

COUNCIL DECISION REQUEST

SUBJECT: Croy, Willson, and Riesdorf water supply wells

MEETING DATE: 6/7/2007

CSP ITEM: Yes No KRA#

ITEM NO.:

TENTATIVE SCHEDULE: n/a

SUBMITTED BY: Michael Ploughe

AMOUNT BUDGETED: n/a

SUBMITTAL TO AGENDA

EXPENDITURE REQUIRED: n/a

APPROVED BY TOWN MANAGER

CONT. FUNDING REQUIRED: n/a

_____ 

EXHIBITS (If Applicable, To Be Attached): "Well testing results and status of the Croy, Willson, and Reisdorf wells". Memo from Michael Ploughe to Mr. Walker and Mr. Carpenter, Dated May 14th, 2007.

RECOMMENDED MOTION: I MOVE TO ACCEPT.....

The "Well testing results and status of the Croy, Willson, and Reisdorf wells". Memo from Michael Ploughe to Mr. Walker and Mr. Carpenter, Dated May 14th, 2007.

SUMMARY OF THE BASIS FOR RECOMMENDED MOTION: In fulfillment of Council direction per Resolution No.2266 of April 5th, 2007, the water department has completed an assessment of the status of yield of the Croy, Willson, and Riesdorf domestic water supply wells.

PROS: The Council may now consider the domestic water supply wells of Croy, Willson, and Reisdorf in their current status relative to the further consideration of Resolution No.2250.

CONS: none

PUBLIC INPUT (if any):

BOARD/COMMITTEE/COMMISSION ACTIONS/RECOMMENDATIONS (if any) (give dates and attach minutes):

JUN 07 2007 H.3



Water Department

Inter Office Memo

303 N. Beeline Highway
Payson, AZ 85541
Phone (928) 474-5242
Fax (928) 474-7052

5/14/07

To: Buzz Walker, Public works Director
Fred Carpenter, Town Manager

From: Michael Ploughe P.G., Hydrogeologist

RE: Well testing results and status of the Croy, Willson, and Reisdorf wells

From May 2nd to May 4th, 2007 the Croy, Willson, and Reisdorf wells were inspected and tested to determine their status as domestic water supply wells. The following findings relative to each wells status is presented as follows:

Croy Well

- The Croy well is only capable of producing between ½ to 1 gallon per minute or 720 to 1440 gallons per day maximum.
- The well is currently not equipped to produce at the above rate via equipment or its constructed depth (180ft.).
- The well is not a reliable source in its current configuration.

Willson well

- The Willson well is a 200ft. deep well which, currently, appears to be capable of 10-15 gallons per minute or 1,440 to 21,600 gallons per day maximum.
- The well has been turned off for over a year and appears to have recovered. This “false” recovery is not expected to last should the well be put back into regular service.
- It is highly unlikely that the well could be considered reliable in either the short or long-term, given the status of the nearby Croy and Reisdorf wells.
- The well is not a long-term reliable source in its current configuration.

Reisdorf Well

- The Reisdorf well is a 200ft. deep well that is currently an active domestic water supply well, as opposed to the Croy and Willson wells, which are inactive.
- The well appears to be capable of 2 gallons per minute or 2,880 gallons per day. However, the well is not equipped for such operation.
- Following consistent use, a single episode of persistent high demand will cause the well to fail. This condition was observed during testing.
- The well is not a long-term reliable source in its current configuration.

Based on groundwater elevation (depth to water) trends in the vicinity of these wells the long-term status of the wells can be considered. It can be concluded that even though water levels are approaching stabilization, the stabilization depth is approximately 185ft. or an elevation of 4,814ft/amsl (average) and will not provide adequate available drawdown for reliable operation at either the Willson or Reisdorf well. The Croy well is only 180ft. deep.

Data tables attached.

Well Testing Data

Well Name: Croy Well
ADWR 55# 534542

Well Depth: 180.0
Current Static Depth to Water: 163.3 as of 5/2/07
Original Static Depth to Water: 105.0 as of 7/92
Change Since Installation of Well: **-58.3**

Date/Time	Time Elapsed Total (min)	Time Elapsed (min) Pumping	Time Since Pumping Recovery (min)	Depth to Water (ft)	Drawdown (ft)	Pumping Rate (gpm)	Notes
5/2/2007							
1230		0		163.3			Static DTW
1231	1	1		175	11.7	15	Flow via 5 gal. bucket and stopwatch
1232	2	2		175.5	12.2	1	Well cavitation - water level is at intake
	3		1	170	6.7		Attempts to maintain 1gpm failed.
	5		2	169.2	5.9		Turned well off.
	6		3	168.78	5.48		
	7		4	168.35	5.05		
	8		5	167.93	4.63		
	9		6	167.6	4.3		
	10		7	167.3	4		
	12		9	166.8	3.5		
	13		10	166.53	3.23		
	15.5		12.5	166	2.7		
	17		14	165.7	2.4		
	19		16	165.36	2.06		
	21		18	165.2	1.9		
	24		21	164.72	1.42		
	26		23	164.5	1.2		
	28		25	164.32	1.02		
	33		30	164	0.7		
1303	36		33	163.88	0.58		

Findings:

Since the installation of the well in 1992, water levels have been in decline

The well appears to be capable of no more than 1gpm and is not equipped for such operation.

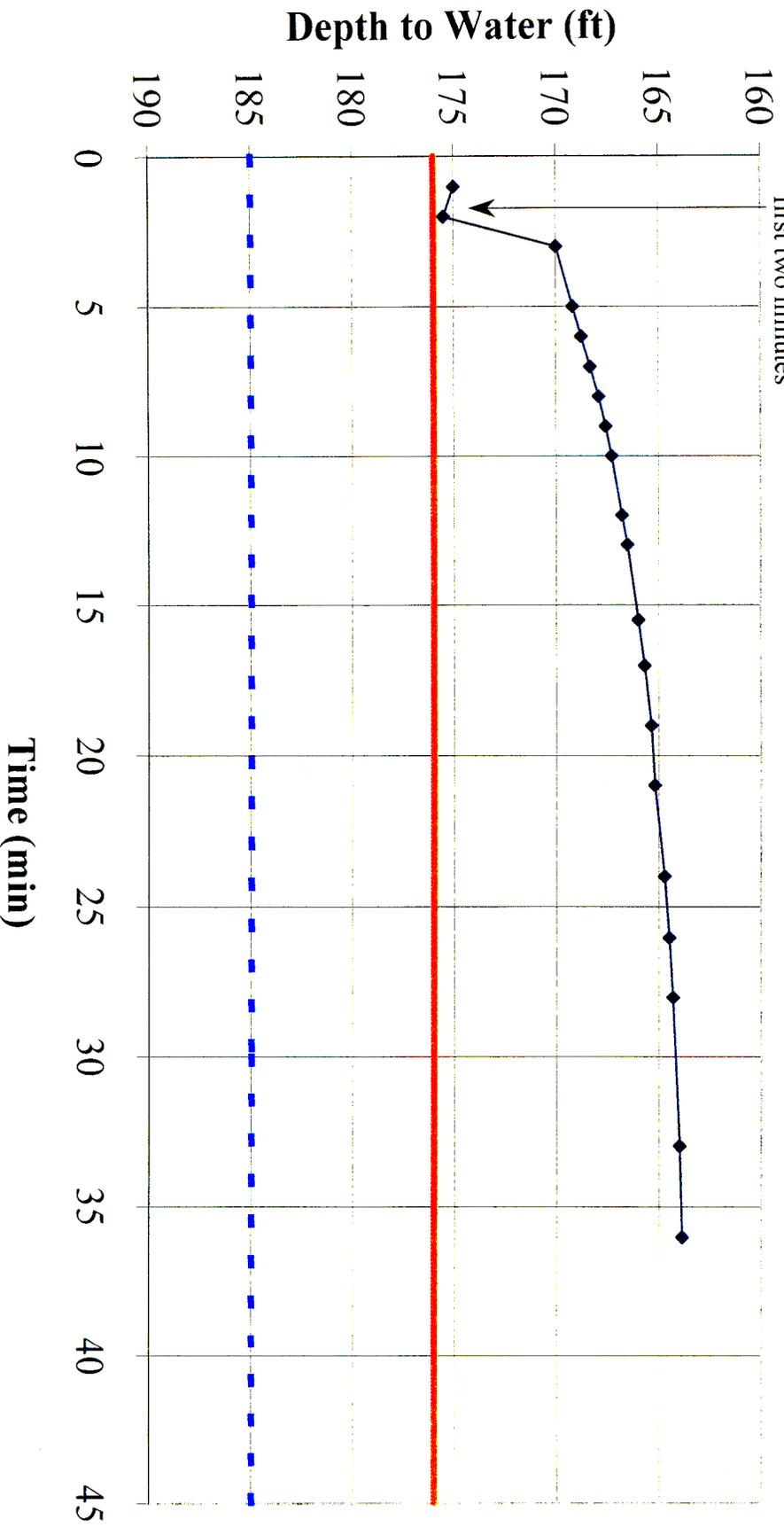
Water level data reviewed in support of this effort indicate levels should be approaching stabilization. However, the dept to water upon reaching this stabilization point at approximately 185ft. or 4,814ft/msl is expected to be slightly below the current well depth.

This well is not a reliable source in its current configuration.

Water Level Trends at the Croy Well

Pumping Test 5/2/07

Pumped to the intake in the first two minutes



—◆— DTW — Intake - - - Long-Term DTW Average

Well Testing Data

Well Name: Willson Well
ADWR 55# 549899

Well Depth: 200.0
Current Static Depth to Water: 169.6 as of 5/3/07
Original Static Depth to Water: 112.0 as of 8/95
Change Since Installation of Well: **-57.6**

Date/Time	Time Elapsed Total (min)	Time Elapsed (min) Pumping	Time Since Pumping Recovery (min)	Depth to Water (ft)	Drawdown (ft)	Pumping Rate (gpm)	Notes
5/3/2007							
915		0		169.62			Static DTW
	1	1		171.1	1.48		
	3	3		175.1	5.48	12	Flow via 5 gal. bucket and stopwatch
	4	4		177.1	7.48		
	5	5		178.3	8.68		
	6	6		178.9	9.28		some red silt and sand
	7	7		179.2	9.58		
	9	9		179.8	10.18		Notable increase in silt and sand
	10	10		179.75	10.13		Borehole storage removed and or
	12	12		179.75	10.13	12	source of sediment.
	13	13		179.8	10.18		
	16	16		180.21	10.59		sediment decreases
	18	18		180.5	10.88		
	20	20		180.75	11.13		
	22	22		180.92	11.3		
	24	24		181.1	11.48	12	
	26	26		181.1	11.48		
	28	28		181.1	11.48		
945	30	30		181.15	11.53	11	
	35	35		181.35	11.73		
	40	40		181.4	11.78	11	
	45	45		181.43	11.81		
	50	50		181.6	11.98		
	55	55		181.69	12.07	11	
1015	60	60		181.72	12.1		
	61		1	173.3	3.68		
	62		2	171.05	1.43		
	63		3	170.56	0.94		
	64		4	170.4	0.78		
	65		5	170.2	0.58		
	66		6	170.1	0.48		
	67		7	170.08	0.46		
	68		8	170	0.38		
	69		9	169.98	0.36		
1025	70		10	169.97	0.35		
	72		12	169.9	0.28		
	74		14	169.87	0.25		
	76		16	169.8	0.18		
	78		18	169.8	0.18		
	80		20	169.8	0.18		
	85		25	169.8	0.18		
1050	95		35	169.71	0.09		
1100	105		45	169.71	0.09		

Findings:

Since the installation of the well in 1995, water levels have been in decline.

The well appears to be capable of 15gpm. However, the well has not been in use for over a year.

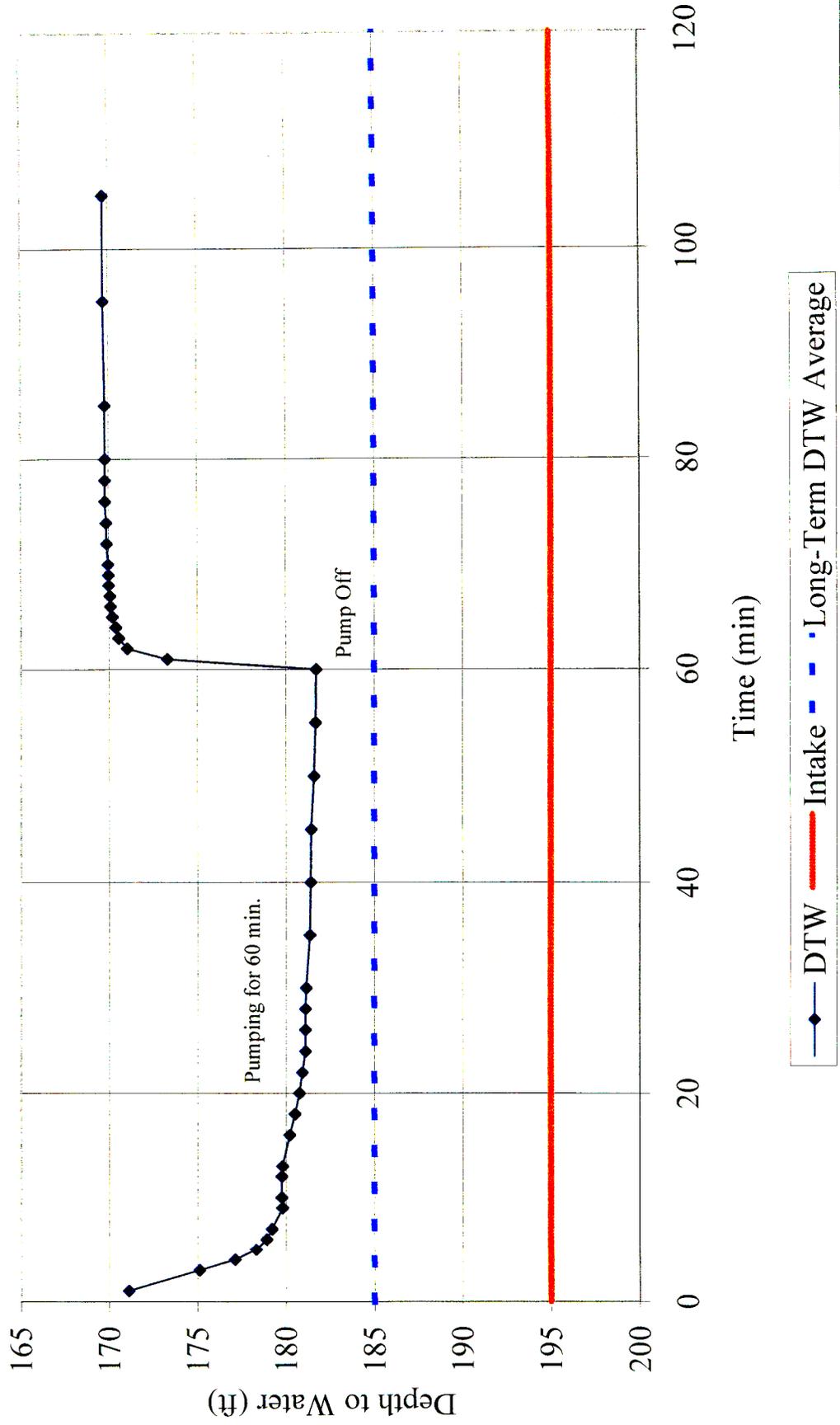
This fact appears to be the only reason for the wells performance when considered in light of the condition of adjacent wells of similar construction and depth.

At present, the well appears to be capable. Yet, short-term reliability is in question, given the surrounding situation.

Following consistent use, a single episode of persistent high demand would likely cause the well to fail.

Water level data reviewed in support of this effort indicate levels should be approaching stabilization. However, the depth to water upon reaching this stabilization point (~4,814ft (amsl)) is anticipated to be just 15 feet above the wells current depth of completion. This would not provide adequate available drawdown for operation.

Depth to Water Trends at Willson Well Pumping Test 5/3/07



Well Testing Data

Well Name: Reisdorf Well
ADWR 55# 551278

Well Depth: 200.0
Current Static Depth to Water: 166.2 as of 5/4/07
Original Static Depth to Water: 108.0 as of 8/95
Change Since Installation of Well: **-58.2**

Tank manifold prevents isolation of pump from tank. Therefore, the well is permitted to cycle on off.

Date/Time	Time Elapsed Total (min)	Time Elapsed (min) Pumping (on/off cycle)	Time Since Pumping Recovery (min)	Depth to Water (ft)	Drawdown (ft)	Pumping Rate (gpm)	Notes
5/4/2007							
915		0		166.2			Static DTW
	1	1			sounder	12	Flow via 5 gal. bucket and stopwatch
	2	2			stuck		Press. switch cycles well off after 3
	3	3					minutes and sounder was briefly snagged
	4	4		172.8	6.6		
	5	5		170.4	4.2		
	6	6		169.3	3.1		
	7	7		171.4	5.2	12	Well turns on again
	8	8		177.42	11.22		
	9	9		182.77	16.57		
	10	10		186.45	20.25	12	
	11	11		190.36	24.16		
	12	12		194.6	28.4		Called for well turn-off
	15	15		195	28.8	12	Well begins to cavitate
	16	16		194	27.8		Well turns off
	18	18	2	184	17.8		
	19	19	3	181.1	14.9		
	20	20	4	175	sounder stuck		estimated drw
	25	25	9	169.8	3.6		
	26	26	10	169	2.8		
	28	28	12	167.8	1.6		Called for well turn-on at 5gpm
	31	31	15	167	0.8		
	32	32		166.7	0.5		
	33	33		174.3	8.1	5	Well on
	34	34		180.2	14		
	35	35		184.05	17.85	5	
	36	36		173.3	7.1		
	37.25	37.25		188.3	22.1		Well off
	38	38	1	184.4	18.2		
	39	39	2	181	14.8		
	40	40	3	178.2	12		
	41	41		182.5	16.3		Well on
	42	42		186.7	20.5	5	
	43	43		189.8	23.6		Called for well turn-off
	44	44		192.7	26.5	5	Well off
1000	45	45	1	188.15	21.95		
	46	46	2	184.4	18.2		
	47	47	3	180.8	14.6		
	48	48	4	177.9	11.7		
	49	49	5	175.75	9.55		
1005	50	50	6	172	5.8		
	51	51	7	170.7	4.5		
	52	52	8	169.5	3.3		
	54	54	10	168.15	1.95		
	56	56	12	167.1	0.9		

Findings:

Since the installation of the well in 1995, water levels have been in decline. The well appears to be capable of 2 gpm but is not equipped for such a production rate.

Short-term reliability is in question, given the surrounding situation. Following normal use, a single episode of persistent high demand would certainly cause the well to fail.

Water level data reviewed in support of this effort indicate levels should be approaching stabilization. However, the depth to water upon reaching this stabilization point (-4,814ft. (amsl)) is anticipated to be just 15 feet above the wells current depth of completion. This would not provide adequate available drawdown for operation.

Depth to Water Trends at Reisdorf Well Pumping Test 5/4/07

