is in non-specific GE units. Gage selection by knowing that reasonably sized labels range from 0.6 to 0.9.



Current symbol settings in columns C:E are saved to CONTROL page if checked.



Folders and Symbol Labels

Folders are selected from a subset of the header row on the DATA page.

The subset is limited to fields (columns) where every row is filled.

For a problem with 50 sites, a field with 49 entries will not be available, while a field with 50 entries will be available.

	G	H	I	J
9	PointDescriptor	Field1	Field2	Field3
10	Folders	HA_NAME	DepthClass	
11	Label	SiteNAME		

CONTROL SYMB DATA +

Nested folders result from field selections in row 10 of the SYMB page.

TESTfile	
Boulder Flat	HA_NAME
1_to_500	DepthClass
1000_to_3K	DepthClass
500_to_1000	DepthClass
lt_1	DepthClass
Independence Valley	HA_NAME
Maggie Creek	HA_NAME
Marys Creek	HA_NAME
Rock Creek	HA_NAME
Susie Creek	HA_NAME
Willow Creek	HA_NAME

Symbols and labels appear in two states, normal and highlighted.

Normal is unselected.

Highlighted is as mouse hovers over symbol.



Symbol magnify in cell D3 is the increase in symbol size when highlighted.

	C	D
3	Symbol Magnify=	1.4

CONTROL SYMB DATA

Color, opacity, and size of labels are defined in range D6:E7 with the same method used for symbols.

Label size ranges from 0.0 (invisible) to 5.0 (really big).

Size is in non-specific GE units. Gage selection by knowing that reasonably sized labels range from 0.6 to 0.9.

	C	D	E	F
5		LABEL_KOL	LABEL_Size	
6	Normal:	60%	0.0	
7	Highlighted:	100%	1.0	

CONTROL SYMB DATA

Symbol Description Balloon

Symbol description balloon is comprised of five elements; Label, DescriptiveTEXT, Figure, HTTPAddress, and TableDATA (Figure 4). A label is mandatory, while the other four elements are optional.

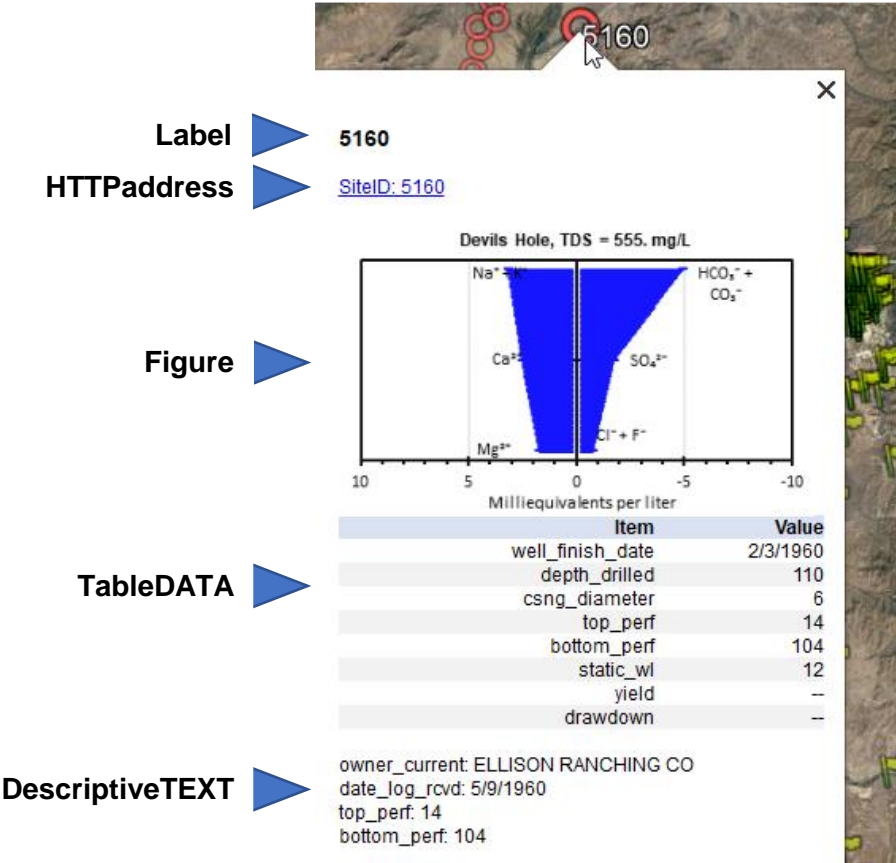
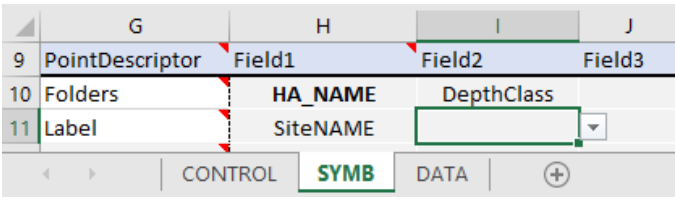
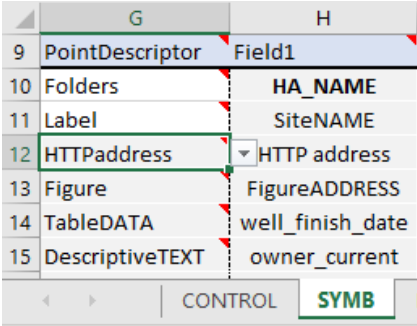
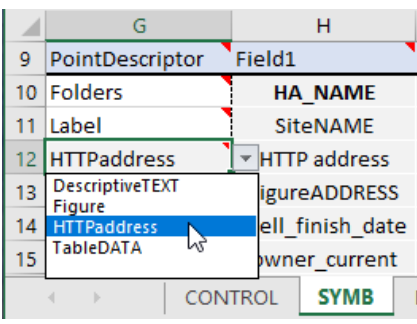
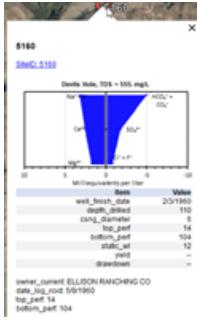
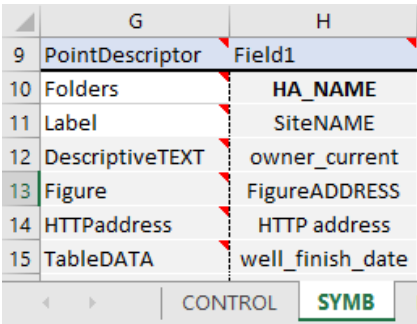
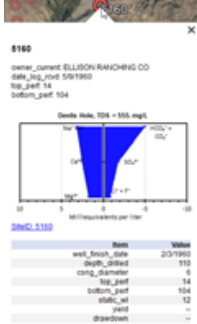
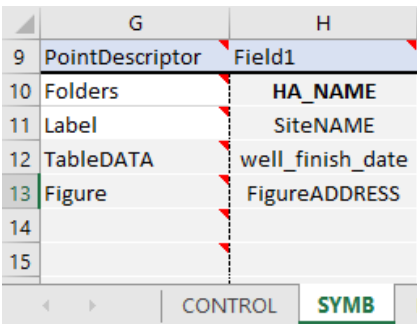
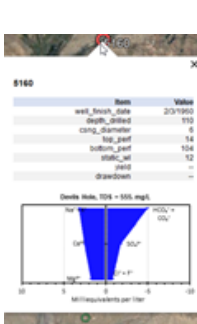


Figure 4.—Elements of a description balloon that are defined in the PointDescriptor array (Range SYMB!G11:K21).

Symbol Description

<p>Label defined on row 11.</p> <p>Typically specify with field 1 (H11), but can be specified with multiple fields.</p>	
<p>Order of optional elements</p> <p>DescriptiveTEXT, Figure, HTTPAddress, and TableDATA</p> <p>can be changed.</p>	
<p>An element is specified with pull-down menus in the range G12:G21.</p>	 
<p>Elements will appear as ordered in column G.</p>	 
<p>Unwanted elements are not specified.</p> <p>Select blank field in pull-down menu to remove an element.</p>	 

Symbol Description— HTTPAddress

HTTPAddress inserts a hyperlink in the description balloon, where field1 (column H) defines the URL and field2 (column I) defines site specific text displayed in the hyperlink.

	G	H	I	J	K
9	PointDescriptor	Field1	Field2	Field3	Field4
10	Folders	HA_NAME	DepthClass		
11	Label	SiteNAME			
12	HTTPAddress	HTTP address	well_log		
13	Figure	FigureADDRESS			
14	TableDATA	well_finish_date	drawdown		
15	DescriptiveTEXT	owner_current	date_log_rcvd	top_perf	bottom_perf

Field1 (column H) defines the URL.
A complete HTTP address of the URL is assumed to exist in the targeted cell on the DATA page and is used without verification.

	S
4	HTTP address
69	http://images.water.nv.gov/images/well_logs/05000/5160.pdf
70	http://images.water.nv.gov/images/well_logs/05000/5161.pdf

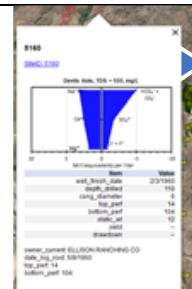
Field2 (column I) defines site specific text displayed in the hyperlink.

	E	F	G	
4	well_log	date_log_rcvd	ha	owner_curre
69	5160	05/09/1960	063	ELLISON RAN
70	5161	05/09/1960	063	ELLISON RAN

An explanatory prefix can be added to text displayed in the hyperlink and is specified in cell H2.

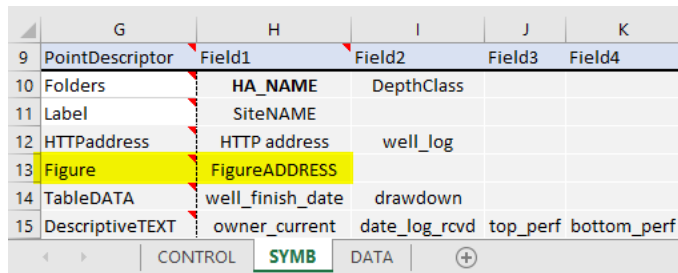
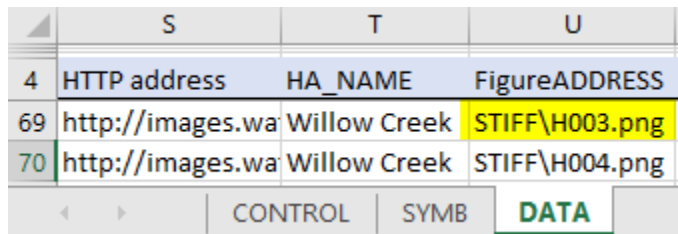
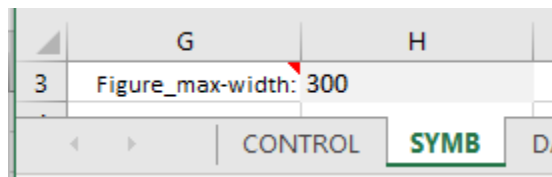
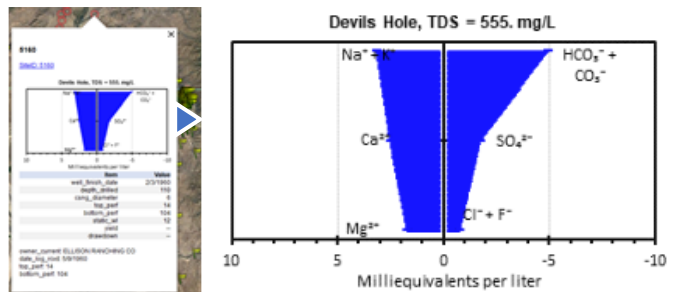
	G	H
2	HTTPAddress_Prefix:	SiteID:

Resulting hyperlink displays as shown.

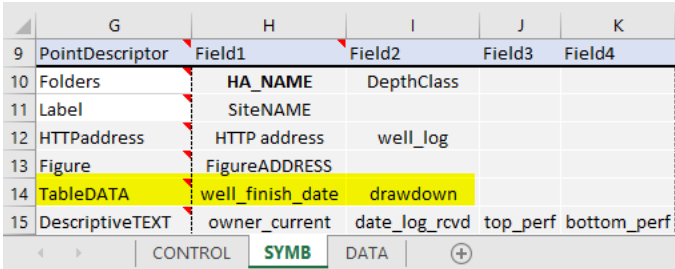
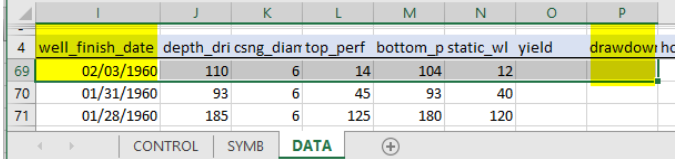
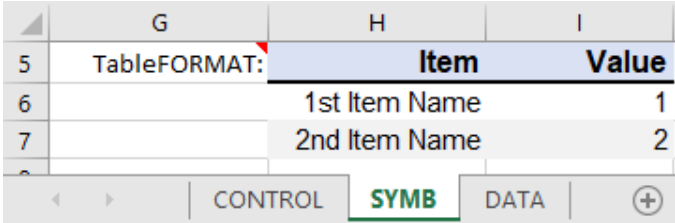
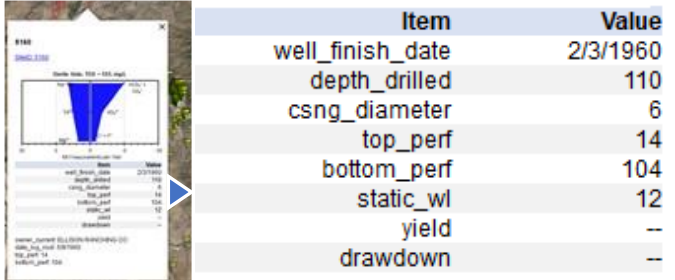


[SiteID: 5160](#)

Symbol Description—Figure

<p>Figure inserts an image file in the description balloon, where field1 (column H) defines the relative path to an image file (*.jpg, *.jpeg, *.png, *.bmp, *.gif).</p>	 <table><tr><th></th><th>G</th><th>H</th><th>I</th><th>J</th><th>K</th></tr><tr><td>9</td><td>PointDescriptor</td><td>Field1</td><td>Field2</td><td>Field3</td><td>Field4</td></tr><tr><td>10</td><td>Folders</td><td>HA_NAME</td><td>DepthClass</td><td></td><td></td></tr><tr><td>11</td><td>Label</td><td>SiteNAME</td><td></td><td></td><td></td></tr><tr><td>12</td><td>HTTP address</td><td>HTTP address</td><td>well_log</td><td></td><td></td></tr><tr><td>13</td><td>Figure</td><td>FigureADDRESS</td><td></td><td></td><td></td></tr><tr><td>14</td><td>TableDATA</td><td>well_finish_date</td><td>drawdown</td><td></td><td></td></tr><tr><td>15</td><td>DescriptiveTEXT</td><td>owner_current</td><td>date_log_rcvd</td><td>top_perf</td><td>bottom_perf</td></tr></table>		G	H	I	J	K	9	PointDescriptor	Field1	Field2	Field3	Field4	10	Folders	HA_NAME	DepthClass			11	Label	SiteNAME				12	HTTP address	HTTP address	well_log			13	Figure	FigureADDRESS				14	TableDATA	well_finish_date	drawdown			15	DescriptiveTEXT	owner_current	date_log_rcvd	top_perf	bottom_perf
	G	H	I	J	K																																												
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14	TableDATA	well_finish_date	drawdown																																														
15	DescriptiveTEXT	owner_current	date_log_rcvd	top_perf	bottom_perf																																												
<p>Field1 (column H) defines relative path to an image file.</p> <p>A figure is not inserted if the targeted cell is empty or the image file does not exist.</p>	 <table><tr><th></th><th>S</th><th>T</th><th>U</th></tr><tr><td>4</td><td>HTTP address</td><td>HA_NAME</td><td>FigureADDRESS</td></tr><tr><td>69</td><td>http://images.wa</td><td>Willow Creek</td><td>STIFF\H003.png</td></tr><tr><td>70</td><td>http://images.wa</td><td>Willow Creek</td><td>STIFF\H004.png</td></tr></table>		S	T	U	4	HTTP address	HA_NAME	FigureADDRESS	69	http://images.wa	Willow Creek	STIFF\H003.png	70	http://images.wa	Willow Creek	STIFF\H004.png																																
	S	T	U																																														
4	HTTP address	HA_NAME	FigureADDRESS																																														
69	http://images.wa	Willow Creek	STIFF\H003.png																																														
70	http://images.wa	Willow Creek	STIFF\H004.png																																														
<p>Defines maximum width of an image in pixels.</p> <p>Images wider than the maximum width are scaled to the Figure_max-width value.</p>	 <table><tr><th></th><th>G</th><th>H</th></tr><tr><td>3</td><td>Figure_max-width:</td><td>300</td></tr></table>		G	H	3	Figure_max-width:	300																																										
	G	H																																															
3	Figure_max-width:	300																																															
<p>Resulting figure displays as shown.</p>	 <p>Devils Hole, TDS = 555. mg/L</p> <p>Na⁺ + K⁺ Ca²⁺ Mg²⁺ HCO₃⁻ + CO₃²⁻ SO₄²⁻ Cl⁻ + F⁻</p> <p>Milliequivalents per liter</p>																																																

Symbol Description—TableDATA

<p>TableDATA inserts a 2-column table in the description balloon, where field1 and field2 (columns H and I) define first and last rows in the table.</p>	
<p>TableDATA inserts a 2-column table in the description balloon.</p> <p>Field1 and field2 (columns H and I) define first and last rows in the table.</p> <p>All fields between first and last rows, inclusive, are tabled.</p> <p>Eight rows in example table because 8 columns targeted on DATA page.</p>	
<p>TableFORMAT range (H5:I7) defines 2-column table format.</p> <p>Values in row 5 are displayed in symbol table.</p> <p>Color in cell H5 defines header color.</p> <p>Colors in cell H6:H7 define colors of alternating rows.</p> <p>Bold text in TableFORMAT range specifies bold text in table rows.</p>	
<p>Resulting table displays as shown.</p> <p>Headers appear in left column,</p> <p>Cell entries appear in right column.</p>	

Symbol Description—DescriptiveTEXT

DescriptiveTEXT inserts delimited and formatted text in the description balloon.

A line is written for each specified field, where a line reads header, delimiter, and cell entry.

Number of lines defined by number of fields specified.

For example, 4 lines will display if 4 fields are specified.

	G	H	I	J	K
9	PointDescriptor	Field1	Field2	Field3	Field4
10	Folders	HA_NAME	DepthClass		
11	Label	SiteNAME			
12	HTTPAddress	HTTP address	well_log		
13	Figure	FigureADDRESS			
14	TableDATA	well_finish_date	drawdown		
15	DescriptiveTEXT	owner_current	date_log_rcvd	top_perf	bottom_perf

Targeted text on DATA page will be ordered by specified field order on the SYMB page.

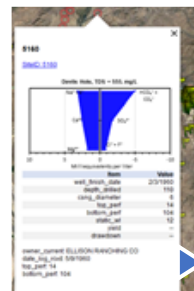
	F	G	H	I	J	K	L	M
3	2		1				3	4
4	date_log_rcvd	ha	owner_current	well_finish	depth	csng_d	top_perf	bottom_p
69	05/09/1960	063	ELLISON RANCHING CO	02/03/1960	110	6	14	104
70	05/09/1960	063	ELLISON RANCHING CO	01/31/1960	93	6	45	93

Descriptive text delimiter between header and cell entry is specified in cell D2.

	C	D
2	DescriptiveTEXT delimiter: :	

Resulting text displays as shown with each field appearing on a separate line.

Header and cell entry for a field are written to a line and separated by user-specified, descriptive text delimited (cell D2).



owner_current: ELLISON RANCHING CO
date_log_rcvd: 5/9/1960
top_perf: 14
bottom_perf: 104