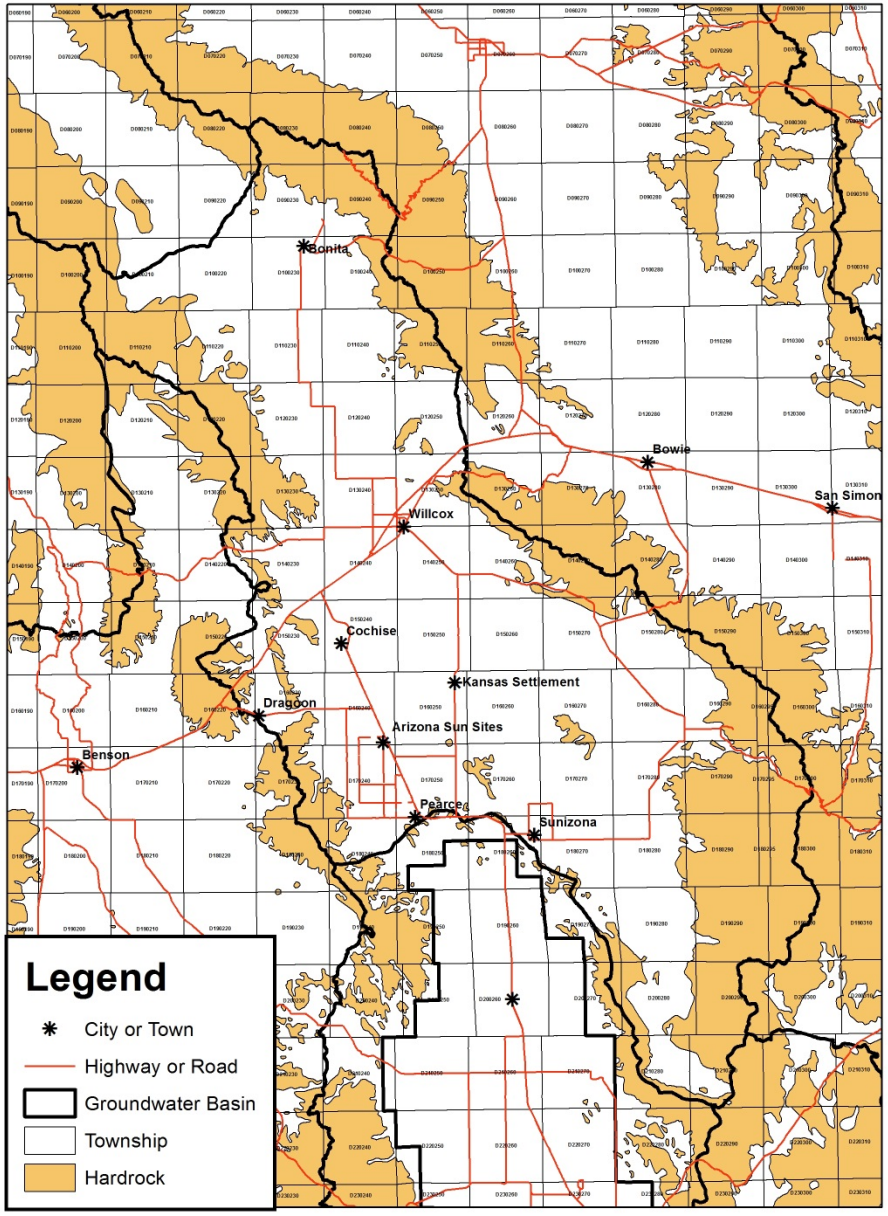
Update On ADWR Well Survey, General Well Information and Groundwater Data Collection In Willcox Basin (1/30/2015)

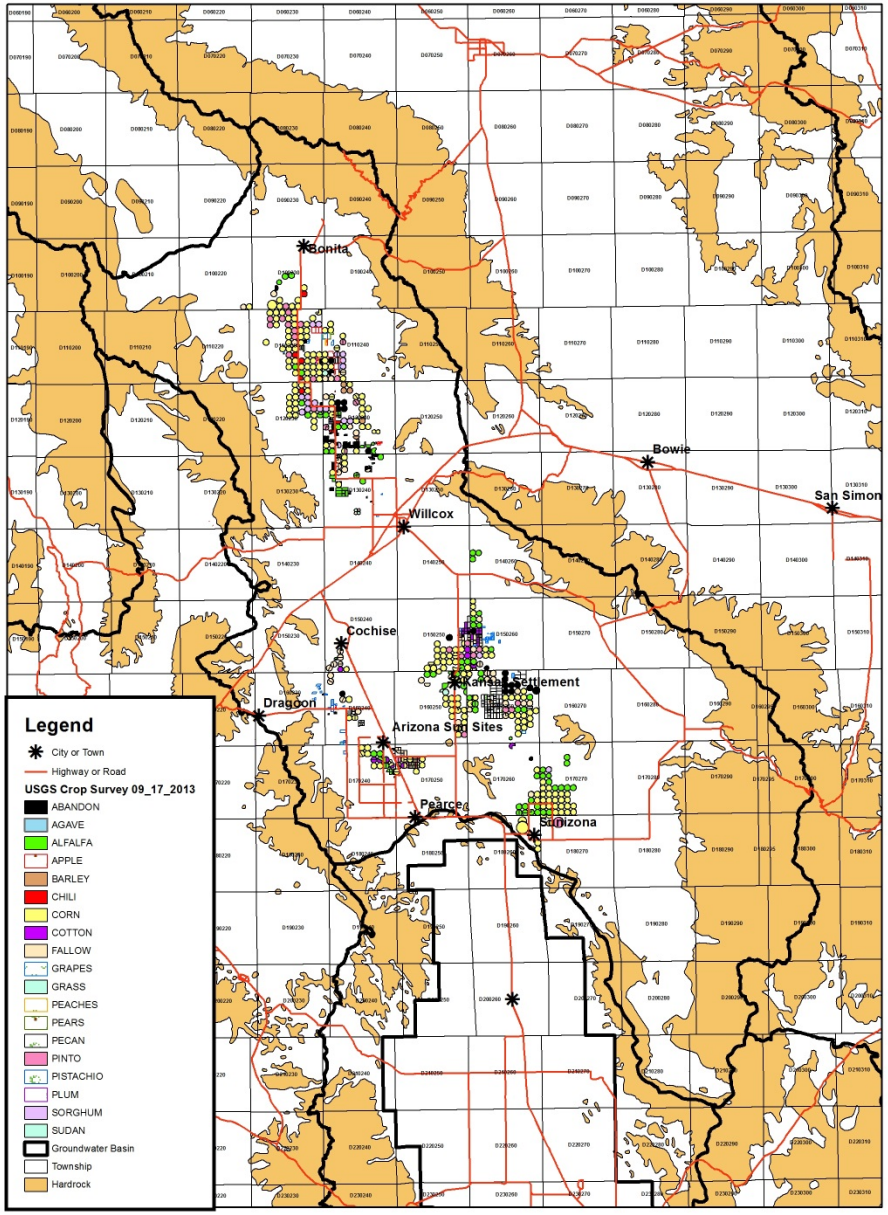
Willcox Basin Major Cities, Towns and Roads



0 3 6 12 18 24 Miles

N

Willcox Basin 9/17/2013 USGS Crop Survey

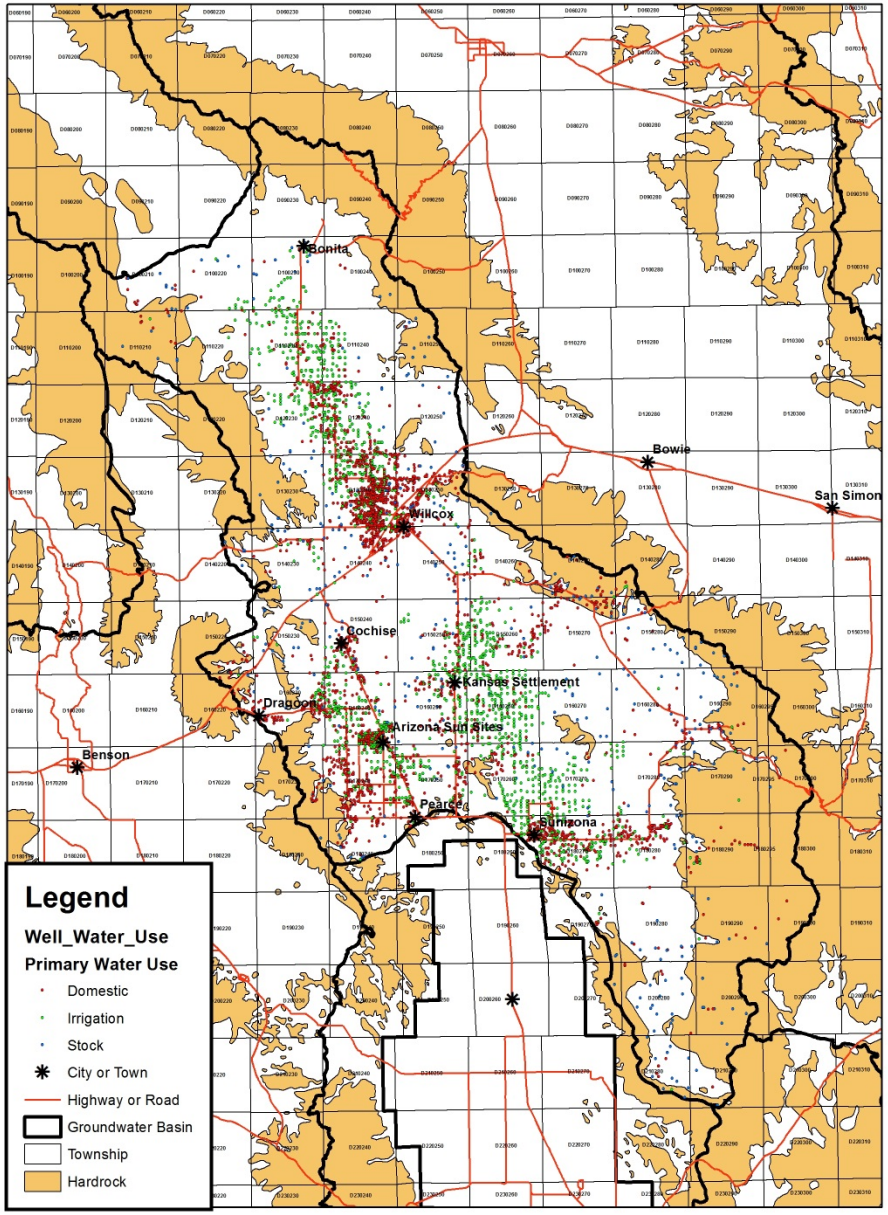


0 3 6 12 18 24 Miles

N

Willcox Basin Registered Domestic, Irrigation and Stock Wells (12/31/2014)

	Well Type		Water Use		
Total Registered Wells In Willcox Basin	Exempt	Non-Exempt	Domestic	Irrigation	Stock
6,710	3,896	2,170	3,284	2,072	466



Preliminary Results of ADWR Willcox Well Survey Factsheet

Preliminary Results Of ADWR's Survey of Well Conditions
In the Willcox Basin Area, Cochise County Arizona
October – December 3, 2014

Over the last two months the Arizona Department of Water Resources (ADWR) has conducted a survey of well owners (mainly domestic well owners) in the Willcox Basin of Cochise County concerning impacts that they have experienced in recent years due to long-term groundwater overdraft, groundwater level decline and land subsidence. The survey was focused on determining the locations of wells that may have gone dry, the nature of any damage incurred and what actions may have been taken to mitigate the damage (re-drilling or deepening wells, set pumps deeper, hauling water etc.). Some wells mentioned in the survey will also be monitored in ADWR's ongoing groundwater level sweep of the area, which began on December 1.

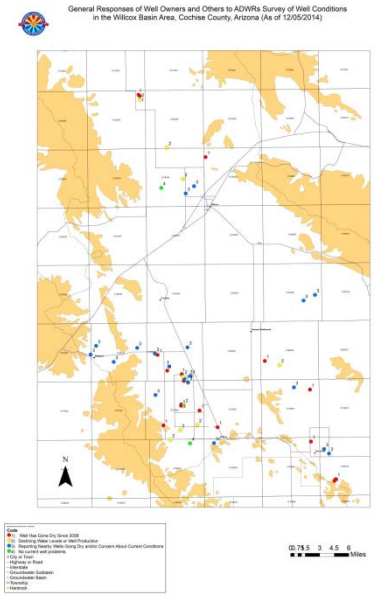
To date, over 60 responses to the survey have been received from well owners and concerned citizens. The results of the survey indicate that many domestic wells have been impacted by declining water levels in the Willcox, Cochise and Pearce areas (see map). Many wells have been deepened or re-drilled (see table), and there has been almost universal concern expressed about the situation from survey participants.

During the next few months ADWR field personnel will be measuring water levels in the Willcox, Douglas and San Simon Basins. The results of their monitoring work will be included in a monitoring report that will be published in the summer of 2015. The information from monitoring activities will provide a comprehensive update of water level decline rates and groundwater conditions throughout the area that will help provide a solid database for future decision making and water planning in the region.

ADWR appreciates the cooperation of everyone who has already responded to the survey, and there is still time to participate if you wish to by visiting the Arizona Well Survey web portal at:

http://www.azwater.gov/azdwr/eforms/Forms/WS/DWR_Well_Survey.aspx

If you have any questions about the survey or would like to contact ADWR further about groundwater conditions in your area please contact Michelle Moreno at (602-771-8530) or Frank Corkhill at (602-771-8537).



Summary of Responses to ADWR's Survey of Well Conditions In the Willcox Basin (October – November 2014)

Area	Number of Responses	Average Time on Property (Years)	Median Time on Property (Years)	Map Code 1	Map Code 2	Map Code 3	Map Code 4	Average Depth of Wells (Feet)	Median Depth of Wells (Feet)	Average Diameter of Wells (Inches)	Median Diameter of Wells (Inches)	Average Depth-to-Water When Well Was Drilled (Feet)	Median Depth-to-Water When Well Was Drilled (Feet)	Average Parcel Size of Person Reporting (Acres)	Median Parcel Size of Person Reporting (Acres)
				Well Has Gone Dry Since 2008	Declining Water Level and/or Declining Well Production	Reporting Nearby Wells Going Dry and/or Concern About Current Conditions	No Current Well Problems								
Willcox	15	21	16	5	4	5	1	351	390	9	8	221	240	30	5
Cochise	17	11	9	5	2	10	0	380	340	8	7	231	160	7	5
Pearce	16	12	12	8	3	4	1	501	501	6	6	360	353	8	5
Dragoon	3	13	14	0	0	3	0	610	620	6	6	438	470	27	20
Other areas (Hereford, McNeal, Naco, Portal)	5	9	8	0	0	5	0	NA	NA	NA	NA	NA	NA	NA	NA
Total Survey Area	56	13	12	18	9	27	2	413	425	7	7	267	282	15	5

Map Codes:

Map Code 1 - Well has Gone Dry Since 2008. Well may have been deepened or replaced. Some well owners now get water from a different source.

Map Code 2 - Declining water level and/or declining well production. Well may have been deepened or replaced, or pump set deeper.

Map Code 3 - Reporting nearby wells going dry and/or concern about current conditions.

Map Code 4 - No current well problems.

Additional Notes about Table and Survey Data

* Responses From Well Owners Who Own Multiple Wells Were Counted As a Single Response

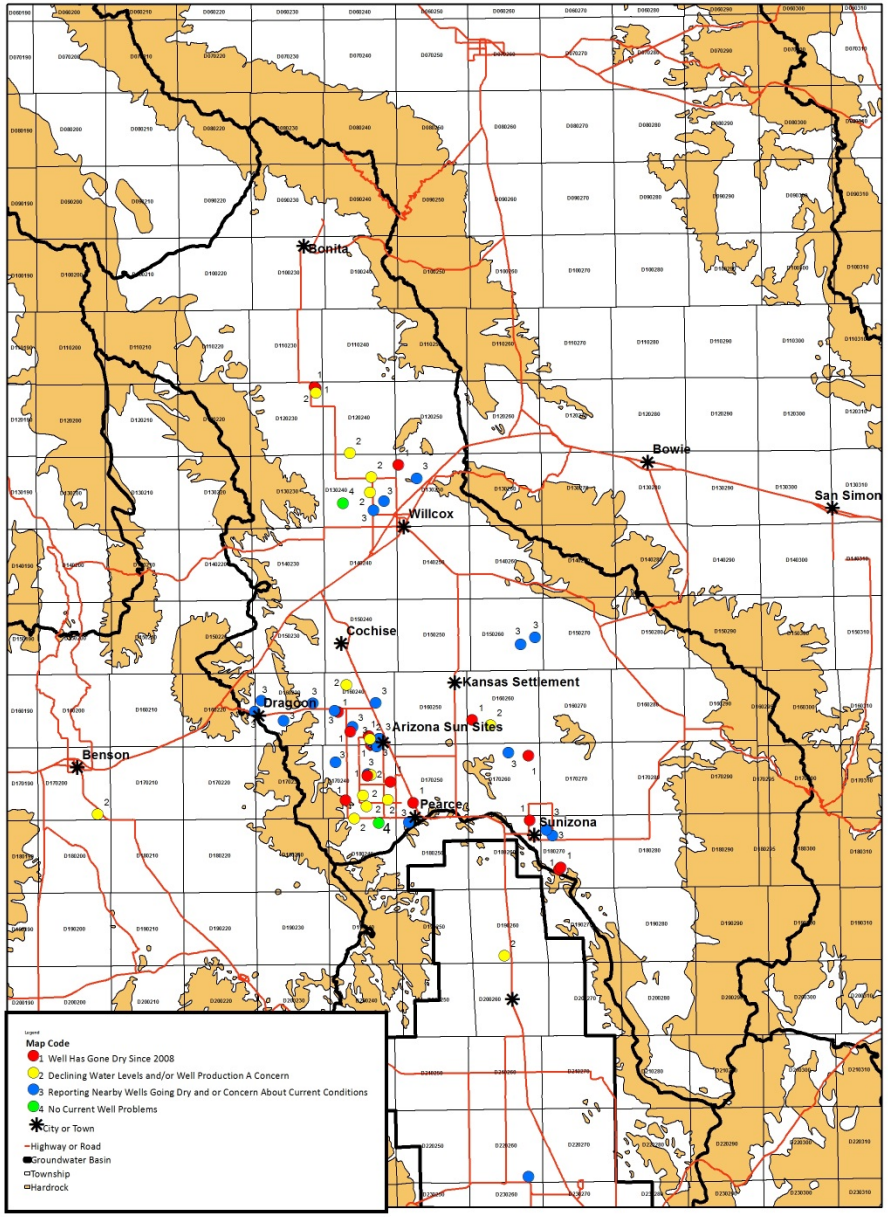
** Some Responses Were From Non-Well Owners

*** Several growers and vintners who own many wells in the area have expressed concern over conditions. However, their well data are not included in this summary.

**** A few responses provided insufficient information and were not counted

***** Well construction and depth-to-water data were not available for all wells. Statistics shown are based only on available data.

General Well Owner Responses to ADWR Well Owner Survey of the Willcox Area (As of 1/2/2015)



0 3 6 12 18 24 Miles

N

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Dragoon	3	13	14	0	0	3	0	610	620	6	6	438	470	27	20
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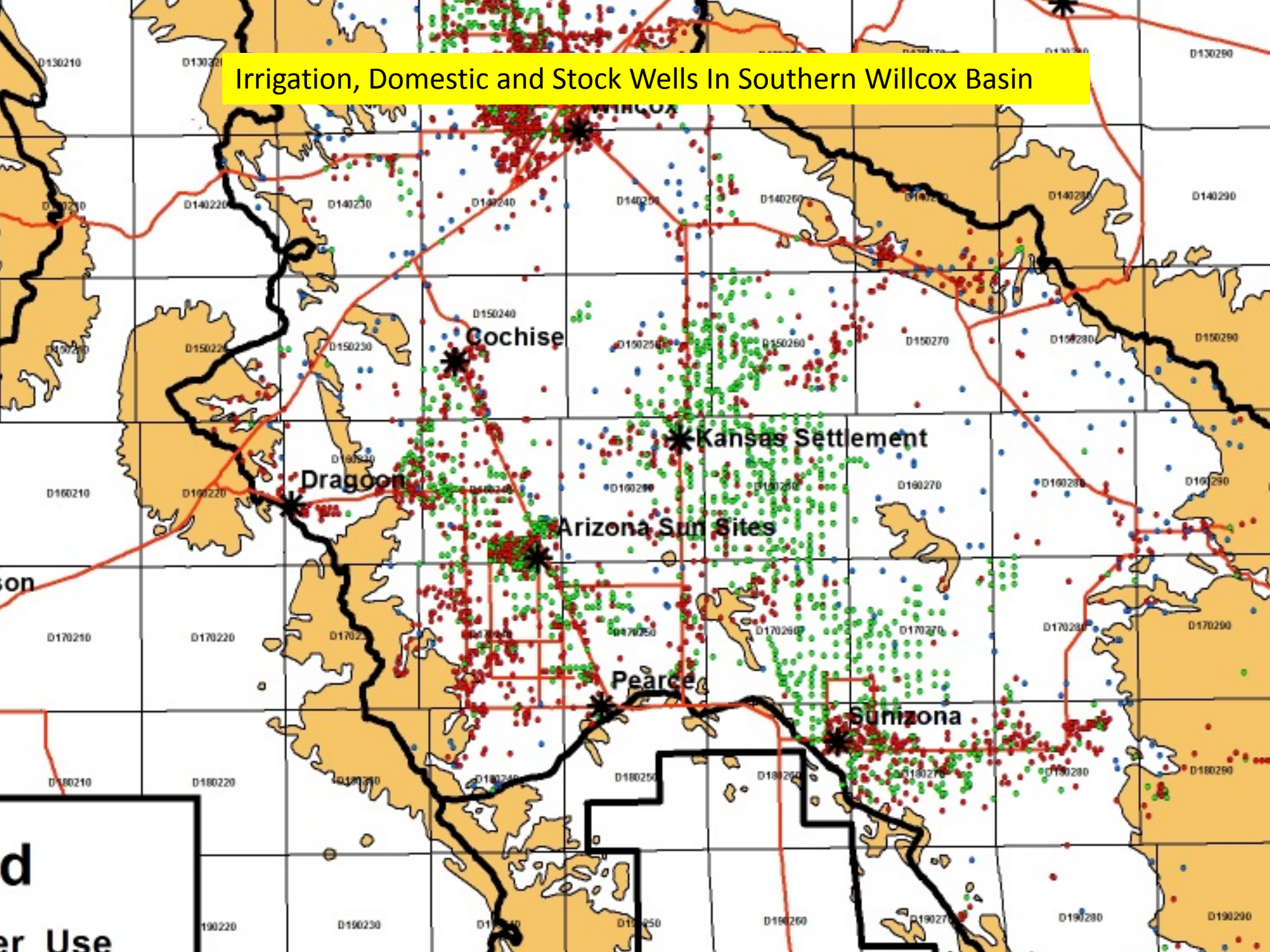
Five Critical Factors That Impact Future Well Conditions

- How deep are the wells in the area?
- What is the current depth to water in the area?
- What is the current and potential future water level change rate in the area? This complicated factor is mainly related to the amount of historic, current and future pumping that may occur in the general area that will impact groundwater levels.
- How thick is the aquifer in the area?
- How productive is the aquifer in the area?

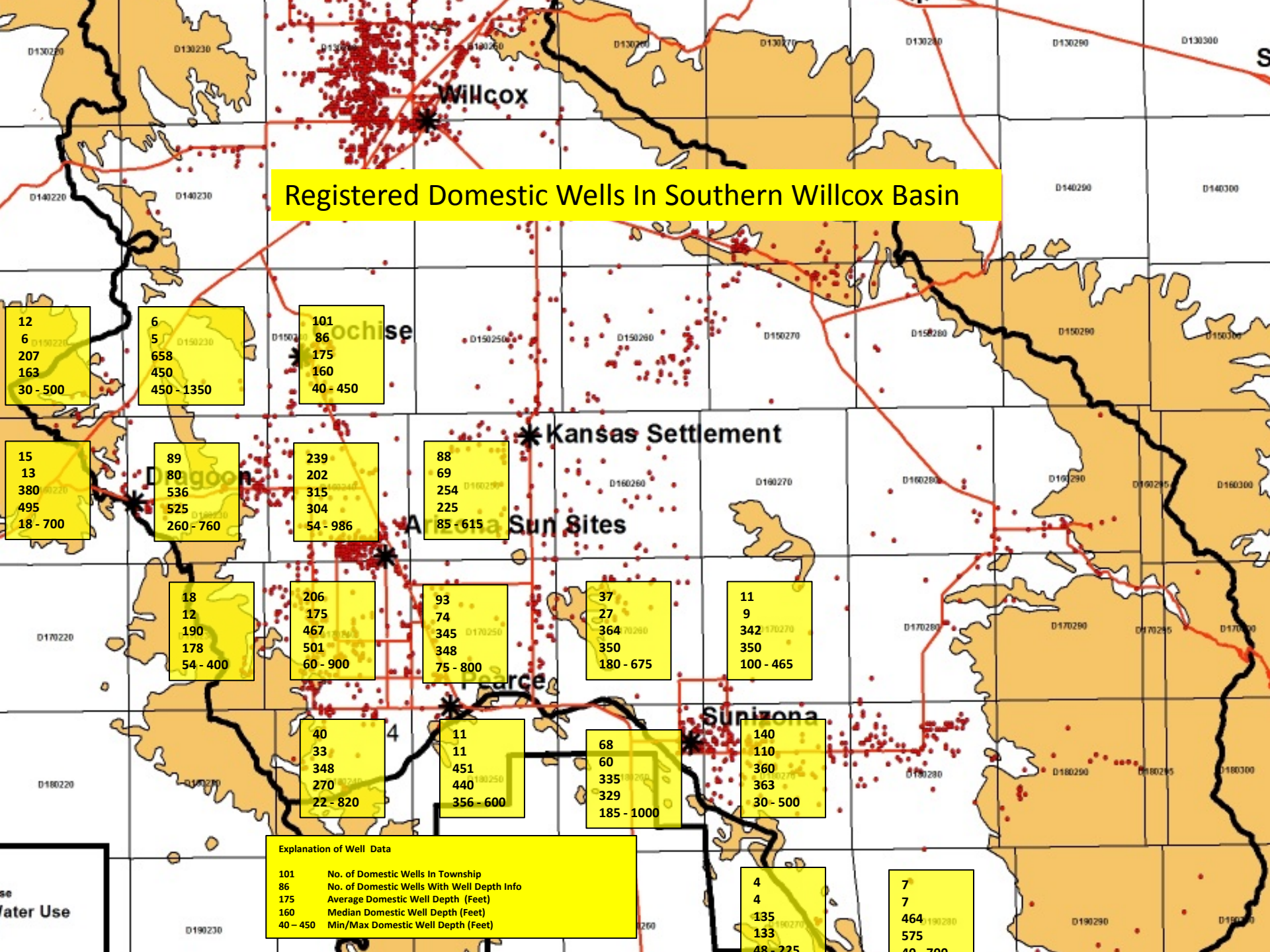
Irrigation, Domestic and Stock Wells In Southern Willcox Basin

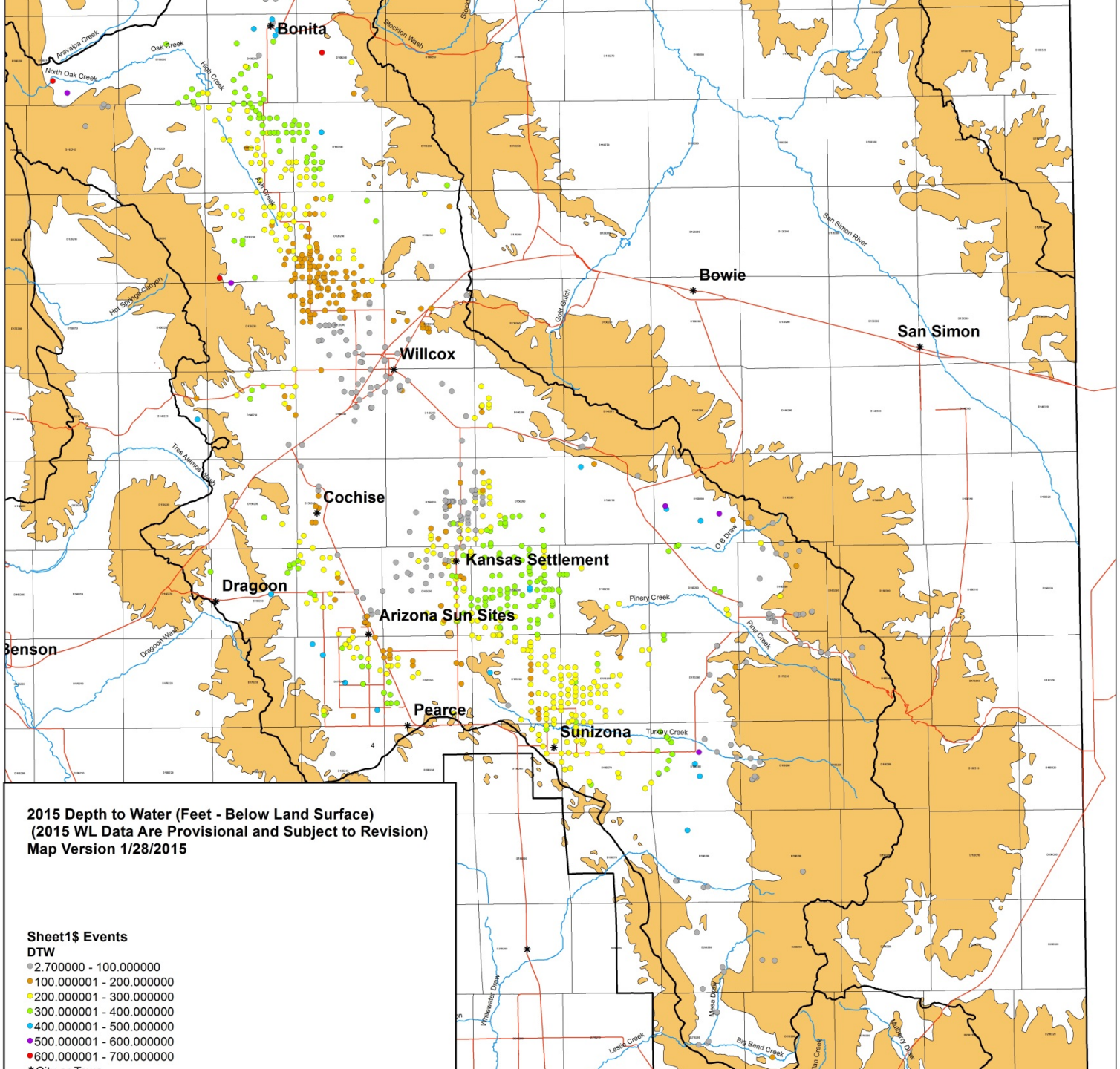


Statistics On Well Depths In Selected Townships of the Willcox Basin (Irrigation, Domestic, Stock Water Uses)

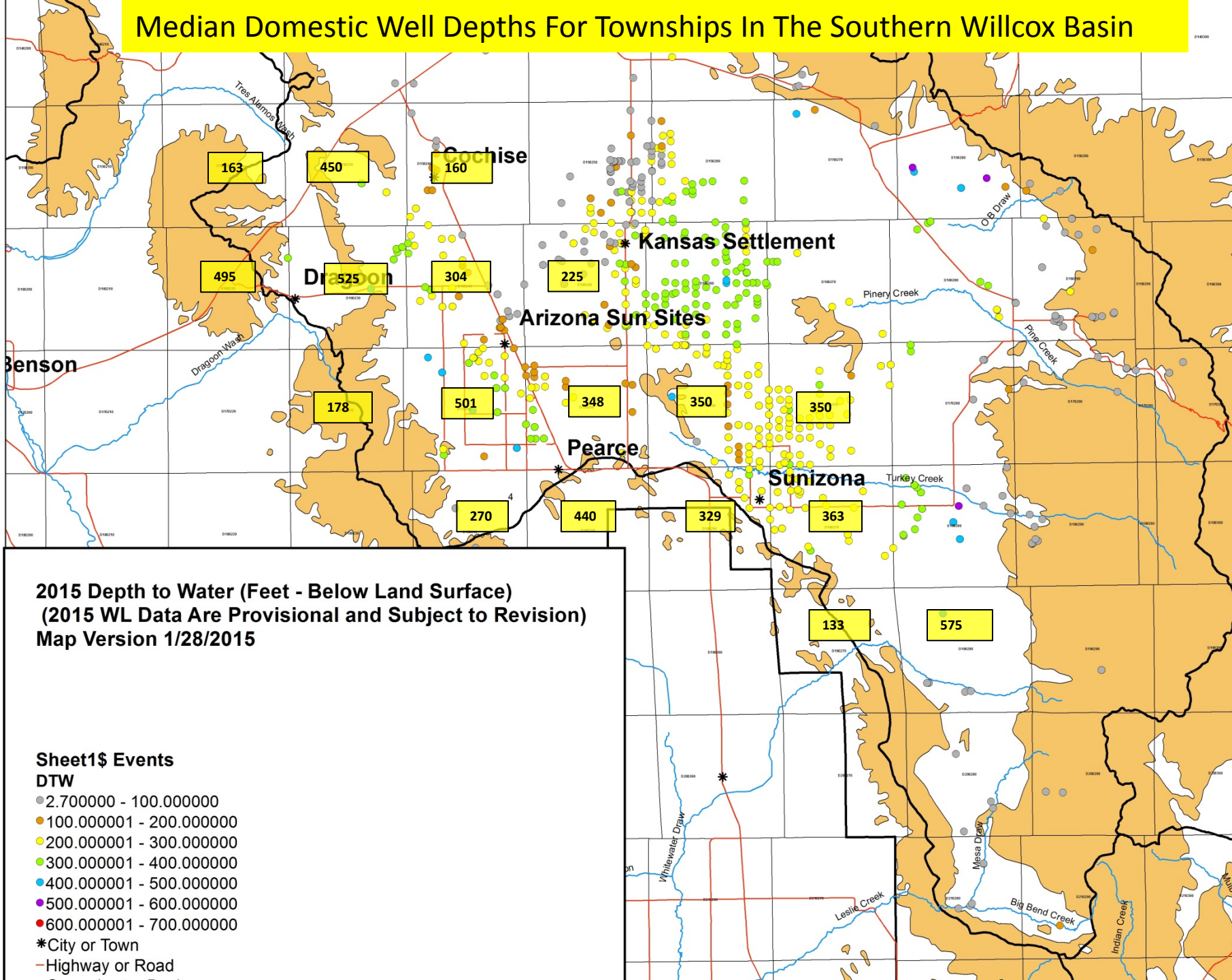
				Water Use = A = Irrigation						Water Use = D = Domestic						Water Use = J = Stock					
T & R	All Wells In T&R	Exempt Wells In T&R	Non-Exempt Wells In T&R	Total Count With WUSE	Count With Well Depth >0	Average Well Depth	Median Well Depth	Maximum Well Depth	Minimum Well Depth	Total Count With WUSE	Count With Well Depth >0	Average Well Depth	Median Well Depth	Maximum Well Depth	Minimum Well Depth	Total Count With WUSE	Count With Well Depth >0	Average Well Depth	Median Well Depth	Maximum Well Depth	Minimum Well Depth
15_22	58	15	3	0	0					12	6	207	163	500	30	2	0				
15_23	65	21	6	4	1	1140	1140	1140	1140	6	5	658	450	1350	450	13	12	438	420	710	100
15_24	142	106	35	29	25	449	450	875	107	101	86	175	160	450	40	8	6	302	230	700	100
16_22	23	19	1	1	1	730	730	730	730	15	13	380	495	700	18	2	0				
16_23	156	94	35	28	24	453	480	670	300	89	80	536	525	760	260	4	3	570	554	696	460
16_24	544	251	243	211	176	342	300	1350	56	239	202	315	304	986	54	5	3	106	77	168	73
16_25	198	109	83	81	57	417	406	1340	94	88	69	254	225	615	85	15	13	116	100	200	50
17_23	22	21	1	1	1	95	95	95	95	18	12	190	178	400	54	3	1	110	110	110	110
17_24	306	214	90	85	77	401	410	700	90	206	175	467	501	900	60	4	3	172	200	220	95
17_25	205	107	88	81	67	462	409	970	120	93	74	345	348	800	75	8	7	173	140	450	75
17_26	159	42	110	102	78	616	555	2200	263	37	27	364	350	675	180	6	6	381	354	600	205
17-27	97	23	74	75	63	737	700	1167	300	11	9	342	350	465	100	8	6	246	293	500	20
18_23	7	1	0	0	0					0	0					1	0				
18_24	54	49	3	3	3	252	100	575	80	40	33	348	270	820	22	8	6	209	190	405	25
18_25	27	13	1	3	2	468	468	511	425	11	11	451	440	600	356	0	0				
18_26	103	66	36	33	26	576	583	1100	260	68	60	335	329	1000	185	0	0				
18_27	257	134	123	109	82	383	350	805	45	140	110	360	363	500	30	4	4	107	100	200	26
19_27	10	9	1	2	1	100	100	100	100	4	4	135	133	225	48	3	3	108	12	300	12
19_28	18	17	1	0	0					7	7	464	575	700	40	11	10	202	133	750	24
Total	2451	1311	934	848	684					1185	983					105	83				

Registered Domestic Wells In Southern Willcox Basin




2015 Depth to Water (Feet - Below Land Surface)
(2015 WL Data Are Provisional and Subject to Revision)
Map Version 1/28/2015
Sheet1$ Events
DTW
2.700000 - 100.000000
100.000001 - 200.000000
200.000001 - 300.000000
300.000001 - 400.000000
400.000001 - 500.000000
500.000001 - 600.000000
600.000001 - 700.000000
Bonita
Bowie
San Simon
Willcox
Cochise
Kansas Settlement
Dragoon
Arizona Sun Sites
Benson
Pearce
Sunizona
Stockton Wash
Aravaipa Creek
Oak Creek
North Oak Creek
High Creek
Ash Creek
Hot Springs Canyon
Tres Alamos Wash
Dragoon Wash
San Simon River
Gold Gulch
G B Draw
Pinery Creek
Pine Creek
Turkey Creek
Whitewater Draw
Leslie Creek
Mesa Draw
Big Bend Creek
Mulberry Draw

Median Domestic Well Depths For Townships In The Southern Willcox Basin

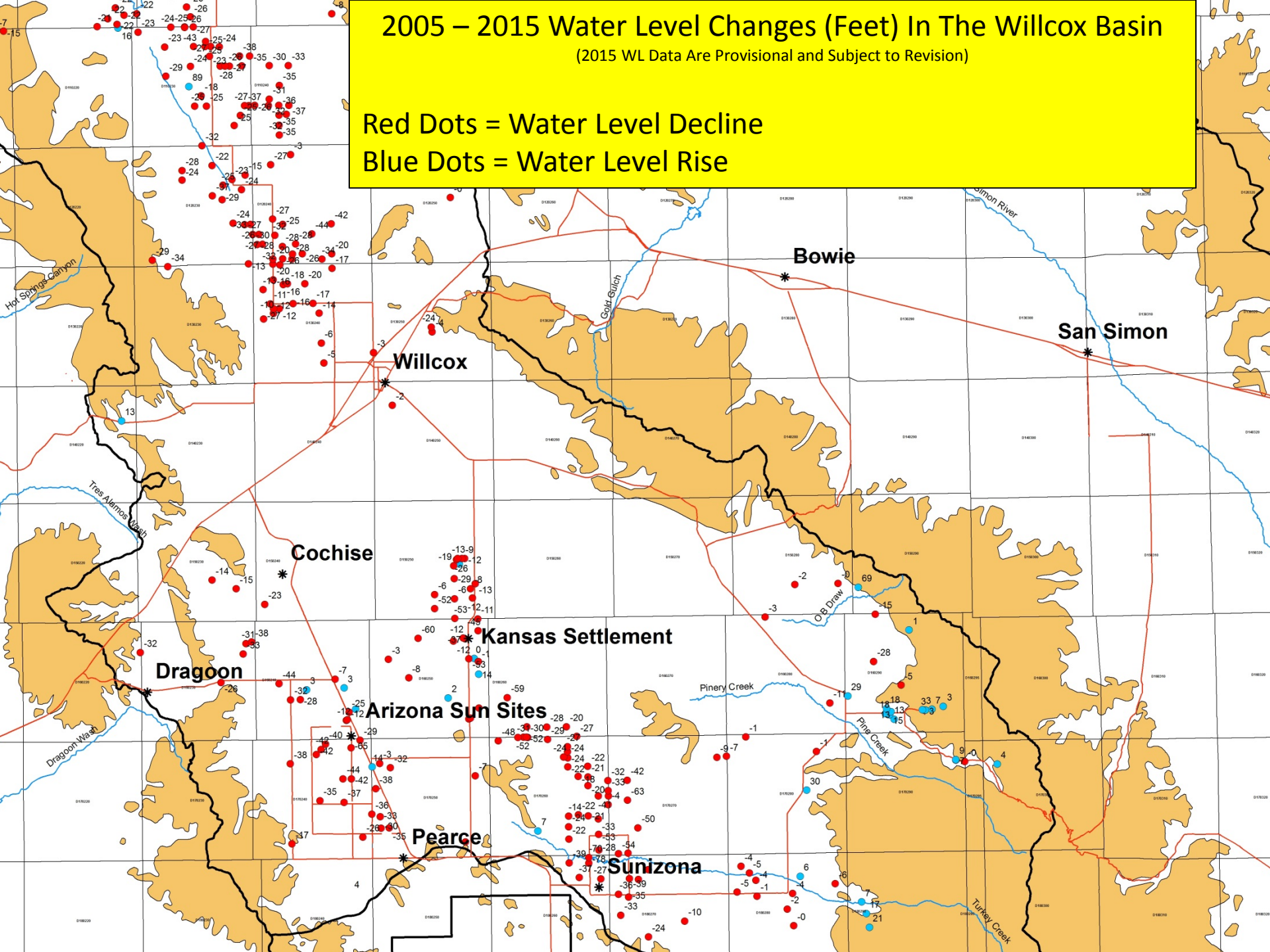


2005 – 2015 Water Level Changes (Feet) In The Willcox Basin

(2015 WL Data Are Provisional and Subject to Revision)

Red Dots = Water Level Decline

Blue Dots = Water Level Rise



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Map Scale 1:150000

Satellite

D-15-24 08DCA 2013 DTW = 74.5 feet
2005/2013 WL Change = -5.4 ft Or -.7 ft/yr

Median Domestic Well Depth In Township D-15-24 = 160 feet

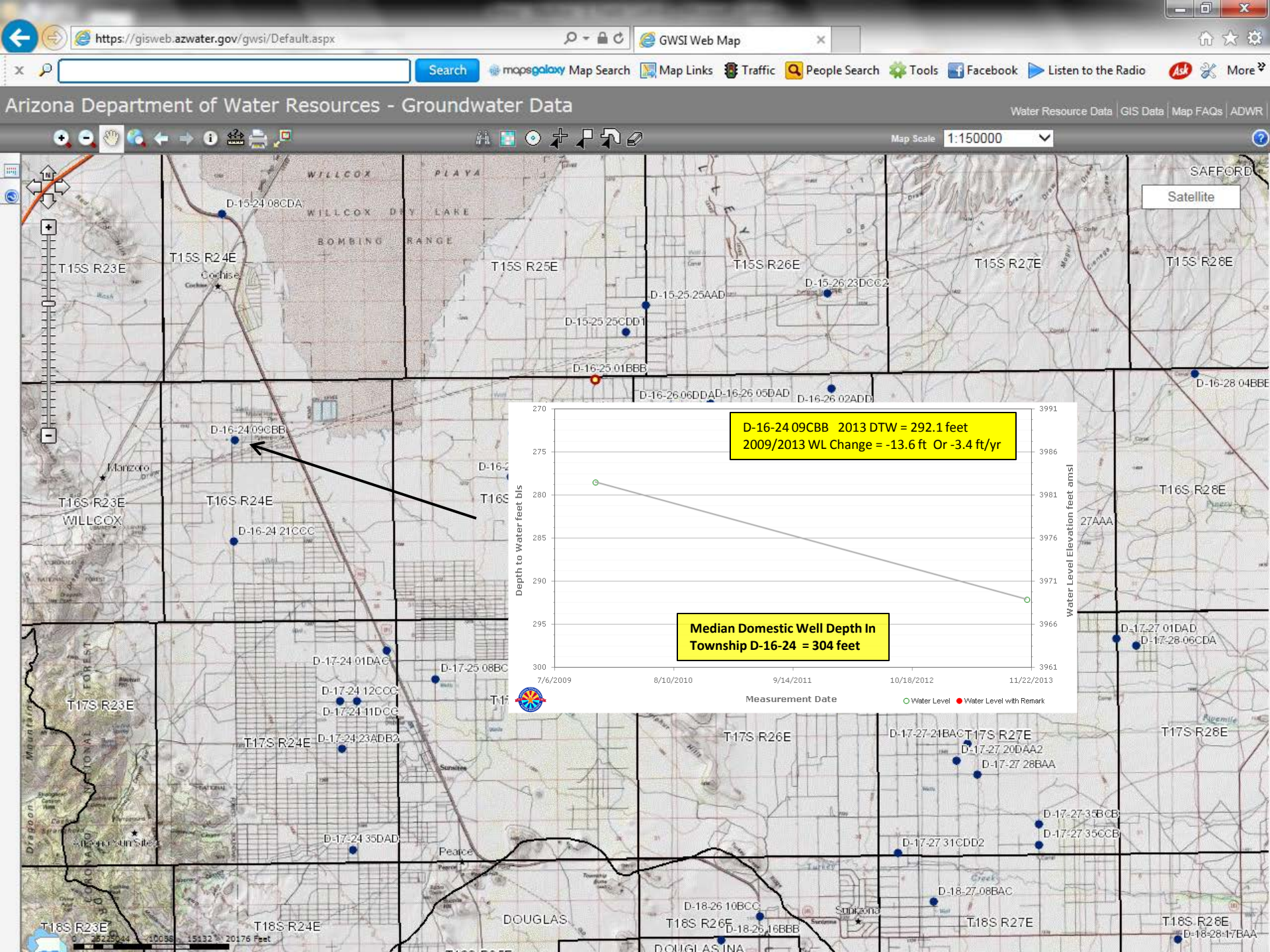
Depth to Water feet bls

Water Level Elevation feet amsl

Measurement Date

Water Level | Water Level with Remark

WILLCOX PLAYA
WILLCOX DRY LAKE
BOMBING RANGE
SAFFORD
T15S R23E
T15S R24E
T15S R28E
Cochise
D-15-24 08DCA
D-16-24 09CBB
Manzoro
T16S R23E
WILLCOX
T16S R24E
T16S R28E
D-16-24 21CCC
D-16-28 04BBB
D-16-27 27AAA
D-16-25 36AAA
D-16-26 32AAA
D-17-26 06BAD
D-17-26 04ADD1
D-17-26 12BAA
D-17-26 14AAA
D-17-27 01DAD
D-17-28 06CDA
D-17-24 01DAC
D-17-25 08BCC2
D-17-24 12CCC
D-17-24 11DCC
T17S R23E
T17S R25E
T17S R26E
T17S R27E
T17S R28E
T17S R24E
D-17-24 23ADB2
D-17-27 21BAC
D-17-27 20DAA2
D-17-27 28BAA
D-17-27 35BCB
D-17-27 35CCB
D-17-24 35DAD
Pearce
D-17-27 31CDD2
D-18-27 08BAC
D-18-26 10BCC
D-18-26 16BBB
T18S R23E
T18S R24E
DOUGLAS
T18S R26E
T18S R27E
T18S R28E
D-18-28 17BAA
DOUGLAS INA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Satellite
WILLCOX PLAYA
WILLCOX DRY LAKE
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T15S R23E
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T17S R27E
T17S R28E
T18S R23E
T18S R24E
T18S R26E
T18S R27E
T18S R28E
Cochise
Manzoro
WILLCOX
Pearce
DOUGLAS
Sunizona
D-15-24 08CDA
D-15-25 25AAD
D-15-25 25CDD1
D-15-26 23DCC2
D-16-25 01BBB
D-16-26 06DDA
D-16-26 05DAD
D-16-26 02ADD
D-16-28 04BBE
D-16-24 09CBB
D-16-24 21CCC
D-17-24 01DAC
D-17-25 08BC
D-17-24 12CCC
D-17-24 11DCC
D-17-24 23ADB2
D-17-24 35DAD
D-17-27 01DAD
D-17-28 06CDA
D-17-27 21BAC
D-17-27 20DAA2
D-17-27 28BAA
D-17-27 35BCB
D-17-27 35CCB
D-17-27 31CDD2
D-18-27 08BAC
D-18-26 10BCC
D-18-26 16BBB
D-18-28 17BAA
D-16-24 09CBB 2013 DTW = 292.1 feet
2009/2013 WL Change = -13.6 ft Or -3.4 ft/yr
Median Domestic Well Depth In Township D-16-24 = 304 feet
Depth to Water feet bls
Water Level Elevation feet amsl
270
275
280
285
290
295
300
3991
3986
3981
3976
3971
3966
3961
7/6/2009
8/10/2010
9/14/2011
10/18/2012
11/22/2013
Measurement Date
Water Level
Water Level with Remark

https://gisweb.azwater.gov/gwsi/Default.aspx

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Map Scale 1:150000

Satellite

D-15-24 08CDA
WILLCOX PLAYA
WILLCOX DRY LAKE
BOMBING RANGE
T15S R23E
T15S R24E
Cochise
T15S R25E
T15S R26E
T15S R27E
T15S R28E
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D-15-25 25AAD
D-15-25 25CDD1
D-15-26 23DCC2
D-16-28 04BBE
D-16-24 09CBB
Manzoro
T16S R23E
WILLCOX
T16S R24E
D-16-24 21CCC
T16S R28E
27 27AAA
D-17-27 01DAD
D-17-28 06CDA
D-17-24 01DAC
D-17-25 08BCC2
D-17-24 12CCC
D-17-24 11DCC
T17S R23E
T17S R24E
D-17-24 23ADB2
T17S R25E
D-17-26 14AAA
T17S R26E
D-17-27 21BAC
T17S R27E
D-17-27 20DAA2
D-17-27 28BAA
T17S R28E
D-17-27 35BCB
D-17-27 35CCB
D-17-24 35DAD
Pearce
D-17-27 31CDD2
D-18-27 08BAC
D-18-26 10BCC
D-18-26 16BBB
DOUGLAS
T18S R23E
T18S R24E
T18S R26E
T18S R27E
T18S R28E
D-18-28 17BAA
DOUGLAS INA

D-17-24 23ADB2 2013 DTW = 371.1 feet (R)
2005/2013 WL Change = -37.5 ft Or -4.7 ft/yr

Median Domestic Well Depth In Township D-17-24 = 501 feet

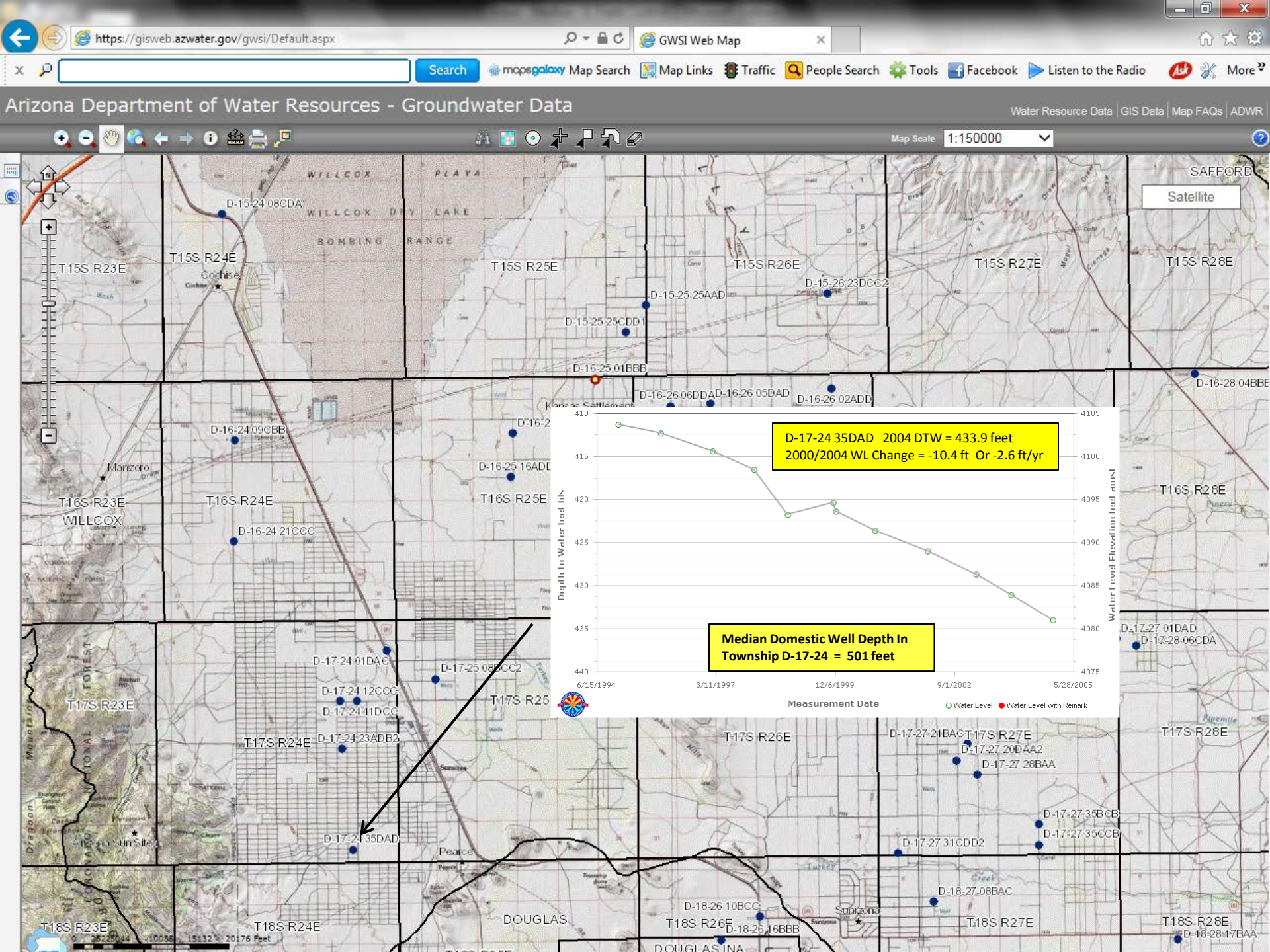
Depth to Water feet bls: 330, 335, 340, 345, 350, 355, 360, 365, 370, 375, 380

Water Level Elevation feet amsl: 4060, 4055, 4050, 4045, 4040, 4035, 4030, 4025, 4020, 4015, 4010

5/28/2005 | 2/22/2008 | 11/18/2010 | 8/14/2013

Measurement Date

Water Level | Water Level with Remark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Satellite
WILLCOX PLAYA
WILLCOX DRY LAKE
BOMBING RANGE
SAFFORD
T15S R23E
T15S R24E
T15S R25E
T15S R26E
T15S R27E
T15S R28E
T16S R23E
T16S R24E
T16S R25E
T16S R28E
T17S R23E
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T17S R25
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T17S R27E
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D-16-25 01BBB
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D-16-26 05DAD
D-16-26 02ADD
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D-16-24 09CBB
D-16-25 16ADD
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D-17-28 06CDA
D-17-27 21BAC
D-17-27 20DAA2
D-17-27 28BAA
D-17-27 35BCB
D-17-27 35CCB
D-17-27 31CDD2
D-18-27 08BAC
D-18-26 10BCC
D-18-26 16BBB
D-18-28 17BAA
Cochise
Manzoro
WILLCOX
Pearce
DOUGLAS
Sunkona
Arizona Sun Site
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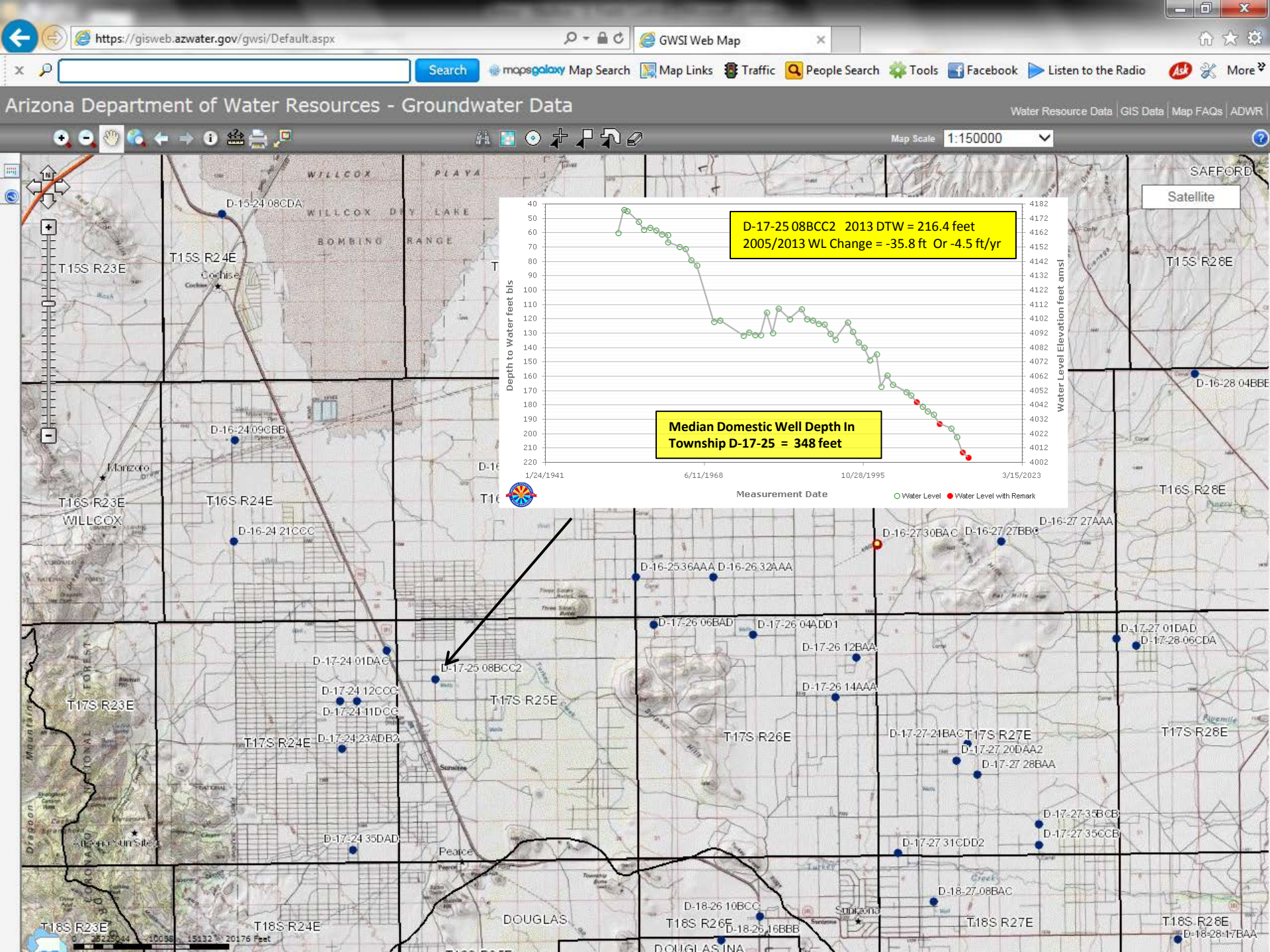
Depth to Water feet bls
Water Level Elevation feet amsl
410
415
420
425
430
435
440
4105
4100
4095
4090
4085
4080
4075
6/15/1994
3/11/1997
12/6/1999
9/1/2002
5/28/2005
Measurement Date
Water Level
Water Level with Remark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Traffic
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ADWR
Map Scale
1:150000
Satellite
D-17-25 08BCC2 2013 DTW = 216.4 feet
2005/2013 WL Change = -35.8 ft Or -4.5 ft/yr
Median Domestic Well Depth In Township D-17-25 = 348 feet
Depth to Water feet bls
Water Level Elevation feet amsl
Measurement Date
1/24/1941
6/11/1968
10/28/1995
3/15/2023
Water Level
Water Level with Remark
WILLCOX PLAYA
WILLCOX DRY LAKE
BOMBING RANGE
SAFFORD
T15S R23E
T15S R24E
T15S R28E
T16S R23E
T16S R24E
T16S R28E
T17S R23E
T17S R24E
T17S R25E
T17S R26E
T17S R27E
T17S R28E
T18S R23E
T18S R24E
T18S R26E
T18S R27E
T18S R28E
D-15-24 08CDA
D-16-24 09CBB
D-16-24 21CCC
D-16-25 36AAA
D-16-26 32AAA
D-16-27 30BAC
D-16-27 27BBC
D-16-27 27AAA
D-16-28 04BBB
D-17-26 06BAD
D-17-26 04ADD1
D-17-26 12BAA
D-17-26 14AAA
D-17-27 01DAD
D-17-28 06CDA
D-17-24 01DAC
D-17-25 08BCC2
D-17-24 12CCC
D-17-24 11DCC
D-17-24 23ADB2
D-17-24 35DAD
D-17-27 21BAC
D-17-27 20DAA2
D-17-27 28BAA
D-17-27 35BCB
D-17-27 35CCB
D-17-27 31CDD2
D-18-27 08BAC
D-18-26 10BCC
D-18-26 16BBB
D-18-28 17BAA
Cochise
Manzoro
WILLCOX
Pearce
Sunizona
DOUGLAS
DOUGLAS INA
Arizona Sun Site
0 25225044 10038 15132 20176 Feet

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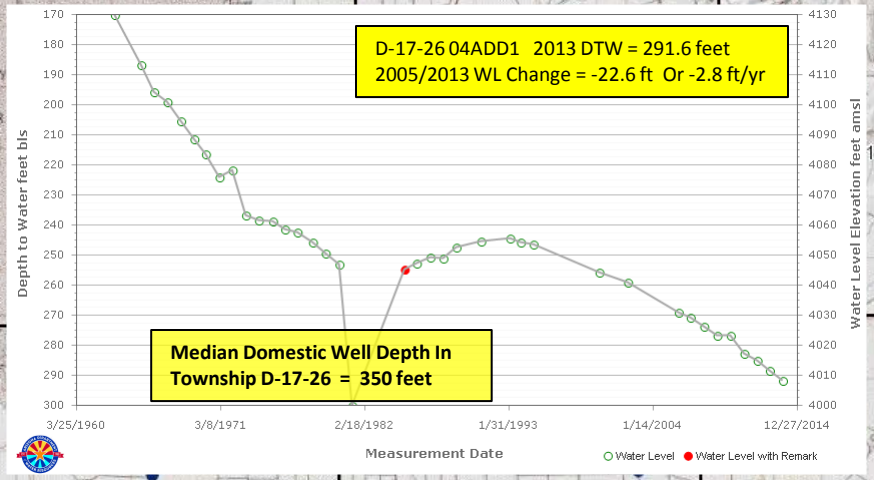
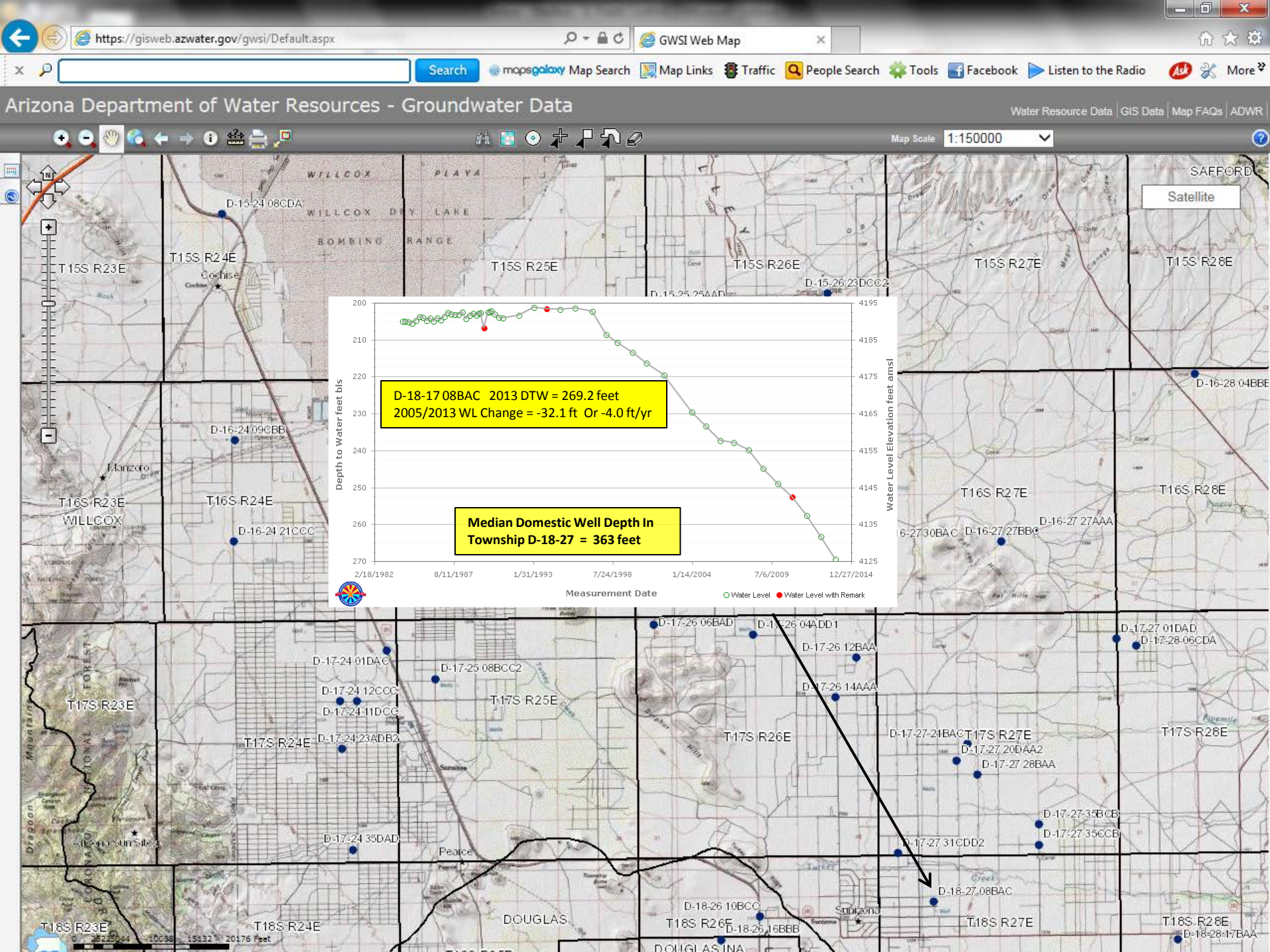
Satellite



D-15-24 08CDA
T15S R23E
T15S R24E
Cochise
WILLCOX
WILLCOX DRY
BOMBING
D-16-24 09CBB
Manzoro
T16S R23E
WILLCOX
T16S R24E
D-16-24 21CCC
T16S R25E
D-16-25 13CDD
T16S R26E
T16S R27E
T16S R28E
SAFFORD
T15S R27E
T15S R28E
D-16-28 04BBB
D-16-27 27AAA
D-16-27 27BBC
D-16-27 30BAC
D-16-25 36AAA
D-16-26 32AAA
D-17-26 06BAD
D-17-26 04ADD1
D-17-26 12BAA
D-17-26 14AAA
D-17-27 01DAD
D-17-28 06CDA
D-17-24 01DAC
D-17-25 08BCC2
D-17-24 12CCC
D-17-24 11DCC
T17S R23E
T17S R24E
D-17-24 23ADB2
T17S R25E
T17S R26E
D-17-27 21BAC
T17S R27E
D-17-27 20DAA2
D-17-27 28BAA
T17S R28E
D-17-27 35BCB
D-17-27 35CCB
D-17-27 31CDD2
D-17-24 35DAD
Pearce
D-18-27 08BAC
D-18-26 10BCC
D-18-26 16BBB
DOUGLAS
T18S R23E
T18S R24E
T18S R26E
T18S R27E
T18S R28E
D-18-28 17BAA
DOUGLAS INA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Satellite
D-18-17 08BAC 2013 DTW = 269.2 feet
2005/2013 WL Change = -32.1 ft Or -4.0 ft/yr
Median Domestic Well Depth In Township D-18-27 = 363 feet
Depth to Water feet bls
Water Level Elevation feet amsl
Measurement Date
2/18/1982
8/11/1987
1/31/1993
7/24/1998
1/14/2004
7/6/2009
12/27/2014
Water Level
Water Level with Remark
T15S R23E
T15S R24E
T15S R25E
T15S R26E
T15S R27E
T15S R28E
T16S R23E
T16S R24E
T16S R27E
T16S R28E
T17S R23E
T17S R24E
T17S R25E
T17S R26E
T17S R27E
T17S R28E
T18S R23E
T18S R24E
T18S R26E
T18S R27E
T18S R28E
WILLCOX
DOUGLAS
SAFFORD
Cochise
Manzoro
Pearce
Sunizona
D-15-24 08CDA
D-15-26 23DCC2
D-16-24 09CBB
D-16-24 21CCC
D-16-28 04BBB
D-16-27 27AAA
D-16-27 27BBC
D-17-26 06BAD
D-17-26 04ADD1
D-17-26 12BAA
D-17-26 14AAA
D-17-27 01DAD
D-17-28 06CDA
D-17-24 01DAC
D-17-25 08BCC2
D-17-24 12CCC
D-17-24 11DCC
D-17-24 23ADB2
D-17-24 35DAD
D-17-27 21BAC
D-17-27 20DAA2
D-17-27 28BAA
D-17-27 35BCB
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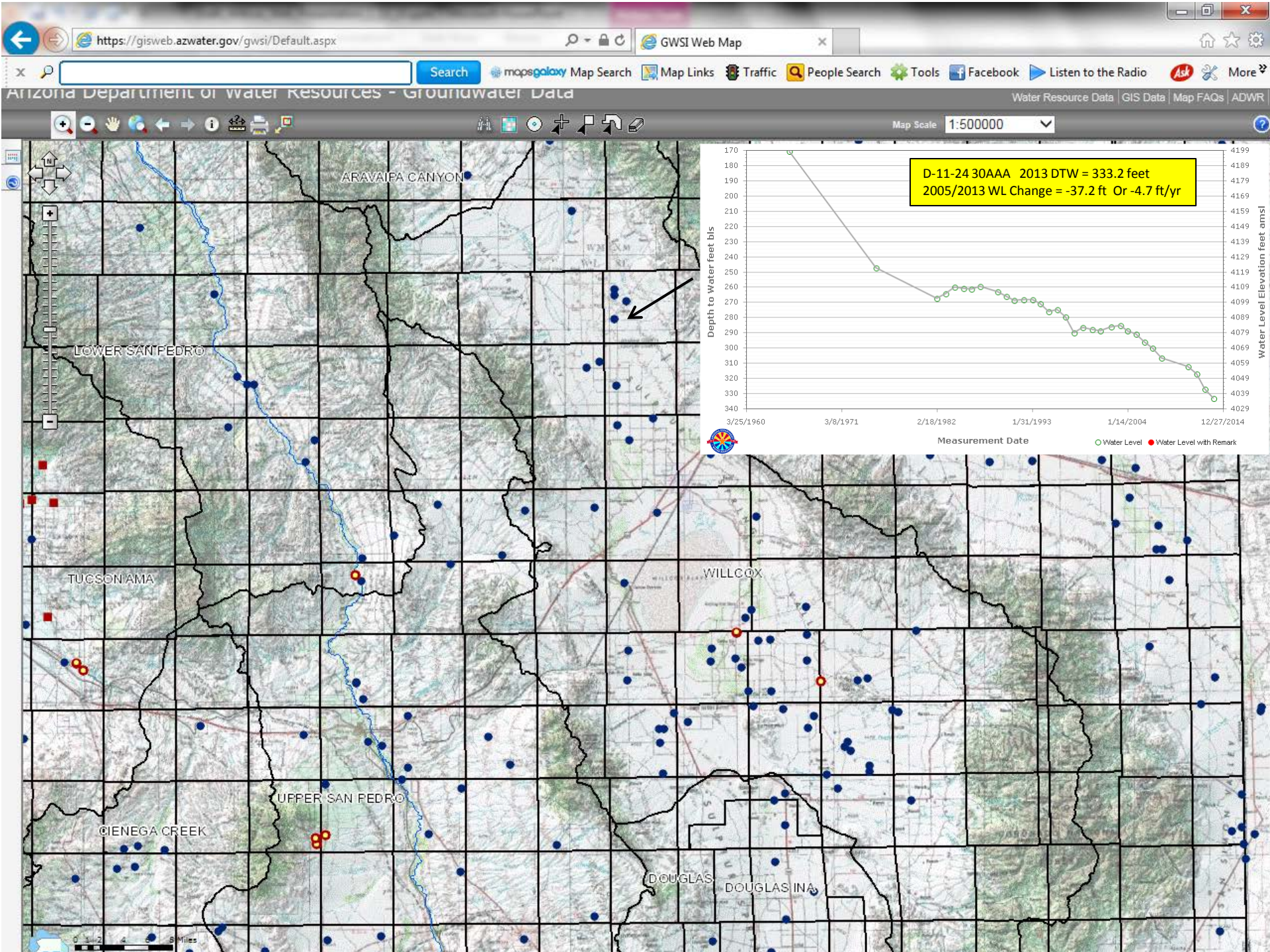
D-18-26 10BCC
D-18-26 16BBB
D-18-28 17BAA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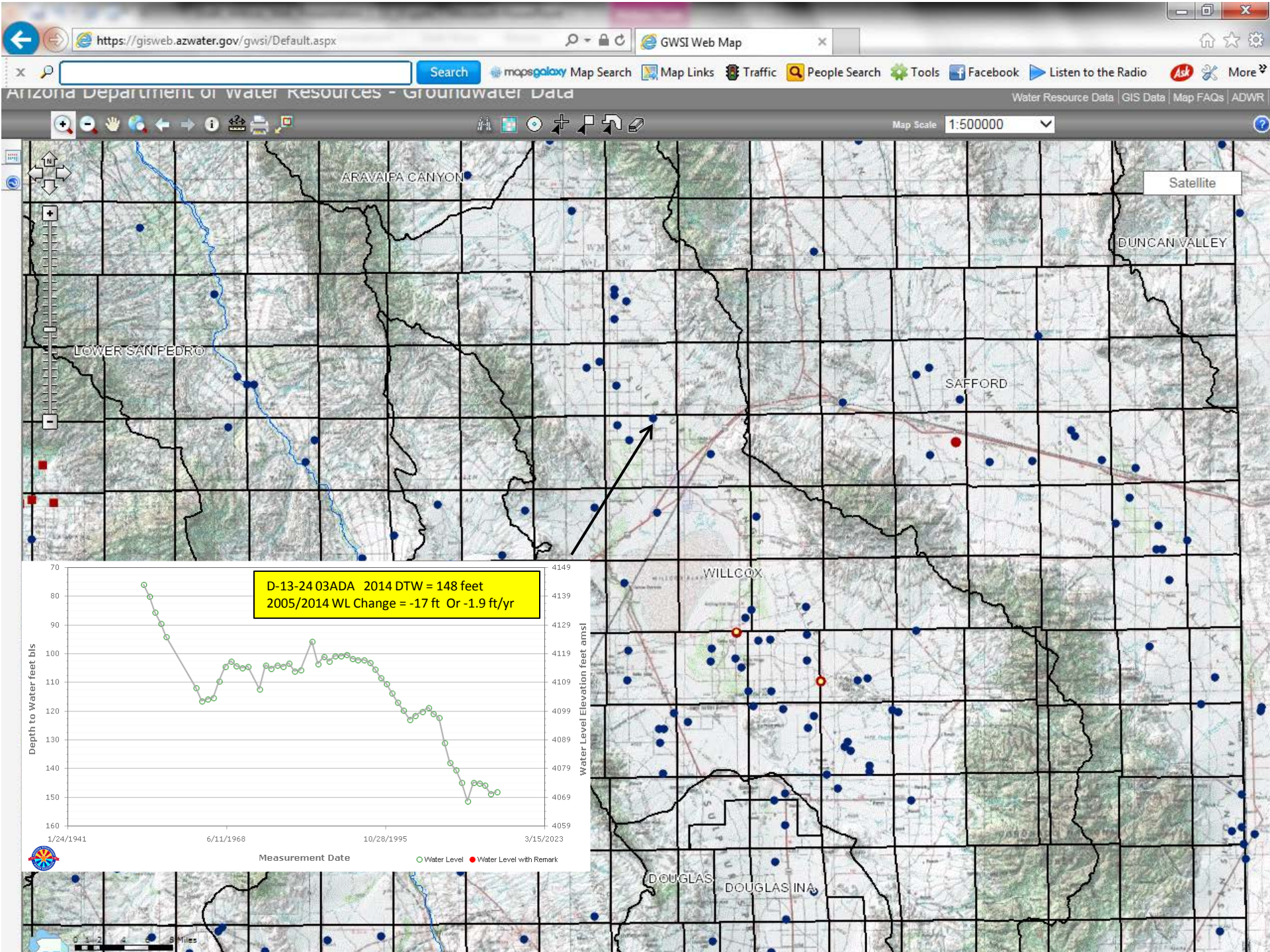
ARAVAIPA CANYON
LOWER SAN PEDRO
TUCSON AMA
WILLCOX
UPPER SAN PEDRO
CIENEGA CREEK
DOUGLAS
DOUGLAS INA
D-11-24 30AAA 2013 DTW = 333.2 feet
2005/2013 WL Change = -37.2 ft Or -4.7 ft/yr
Depth to Water feet bls
Water Level Elevation feet amsl
Measurement Date
3/25/1960
3/8/1971
2/18/1982
1/31/1993
1/14/2004
12/27/2014
Water Level
Water Level with Remark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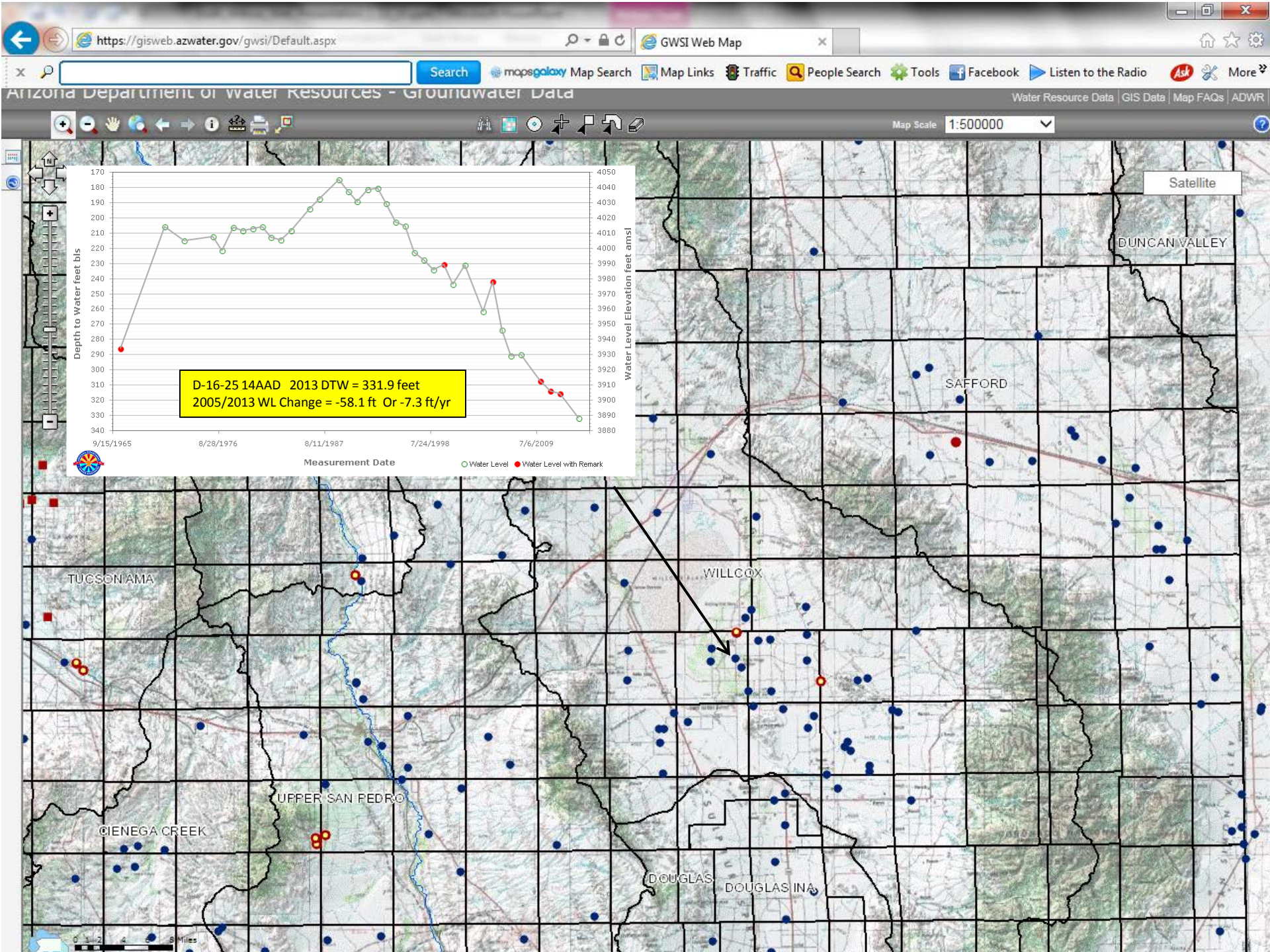
Satellite
ARAVAIPA CANYON
DUNCAN VALLEY
LOWER SAN PEDRO
SAFFORD
WILLCOX
DOUGLAS
DOUGLAS INA
D-13-24 03ADA 2014 DTW = 148 feet
2005/2014 WL Change = -17 ft Or -1.9 ft/yr
Depth to Water feet bls
Water Level Elevation feet amsl
Measurement Date
1/24/1941
6/11/1968
10/28/1995
3/15/2023
Water Level
Water Level with Remark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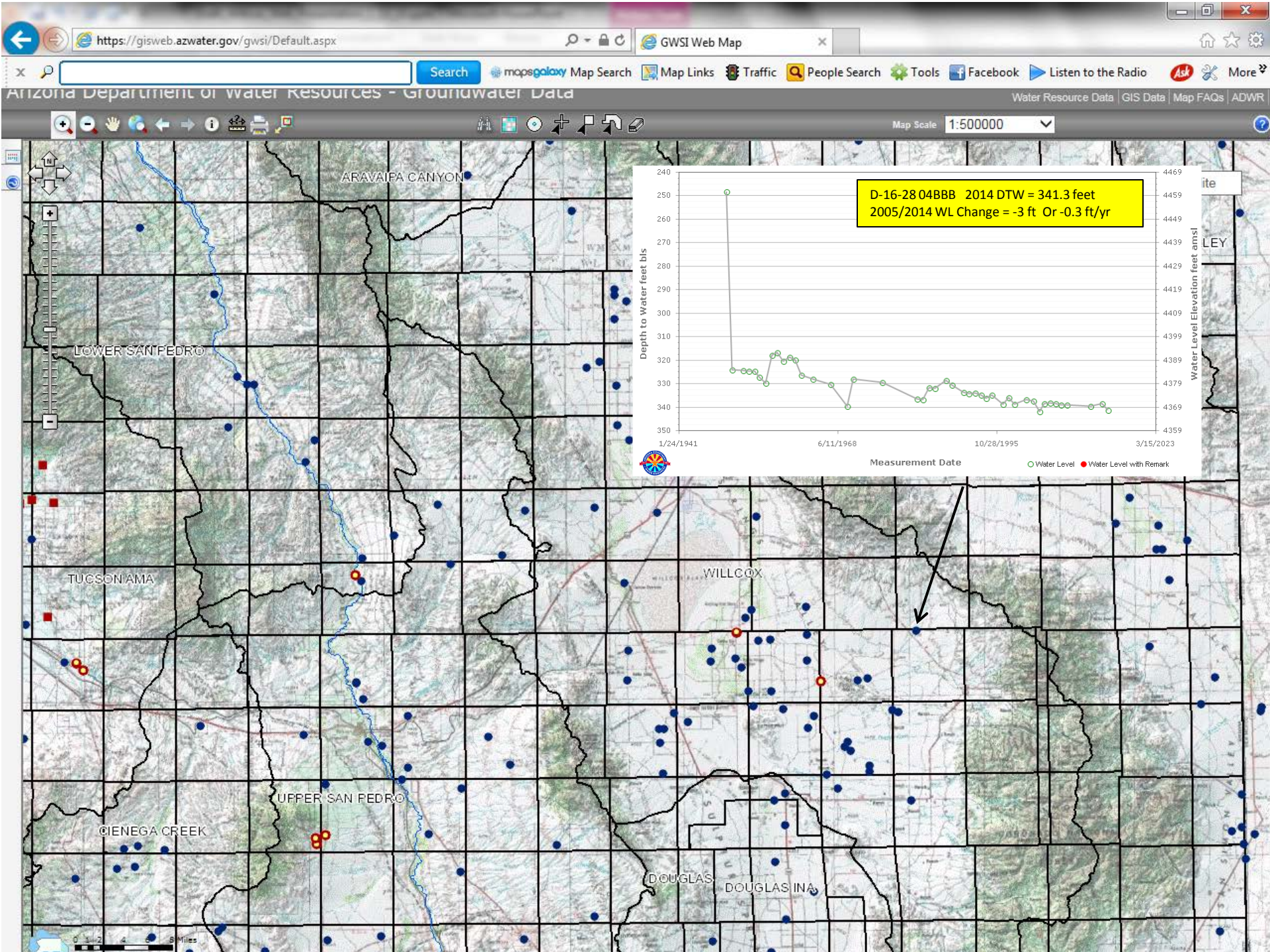
1:500000
Satellite
Depth to Water feet bls
Water Level Elevation feet amsl
D-16-25 14AAD 2013 DTW = 331.9 feet
2005/2013 WL Change = -58.1 ft Or -7.3 ft/yr
9/15/1965
8/28/1976
8/11/1987
7/24/1998
7/6/2009
Measurement Date
Water Level
Water Level with Remark
DUNCAN VALLEY
SAFFORD
WILLCOX
TUCSON AMA
UPPER SAN PEDRO
CIENEGA CREEK
DOUGLAS
DOUGLAS INA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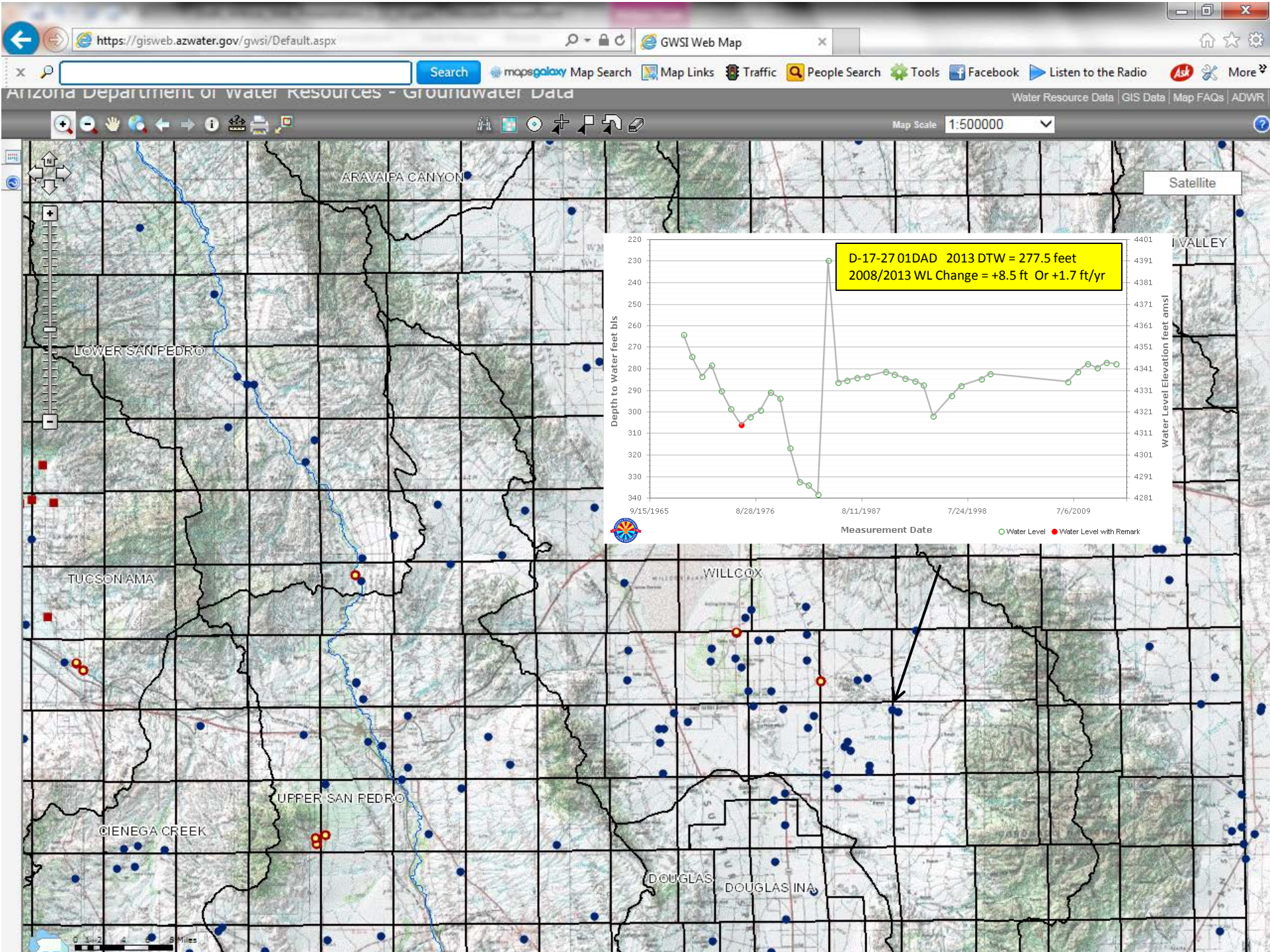
ARAVAIPA CANYON
LOWER SAN PEDRO
TUCSON AMA
WILLCOX
UPPER SAN PEDRO
CIENEGA CREEK
DOUGLAS
DOUGLAS INA
D-16-28 04BBB 2014 DTW = 341.3 feet
2005/2014 WL Change = -3 ft Or -0.3 ft/yr
Depth to Water feet bls
Water Level Elevation feet amsl
1/24/1941
6/11/1968
10/28/1995
3/15/2023
Measurement Date
Water Level
Water Level with Remark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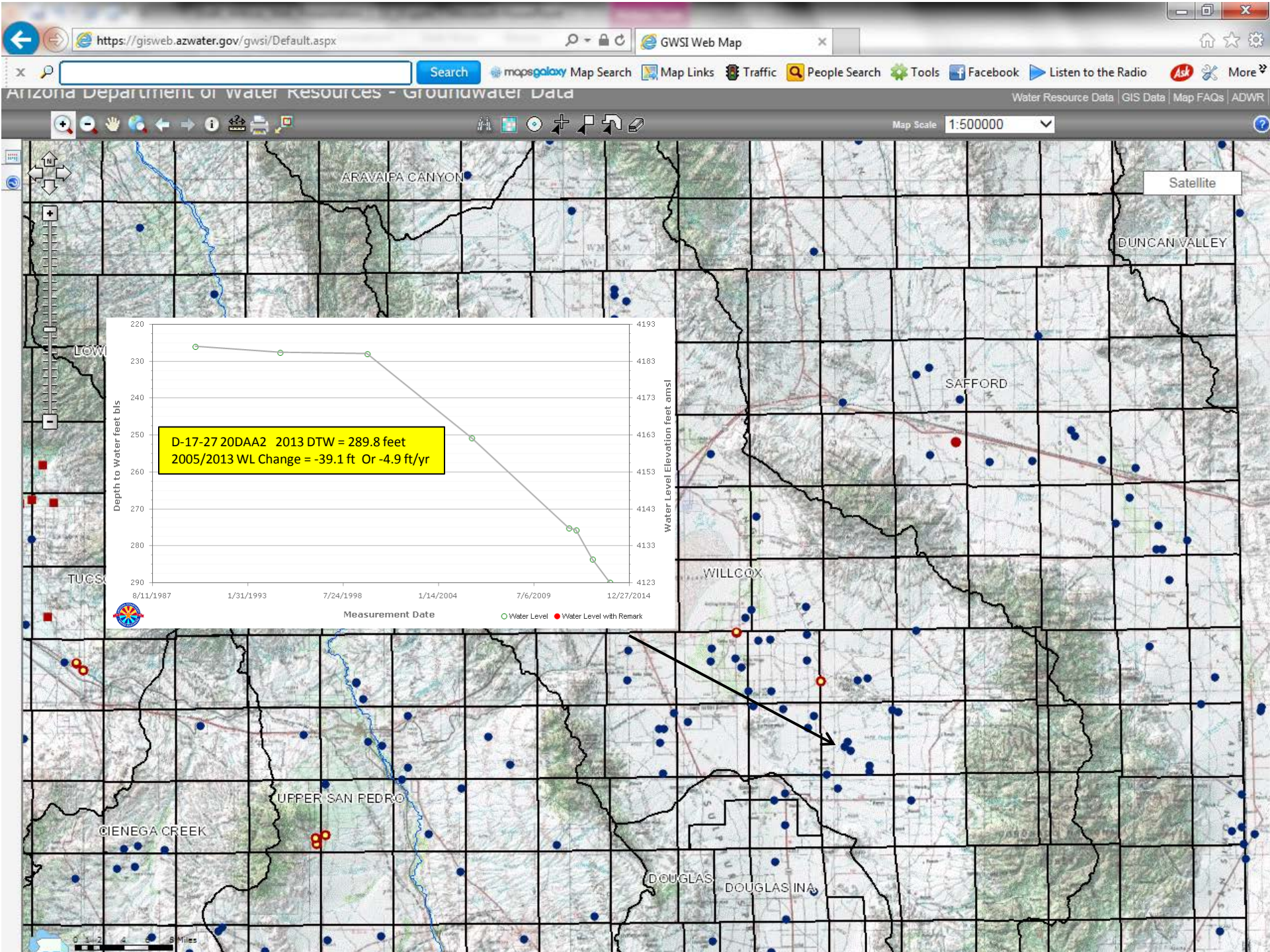
1:500000
Satellite
ARAVAIPA CANYON
LOWER SAN PEDRO
TUCSON AMA
WILLCOX
UPPER SAN PEDRO
CIENEGA CREEK
DOUGLAS
DOUGLAS INA
D-17-27 01DAD 2013 DTW = 277.5 feet
2008/2013 WL Change = +8.5 ft Or +1.7 ft/yr
Depth to Water feet bls
Water Level Elevation feet amsl
Measurement Date
9/15/1965
8/28/1976
8/11/1987
7/24/1998
7/6/2009
Water Level
Water Level with Remark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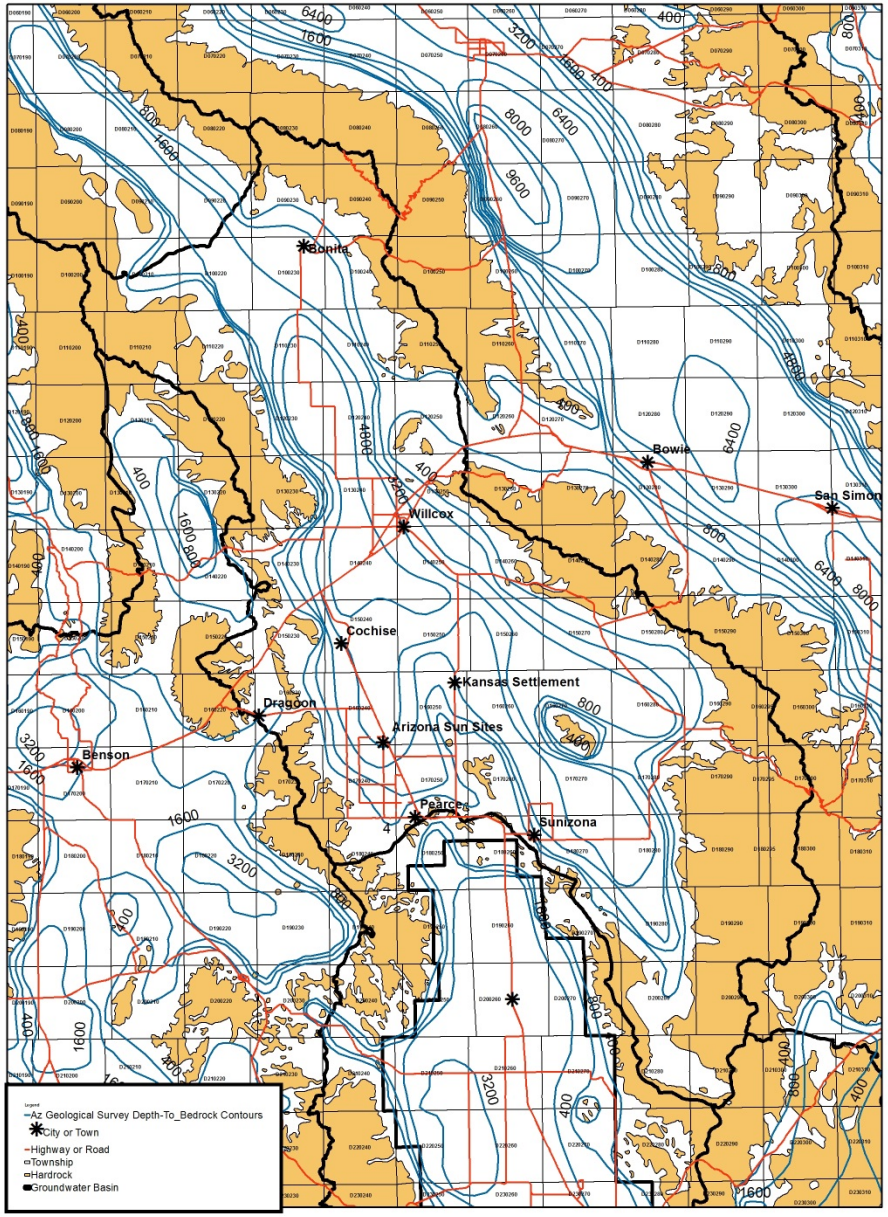
DUNCAN VALLEY
SAFFORD
WILLCOX
UPPER SAN PEDRO
CIENEGA CREEK
DOUGLAS
DOUGLAS INA
D-17-27 20DAA2 2013 DTW = 289.8 feet
2005/2013 WL Change = -39.1 ft Or -4.9 ft/yr
Depth to Water feet bls
Water Level Elevation feet amsl
Measurement Date
8/11/1987
1/31/1993
7/24/1998
1/14/2004
7/6/2009
12/27/2014
Water Level
Water Level with Remark

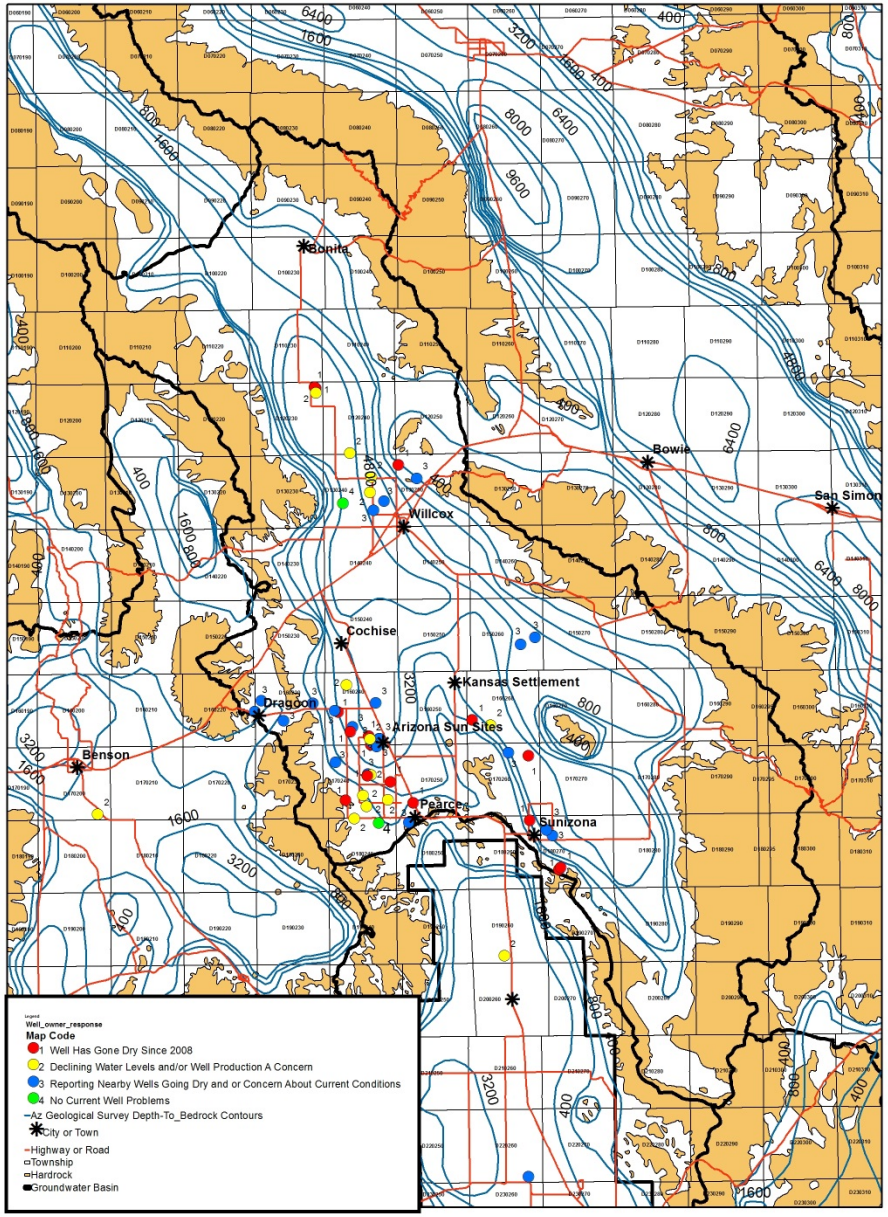
Arizona Geological Survey Depth-to-Bedrock In Willcox Basin



0 3 6 12 18 24 Miles

N

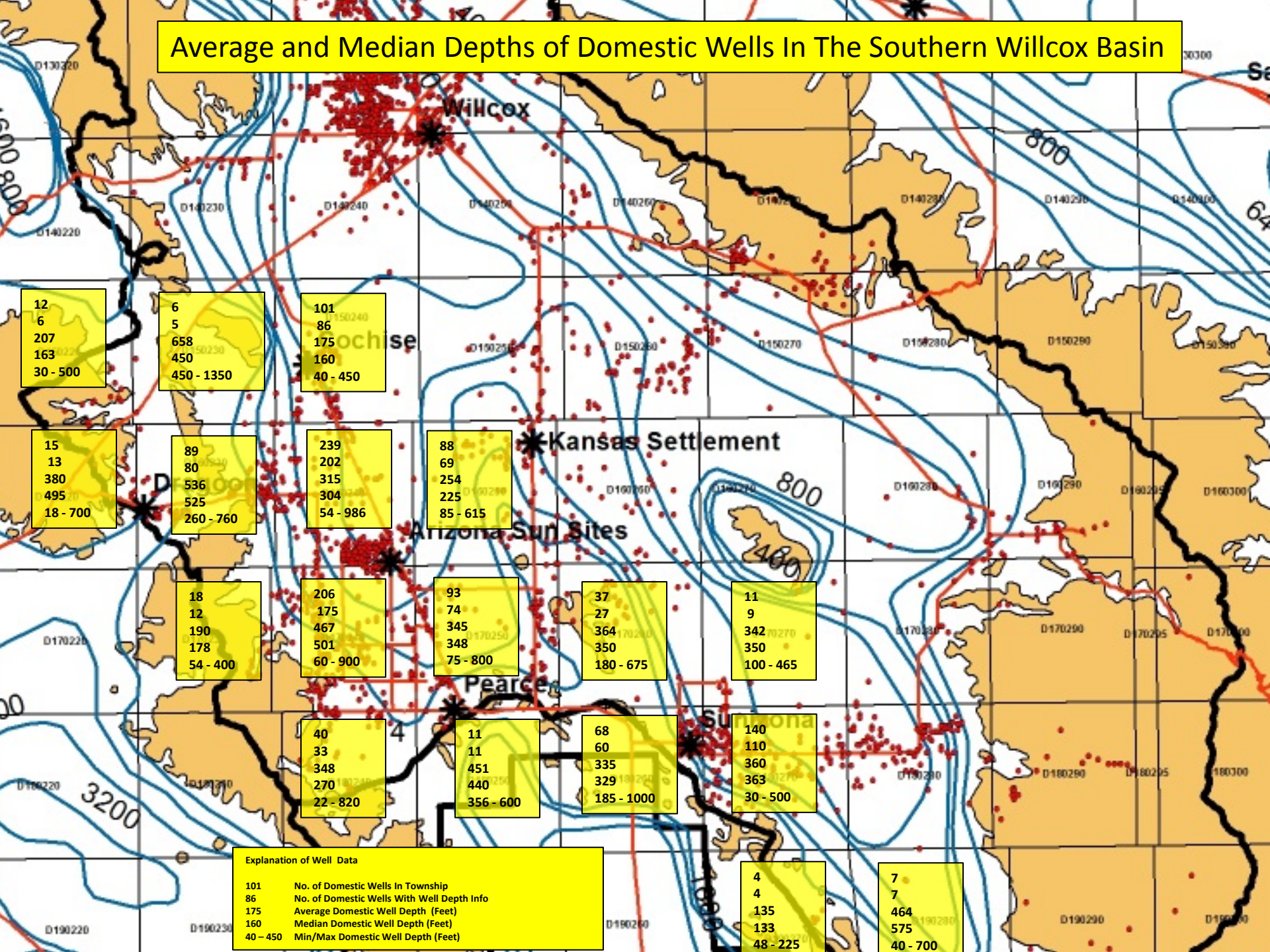
Arizona Geological Survey Depth-to-Bedrock With Well Survey Responses In Willcox Basin (1/2/2015)



0 3 6 12 18 24 Miles

N

Average and Median Depths of Domestic Wells In The Southern Willcox Basin



Typical Types of Lithologic Descriptions From Driller’s Logs In SW Portion of Willcox Basin

- Clay, Gravel, Sand, Boulders(variable frequency of layers with most emphasis on clay)
- Conglomerate, Clay Conglomerate, Cemented Conglomerate
- Volcanics (Rhyolite & Basalt)
- Decomposed Granite
- Granite
- Limestone, Shale, Skarn
- Schist
- Rock
- Fractured Rock

QUESTIONS ?