Appendix G - Average Model Flows through PRSs under MDD2030 Conditions.

Average Flow by PRS

PRS	gpm	mgd
1	0	0.0
2	3,132	4.5
3	399	0.6
4	3,604	5.2
5	2,371	3.4
6	29	0.0
7	6,078	8.8
8	1,705	2.5
9	1,855	2.7
10	2,912	4.2
11	4,287	6.2
12	1,239	1.8
13	1,491	2.1
14	n/a	n/a
15	0	0.0
16	2,811	4.0
17	2,875	4.1
18	5,982	8.6
19	0	0.0
AV1	1,500	2.2
AV2	2,300	3.3
AV-3	2,280	3.3
AV-4	4,180	6.0

From 1348 to 1212

PRS	Flow (gpm)	Flow (mgd)
15	0	0.0
Total	***0.0***	***0.0***

From 1212 to 1074

PRS	Flow (gpm)	Flow (mgd)
6	29	0.0
9	1,855	2.7
10	2,912	4.2
11	4,287	6.2
12	1,239	1.8
Total	***10,323***	***14.9***

From 1212 to 1010

PRS	Flow (gpm)	Flow (mgd)
7	6,078	8.8
8	1,705	2.5
13	1,491	2.1
AV-1	1,500	2.2
Total	***10,774***	***15.5***

From 1074 to 1010

PRS	Flow (gpm)	Flow (mgd)
1	0	0.0
2	3,132	4.5
3	399	0.6
4	3,604	5.2
5	2,371	3.4
AV2	2,300	3.3
Total	***11,806***	***17.0***

From 1212 to 925

PRS	Flow (gpm)	Flow (mgd)
19	0	0.0
AV-3	2,280	3.3
Total	***2,280.0***	***3.3***

From 1212 to 925

PRS	Flow (gpm)	Flow (mgd)
AV-4	4,180	6.0
Total	***4,180***	***6.0***

From 1010 to 925

PRS	Flow (gpm)	Flow (mgd)
16	2,811	4.0
17	2,875	4.1
18	5,982	8.6
Total	***11,669***	***16.8***

Future System Water Supply Analysis

Groundwater Supplies only - With System Improvements (ADD)

Year	ZONE	Maximum Day Demand (mgd)	Source of Water Supply (mgd)				Total Supply	Zone Balance	Transfer of Water between Zones [2],[3]					Excess Supply
			Wells	WFA[1]	CDA-1	CDA-2			1348'	1212'	1074'	1010'	925'	
2010	1348' Zone	4.8	3.6	0.0	0.0	0.0	3.6	-1.2		1.2				0.0
	1212' Zone	18.0	43.2	0.0	0.0	3.5	46.7	28.7	-1.2		-15.1	-12.4		0.0
	1074' Zone	8.6	24.8	0.0	0.0	0.0	24.8	16.2		15.1		-31.3		0.0
	1010' Zone	9.2	9.0	0.0	1.5	0.0	10.5	1.3		12.4	31.3		-45.0	0.0
	925' Zone	5.7	10.8	0.0	0.0	0.0	10.8	5.1				45.0		50.2
	Total	**46.4**	**91.5**	**0.0**	**1.5**	**3.5**	**96.5**	**50.2**	**-1.2**	**28.7**	**16.2**	**1.3**	**-45.0**	**50.2**
2015	1348' Zone	4.8	3.6	0.0	0.0	0.0	3.6	-1.2		1.2				0.0
	1212' Zone	18.7	43.2	0.0	0.0	0.0	43.2	24.5	-1.2		-12.8	-10.5		0.0
	1074' Zone	8.8	24.8	0.0	0.0	0.0	24.8	16.0		12.8		-28.8		0.0
	1010' Zone	10.0	9.0	0.0	1.5	0.0	10.5	0.5		10.5	28.8		-39.8	0.0
	925' Zone	8.0	10.8	0.0	0.0	3.5	14.3	6.3				39.8		46.1
	Total	**50.4**	**91.5**	**0.0**	**1.5**	**3.5**	**96.5**	**46.1**	**-1.2**	**24.5**	**16.0**	**0.5**	**-39.8**	**46.1**
2020	1348' Zone	4.8	3.6	0.0	0.0	0.0	3.6	-1.2		1.2				0.0
	1212' Zone	19.2	43.2	0.0	0.0	0.0	43.2	24.1	-1.2		-12.5	-10.3		0.0
	1074' Zone	9.0	24.8	0.0	0.0	0.0	24.8	15.8		12.5		-28.3		0.0
	1010' Zone	11.1	9.0	0.0	1.5	0.0	10.5	-0.6		10.3	28.3		-38.1	0.0
	925' Zone	12.3	14.4	0.0	0.0	3.5	17.9	5.6				38.1		43.7
	Total	**56.4**	**95.1**	**0.0**	**1.5**	**3.5**	**100.1**	**43.7**	**-1.2**	**24.1**	**15.8**	**-0.6**	**-38.1**	**43.7**
2030	1348' Zone	4.9	3.6	0.0	0.0	0.0	3.6	-1.3		1.3				0.0
	1212' Zone	20.3	43.2	0.0	0.0	0.0	43.2	22.9	-1.3		-11.8	-9.8		0.0
	1074' Zone	9.4	24.8	0.0	0.0	0.0	24.8	15.5		11.8		-27.3		0.0
	1010' Zone	13.3	9.0	0.0	1.5	0.0	10.5	-2.8		9.8	27.3		-34.3	0.0
	925' Zone	21.0	28.8	0.0	0.0	3.5	32.3	11.3				34.3		45.6
	Total	**68.9**	**109.5**	**0.0**	**1.5**	**3.5**	**114.5**	**45.6**	**-1.3**	**22.9**	**15.5**	**-2.8**	**-34.3**	**45.6**

(1) WFA is assumed to be out of service for this analysis

(2) Water Transfer between Pressure Zones (minus = water leaving the zone, plus = water is added to the zone)

(3) Zone transfers - 1212' to 1010' = 45%, 1212' to 1074' = 55% based on equivalent diameters of the PRVs

Future System Water Supply Analysis

Groundwater Supplies only - With System Improvements (MDD)

Year	ZONE	Maximum Day Demand (mgd)	Source of Water Supply (mgd)				Total Supply	Zone Balance	Transfer of Water between Zones [2],[3]					Excess Supply
			Wells	WFA[1]	CDA-1	CDA-2			1348'	1212'	1074'	1010'	925'	
2010	1348' Zone	7.6	3.6	0.0	0.0	0.0	3.6	-4.0		4.0				0.0
	1212' Zone	31.0	43.2	0.0	0.0	3.5	46.7	15.8	-4.0		-6.4	-5.3		0.0
	1074' Zone	15.1	24.8	0.0	0.0	0.0	24.8	9.7		6.4		-16.2		0.0
	1010' Zone	15.4	9.0	0.0	1.5	0.0	10.5	-4.9		5.3	16.2		-16.6	0.0
	925' Zone	9.1	10.8	0.0	0.0	0.0	10.8	1.7				16.6		18.3
	Total	**78.2**	**91.5**	**0.0**	**1.5**	**3.5**	**96.5**	**18.3**	**-4.0**	**15.8**	**9.7**	**-4.9**	**-16.6**	**18.3**
2015	1348' Zone	7.7	3.6	0.0	0.0	0.0	3.6	-4.1		4.1				0.0
	1212' Zone	32.0	43.2	0.0	0.0	0.0	43.2	11.2	-4.1		-3.9	-3.2		0.0
	1074' Zone	15.4	24.8	0.0	0.0	0.0	24.8	9.4		3.9		-13.4		0.0
	1010' Zone	16.7	9.0	0.0	1.5	0.0	10.5	-6.2		3.2	13.4		-10.4	0.0
	925' Zone	12.9	10.8	0.0	0.0	3.5	14.3	1.4				10.4		11.8
	Total	**84.7**	**91.5**	**0.0**	**1.5**	**3.5**	**96.5**	**11.8**	**-4.1**	**11.2**	**9.4**	**-6.2**	**-10.4**	**11.8**
2020	1348' Zone	7.7	3.6	0.0	0.0	0.0	3.6	-4.1		4.1				0.0
	1212' Zone	32.7	43.2	0.0	0.0	0.0	43.2	10.5	-4.1		-3.5	-2.9		0.0
	1074' Zone	15.6	24.8	0.0	0.0	0.0	24.8	9.2		3.5		-12.7		0.0
	1010' Zone	18.3	9.0	0.0	1.5	0.0	10.5	-7.8		2.9	12.7		-7.8	0.0
	925' Zone	19.3	14.4	0.0	0.0	3.5	17.9	-1.4				7.8		6.4
	Total	**93.7**	**95.1**	**0.0**	**1.5**	**3.5**	**100.1**	**6.4**	**-4.1**	**10.5**	**9.2**	**-7.8**	**-7.8**	**6.4**
2030	1348' Zone	7.8	3.6	0.0	0.0	0.0	3.6	-4.2		4.2				0.0
	1212' Zone	34.5	43.2	0.0	0.0	0.0	43.2	8.8	-4.2		-2.5	-2.1		0.0
	1074' Zone	16.2	24.8	0.0	0.0	0.0	24.8	8.7		2.5		-11.2		0.0
	1010' Zone[4]	22.0	9.0	0.0	1.5	0.0	10.5	-11.5		2.1	11.2		-1.7	0.0
	925' Zone[5]	33.8	28.8	0.0	0.0	3.5	32.3	-1.5				1.7		0.2
	Total	**114.3**	**109.5**	**0.0**	**1.5**	**3.5**	**114.5**	**0.2**	**-4.2**	**8.8**	**8.7**	**-11.5**	**-1.7**	**0.2**

(1) WFA is assumed to be out of service for this analysis

(2) Water Transfer between Pressure Zones (minus = water leaving the zone, plus = water is added to the zone)

(3) Zone transfers - 1212' to 1010' = 45%, 1212' to 1074' = 55% based on equivalent diameters of the PRVs

Future System Water Supply Analysis

Groundwater Supplies only - Without System Improvements (MDD)

Year	ZONE	Maximum Day Demand (mgd)	Source of Water Supply (mgd)				Total Supply	Zone Balance	Transfer of Water between Zones [2],[3]					Excess Supply
			Wells	WFA[1]	CDA-1	CDA-2			1348'	1212'	1074'	1010'	925'	
2010	1348' Zone	7.6	0.0	0.0	0.0	0.0	0.0	-7.6		7.6				0.0
	1212' Zone	31.0	30.1	0.0	0.0	3.5	33.6	2.6	-7.6		2.8	0.0		-2.2
	1074' Zone	15.1	17.8	0.0	0.0	0.0	17.8	2.8		-2.8		0.0		0.0
	1010' Zone	15.4	5.4	0.0	1.5	0.0	6.9	-8.5		0.0	0.0		8.5	0.0
	925' Zone	9.1	0.0	0.0	0.0	0.0	0.0	-9.1				-8.5		-17.6
	Total	**78.2**	**53.4**	**0.0**	**1.5**	**3.5**	**58.4**	**-19.8**	**-7.6**	**4.9**	**2.8**	**-8.5**	**8.5**	**-19.8**
2015	1348' Zone	7.7	0.0	0.0	0.0	0.0	0.0	-7.7		7.7				0.0
	1212' Zone	32.0	30.1	0.0	0.0	0.0	30.1	-1.9	-7.7		2.4	0.0		-7.1
	1074' Zone	15.4	17.8	0.0	0.0	0.0	17.8	2.4		-2.4		0.0		0.0
	1010' Zone	16.7	5.4	0.0	1.5	0.0	6.9	-9.8		0.0	0.0		9.8	0.0
	925' Zone	12.9	0.0	0.0	0.0	3.5	3.5	-9.4				-9.8		-19.2
	Total	**84.7**	**53.4**	**0.0**	**1.5**	**3.5**	**58.4**	**-26.3**	**-7.7**	**5.2**	**2.4**	**-9.8**	**9.8**	**-26.3**
2020	1348' Zone	7.7	0.0	0.0	0.0	0.0	0.0	-7.7		7.7				0.0
	1212' Zone	32.7	30.1	0.0	0.0	0.0	30.1	-2.6	-7.7		2.2	0.0		-8.1
	1074' Zone	15.6	17.8	0.0	0.0	0.0	17.8	2.2		-2.2		0.0		0.0
	1010' Zone	18.3	5.4	0.0	1.5	0.0	6.9	-11.4		0.0	0.0		11.4	0.0
	925' Zone	19.3	0.0	0.0	0.0	3.5	3.5	-15.8				-11.4		-27.2
	Total	**93.7**	**53.4**	**0.0**	**1.5**	**3.5**	**58.4**	**-35.3**	**-7.7**	**5.5**	**2.2**	**-11.4**	**11.4**	**-35.3**
2030	1348' Zone	7.8	0.0	0.0	0.0	0.0	0.0	-7.8		7.8				0.0
	1212' Zone	34.5	30.1	0.0	0.0	0.0	30.1	-4.3	-7.8		1.7	0.0		-10.5
	1074' Zone	16.2	17.8	0.0	0.0	0.0	17.8	1.7		-1.7		0.0		0.0
	1010' Zone	22.0	5.4	0.0	1.5	0.0	6.9	-15.1		0.0	0.0		15.1	0.0
	925' Zone	33.8	0.0	0.0	0.0	3.5	3.5	-30.3				-15.1		-45.4
	Total	**114.3**	**53.4**	**0.0**	**1.5**	**3.5**	**58.4**	**-55.9**	**-7.8**	**6.1**	**1.7**	**-15.1**	**15.1**	**-55.9**

(1) WFA is assumed to be out of service for this analysis

(2) Water Transfer between Pressure Zones (minus = water leaving the zone, plus = water is added to the zone)

(3) Zone transfers - 1212' to 1010' =45%, 1212' to 1074' = 55% based on equivalent diameters of the PRVs

Future System Water Supply Analysis

All Water Supplies - Without System Improvements (MDD)

Year	ZONE	Average Day Demand (mgd)	Source of Water Supply (mgd)				Total Supply	Zone Balance	Transfer of Water between Zones [3],[4]					Excess Supply
			Wells[1]	WFA[2]	CDA-1	CDA-2			1348'	1212'	1074'	1010'	925'	
2010	1348' Zone	7.6	0.0	7.0	0.0	0.0	7.0	-0.6		0.6				0.0
	1212' Zone	31.0	30.1	13.0	0.0	3.5	46.6	15.6	-0.6		-8.2	-6.8		0.0
	1074' Zone	15.1	13.1	0.0	0.0	0.0	13.1	-2.0		8.2		-6.3		0.0
	1010' Zone	15.4	5.4	0.0	1.5	0.0	6.9	-8.5		6.8	6.3		-4.5	0.0
	925' Zone	9.1	0.0	0.0	0.0	0.0	0.0	-9.1				4.5		-4.6
	Total	**78.2**	**48.7**	**20.0**	**1.5**	**3.5**	**73.7**	**-4.6**	**-0.6**	**15.6**	**-2.0**	**-8.5**	**-4.5**	**-4.6**
2015	1348' Zone	7.7	0.0	7.0	0.0	0.0	7.0	-0.7		0.7				0.0
	1212' Zone	32.0	30.1	13.0	0.0	0.0	43.1	11.1	-0.7		-5.7	-4.7		0.0
	1074' Zone	15.4	13.1	0.0	0.0	0.0	13.1	-2.3		5.7		-3.4		0.0
	1010' Zone	16.7	5.4	0.0	1.5	0.0	6.9	-9.8		4.7	3.4		0.0	-1.6
	925' Zone	12.9	0.0	0.0	0.0	3.5	3.5	-9.4				0.0		-9.4
	Total	**84.7**	**48.7**	**20.0**	**1.5**	**3.5**	**73.7**	**-11.0**	**-0.7**	**11.1**	**-2.3**	**-8.2**	**0.0**	**-11.0**
2020	1348' Zone	7.7	0.0	7.0	0.0	0.0	7.0	-0.7		0.7				0.0
	1212' Zone	32.7	30.1	13.0	0.0	0.0	43.1	10.4	-0.7		-5.3	-4.4		0.0
	1074' Zone	15.6	13.1	0.0	0.0	0.0	13.1	-2.5		5.3		-2.8		0.0
	1010' Zone	18.3	5.4	0.0	1.5	0.0	6.9	-11.4		4.4	2.8		0.0	-4.2
	925' Zone	19.3	0.0	0.0	0.0	3.5	3.5	-15.8				0.0		-15.8
	Total	**93.7**	**48.7**	**20.0**	**1.5**	**3.5**	**73.7**	**-20.0**	**-0.7**	**10.4**	**-2.5**	**-7.2**	**0.0**	**-20.0**
2030	1348' Zone	7.8	0.0	7.0	0.0	0.0	7.0	-0.8		0.8				0.0
	1212' Zone	34.5	30.1	13.0	0.0	0.0	43.1	8.7	-0.8		-4.3	-3.6		0.0
	1074' Zone	16.2	13.1	0.0	0.0	0.0	13.1	-3.1		4.3		-1.2		0.0
	1010' Zone	22.0	5.4	0.0	1.5	0.0	6.9	-15.1		3.6	1.2		0.0	-10.3
	925' Zone	33.8	0.0	0.0	0.0	3.5	3.5	-30.3				0.0		-30.3
	Total	**114.3**	**48.7**	**20.0**	**1.5**	**3.5**	**73.7**	**-40.6**	**-0.8**	**8.7**	**-3.1**	**-4.8**	**0.0**	**-40.6**

(1) Firm Well Capacity Only (excludes the largest well, Well 40 in Zone 1074')

(2) WFA is assumed to be out of service for this analysis

(3) Water Transfer between Pressure Zones (minus = water leaving the zone, plus = water is added to the zone)

(4) Zone transfers - 1212' to 1010' = 45%, 1212' to 1074' = 55% based on equivalent diameters of the PRVs

Future System Water Supply Analysis

All Water Supplies - With System Improvements (MDD)

Year	ZONE	Maximum Day Demand (mgd)	Source of Water Supply (mgd)				Total Supply	Zone Balance	Transfer of Water between Zones [2],[3]					Excess Supply
			Wells	WFA[1]	CDA-1	CDA-2			1348'	1212'	1074'	1010'	925'	
2010	1348' Zone	7.6	3.6	8.0	0.0	0.0	11.6	4.0		-4.0				0.0
	1212' Zone	31.0	43.2	16.0	0.0	3.5	62.7	31.8	4.0		-19.6	-16.1		0.0
	1074' Zone[4]	15.1	20.1	0.0	0.0	0.0	20.1	5.0		19.6		-24.6		0.0
	1010' Zone	15.4	9.0	0.0	1.5	0.0	10.5	-4.9		16.1	24.6		-35.8	0.0
	925' Zone	9.1	10.8	0.0	0.0	0.0	10.8	1.7				35.8		37.5
	Total	**78.2**	**86.8**	**24.0**	**1.5**	**3.5**	**115.8**	**37.5**	**4.0**	**31.8**	**5.0**	**-4.9**	**-35.8**	**37.5**
2015	1348' Zone	7.7	3.6	8.0	0.0	0.0	11.6	3.9		-3.9				0.0
	1212' Zone	32.0	43.2	16.0	0.0	0.0	59.2	27.2	3.9		-17.1	-14.1		0.0
	1074' Zone	15.4	20.1	0.0	0.0	0.0	20.1	4.7		17.1		-21.8		0.0
	1010' Zone	16.7	9.0	0.0	1.5	0.0	10.5	-6.2		14.1	21.8		-29.7	0.0
	925' Zone	12.9	10.8	0.0	0.0	3.5	14.3	1.4				29.7		31.1
	Total	**84.7**	**86.8**	**24.0**	**1.5**	**3.5**	**115.8**	**31.1**	**3.9**	**27.2**	**4.7**	**-6.2**	**-29.7**	**31.1**
2020	1348' Zone	7.7	3.6	8.0	0.0	0.0	11.6	3.9		-3.9				0.0
	1212' Zone	32.7	43.2	16.0	0.0	0.0	59.2	26.5	3.9		-16.7	-13.7		0.0
	1074' Zone	15.6	20.1	0.0	0.0	0.0	20.1	4.5		16.7		-21.1		0.0
	1010' Zone	18.3	9.0	0.0	1.5	0.0	10.5	-7.8		13.7	21.1		-27.1	0.0
	925' Zone	19.3	14.4	0.0	0.0	3.5	17.9	-1.4				27.1		25.7
	Total	**93.7**	**90.4**	**24.0**	**1.5**	**3.5**	**119.4**	**25.7**	**3.9**	**26.5**	**4.5**	**-7.8**	**-27.1**	**25.7**
2030	1348' Zone	7.8	3.6	8.0	0.0	0.0	11.6	3.8		-3.8				0.0
	1212' Zone	34.5	43.2	16.0	0.0	0.0	59.2	24.8	3.8		-15.7	-12.9		0.0
	1074' Zone	16.2	20.1	0.0	0.0	0.0	20.1	3.9		15.7		-19.6		0.0
	1010' Zone	22.0	9.0	0.0	1.5	0.0	10.5	-11.5		12.9	19.6		-21.0	0.0
	925' Zone	33.8	28.8	0.0	0.0	3.5	32.3	-1.5				21.0		19.5
	Total	**114.3**	**104.8**	**24.0**	**1.5**	**3.5**	**133.8**	**19.5**	**3.8**	**24.8**	**3.9**	**-11.5**	**-21.0**	**19.5**

(1) Firm Well Capacity Only (excludes the largest well, Well 40 in Zone 1074')

(2) WFA is assumed to be out of service for this analysis

(3) Water Transfer between Pressure Zones (minus = water leaving the zone, plus = water is added to the zone)

(4) Zone transfers - 1212' to 1010' = 45%, 1212' to 1074' = 55% based on equivalent diameters of the PRVs

Appendix G : Maximum flow from WFA

Modeled WFA Take

Demand Scenario	2005	2015	2030	Season (months)
MinDD (mgd)	13	17	17	3
ADD (mgd)	19	21	21	6
MDD (mgd)	20	25	25	3
Weighted Average (mgd)	**18**	**21**	**21**	**MGD**
Annual Take (AFY)	**20,012**	**23,402**	**23,402**	**AFY**

Note: Weighted average is computed based on duration of the season

Note: All values assume that groundwater wells in the upper zones are turned off as listed in Tables A, B, and C.

Note: Model runs under 2005 are without the conveyance improvements shown on Figure 9-2 are not in place.

Model runs under 2015 and 2030 includes these improvements.

For Planning Purposes

Demand Scenario	2005	2015	2030	Season (months)
MinDD (mgd)	9	11	11	3
ADD (mgd)	13	14	14	6
MDD (mgd)	14	17	17	3
Weighted Average (mgd)	**12**	**14**	**14**	**MGD**
Annual Take (AFY)	**13,408**	**15,679**	**15,679**	**AFY**

Actual Take is assumed to be 67% of modeled values to account tor peaking.

Closed Wells in Model Runs

Table A

2005 MinDD	2005 ADD	2005 MDD
Well 24	Well 24	Well 24
Well 25	Well 29	Well 38
Well 26	Well 37	Well 41
Well 27	Well 38	-
Well 29	Well 40	-
Well 31	-	-
Well 37	-	-
Well 38	-	-
Well 40	-	-
Well 41	-	-

Note: Wells 3,4,18,19, and 30 are closed due to WQ reasons

Table B

2015 MinDD	2015 ADD	2015 MDD
Well 17	Well 17	Well 17
Well 20	Well 20	Well 24
Well 24	Well 24	Well 25
Well 25	Well 25	Well 29
Well 26	Well 26	Well 31
Well 27	Well 27	Well 41
Well 29	Well 29	Well 42
Well 31	Well 31	Well 43
Well 35	Well 35	Well 47
Well 37	Well 37	Well 52
Well 38	Well 38	-
Well 39	Well 40	-
Well 40	Well 41	-
Well 41	Well 42	-
Well 42	Well 43	-
Well 43	Well 46	-
Well 45	Well 47	-
Well 46	Well 48	-
Well 47	Well 49	-
Well 48	Well 51	-
Well 49	Well 52	-
Well 50	Well 53	-
Well 51	Well 54	-
Well 52	-	-
Well 53	-	-

Note: Wells 3,4,18,19, and 30 are closed due to WQ reasons

Table C

2030 MinDD	2030 ADD	2030 MDD
Well 24	Well 24	-
Well 29	Well 29	-
Well 31	Well 31	-
Well 34	Well 34	-
Well 35	Well 35	-
Well 36	Well 36	-
Well 37	Well 37	-
Well 38	Well 38	-
Well 40	Well 40	-
Well 41	Well 41	-
Well 42	Well 42	-
Well 43	Well 48	-
Well 47	Well 49	-
Well 48	Well 52	-
Well 49	Well 53	-
Well 50	Well 54	-
Well 51	-	-
Well 52	-	-
Well 53	-	-

Note: Wells 3,4,18,19, and 30 are closed due to WQ reasons