Appendix B

Supporting Water-Related Data

B1

Revised Model Simulations in Support of Responses to DEIR Comments Village at Squaw Valley Specific Plan

October 16, 2015

DRAFT MEMORANDUM

To: Chevis Hosea, Squaw Valley Real Estate

From: Chad Taylor PG CHg and Maureen Reilly PE

Re: Revised Model Simulation Results in Support of Responses to Draft EIR Comments Village at Squaw Valley Specific Plan

Assessment of future increases in Squaw Valley groundwater production to supply water for the Village at Squaw Valley Specific Plan (Project) and other future growth has been completed using the most recent version of the Squaw Valley Model, which was also used in the Village at Squaw Valley Specific Plan Water Supply Assessment 2015 Update (WSA Update, Farr West et al. 2015). Previous versions of the model were used in the WSA prepared in 2014 (Farr West et al. 2014) and the Project Draft Environmental Impact Report (Draft EIR). Modifications to the model following completion of the Draft EIR were documented in the WSA Update (Farr West et al. 2015). Following completion of the WSA Update, the Placer County Planning Department (County) requested the development and analysis of additional model simulations to evaluate fewer new wells than were assumed in the WSA, reevaluation of potential refugia pool drying using the extended model time period through the end of 2014, provision of updated groundwater elevation data representing conditions beneath stream cells, and limited evaluation of variable pumping distribution. In response to this request, Todd Groundwater worked with HydroMetrics to prepare model simulations to assess these requests.

INTRODUCTION

Assessment of future increases in groundwater supply production relating to the Project and other future growth in the Project Draft Environmental Impact Report (Draft EIR) and WSA has included simulations of future groundwater conditions using an existing numerical groundwater model (Model) that was developed and is maintained by the Squaw Valley Public Service District (SVPSD). The Model was first constructed in 2001 to simulate the Olympic Valley Groundwater Basin (Basin, DWR 2003) using the widely-accepted MODFLOW computer code developed by the United States Geological Survey (Williams 2001). Since its original construction, the Model has been updated multiple times to incorporate new data and refine conceptualizations (West Yost 2001 and 2003 and HydroMetrics 2006, 2007, and 2014). The most recent updates incorporated significant additional information regarding recently acquired groundwater elevation, streamflow, and climate data and an extension of the model period to simulate conditions from May 1992 through December 2014

(HydroMetrics 2015, Farr West et al. 2014, and Farr West, HydroMetrics, and Todd Groundwater 2015).

The current version of the Model is a good tool for simulating changed conditions and management practice alternatives. The recently updated version of the Model documented by HydroMetrics as part of the WSA Update (Farr West et al. 2015) was applied with the same assumptions as the model used in the groundwater analyses that supported Draft EIR to assess the County's requests for additional information. Specifically, new model simulations were completed that used the existing (Baseline), Project, and non-project future water demand estimates described in the WSA Update (Farr West et al. 2015) to assess the following:

- What are the effects of producing water supply from a wellfield with six new wells to meet existing, Project, and non-project future demands as compared to the nine new wells added to the wellfield in the assessments presented in the WSA, WSA Update, and Draft EIR?
- How do the simulated refugia pool drying conditions in recent years compare to those described in the Draft EIR? The Model available when the Draft EIR was prepared ended in December 2011, while the current model extends through the end of 2014.
- How do the simulated groundwater elevations beneath the selected stream cell locations presented in the Draft EIR compare to those simulated using the extended model period, updated water demands, and wellfield configuration?
- What effect does limiting pumping in the well closest to Squaw Creek SVPSD Well 5R) have on pool drying, groundwater elevations beneath the creek, and water supply sufficiency?

A total of ten individual simulations were developed, modeled, and analyzed to address these questions. These simulations were completed in two groups comprised of five scenarios, as described below. The two groups in this case were defined by pumping distributions approaches. Both groups of simulations used the water demand estimates from the WSA Update for all existing and future groundwater pumping. The first group of simulations used the same pumping distribution assumptions as the Draft EIR, with the exception of the addition of a scenario with only six new wells to meet future Project and non-project demand. This group is referred to as the 2015 WSA Update Model Simulations. The second group of simulations used a modified pumping distribution in which SVPSD Well 5R was not operated July through October. SVPSD Well 5R is the closest existing or proposed well to Squaw Creek and the closest well to the area of reduced refugia pool depths identified in the Draft EIR. This group is referred to below as the SVPSD Well 5R Off in Late Summer/Fall Model Simulations. The five model simulations in each group were:

1. **Cumulative Conditions with Nine New Wells** – The first simulation in each group was the future scenario that includes all Project and non-Project demand produced from an expanded wellfield with nine new wells in addition to the existing SVPSD and Squaw Valley Mutual Water Company (SVMWC) wells. This is the same wellfield

that was simulated in the WSA (Farr West et al. 2014), Draft EIR, and WSA 2015 Update (Farr West et al. 2015). Cumulative future water demands were the same as those used in the WSA Update (Farr West et al. 2015). In the SVPSD Well 5R Off in Late Summer/Fall Model Simulation, the cumulative SVPSD demand in July through October was distributed evenly to all the SVPSD wells except Well 5R. The locations of the wells used in both the 2015 WSA Update and SVPSD Well 5R Off in Late Summer/Fall Model Simulations are shown on Figure 1. This wellfield configuration is effectively the same as the wellfield in the WSA, Potential Impacts of Increased Groundwater Pumping on Squaw Creek Fisheries and Aquatic Resources Technical Memorandum prepared by Garcia and Associates (GANDA 2014), and the Draft EIR, with the exception of slight modifications of the locations of wells New-39/54 and New-15/07. These wells were each moved less than 100 feet from the locations presented in the WSA and Draft EIR.

2. **Cumulative Conditions with Six New Wells** – These simulations used the same demands as the previous scenario, with pumping from the existing wells plus six new wells, which is the minimum number of new wells indicated by the WSA and WSA Update. The six new well locations were selected to take advantage of the best hydrogeologic conditions and fewest obstacles to well construction and operation. The new well locations include a well on the PlumpJack property; redevelopment of this property is currently in planning, and the well location has been identified by PlumpJack and the SVPSD. For the simulation with Well 5R off in the late summer and fall, a seventh new well was added to the wellfield to meet peak demand well requirements from the WSA Update. This SVPSD Well 5R Off simulation is described as a six new well scenario, but it could also be characterized as a seven new well scenario that allows for Well 5R to be turned off during the late summer and fall. Distribution of pumping to individual wells in these scenarios was as described in the nine new well scenarios and the locations of the new wells simulated in this scenario are shown on Figure 2.
3. **Project Only Conditions** – These simulations included pumping to meet existing and Project water demand from a slightly expanded wellfield including four new wells to meet Project Only demands. As in the six new well scenario, the Well 5R Off simulation included a fifth new well to meet peaking requirements. Monthly demands were distributed to a slightly expanded wellfield including four new wells as shown in Figure 3. With the exception of the additional well to meet peaking when Well 5R is off, this is the same wellfield that was used in the GANDA Squaw Creek Fisheries and Aquatic Resources Memorandum prepared (GANDA 2014) and in the Draft EIR.
4. **Non-Project Only Conditions** – The fourth future simulation in each group included existing and Non-Project demand production from the existing wellfield plus a single new well and the Resort at Squaw Creek (RSC) wells for the RSC Phase 2 expansion. SVPSD and SVMWC demands were distributed to the existing western wellfield at the current average distribution rates, to the new well at the average existing rate, and to the RSC wells according to the existing Development Agreement between SVPSD and RSC (Farr West et al. 2015, GANDA 2014). The same wellfield was used in

all Non-Project Only simulations. The locations of the wells simulated in this scenario are shown on Figure 4.

5. **Baseline Conditions** – The final simulation in each group was the Baseline condition representing current average pumping in Olympic Valley with distribution to the existing wells at the historical average distribution rate. For the SVPSD Well 5R Off in Late Summer/Fall Model Simulations pumping was modified for the months of July through October so that historical average Well 5R production was distributed to the other existing SVPSD wells.

MODEL SIMULATED GROUNDWATER ELEVATIONS

Model simulated groundwater elevations from the scenarios described above are presented in the following ways:

- The results of the cumulative water demand (i.e., the existing, Project, and non-project estimated demands at 2040) simulations were compared to the sufficiency of supply criteria developed and applied in the WSA (Farr West et al. 2015). Only the cumulative demand simulations were evaluated against the sufficiency of supply criteria because these scenarios represent the largest demand increases.
- Simulated groundwater elevations for all scenarios were extracted from the stream cell locations that were used by GANDA and in the Draft Environmental Impact Report (DEIR). These simulated groundwater elevations were used to evaluate potential refugia pool drying conditions using the same methodology and assumptions as described by GANDA (2014) and presented in the Draft EIR.
- The simulated groundwater elevations from the modeled stream cells in the eastern portion and western portion of the aquifer were extracted and are presented on graphs showing both elevation and changes compared to baseline conditions for each cumulative simulation and the cumulative model simulated groundwater results from the Draft EIR.

2015 WSA Update Model Simulations Groundwater Elevation Results

Cumulative Demands Compared to Sufficiency of Supply Criteria

The percent saturation results for the 2015 WSA Update simulation using nine new wells and six new wells are shown with the percent saturation from the 2014 WSA and Draft EIR on Figure 6. Both of these current simulations meet the minimum percent saturated thickness criteria and are above the 65 percent threshold. The percent saturation for the cumulative demand simulation with six new wells indicates higher percent saturation results as compared to the cumulative demand simulation with nine new wells. This is because the wells simulated in the six new well version are located in thicker and more productive areas of the aquifer. The nine new well simulations include wells located in thinner areas of the aquifer where percent saturation is more affected by pumping.

Model Simulated Groundwater Elevations in Stream Cells

Groundwater elevations were extracted from the model for selected locations in the stream for each of the five scenarios described above for each month of the model period from October 1992 through the end of December 2014. The stream cell locations are the same as those used in the DEIR and the assessment by Ganda (2014). The locations and designations of these cells are shown on Figures 7 and 8. Two versions of the creek are shown to account for the modifications to the creek planned in the restoration associated with the project. This restoration work includes changes to the existing streambed in the trapezoidal channel area. The elevations of the streambed resulting from this modification have been included in the two cumulative simulations and the Project Only simulation.

Potential drying of refugia pools in the eastern portion of Squaw Creek was assessed using the same methods and assumptions as applied by GANDA (2014) and in the Draft EIR. Pool drying was assessed for all of the simulations, which showed that only East Cells A, B, and C had dry pools in the Baseline or any future simulation. The results of these assessments for East Cells A, B, and C are shown in Table 1. The results of the pool drying assessment for the 2015 WSA Update simulations showed drying in East Cells A, B, or C in the Baseline simulations in the extended model period from 2011 through the end of 2014. The cumulative nine new well and six new well simulations are shown in comparison to the results presented in the Draft EIR in Table 2. The nine new well assessment shows very similar results to the dry pool analyses in the Draft EIR, with some new dry pool events in the extended model period of 2011 through the end of 2014. The dry pool analysis does show an increase in dry pool events in the six new well cumulative simulation as compared to the nine well simulation.

The dry pool analyses presented in Tables 1 are compared to Table 13-13 of the Draft EIR in Table 2. This comparison shows some differences between the Draft EIR version of the analyses and the current version. A summary discussion of these differences follows:

- ***East Cell A Baseline Pool Drying Assessment Comparison*** – The 2015 WSA Update Baseline scenario version of the pool drying assessment for East Cell A shows some slight differences compared to the same analysis from the Draft EIR. Specifically:
    - The current version shows only one dry month in 1994, while the Draft EIR version shows two.
    - The current version shows a dry month in 1999 that was not identified in the Draft EIR version.

  These differences result an increased year with a dry pool event in the current version of the Baseline as compared to the Draft EIR version. However, the total number of months of dry pool events in the Baseline scenarios is the same in both versions.

  The reason for the variation in pool drying in the Baseline scenario between the two versions is the result of updated Baseline demand as a result of an increased historical period over which the average existing water demand was assessed in the WSA Update (Farr West et al. 2015). This updated water demand information

resulted in a different distribution of monthly water demand and pumping in the current Baseline version of the model as compared to the version presented in the Draft EIR, which affects pool drying. Updated water demand estimates are documented in the WSA Update (Farr West et al. 2015).

- ***East Cell B Future Pool Drying Assessment Comparison*** – The 2015 WSA Update future scenarios versions of the pool drying assessment for East Cell B are different from those in the Draft EIR due to updated demand estimates and distribution, as described for East Cell A. Updated water demand estimates are documented in the WSA Update (Farr West et al. 2015).
- ***East Cell C Baseline Pool Drying Assessment Comparison*** – The 2015 WSA Update Baseline scenario version of the pool drying assessment for East Cell C indicates drying only in a single month in 2001, whereas the Draft EIR version showed a dry month in both 2001 and 2002. This slight variation is the result of the difference in the updated baseline water demand and distribution mentioned above. Updated water demand estimates are documented in the WSA Update (Farr West et al. 2015).
- ***East Cell C Future Pool Drying Assessment Comparison*** – The 2015 WSA Update future scenarios versions of the pool drying assessment for East Cell C are different from those in the Draft EIR due to updated demand estimates and distribution, as described for East Cell A. Updated water demand estimates are documented in the WSA Update (Farr West et al. 2015).

Model simulated groundwater elevation data from the cumulative 2015 WSA Update Model Simulations for all the stream cells are shown graphically along with simulated groundwater elevations from the Draft EIR in Appendix A. These model results are also shown graphically as a comparison to baseline and Draft EIR conditions in Appendix B. The simulated groundwater elevation data for all of the scenarios in the 2015 WSA Update group are included in the Microsoft Excel workbooks titled *WSA Update Simulations - Model Simulated Groundwater Elevation Data – Squaw Creek West.xlsx* and *WSA Update Simulations - Model Simulated Groundwater Elevation Data – Squaw Creek East.xlsx*. Simulated groundwater elevations from the 2014 WSA and Draft EIR were provided in Excel files in October 2014.

SVPSD Well 5R Off in Late Summer/Fall Model Simulations Groundwater Elevation Results

Cumulative Demands Compared to Sufficiency of Supply Criteria

The percent saturation results for the Well 5R Off cumulative demand simulations using nine and six new wells are shown on Figure 9 along with the results from the 2014 WSA and Draft EIR. As with the 2015 WSA Update results described above, both of these simulations meet the minimum percent saturated thickness criteria of 65 percent. The percent saturation for the cumulative demand simulation with six new wells with Well 5R off indicates a higher percent saturation as compared to the cumulative demand simulation with nine new wells, as described above.

Model Simulated Groundwater Elevations in Stream Cells

Groundwater elevations were extracted from the model for selected locations in the stream for each of the five scenarios described above for each month of the model period from October 1992 through the end of December 2014. The stream cell locations are the same as those used in the DEIR and the assessment by Ganda (2014). The locations and designations of these cells are shown on Figures 7 and 8.

Potential drying of refugia pools in the eastern portion of Squaw Creek was assessed for these simulations as well, using the same methods and assumptions as above. Pool drying in these simulations showed no differences from the 2015 WSA Update simulations described above. The results of these assessments for East Cells A, B, and C are shown in Tables 3 and 4, which are the same as Tables 1 and 2.

Model simulated groundwater elevation data from the Well 5R Off Simulations for all the stream cells are shown graphically along with results from the Draft EIR in Appendix C and graphs showing the comparison of these elevations to baseline are included in Appendix D. These graphs do show that there are increased groundwater elevations beneath the stream cells as a result of the modified Well 5R pumping schedule. These increased groundwater elevations are not of sufficient magnitude to have an effect on the results of the pool drying assessment. However, increased groundwater elevations resulting from not pumping Well 5R in the late summer and fall may be beneficial to vegetation. The modification of pumping near Squaw Creek on a seasonal basis is discussed as one potential mitigation measure in the Draft EIR, and the simulations in this group show that these mitigations have potential.

The simulated groundwater elevation data for all of the scenarios in the SVPSD Well 5R Off in Late Summer/Fall Model Simulation group are included in the Microsoft Excel workbooks titled *5R On-Off Simulations - Model Simulated Groundwater Elevation Data – Squaw Creek West.xlsx* and *5R On-Off Simulations - Model Simulated Groundwater Elevation Data – Squaw Creek East.xlsx.* Simulated groundwater elevations from the 2014 WSA and Draft EIR were provided in Excel files in October 2014.

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TABLES

Table 1: Predicted Number of Months Where Groundwater Stops Feeding 3-foot Deep Pools - 2015 WSA Update Simulations

	East Cell A					East Cell B					East Cell C				
Year	Baseline	2040 Cumulative - 9 New Wells	2040 Cumulative - 6 New Wells	Project Only	Non-Project Only	Baseline	2040 Cumulative - 9 New Wells	2040 Cumulative - 6 New Wells	Project Only	Non-Project Only	Baseline	2040 Cumulative - 9 New Wells	2040 Cumulative - 6 New Wells	Project Only	Non-Project Only
1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1993	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
1994	1	3	3	3	2	1	3	3	2	2	0	0	1	0	0
1995	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0
1996	0	1	1	1	1	0	0	1	0	0	0	0	0	0	0
1997	1	1	2	1	1	0	1	1	1	1	0	0	0	0	0
1998	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1999	1	2	2	1	1	0	1	1	1	1	0	0	0	0	0
2000	1	5	5	4	3	0	4	5	3	1	0	0	0	0	0
2001	3	6	6	5	5	3	4	6	4	4	1	4	4	3	3
2002	2	3	3	3	3	2	3	3	3	2	0	2	2	2	1
2003	1	2	2	2	2	0	1	2	1	1	0	0	0	0	0
2004	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
2005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2006	0	2	2	1	0	0	1	1	0	0	0	0	0	0	0
2007	1	2	2	2	2	0	1	2	1	1	0	0	0	0	0
2008	1	2	3	3	3	1	2	2	1	1	0	0	0	0	0
2009	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
2010	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
2011	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2012	0	1	1	1	0	0	0	1	0	0	0	0	0	0	0
2013	0	1	1	0	0	0	0	1	0	0	0	0	0	0	0
2014	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Total Dry Pool Months	**13**	**34**	**40**	**28**	**24**	**8**	**22**	**30**	**18**	**15**	**1**	**6**	**7**	**5**	**4**
Dry Months as Percent of Total	**4.9%**	**12.7%**	**15.0%**	**10.5%**	**9.0%**	**3.0%**	**8.2%**	**11.2%**	**6.7%**	**5.6%**	**0.4%**	**2.2%**	**2.6%**	**1.9%**	**1.5%**
Years with Dry Cell	**10**	**16**	**19**	**13**	**11**	**5**	**11**	**14**	**10**	**10**	**1**	**2**	**3**	**2**	**2**

Notes:

1: Only East Cells A through C are shown; simulated groundwater elevation information does not indicate any dry pool events in East Cells D through N in Baseline or any future scenario.
2: Yellow cells indicate years in which a modeled "pool" was predicted to dry during at least one month under Baseline conditions.
3: Orange cells indicate years in which a modeled "pool" was predicted to dry for one or more additional month in Future conditions.
4: Red cells indicate years in which no modeled pools were predicted to dry during the Baseline condition, but one or more modeled pools were predicted to dry in the future conditions in either the Cumulative, Project, or Non-Project scenario.
5: There are a total of 267 months represented in the modeled time period from October 1992 through December 2014.

Table 2: Comparison of Cumulative Pool Drying in DEIR and 2015 WSA Update Simulations

Year	East Cell A				East Cell B				East Cell C			
	Baseline	Draft EIR Results	2040 Cumulative - 9 New Wells	2040 Cumulative - 6 New Wells	Baseline	Draft EIR Results	2040 Cumulative - 9 New Wells	2040 Cumulative - 6 New Wells	Baseline	Draft EIR Results	2040 Cumulative - 9 New Wells	2040 Cumulative - 6 New Wells
1992	0	NA	0	0	0	NA	0	0	0	NA	0	0
1993	0	0	0	1	0	0	0	0	0	0	0	0
1994	1	3	3	3	1	3	3	3	0	0	0	1
1995	0	2	1	2	0	0	0	0	0	0	0	0
1996	0	1	1	1	0	0	0	1	0	0	0	0
1997	1	1	1	2	0	1	1	1	0	0	0	0
1998	0	0	0	0	0	0	0	0	0	0	0	0
1999	1	2	2	2	0	1	1	1	0	0	0	0
2000	1	5	5	5	0	4	4	5	0	0	0	0
2001	3	6	6	6	3	4	4	6	1	3	4	4
2002	2	3	3	3	2	3	3	3	0	2	2	2
2003	1	2	2	2	0	1	1	2	0	0	0	0
2004	1	1	1	1	1	1	1	1	0	0	0	0
2005	0	0	0	0	0	0	0	0	0	0	0	0
2006	0	1	2	2	0	0	1	1	0	0	0	0
2007	1	2	2	2	0	1	1	2	0	0	0	0
2008	1	2	2	3	1	2	2	2	0	0	0	0
2009	0	0	0	1	0	0	0	0	0	0	0	0
2010	0	0	1	1	0	0	0	0	0	0	0	0
2011	0	0	0	0	0	0	0	0	0	0	0	0
2012	0	NA	1	1	0	NA	0	1	0	NA	0	0
2013	0	NA	1	1	0	NA	0	1	0	NA	0	0
2014	0	NA	0	1	0	NA	0	0	0	NA	0	0
Total Dry Pool Months 1993 through 2011	**13**	**31**	**32**	**37**	**8**	**21**	**22**	**28**	**1**	**5**	**6**	**7**
Years with Dry Cell 1993 through 2011	**10**	**13**	**14**	**16**	**5**	**10**	**11**	**12**	**1**	**2**	**2**	**3**
Total Dry Pool Months 1992 through 2014	**13**	**NA**	**34**	**40**	**8**	**NA**	**22**	**30**	**1**	**NA**	**6**	**7**
Years with Dry Cell 1992 through 2014	**10**	**NA**	**16**	**19**	**5**	**NA**	**11**	**14**	**1**	**NA**	**2**	**3**

Notes:

1: Only East Cells A through C are shown; simulated groundwater elevation information does not indicate any dry pool events in East Cells D through N in Baseline or any future scenario.
2: Yellow cells indicate years in which a modeled "pool" was predicted to dry during at least one month under Baseline conditions.
3: Orange cells indicate years in which a modeled "pool" was predicted to dry for one or more additional month in Future conditions.
4: Red cells indicate years in which no modeled pools were predicted to dry during the Baseline condition, but one or more modeled pools were predicted to dry in the future conditions in either the Cumulative, Project, or Non-Project scenario.

Des by: CT
Ckd by: MR

Table 3: Predicted Number of Months Where Groundwater Stops Feeding 3-foot Deep Pools - Simulations with PSD Well 5R Off in Late Summer through Fall

	East Cell A					East Cell B					East Cell C				
Year	Baseline	2040 Cumulative - 9 New Wells	2040 Cumulative - 6 New Wells	Project Only	Non-Project Only	Baseline	2040 Cumulative - 9 New Wells	2040 Cumulative - 6 New Wells	Project Only	Non-Project Only	Baseline	2040 Cumulative - 9 New Wells	2040 Cumulative - 6 New Wells	Project Only	Non-Project Only
1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1993	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
1994	1	3	3	3	2	1	3	3	2	2	0	0	1	0	0
1995	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0
1996	0	1	1	1	1	0	0	1	0	0	0	0	0	0	0
1997	1	1	2	1	1	0	1	1	1	1	0	0	0	0	0
1998	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1999	1	2	2	1	1	0	1	1	1	1	0	0	0	0	0
2000	1	5	5	4	3	0	4	5	3	1	0	0	0	0	0
2001	3	6	6	5	5	3	4	6	4	4	1	4	4	3	3
2002	2	3	3	3	3	2	3	3	3	2	0	2	2	2	1
2003	1	2	2	2	2	0	1	2	1	1	0	0	0	0	0
2004	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
2005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2006	0	2	2	1	0	0	1	1	0	0	0	0	0	0	0
2007	1	2	2	2	2	0	1	2	1	1	0	0	0	0	0
2008	1	2	3	3	3	1	2	2	1	1	0	0	0	0	0
2009	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
2010	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
2011	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2012	0	1	1	1	0	0	0	1	0	0	0	0	0	0	0
2013	0	1	1	0	0	0	0	1	0	0	0	0	0	0	0
2014	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Total Dry Pool Months	**13**	**34**	**40**	**28**	**24**	**8**	**22**	**30**	**18**	**15**	**1**	**6**	**7**	**5**	**4**
Dry Months as Percent of Total	**4.9%**	**12.7%**	**15.0%**	**10.5%**	**9.0%**	**3.0%**	**8.2%**	**11.2%**	**6.7%**	**5.6%**	**0.4%**	**2.2%**	**2.6%**	**1.9%**	**1.5%**
Years with Dry Cell	**10**	**16**	**19**	**13**	**11**	**5**	**11**	**14**	**10**	**10**	**1**	**2**	**3**	**2**	**2**

Notes:

1: Only East Cells A through C are shown; simulated groundwater elevation information does not indicate any dry pool events in East Cells D through N in Baseline or any future scenario.
2: Yellow cells indicate years in which a modeled "pool" was predicted to dry during at least one month under Baseline conditions.
3: Orange cells indicate years in which a modeled "pool" was predicted to dry for one or more additional month in Future conditions.
4: Red cells indicate years in which no modeled pools were predicted to dry during the Baseline condition, but one or more modeled pools were predicted to dry in the future conditions in either the Cumulative, Project, or Non-Project scenario.
5: There are a total of 267 months represented in the modeled time period from October 1992 through December 2014.

Table 4: Comparison of Cumulative Pool Drying in DEIR and Simulations with PSD Well 5R Off in Late Summer through Fall

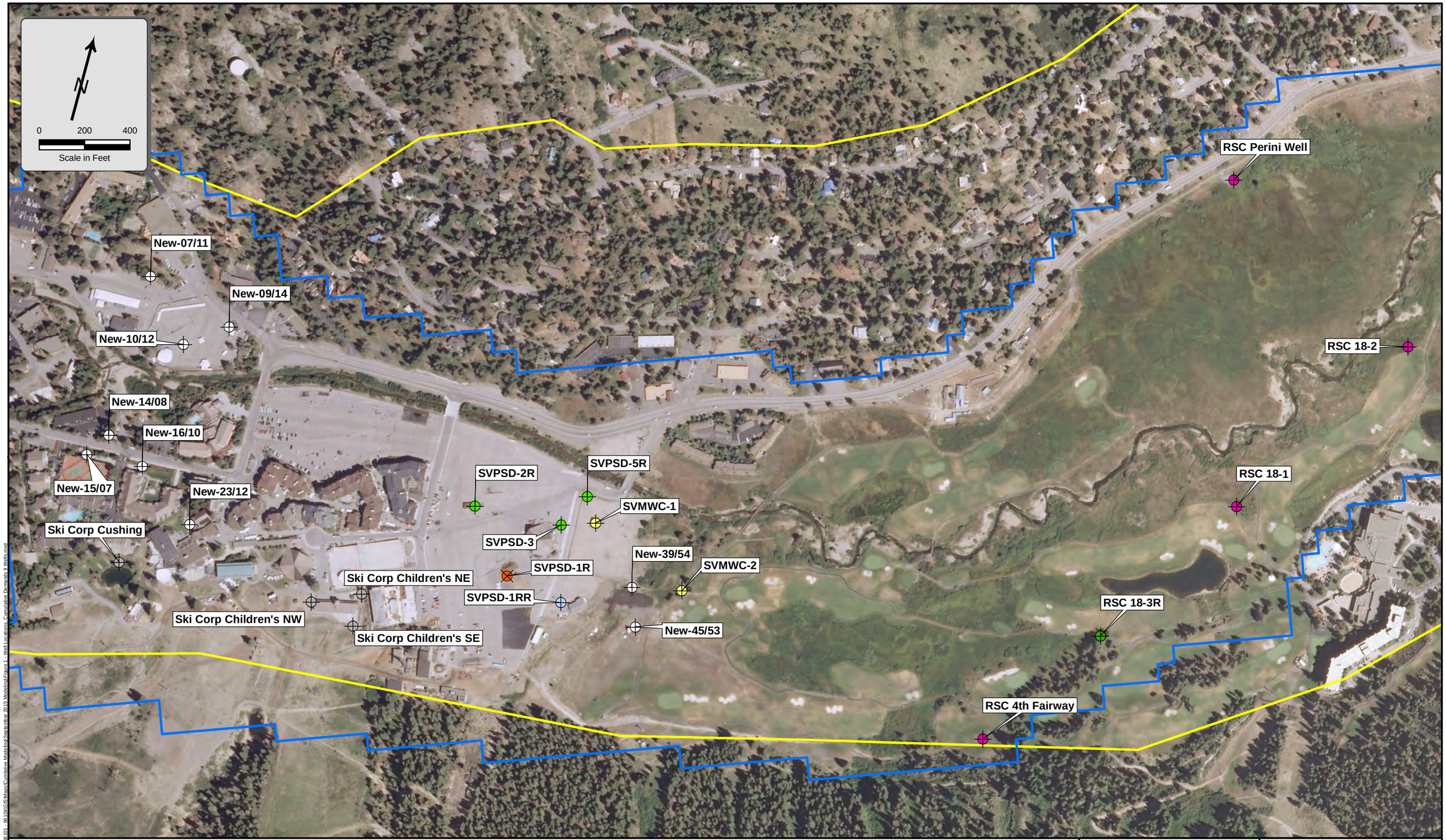
Year	East Cell A				East Cell B				East Cell C			
	Baseline	Draft EIR Results	2040 Cumulative - 9 New Wells	2040 Cumulative - 6 New Wells	Baseline	Draft EIR Results	2040 Cumulative - 9 New Wells	2040 Cumulative - 6 New Wells	Baseline	Draft EIR Results	2040 Cumulative - 9 New Wells	2040 Cumulative - 6 New Wells
1992	0	NA	0	0	0	NA	0	0	0	NA	0	0
1993	0	0	0	1	0	0	0	0	0	0	0	0
1994	1	3	3	3	1	3	3	3	0	0	0	1
1995	0	2	1	2	0	0	0	0	0	0	0	0
1996	0	1	1	1	0	0	0	1	0	0	0	0
1997	1	1	1	2	0	1	1	1	0	0	0	0
1998	0	0	0	0	0	0	0	0	0	0	0	0
1999	1	2	2	2	0	1	1	1	0	0	0	0
2000	1	5	5	5	0	4	4	5	0	0	0	0
2001	3	6	6	6	3	4	4	6	1	3	4	4
2002	2	3	3	3	2	3	3	3	0	2	2	2
2003	1	2	2	2	0	1	1	2	0	0	0	0
2004	1	1	1	1	1	1	1	1	0	0	0	0
2005	0	0	0	0	0	0	0	0	0	0	0	0
2006	0	1	2	2	0	0	1	1	0	0	0	0
2007	1	2	2	2	0	1	1	2	0	0	0	0
2008	1	2	2	3	1	2	2	2	0	0	0	0
2009	0	0	0	1	0	0	0	0	0	0	0	0
2010	0	0	1	1	0	0	0	0	0	0	0	0
2011	0	0	0	0	0	0	0	0	0	0	0	0
2012	0	NA	1	1	0	NA	0	1	0	NA	0	0
2013	0	NA	1	1	0	NA	0	1	0	NA	0	0
2014	0	NA	0	1	0	NA	0	0	0	NA	0	0
Total Dry Pool Months 1993 through 2011	**13**	**31**	**32**	**37**	**8**	**21**	**22**	**28**	**1**	**5**	**6**	**7**
Years with Dry Cell 1993 through 2011	**10**	**13**	**14**	**16**	**5**	**10**	**11**	**12**	**1**	**2**	**2**	**3**
Total Dry Pool Months 1992 through 2014	**13**	**NA**	**34**	**40**	**8**	**NA**	**22**	**30**	**1**	**NA**	**6**	**7**
Years with Dry Cell 1992 through 2014	**10**	**NA**	**16**	**19**	**5**	**NA**	**11**	**14**	**1**	**NA**	**2**	**3**

Notes:

1: Only East Cells A through C are shown; simulated groundwater elevation information does not indicate any dry pool events in East Cells D through N in Baseline or any future scenario.
2: Yellow cells indicate years in which a modeled "pool" was predicted to dry during at least one month under Baseline conditions.
3: Orange cells indicate years in which a modeled "pool" was predicted to dry for one or more additional month in Future conditions.
4: Red cells indicate years in which no modeled pools were predicted to dry during the Baseline condition, but one or more modeled pools were predicted to dry in the future conditions in either the Cumulative, Project, or Non-Project scenario.

Des by: CT
Ckd by: MR

FIGURES

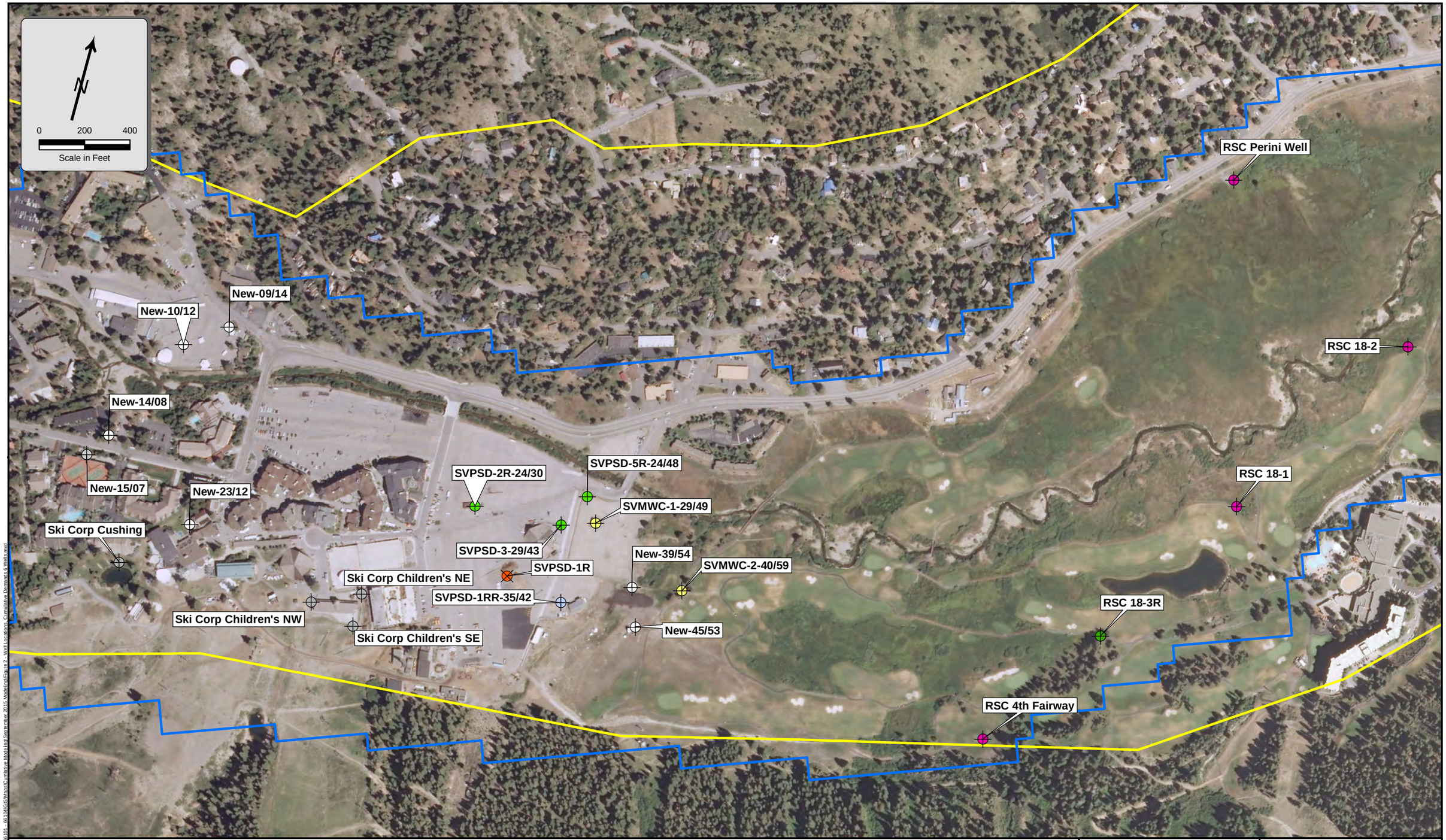


Proposed New Well
PSD Replacement Well
Existing PSD Well to Remain
Existing MWC Well to Remain
Squaw Valley Resort Well
Resort at Squaw Creek 18-3R
Resort at Squaw Creek Irrigation/Snowmaking Well
Well To Be Destroyed
Active Model Area
Olympic Valley Groundwater Basin

October 2015

TODD GROUNDWATER

Figure 1
Existing and New Wells Cumulative Demands with 9 New Wells

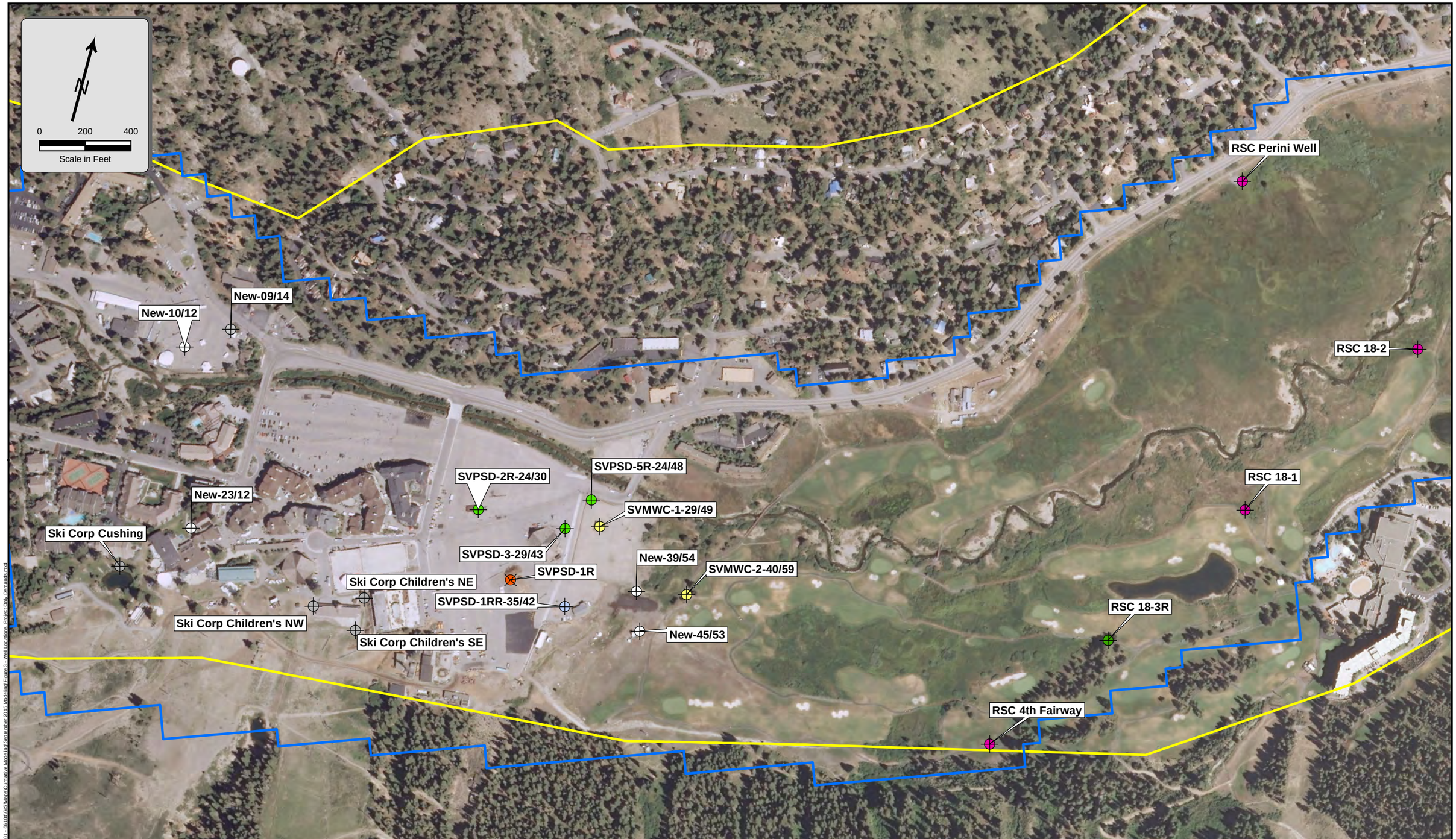


Proposed New Well
Proposed Well 5R Alternative
PSD Replacement Well
Existing PSD Well to Remain
Existing MWC Well to Remain
Squaw Valley Resort Well
Resort at Squaw Creek 18-3R
Resort at Squaw Creek Irrigation/Snowmaking Well
Well To Be Destroyed
Active Model Area
Olympic Valley Groundwater Basin

October 2015

TODD GROUNDWATER

Figure 2
Existing and New Wells
Cumulative Demands
6 New Well Simulation

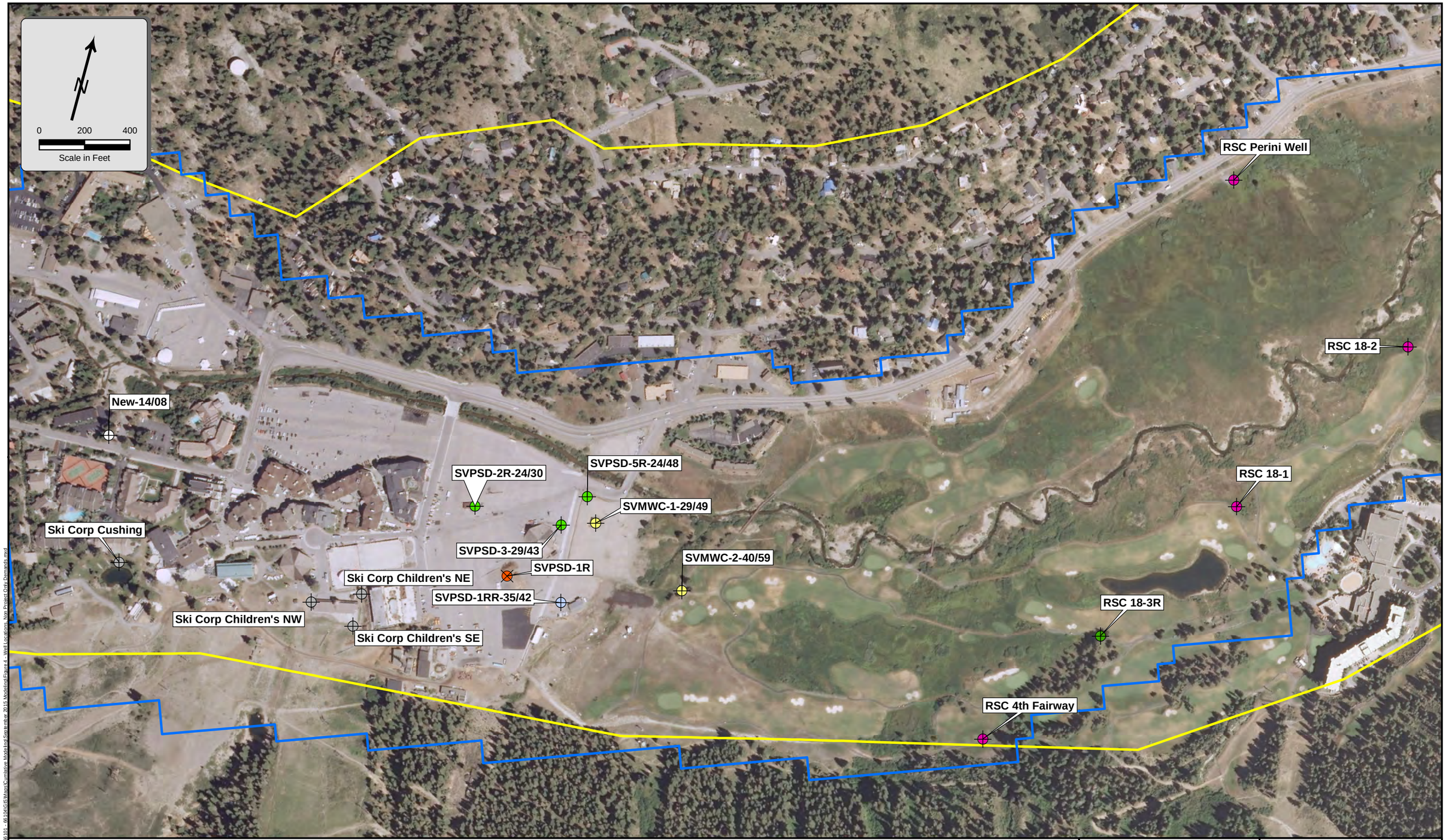


4 Proposed New Wells
Proposed Well 5R Alternate
PSD Replacement Well
Existing PSD Well to Remain
Existing MWC Well to Remain
Squaw Valley Resort Well
Resort at Squaw Creek 18-3R
Resort at Squaw Creek Irrigation/Snowmaking Well
Well To Be Destroyed
Active Model Area
Olympic Valley Groundwater Basin

October 2015

TODD GROUNDWATER

Figure 3
Existing and New Wells
Project Only Demands

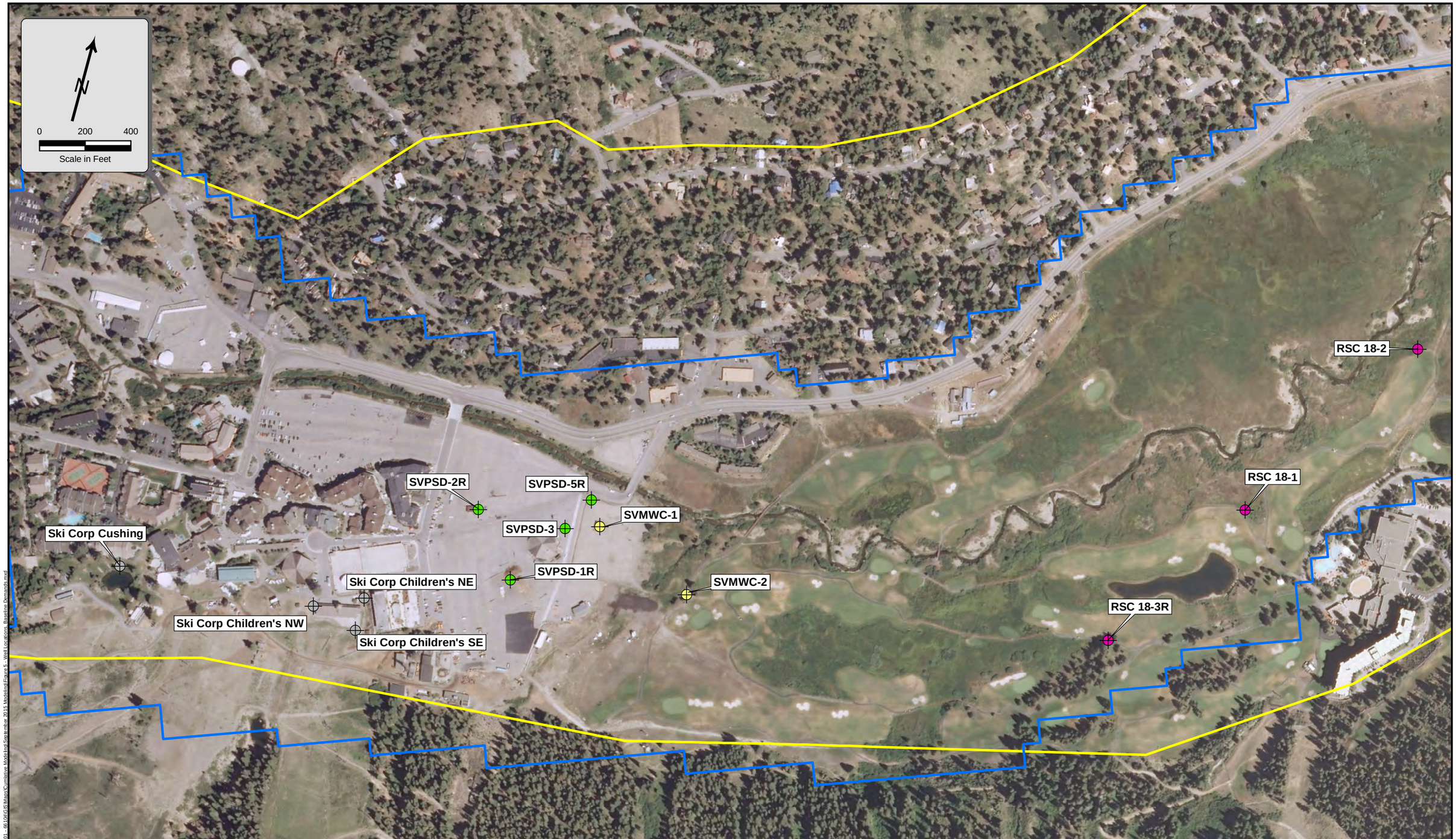


Proposed New Well
PSD Replacement Well
Existing PSD Well to Remain
Existing MWC Well to Remain
Squaw Valley Resort Well
Resort at Squaw Creek 18-3R
Resort at Squaw Creek Irrigation/Snowmaking Well
Well To Be Destroyed
Active Model Area
Olympic Valley Groundwater Basin

October 2015

TODD GROUNDWATER

Figure 4
Existing and New Well Non Project Only Demands

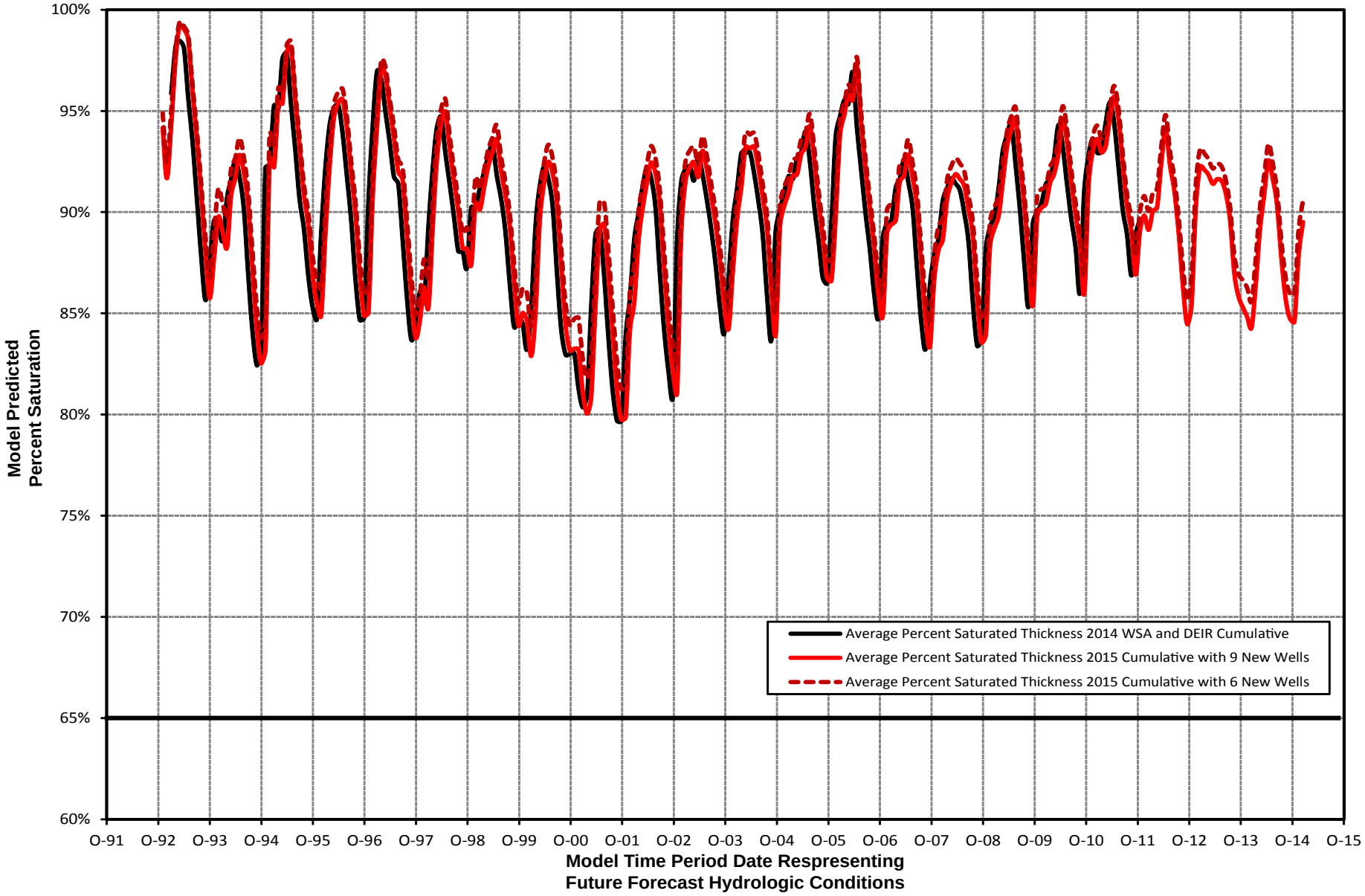


Existing PSD Well
Existing MWC Well
Squaw Valley Resort Well
Resort at Squaw Creek Irrigation/Snowmaking Well
Active Model Area
Olympic Valley Groundwater Basin

October 2015

TODD GROUNDWATER

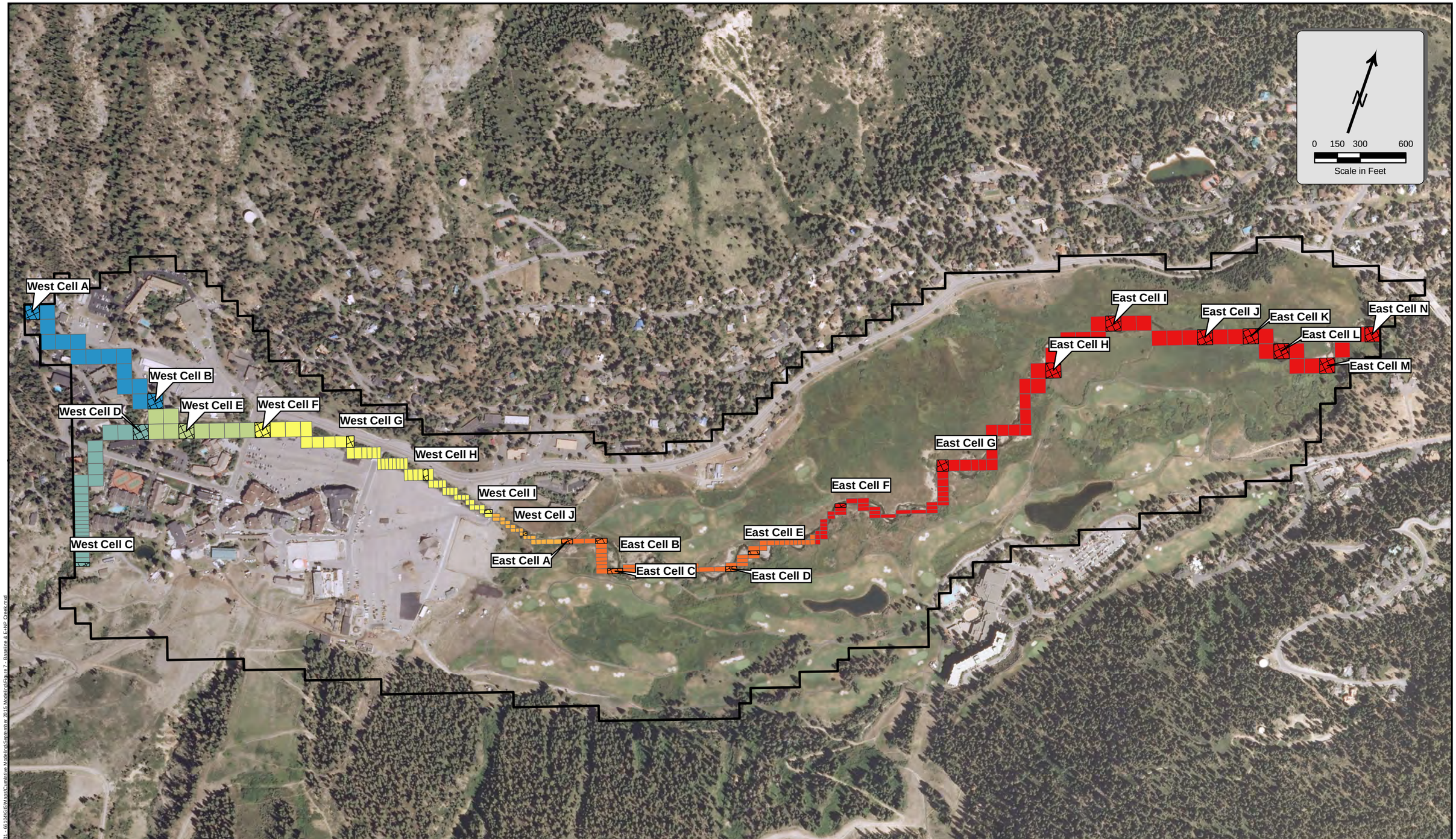
Figure 5
Existing Wells
Baseline Demands



October 2015

TODD GROUNDWATER

Figure 6
2015 WSA Update and DEIR Simulated Average Percent Saturation



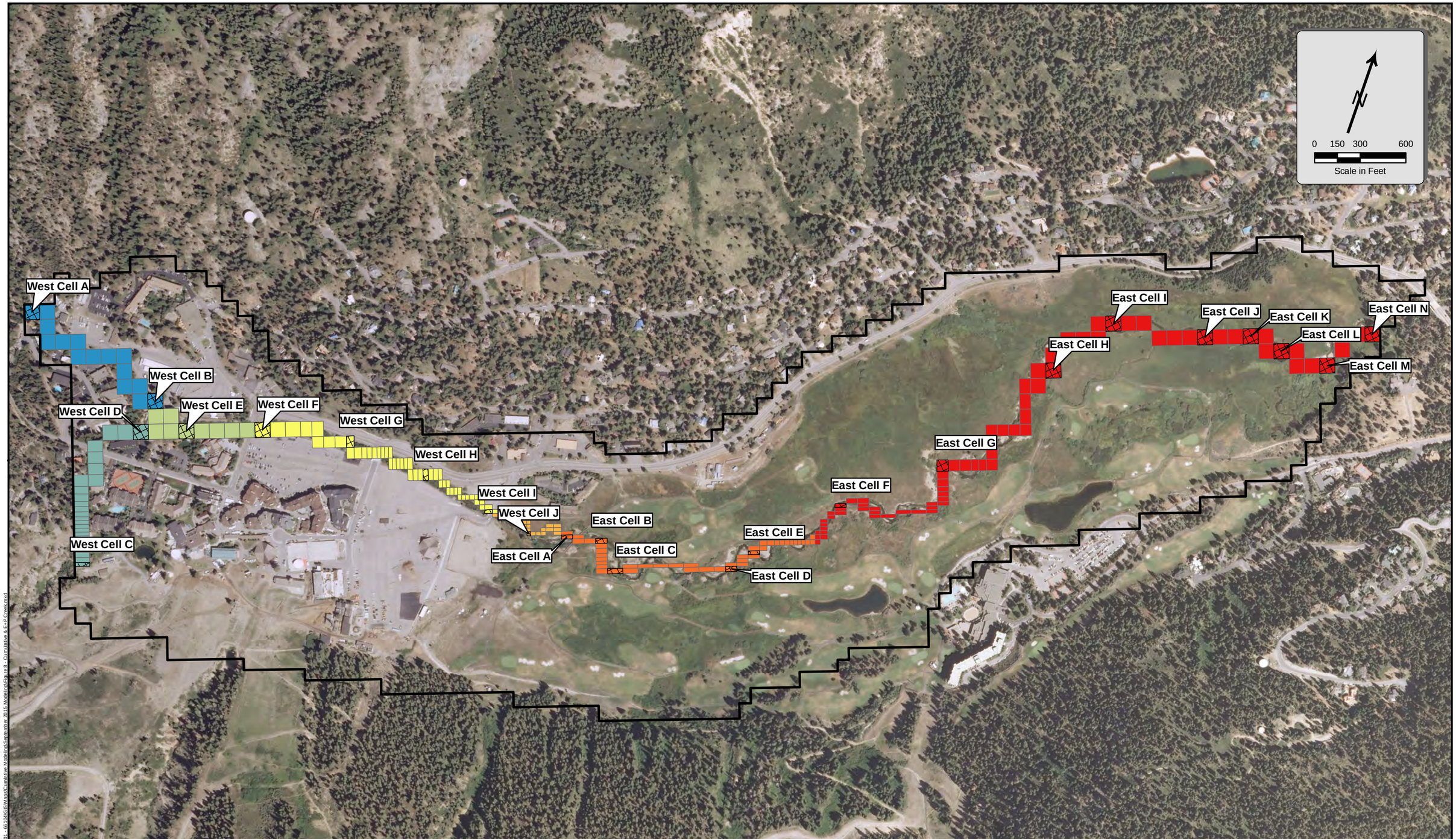
Legend

- North Fork
- South Fork
- Main 1 (West)
- Main 2 (West)
- Main 3 (West)
- Main 4 (East)
- Main 5 (East)
- Stream Cells with Groundwater Elevation
- Active Model Area

October 2015

TODD GROUNDWATER

Figure 7
Squaw Creek in Model Baseline and Non-Project



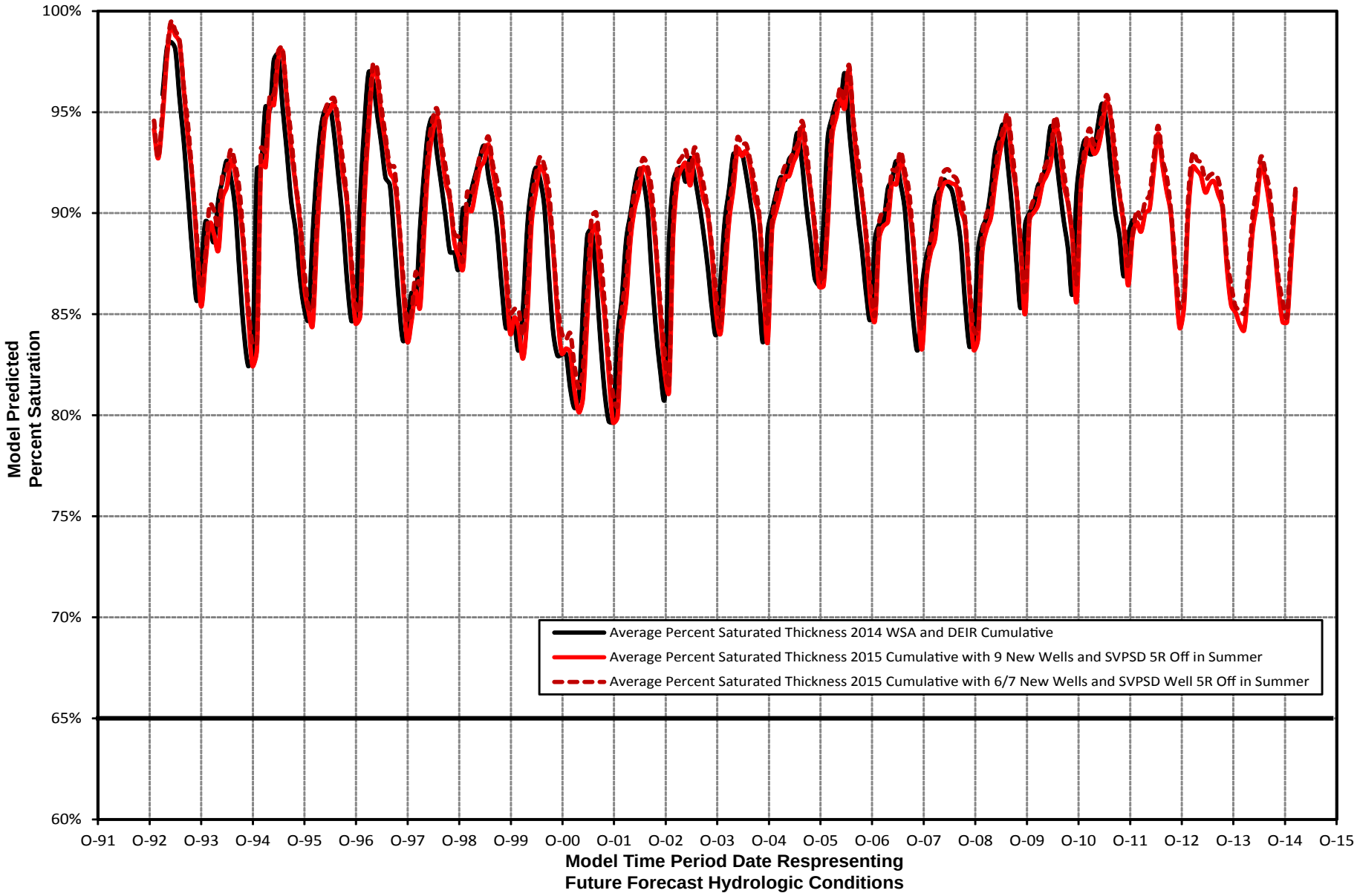
Legend

- North Fork
- South Fork
- Main 1 (West)
- Main 2 (West)
- Main 3 (West)
- Main 4 (East)
- Main 5 (East)
- Model Stream Cells
- Active Model Area

October 2015

TODD GROUNDWATER

Figure 8
Squaw Creek in Model Cumulative and Existing + Project



October 2015

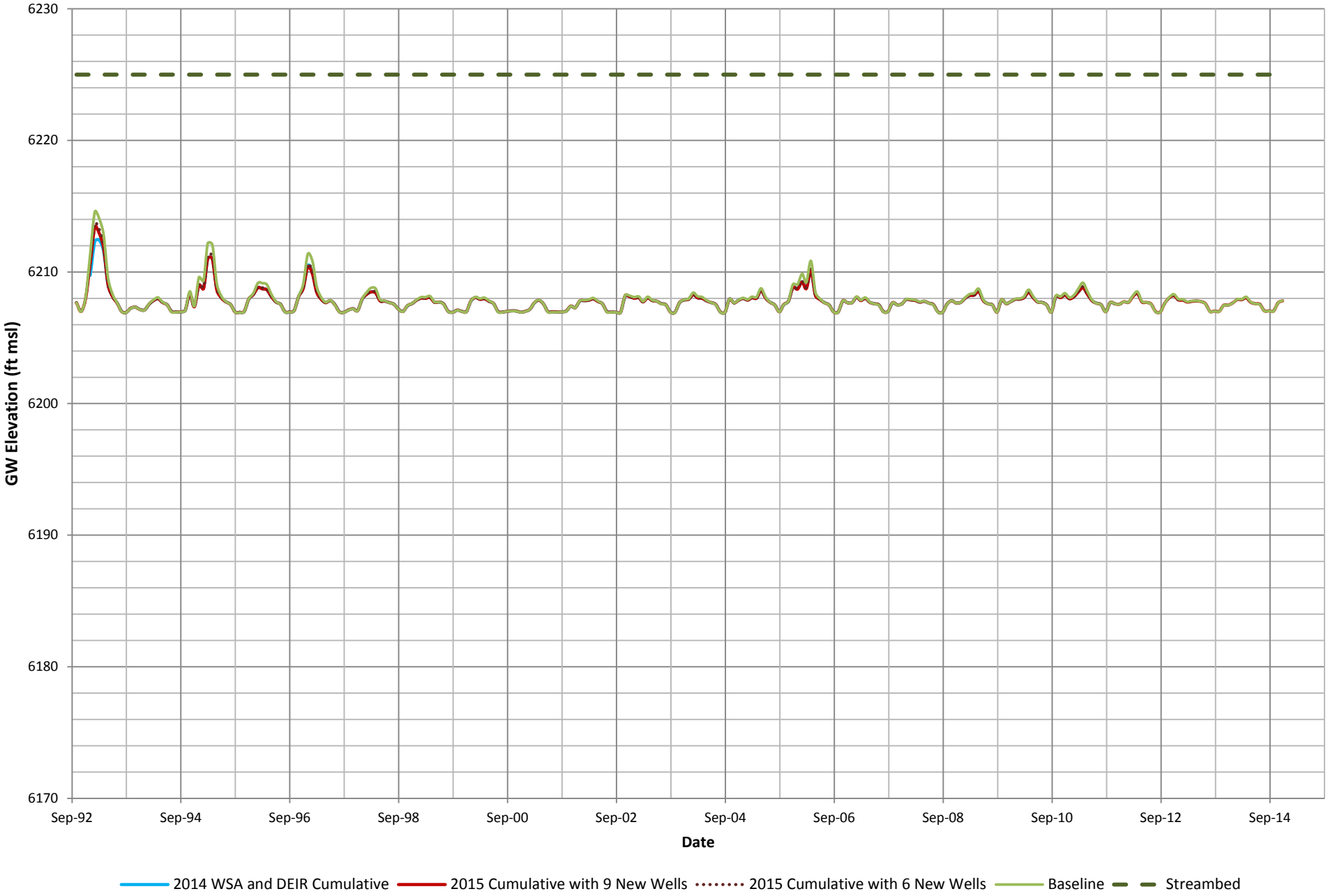
TODD GROUNDWATER

Figure 9
2015 WSA Demands w/ Well 5R Off Summer-Fall and DEIR Simulated Average Percent Saturation

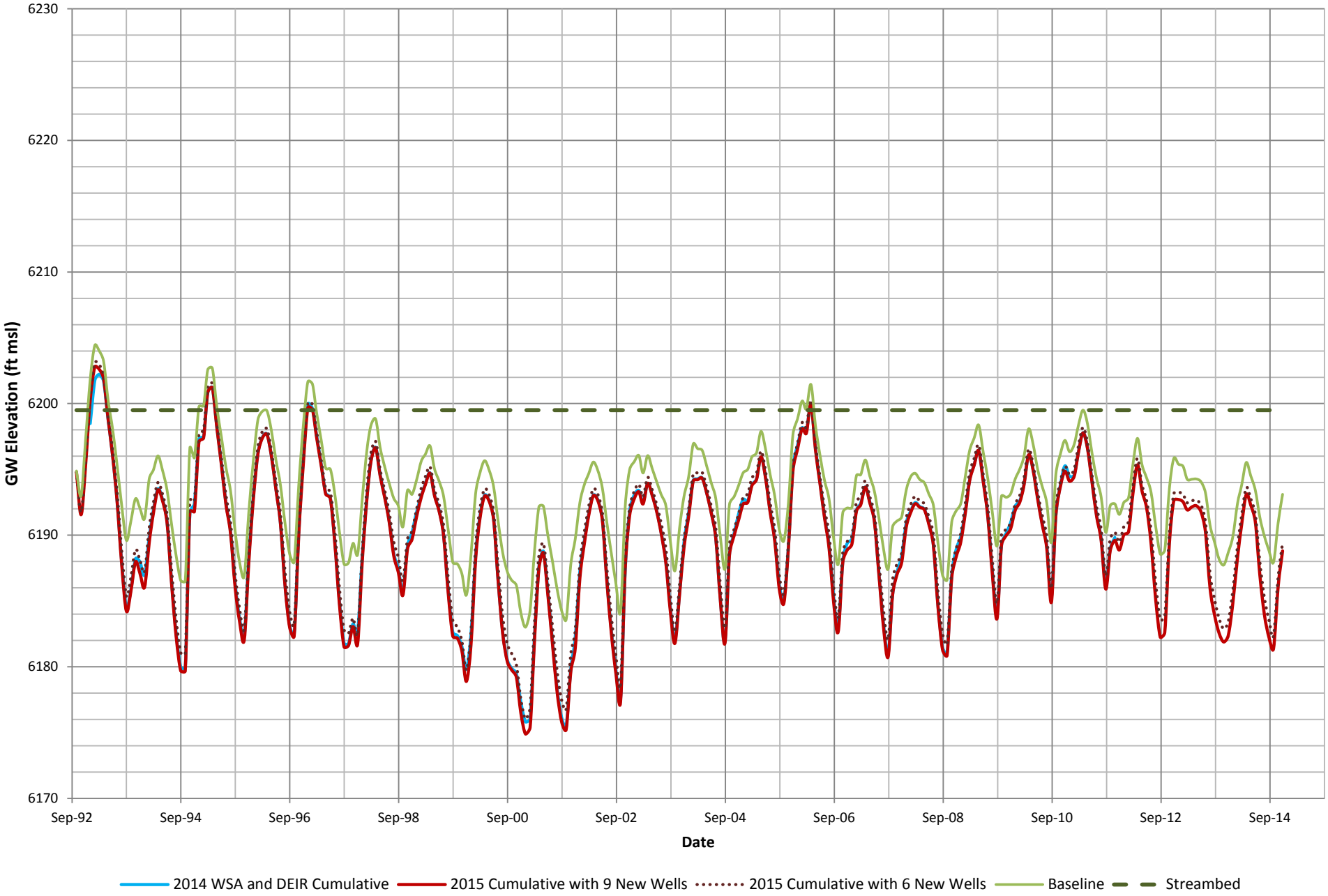
APPENDIX A

Model Simulated Groundwater Elevation Data Beneath Squaw Creek, 2015 WSA Update Simulations

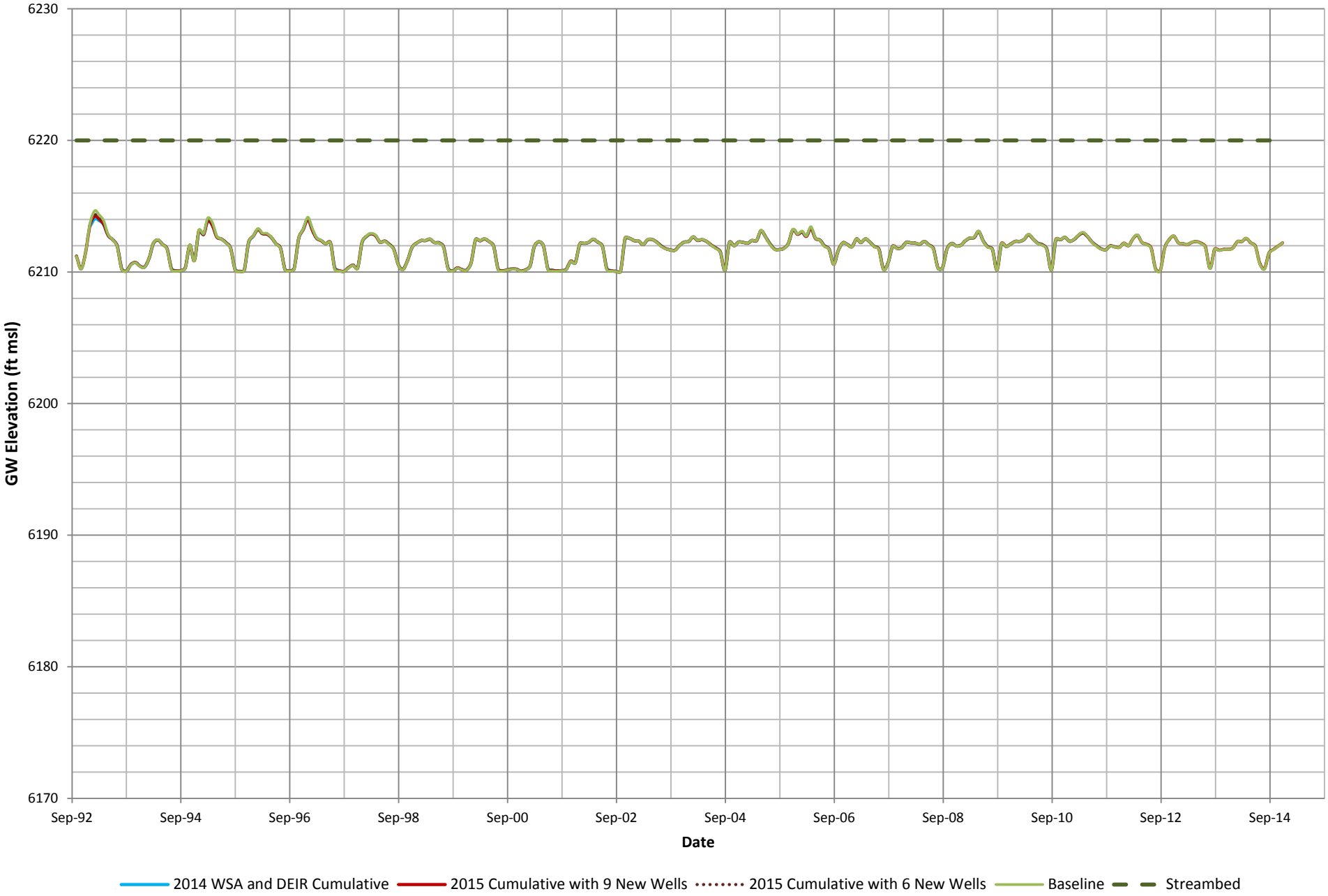
West Cell A Groundwater Elevations
2015 WSA Update and DEIR Model Simulation Comparison



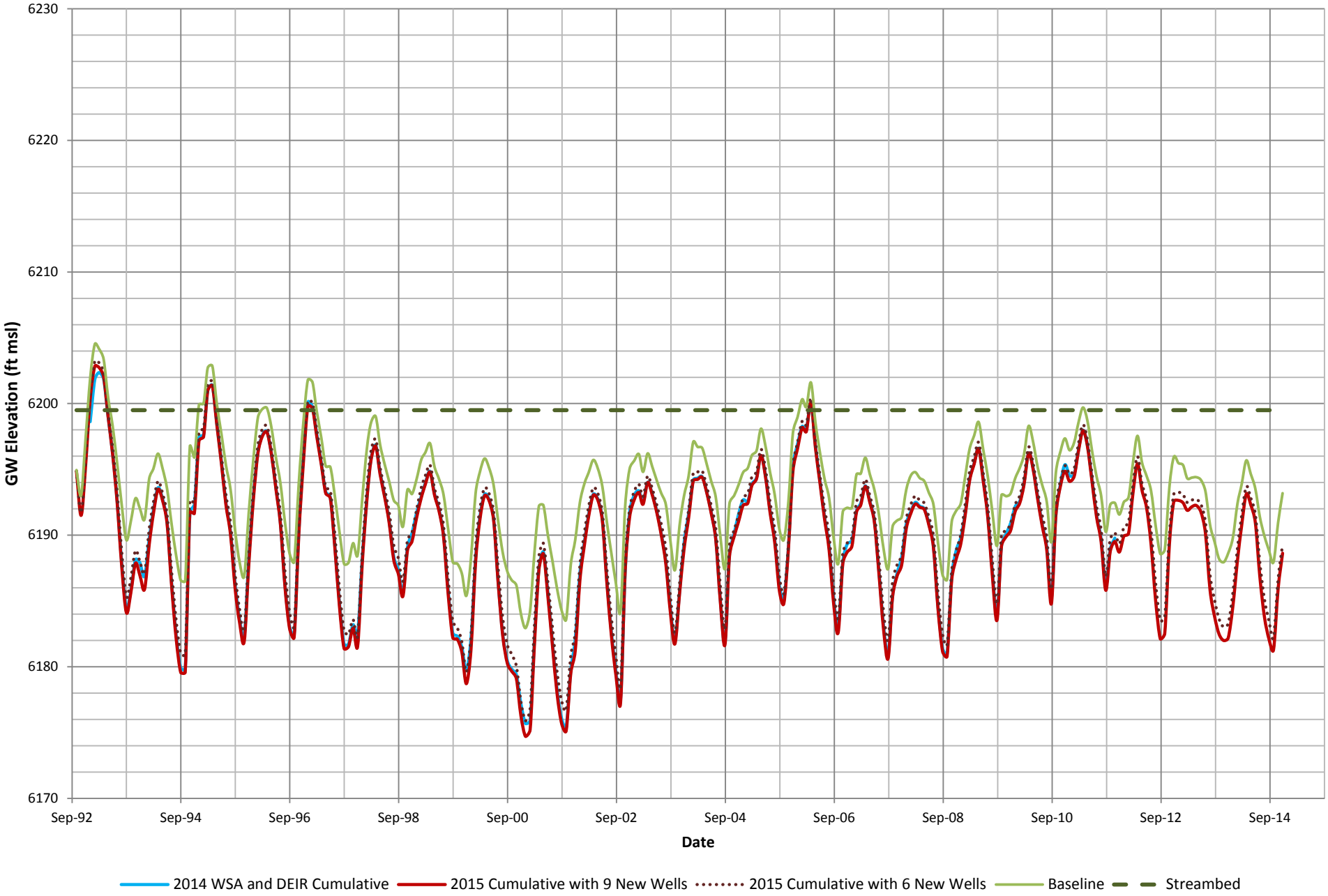
West Cell B Groundwater Elevations
2015 WSA Update and DEIR Model Simulation Comparison



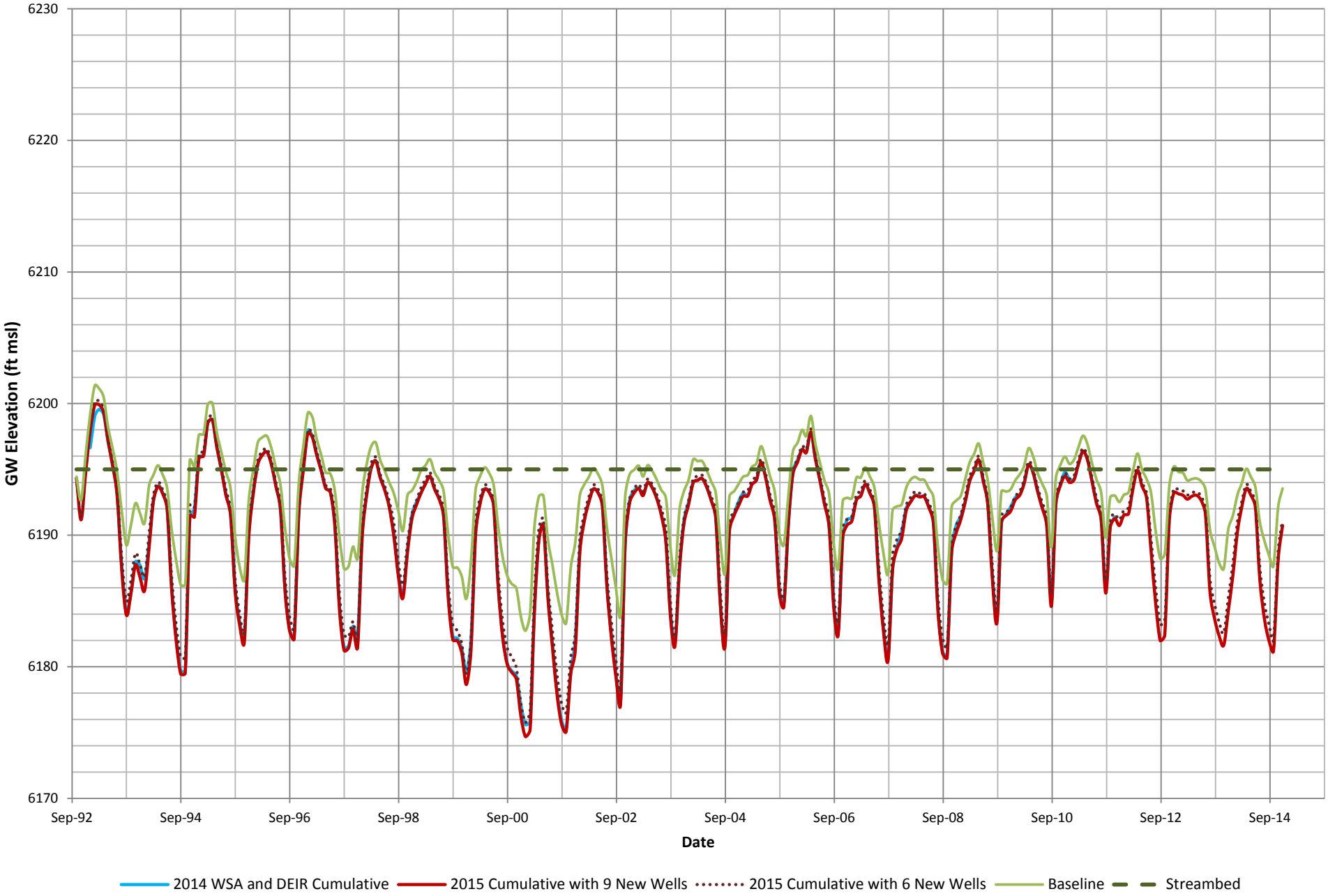
West Cell C Groundwater Elevations
2015 WSA Update and DEIR Model Simulation Comparison



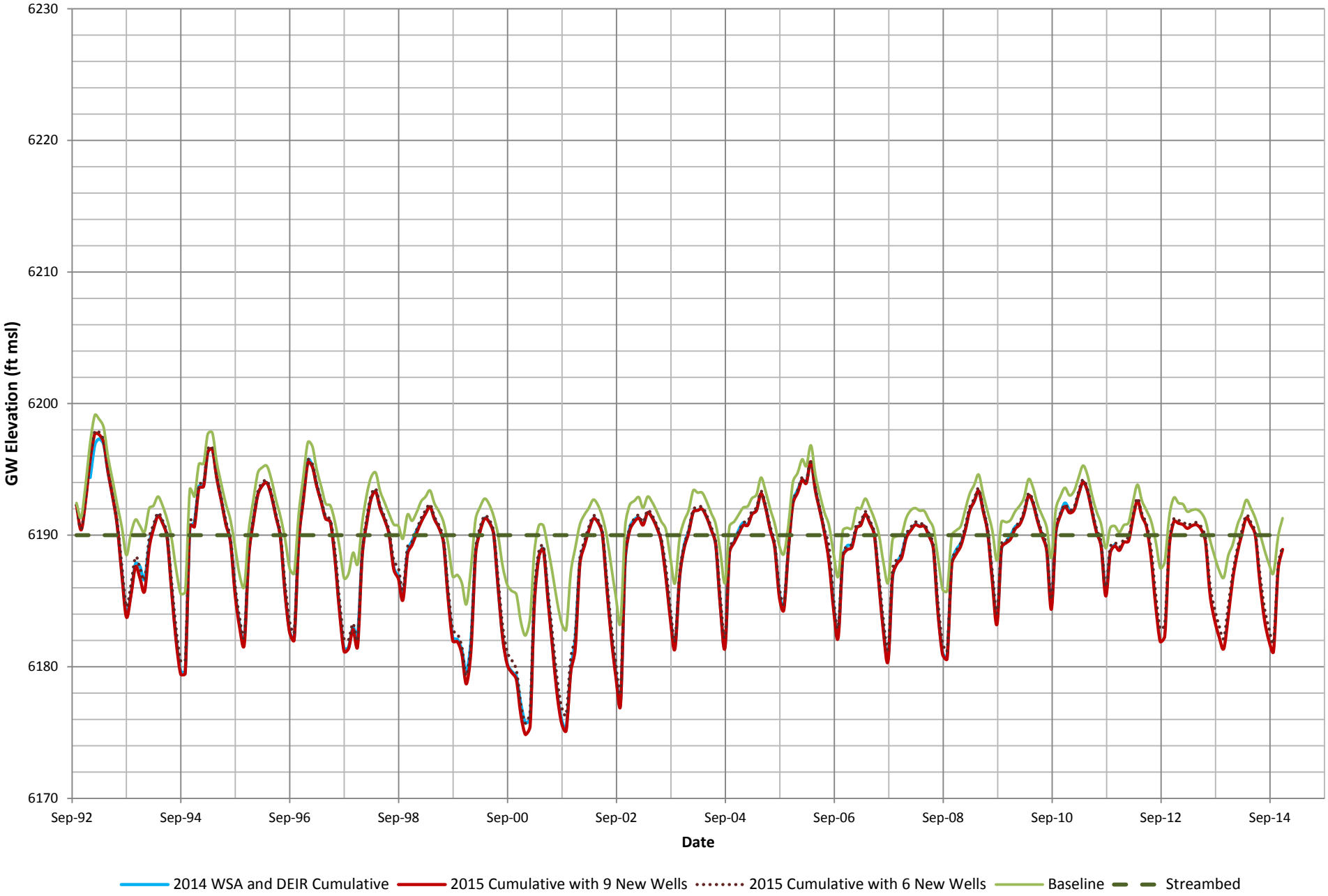
West Cell D Groundwater Elevations
2015 WSA Update and DEIR Model Simulation Comparison



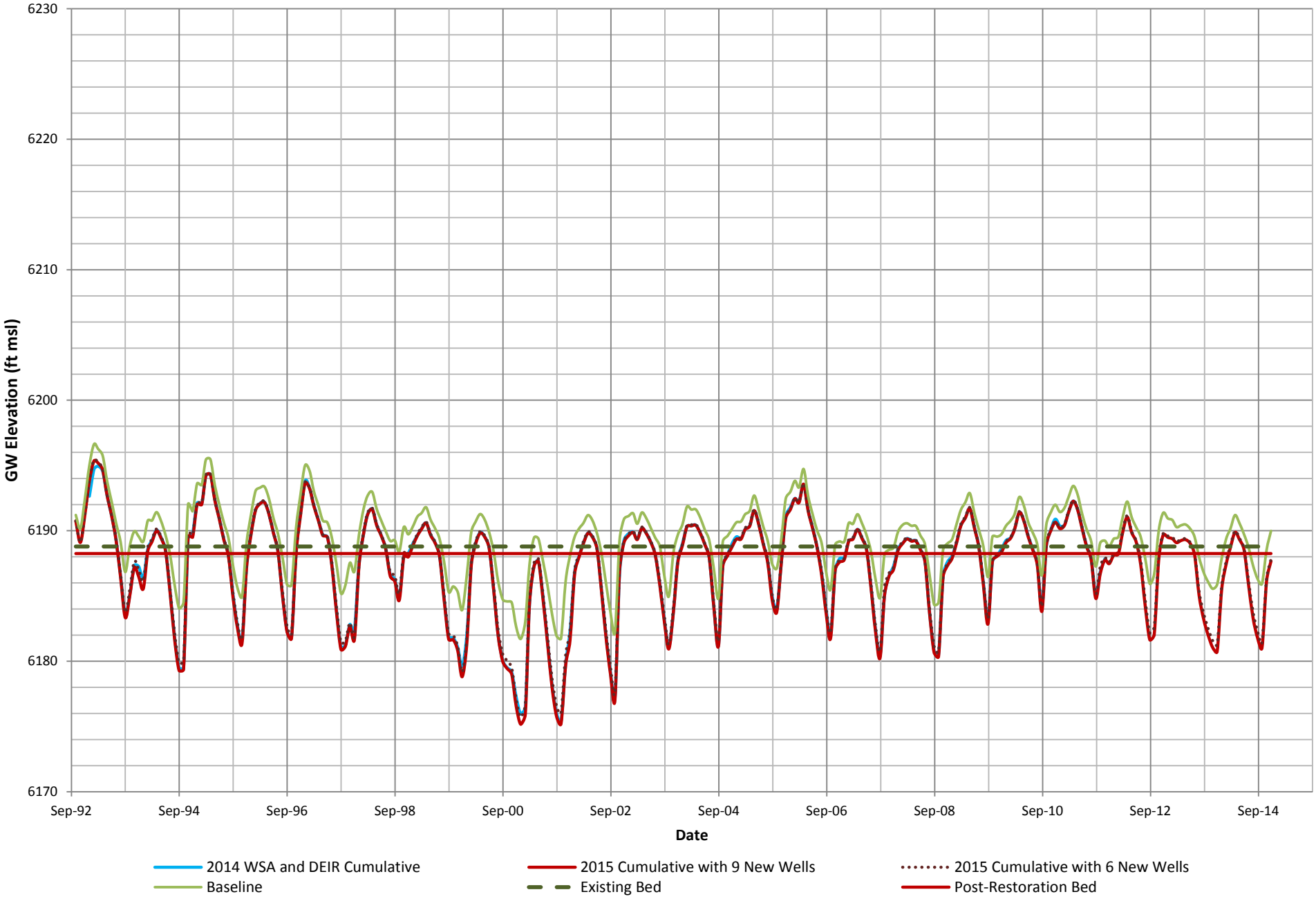
West Cell E Groundwater Elevations
2015 WSA Update and DEIR Model Simulation Comparison



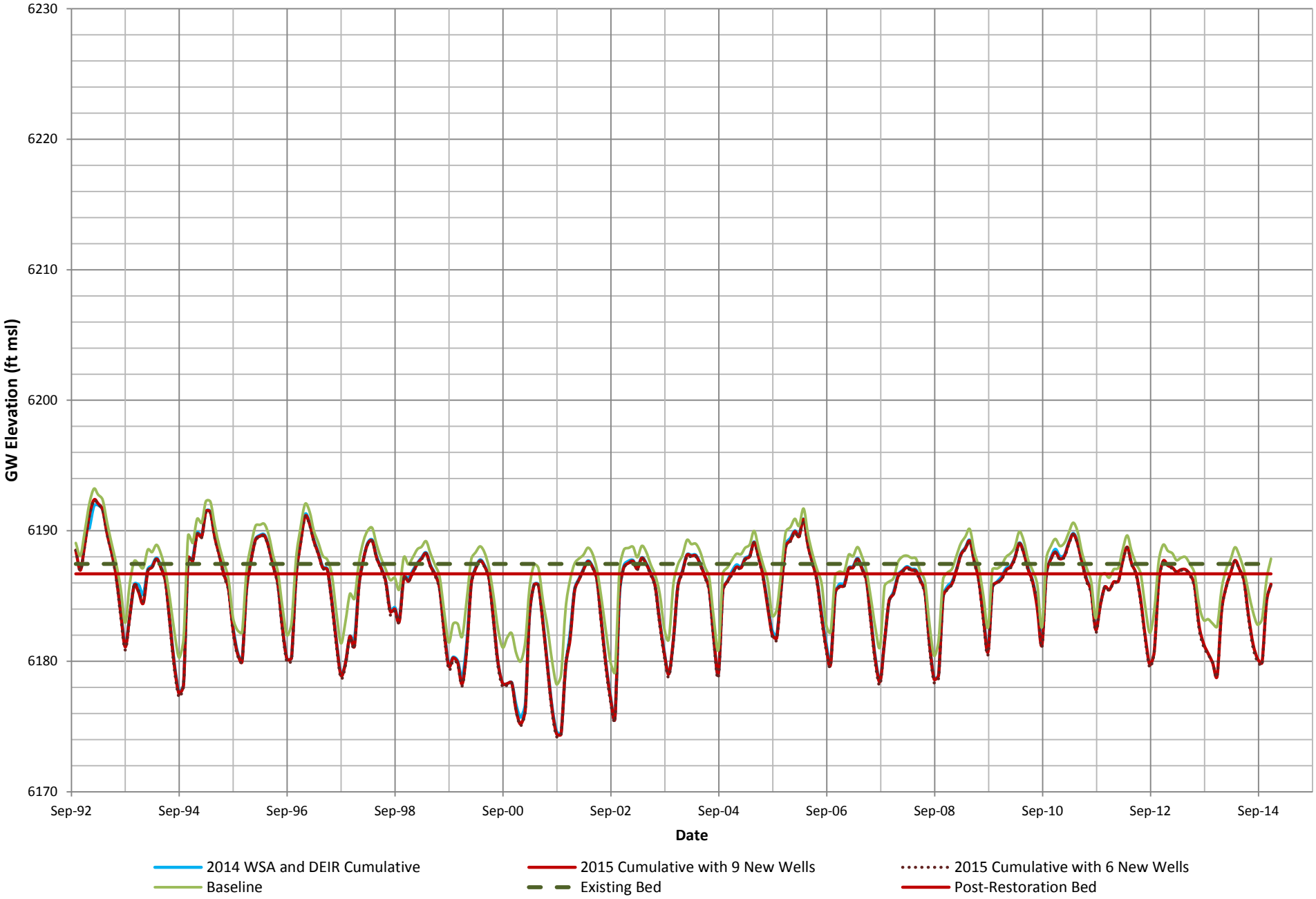
West Cell F Groundwater Elevations
2015 WSA Update and DEIR Model Simulation Comparison



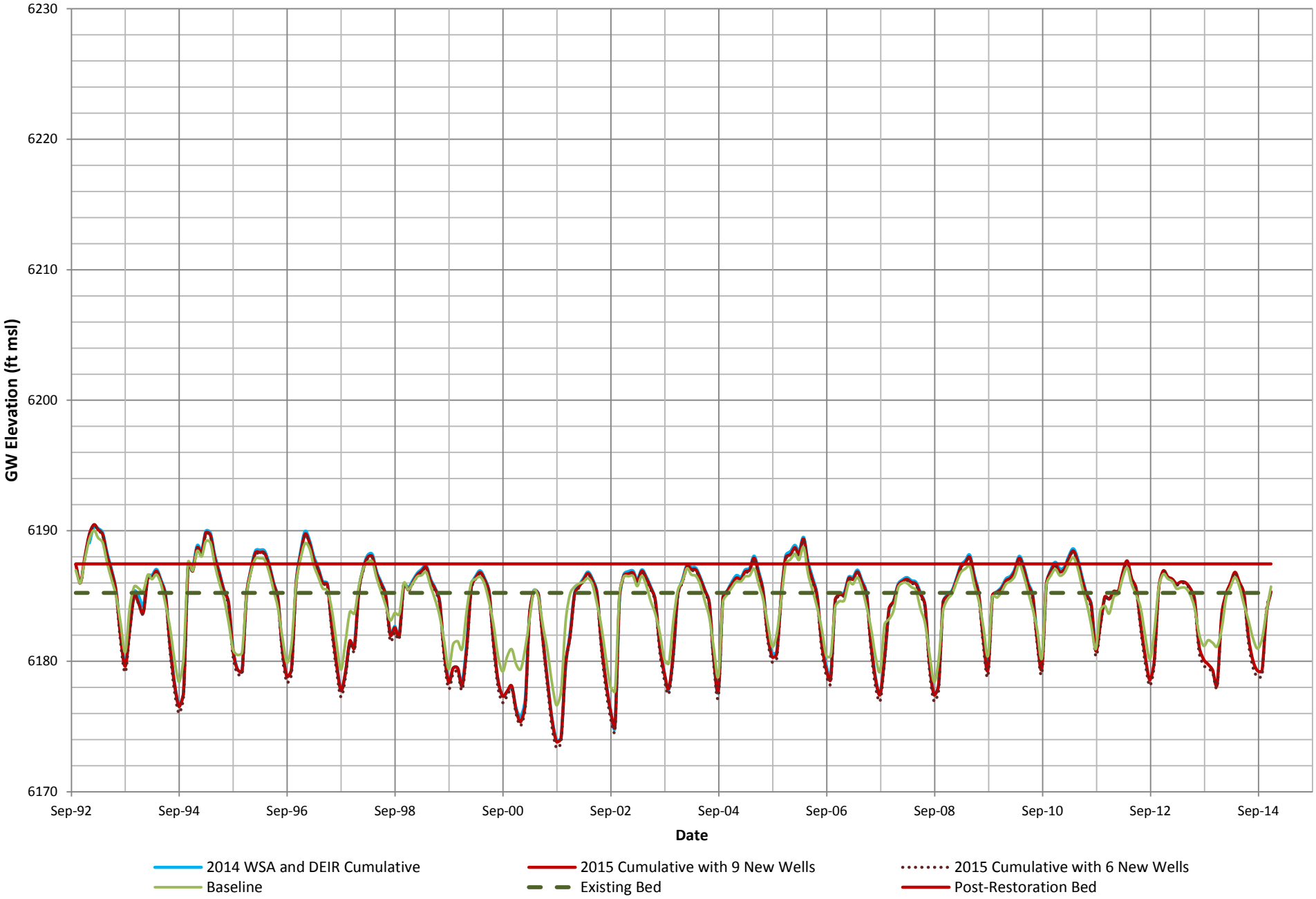
West Cell G Groundwater Elevations
2015 WSA Update and DEIR Model Simulation Comparison



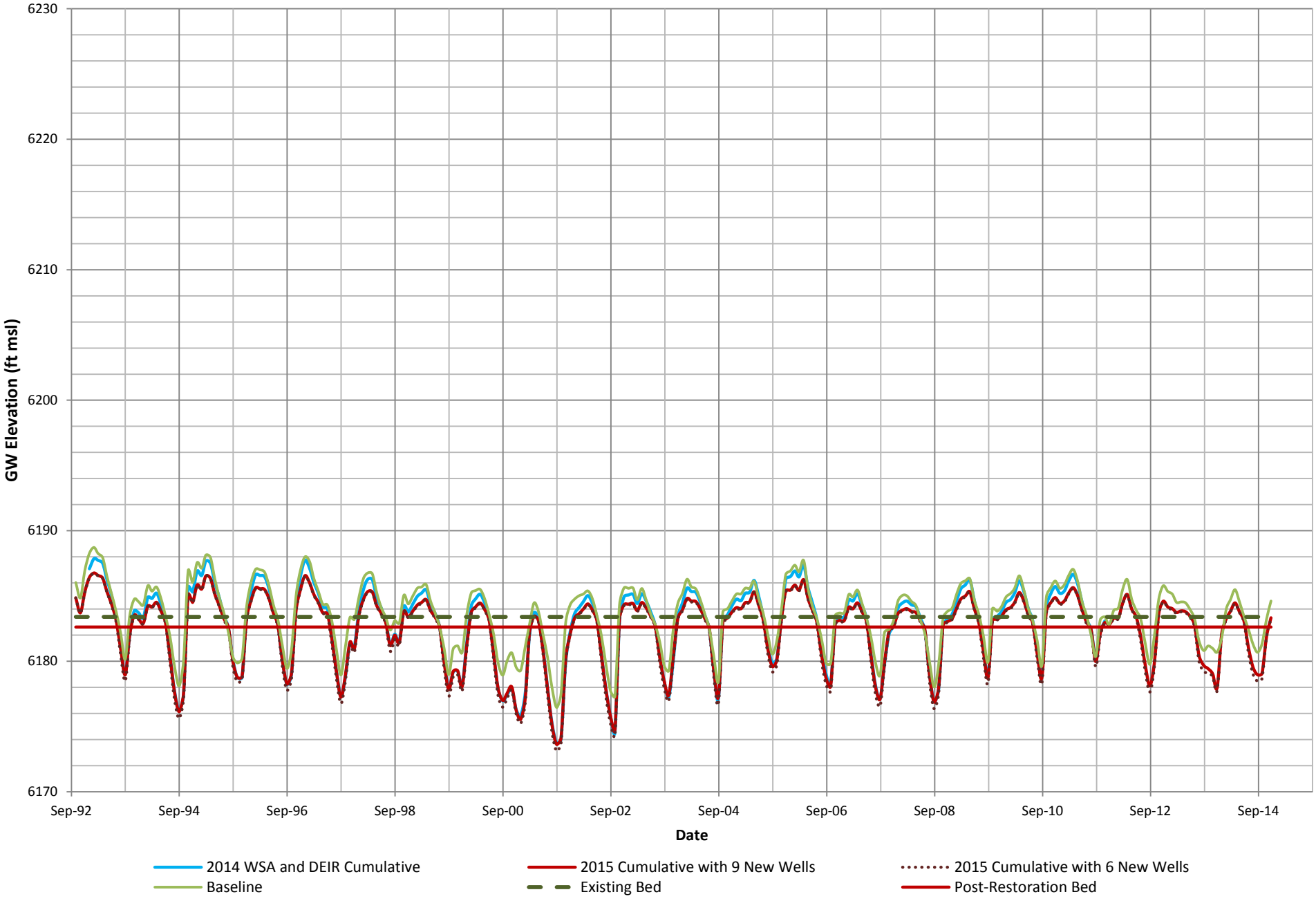
West Cell H Groundwater Elevations
2015 WSA Update and DEIR Model Simulation Comparison



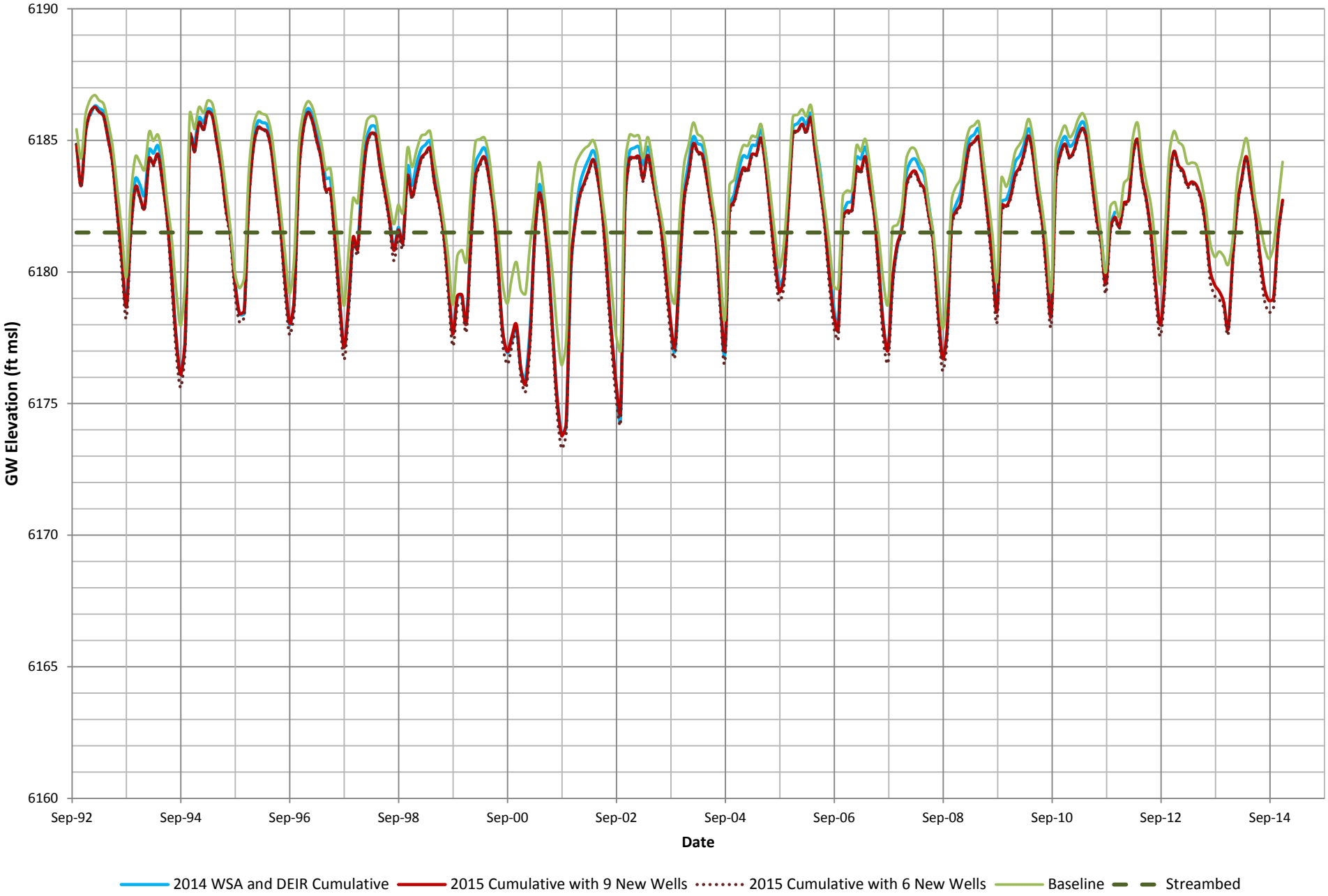
West Cell I Groundwater Elevations
2015 WSA Update and DEIR Model Simulation Comparison



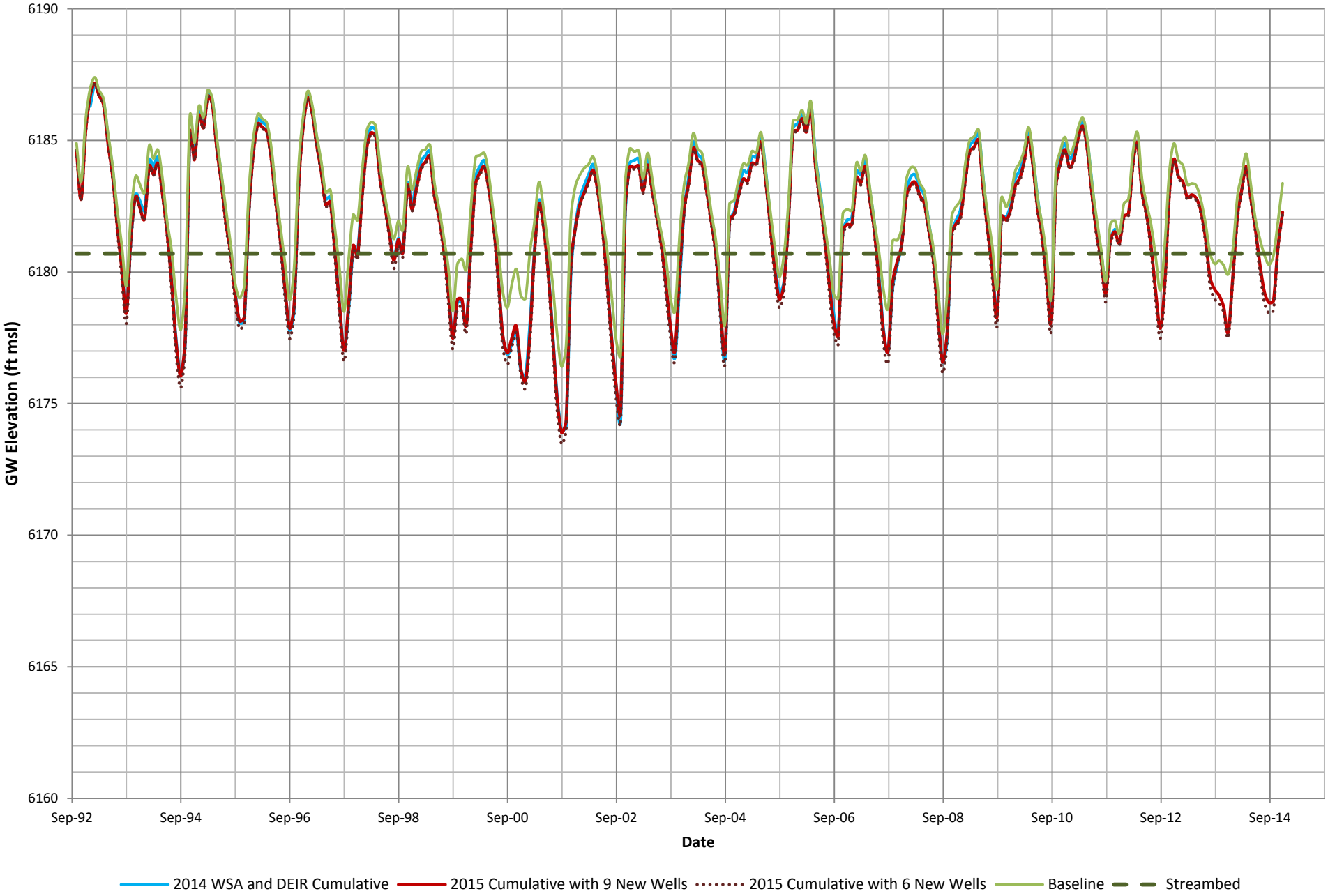
West Cell J Groundwater Elevations
2015 WSA Update and DEIR Model Simulation Comparison



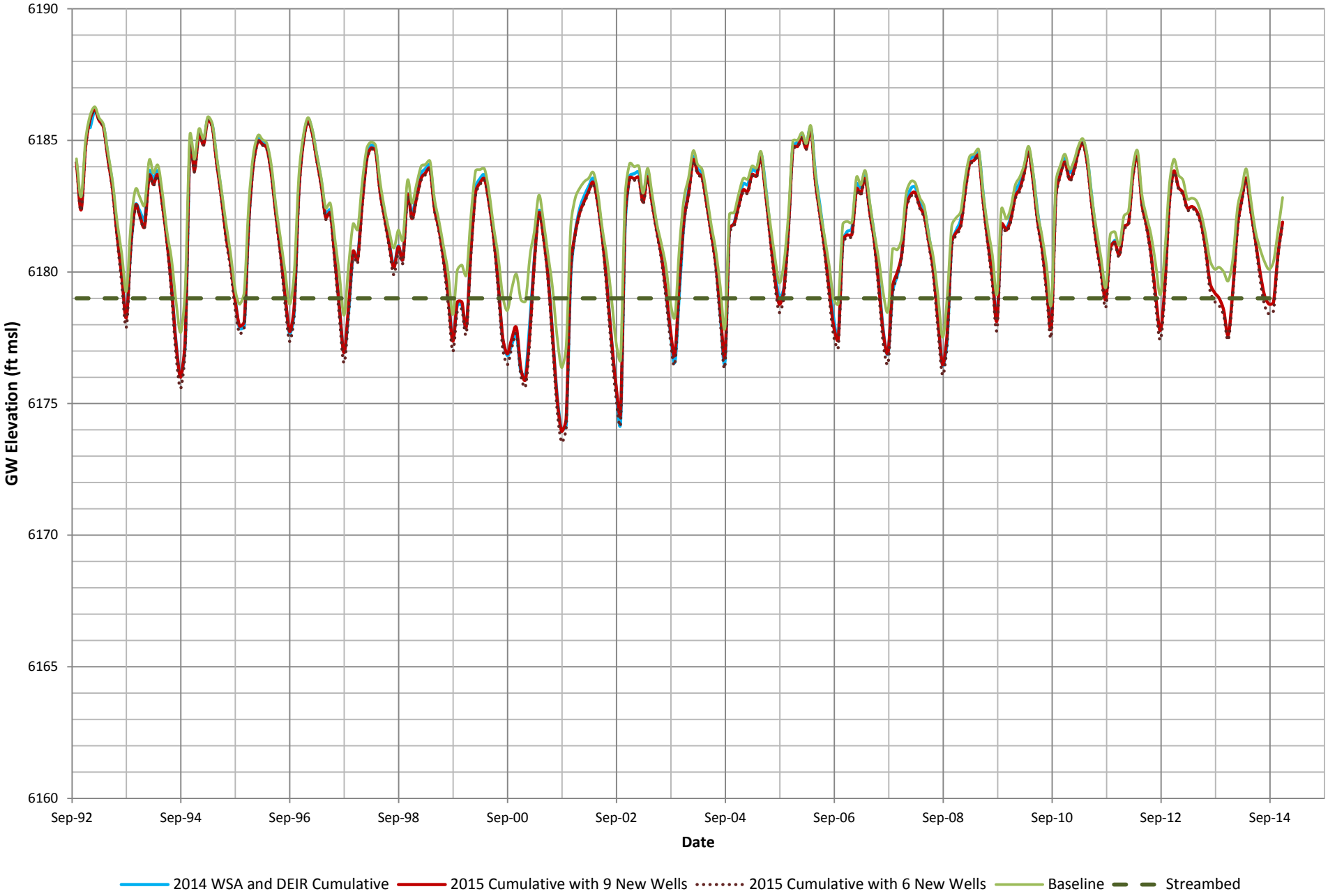
East Cell A Groundwater Elevations
2015 WSA Update and DEIR Model Simulation Comparison



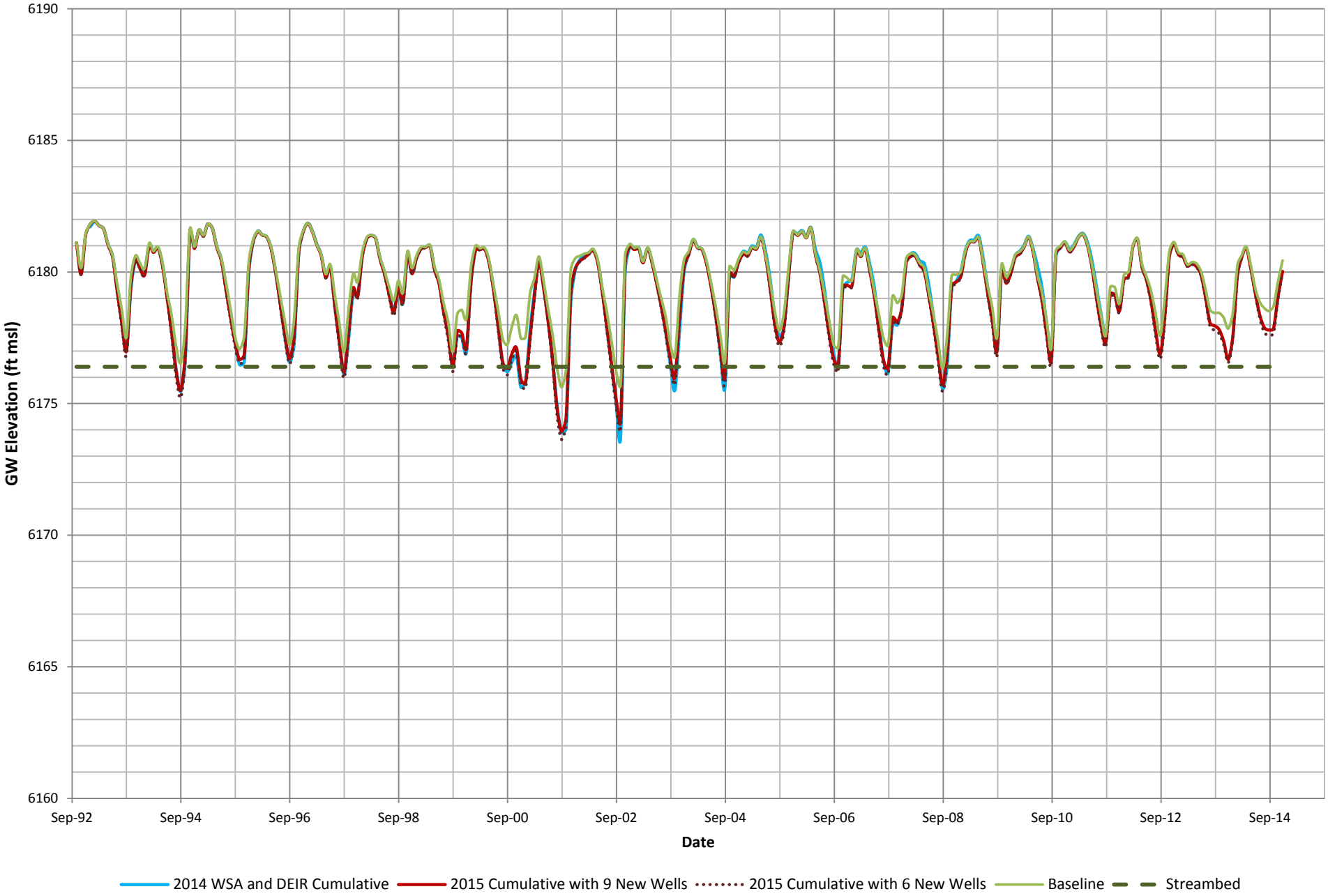
East Cell B Groundwater Elevations
2015 WSA Update and DEIR Model Simulation Comparison



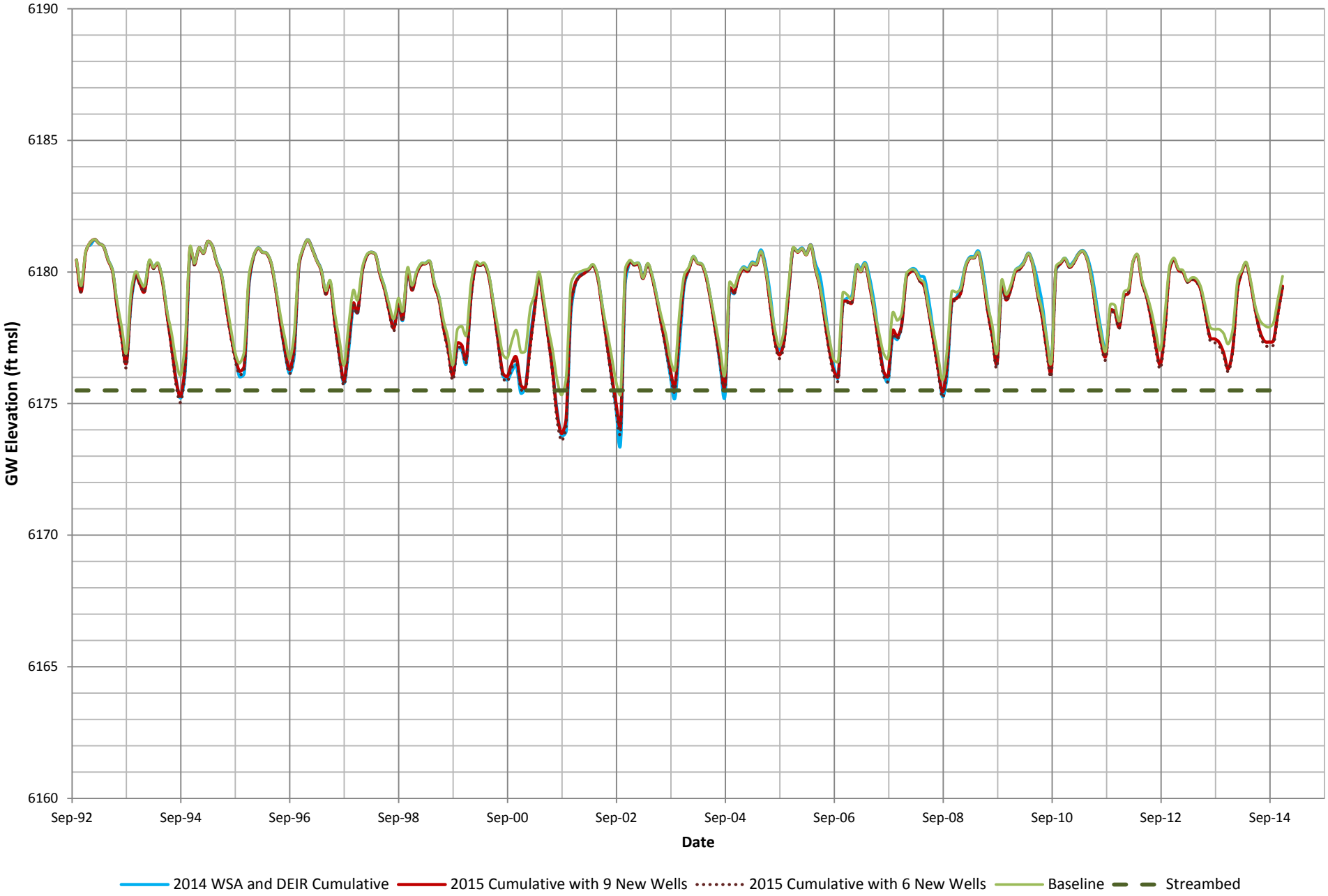
East Cell C Groundwater Elevations
2015 WSA Update and DEIR Model Simulation Comparison



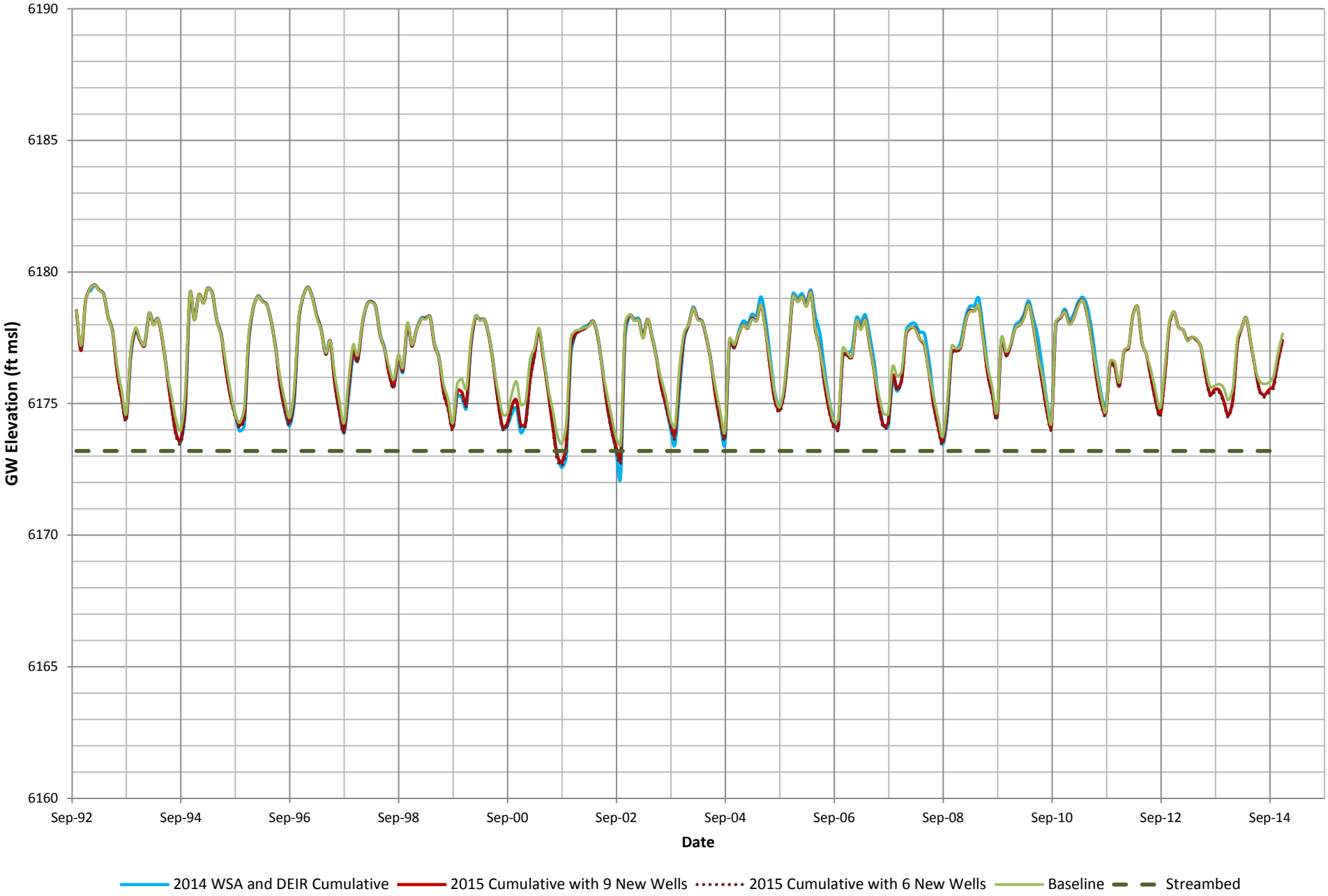
East Cell D Groundwater Elevations
2015 WSA Update and DEIR Model Simulation Comparison



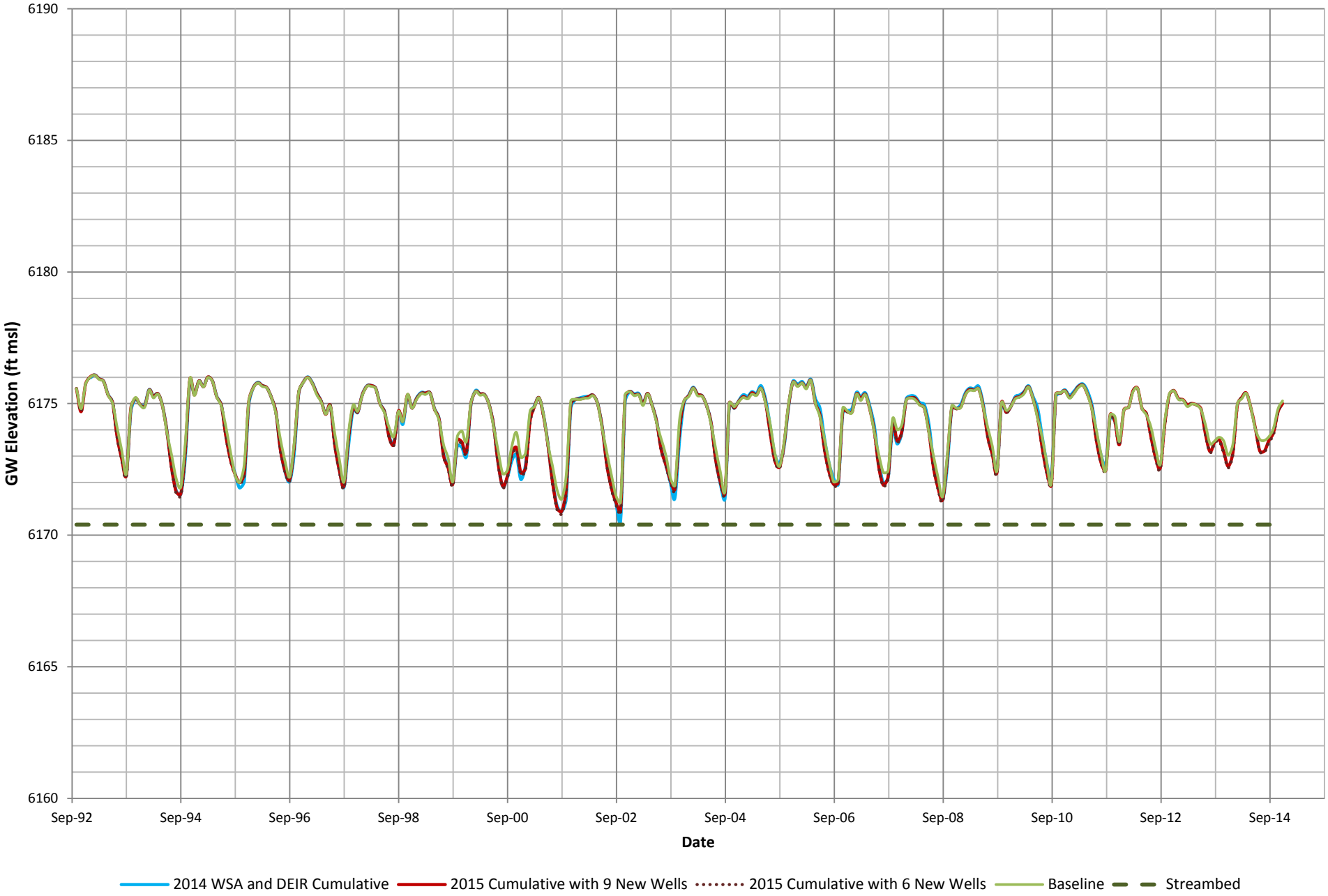
East Cell E Groundwater Elevations
2015 WSA Update and DEIR Model Simulation Comparison



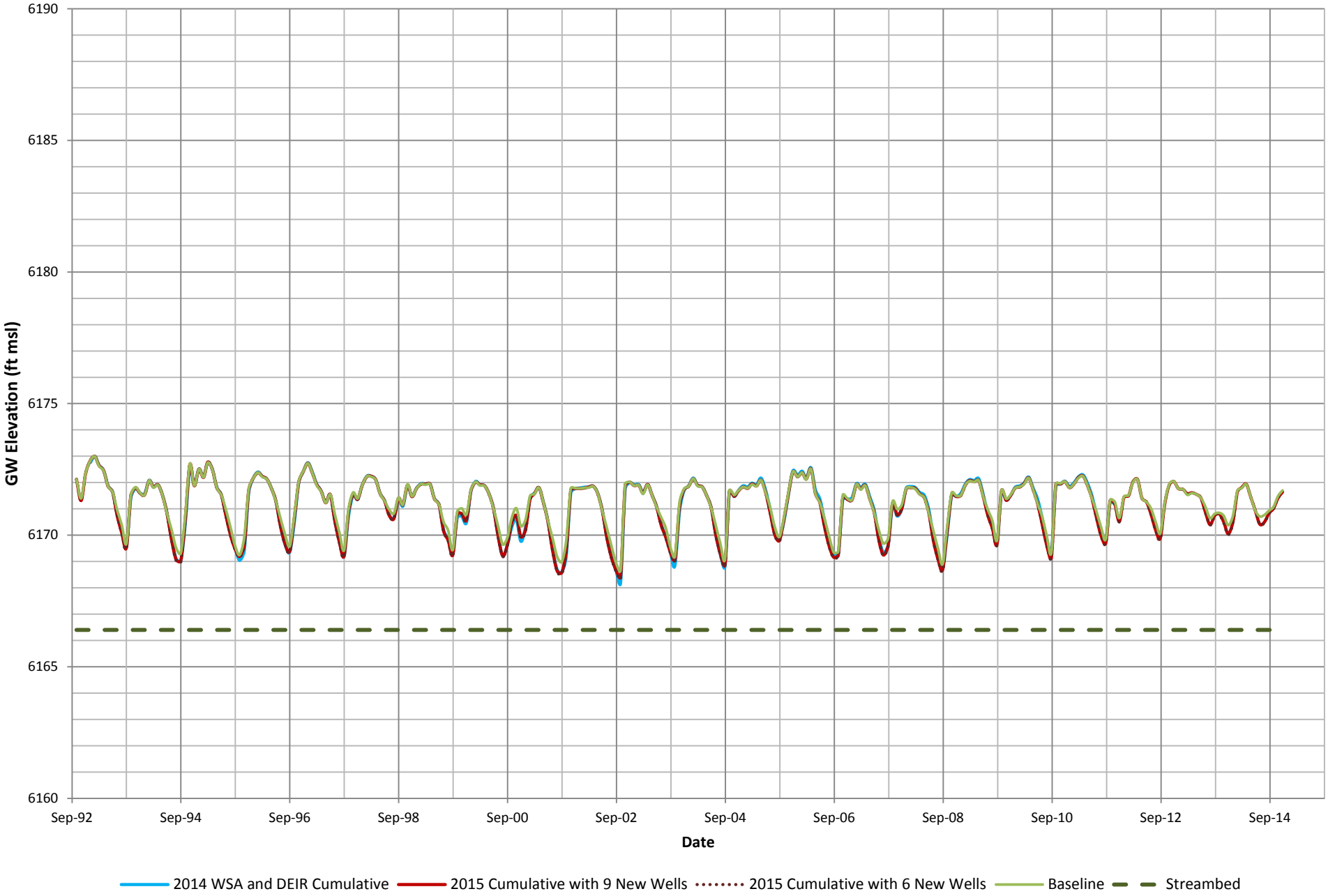
East Cell F Groundwater Elevations
2015 WSA Update and DEIR Model Simulation Comparison



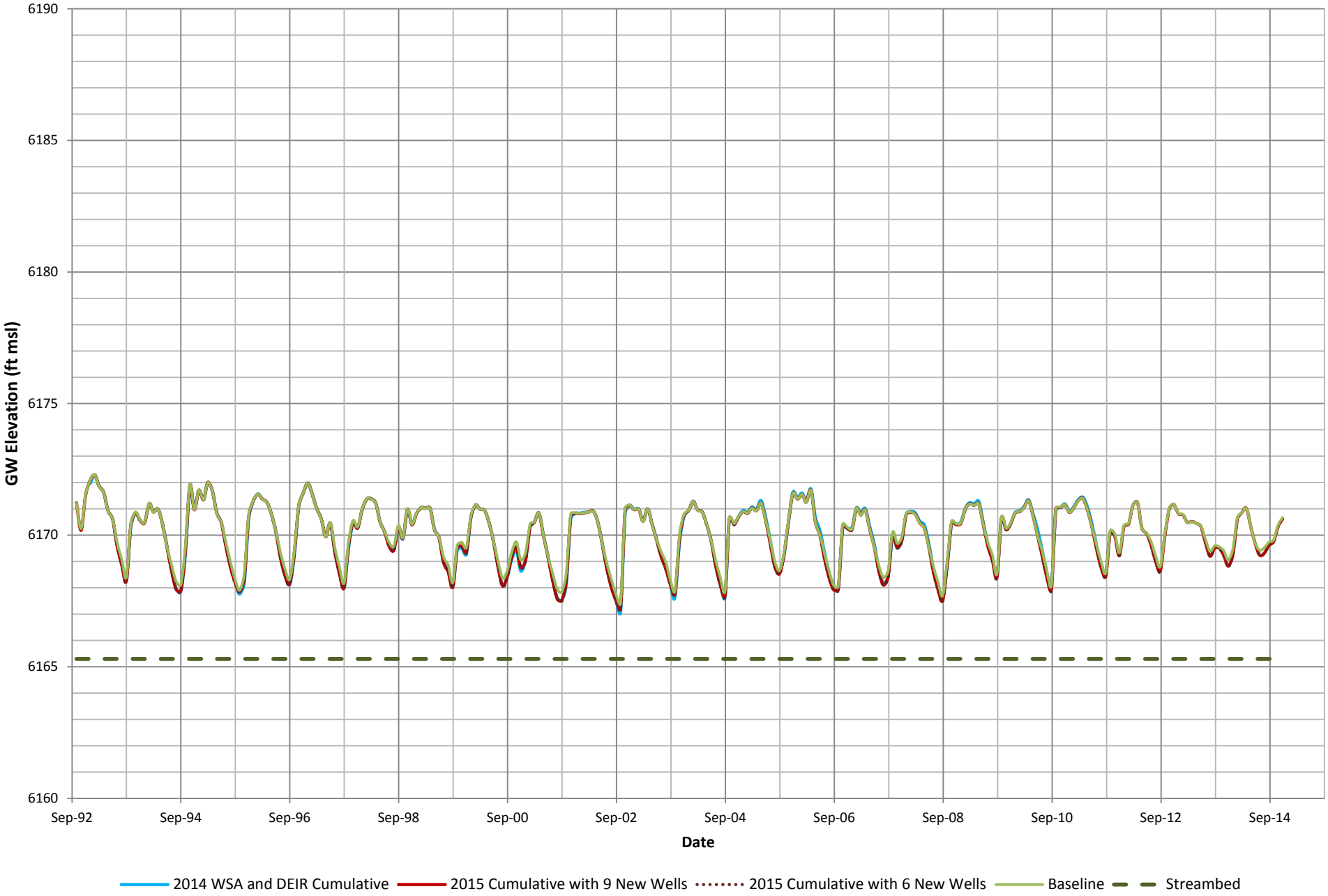
East Cell G Groundwater Elevations
2015 WSA Update and DEIR Model Simulation Comparison



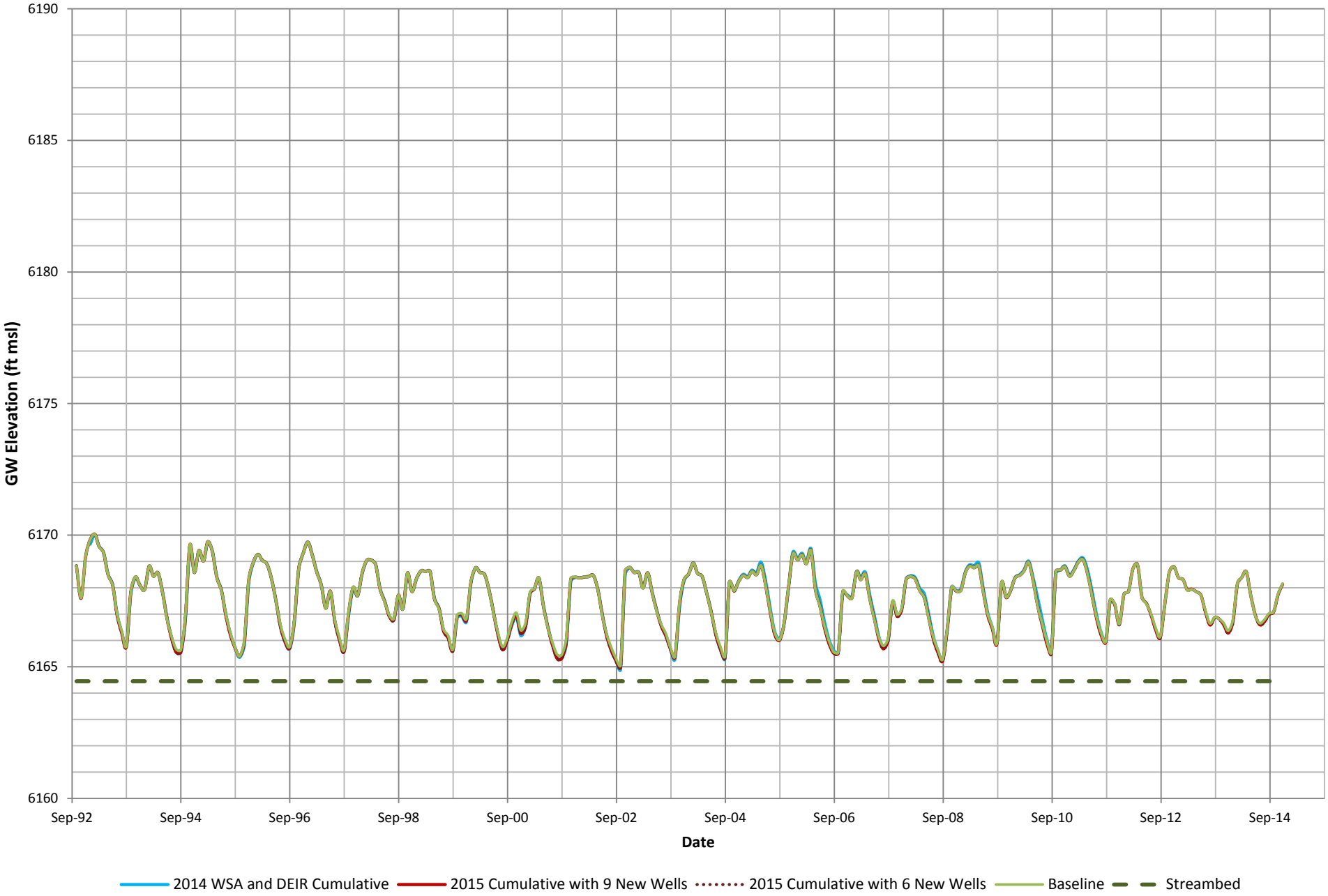
East Cell H Groundwater Elevations
2015 WSA Update and DEIR Model Simulation Comparison



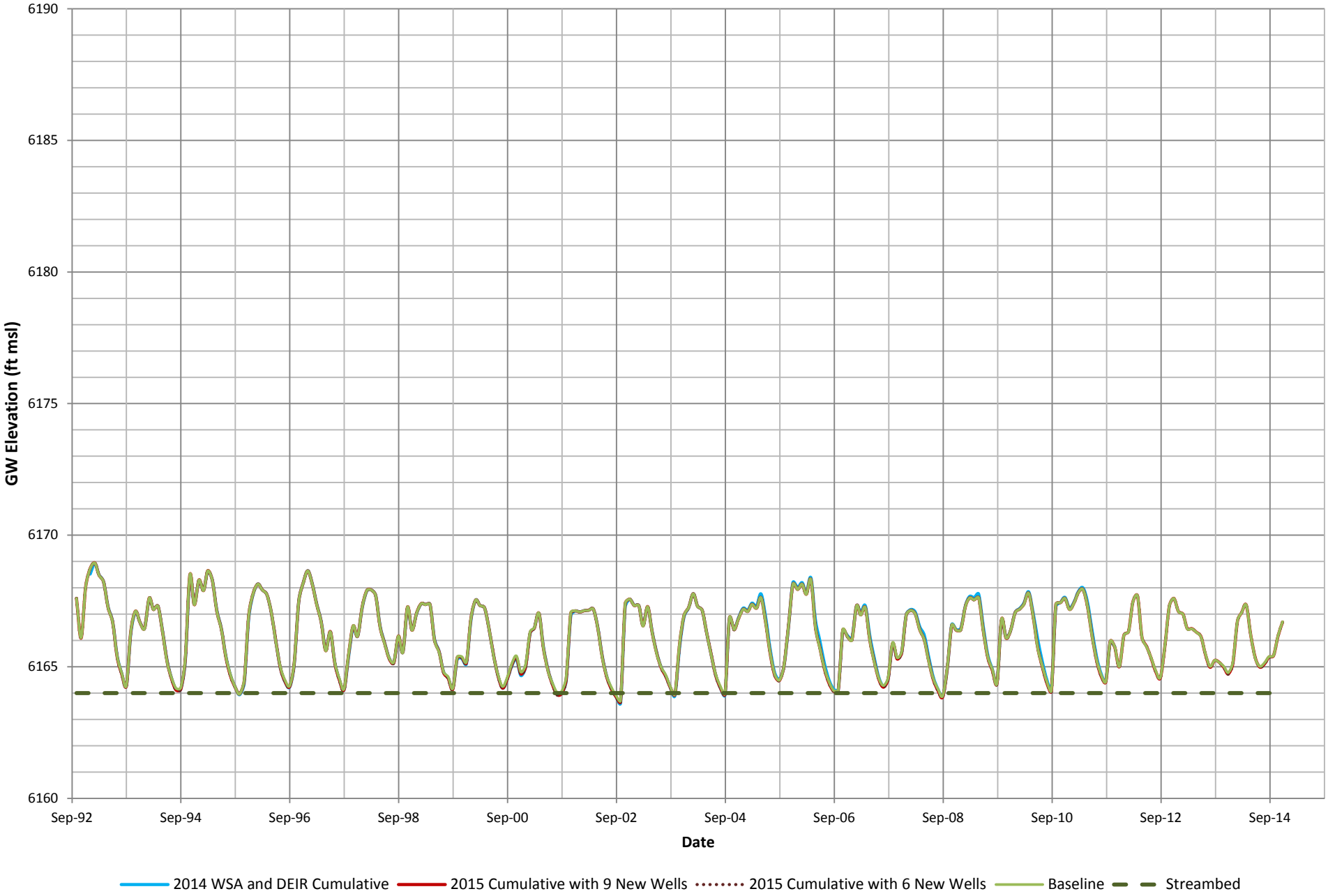
East Cell I Groundwater Elevations
2015 WSA Update and DEIR Model Simulation Comparison



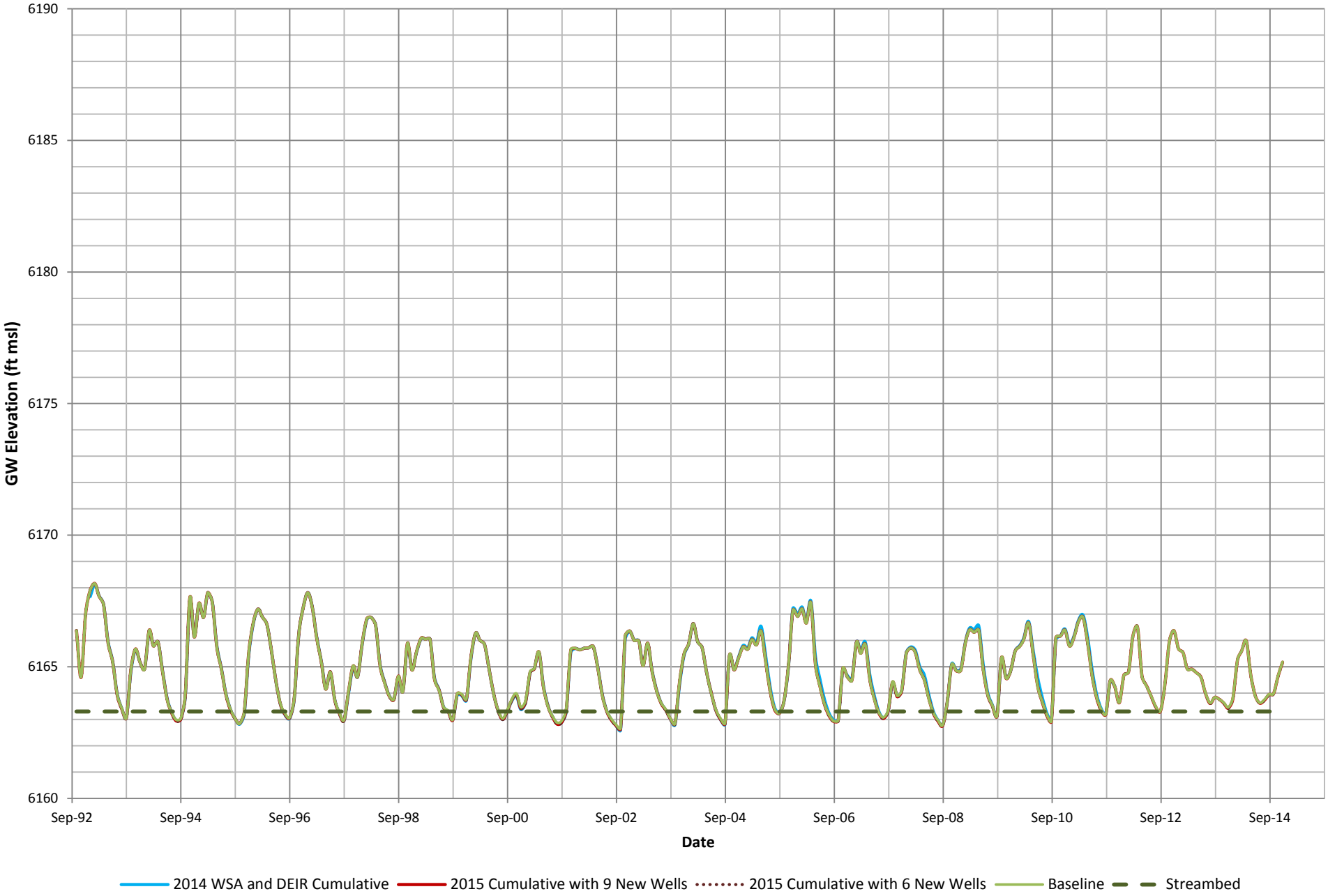
East Cell J Groundwater Elevations
2015 WSA Update and DEIR Model Simulation Comparison



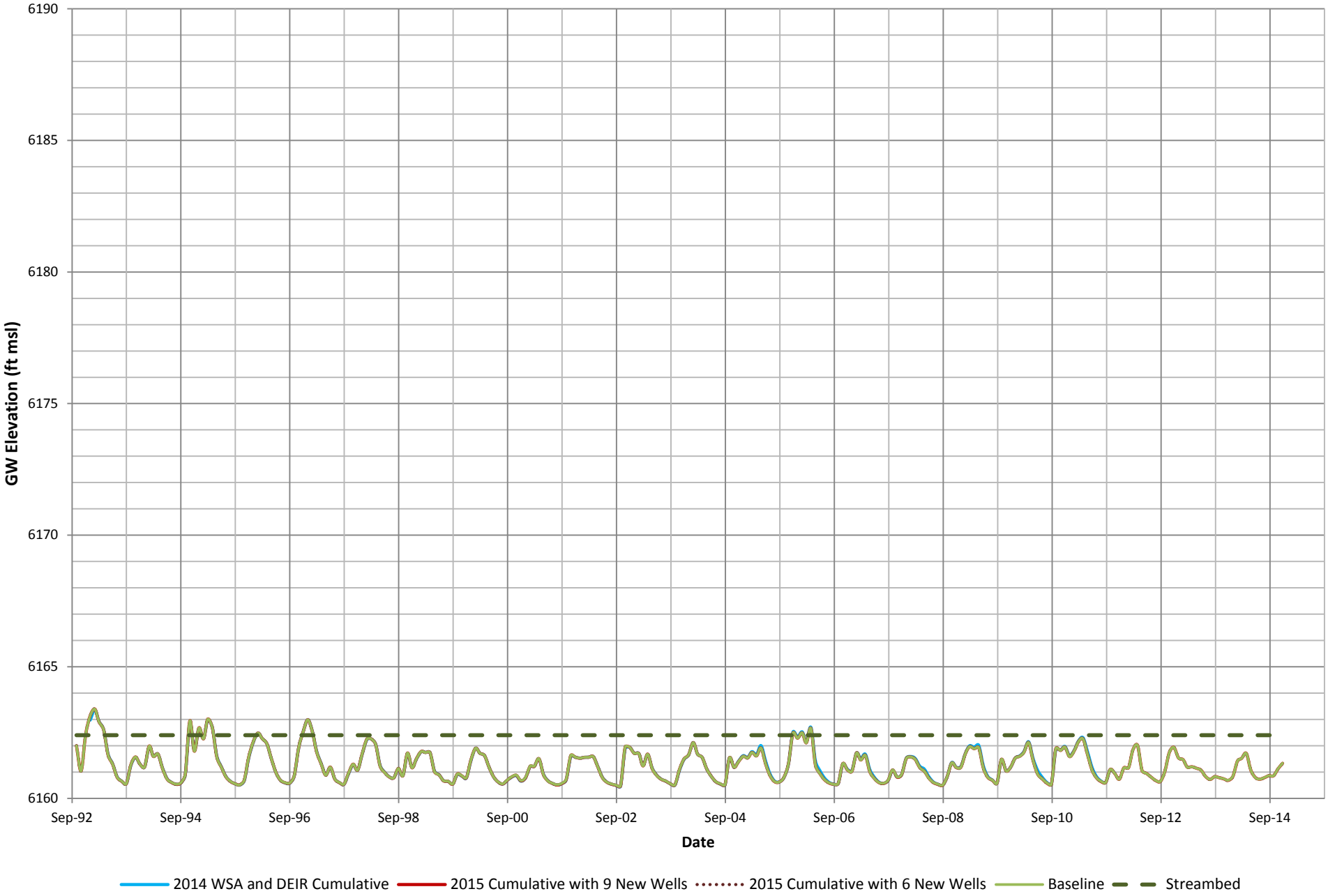
East Cell K Groundwater Elevations
2015 WSA Update and DEIR Model Simulation Comparison



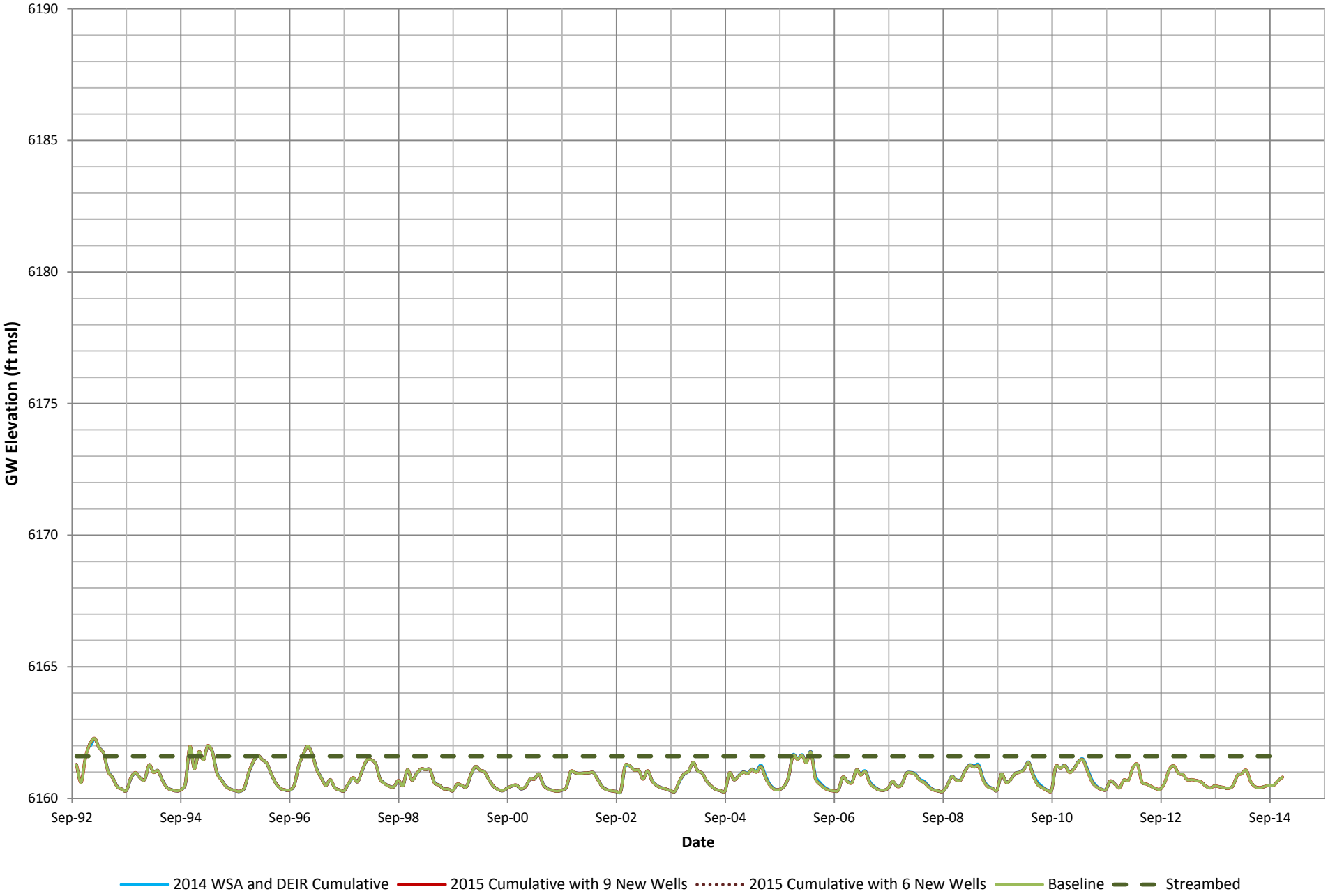
East Cell L Groundwater Elevations
2015 WSA Update and DEIR Model Simulation Comparison



East Cell M Groundwater Elevations
2015 WSA Update and DEIR Model Simulation Comparison



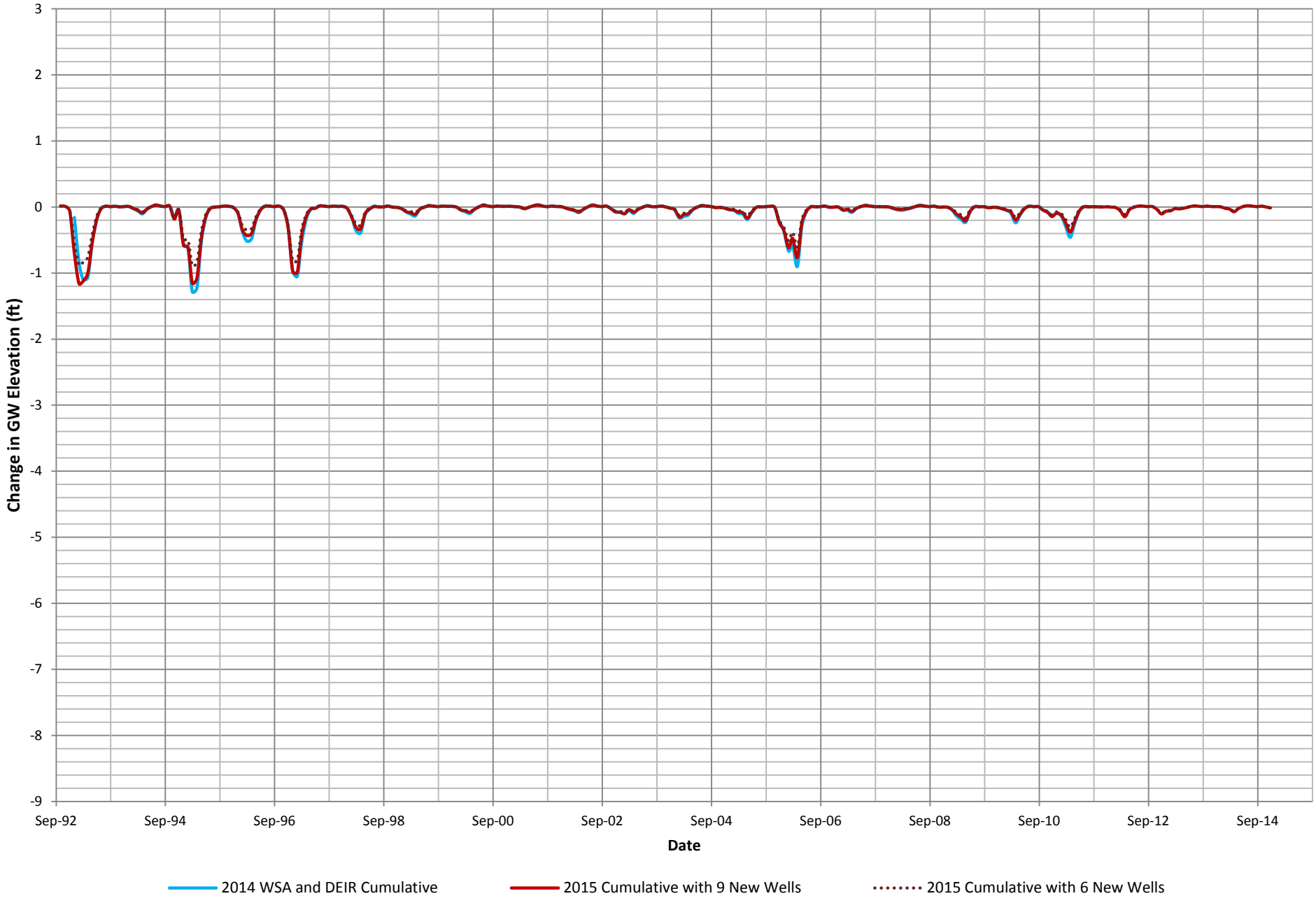
East Cell N Groundwater Elevations
2015 WSA Update and DEIR Model Simulation Comparison



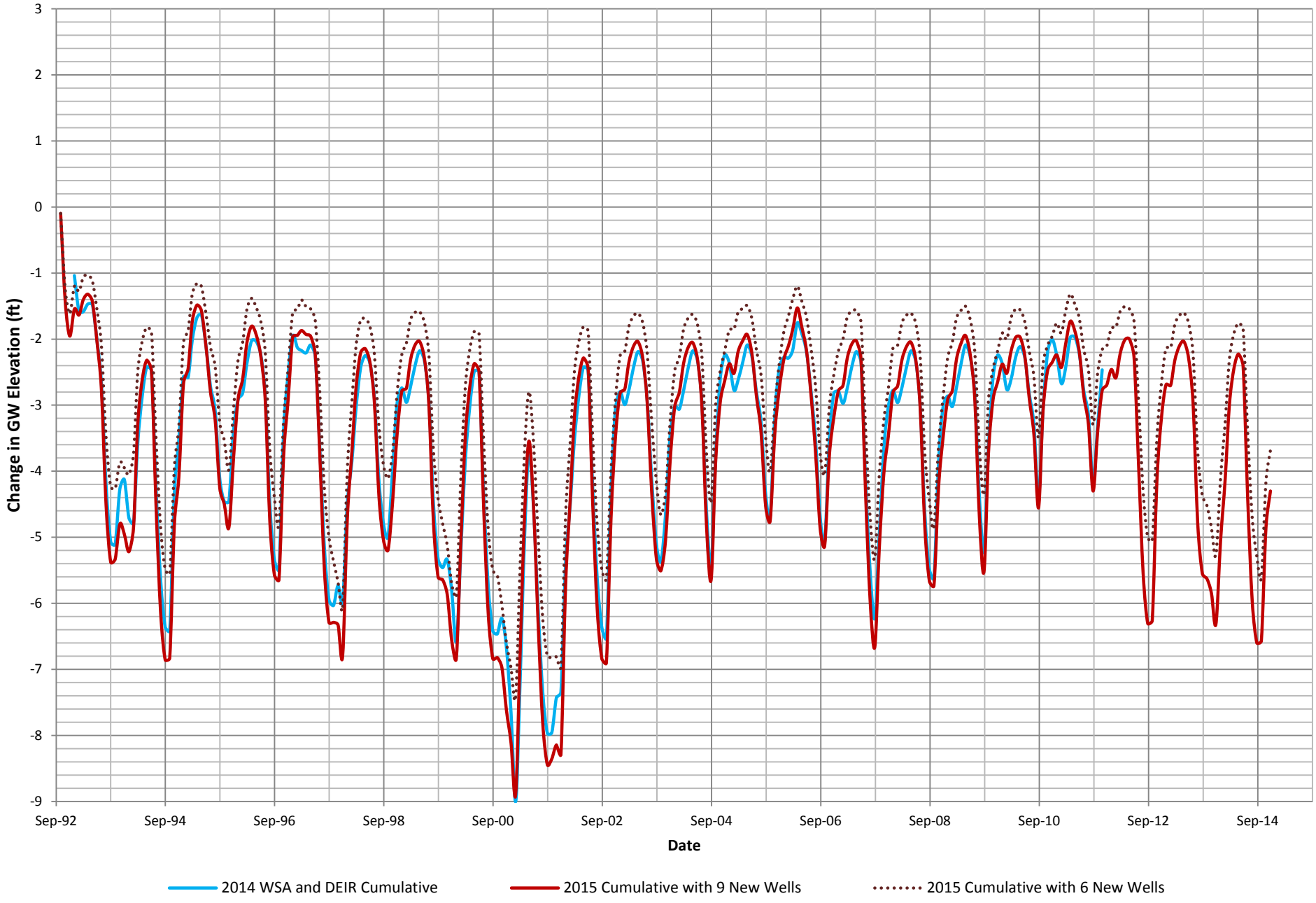
APPENDIX B

Model Simulated Changes in Groundwater Elevations vs. Baseline Beneath Squaw Creek, 2015 WSA Update Simulations

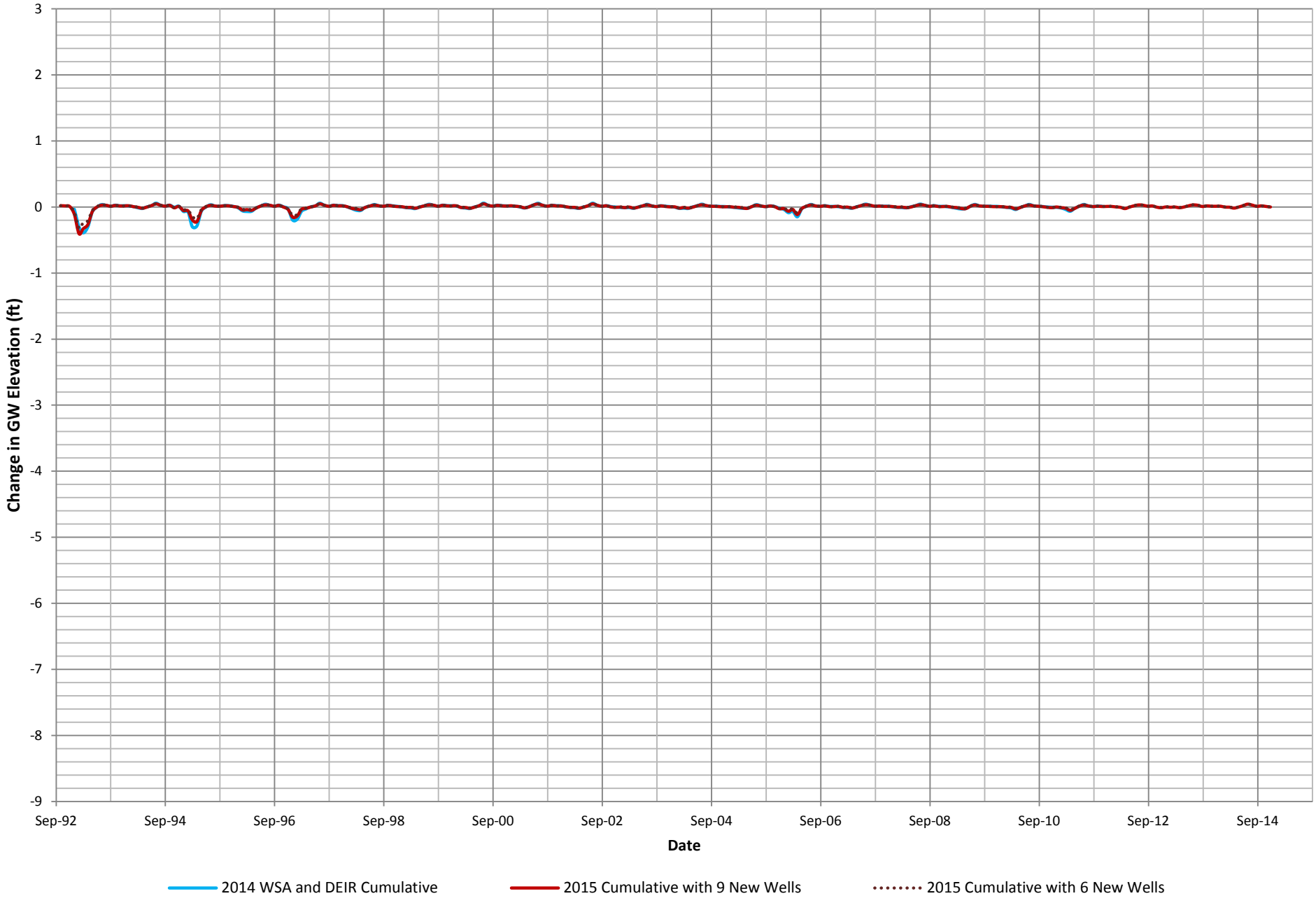
West Cell A Change in Groundwater Elevations, Future vs. Baseline
2015 WSA Update and DEIR Model Simulation Comparison



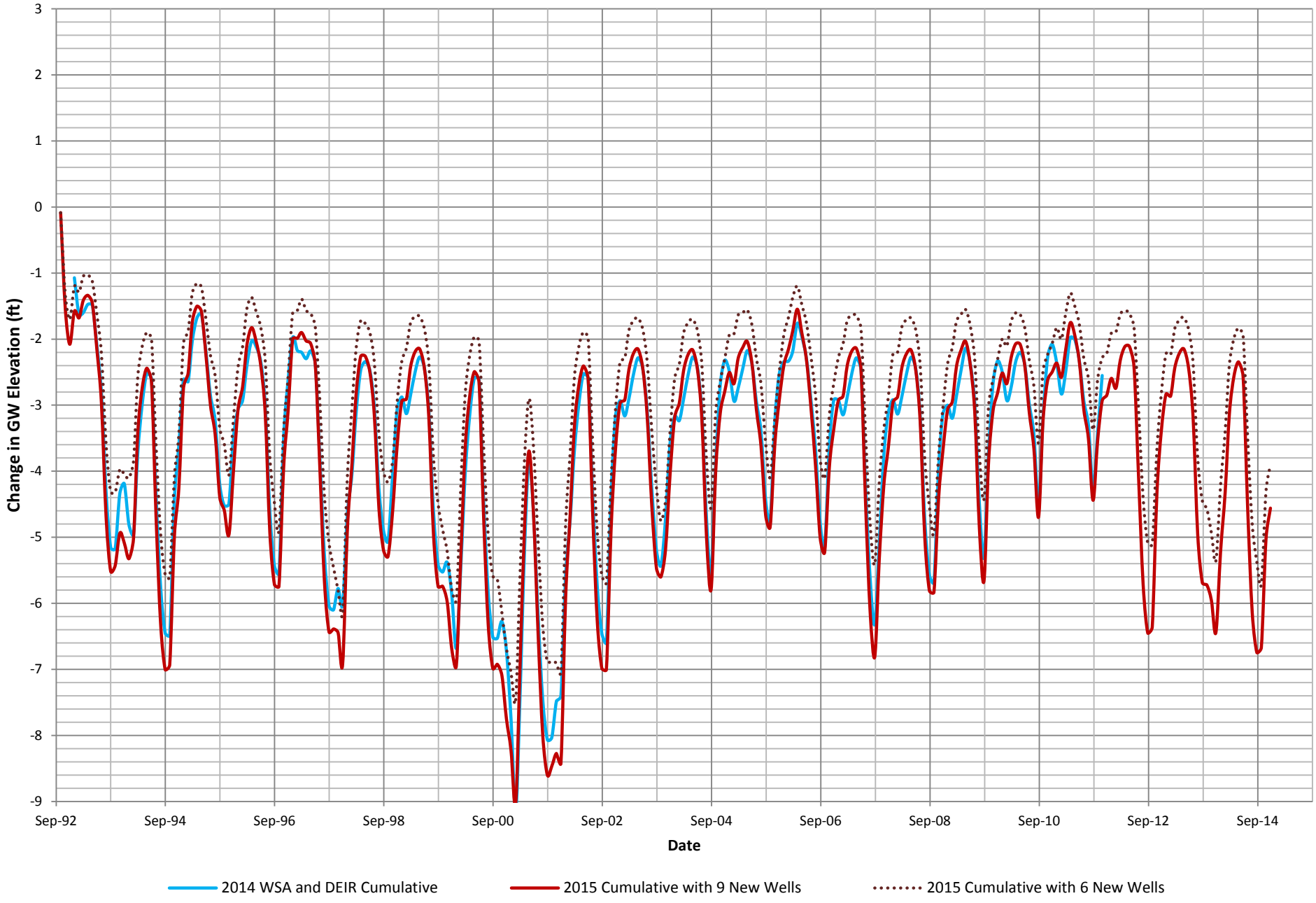
West Cell B Change in Groundwater Elevations, Future vs. Baseline
2015 WSA Update and DEIR Model Simulation Comparison



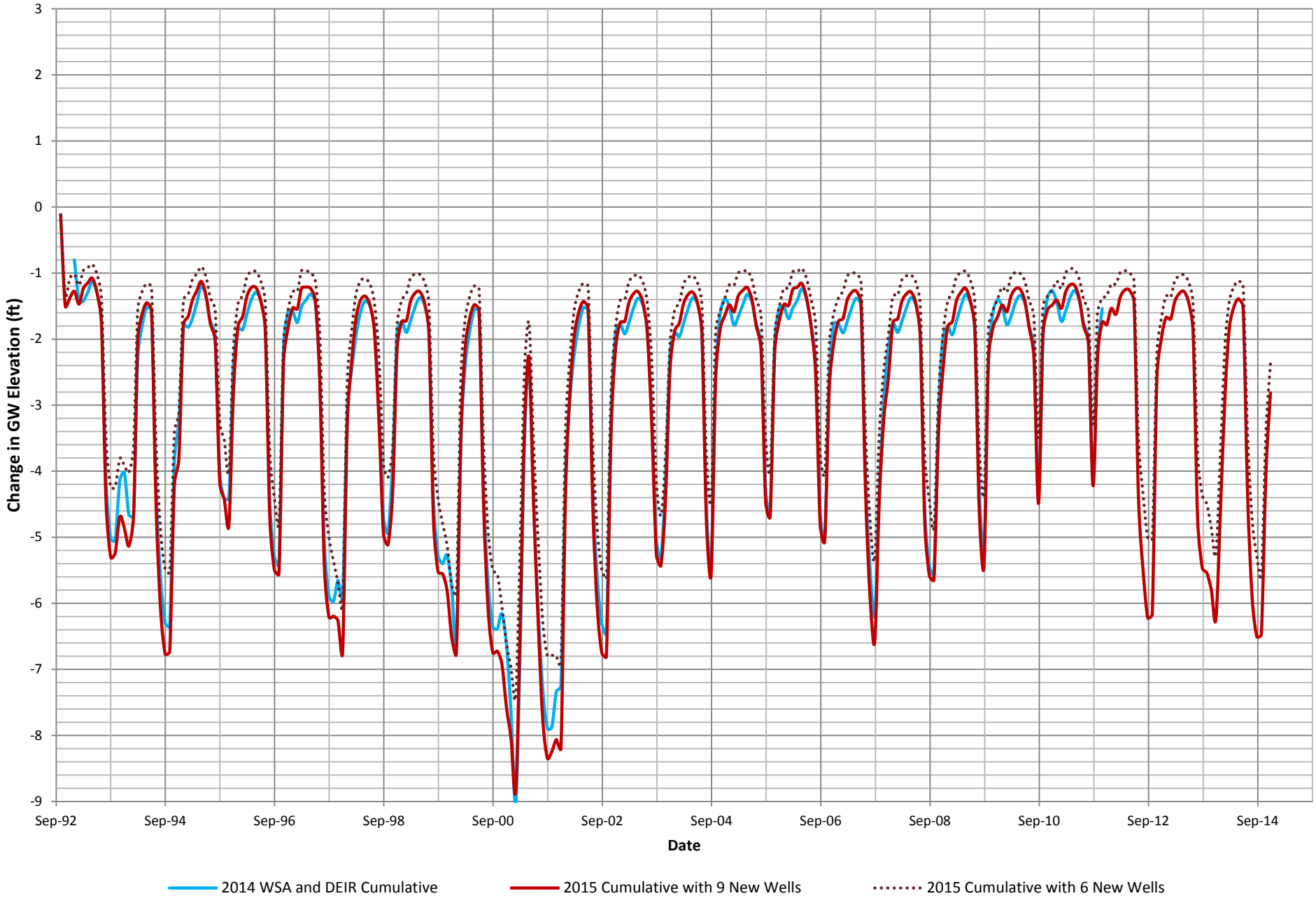
West Cell C Change in Groundwater Elevations, Future vs. Baseline
2015 WSA Update and DEIR Model Simulation Comparison



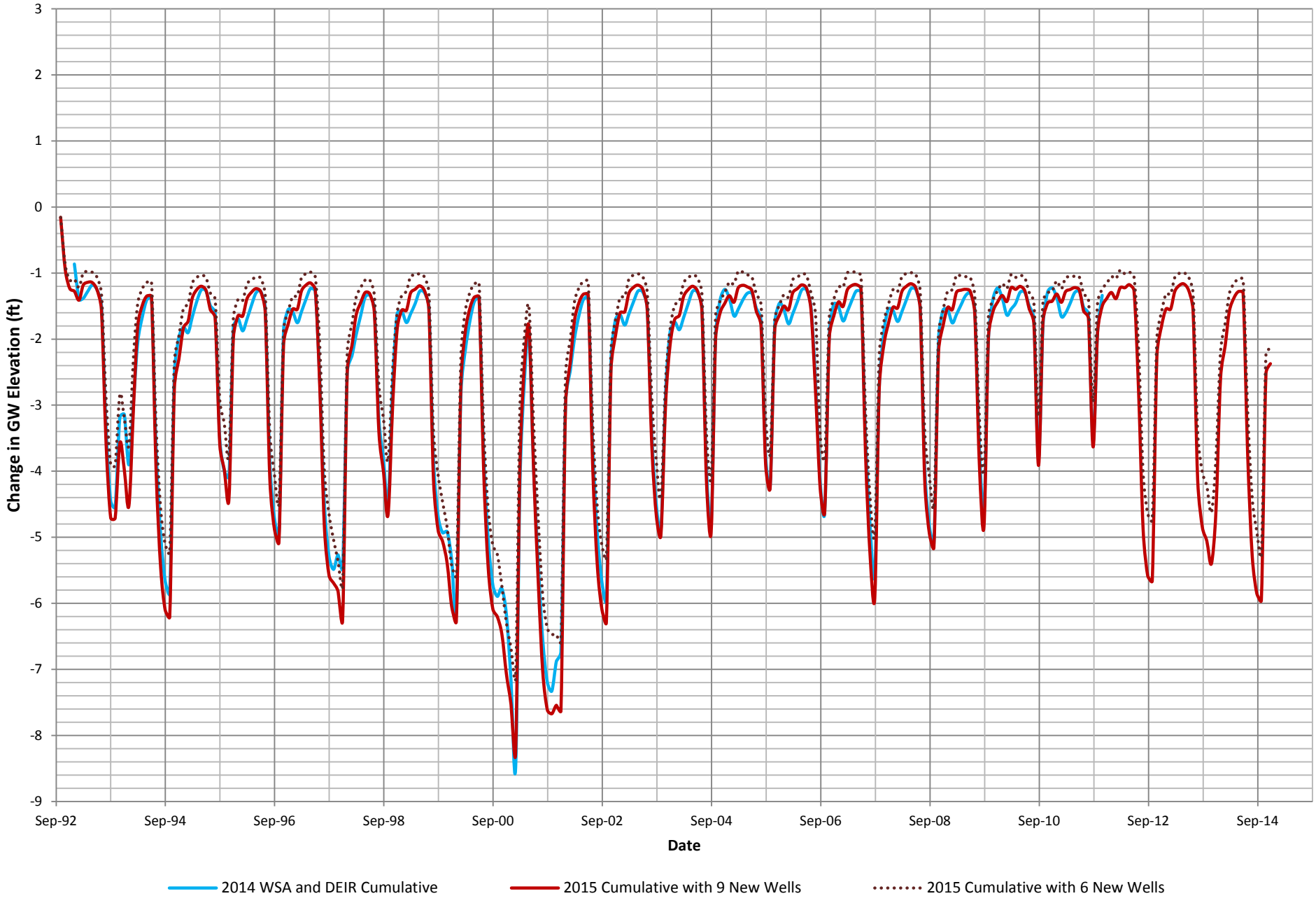
West Cell D Change in Groundwater Elevations, Future vs. Baseline
2015 WSA Update and DEIR Model Simulation Comparison



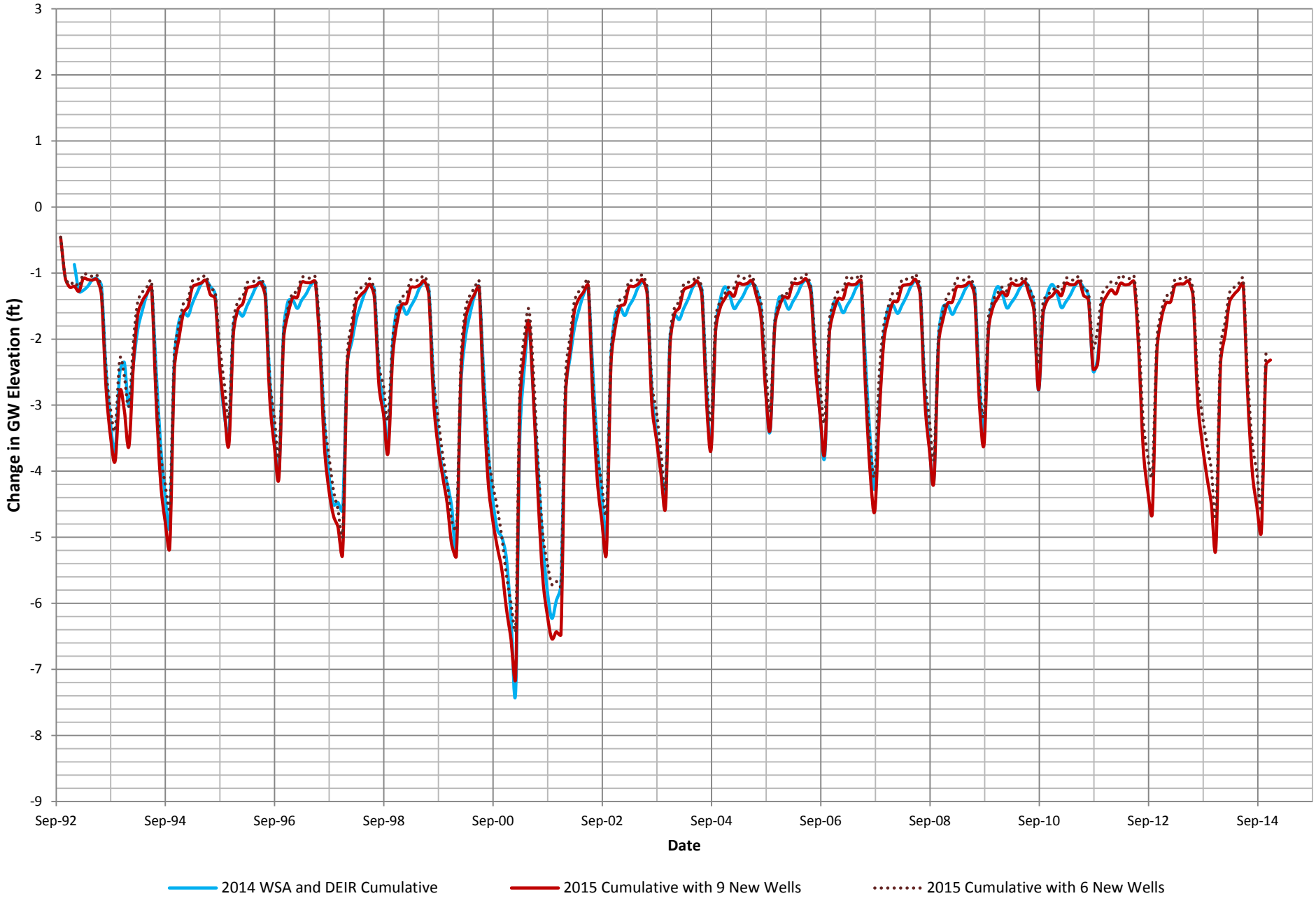
West Cell E Change in Groundwater Elevations, Future vs. Baseline
2015 WSA Update and DEIR Model Simulation Comparison



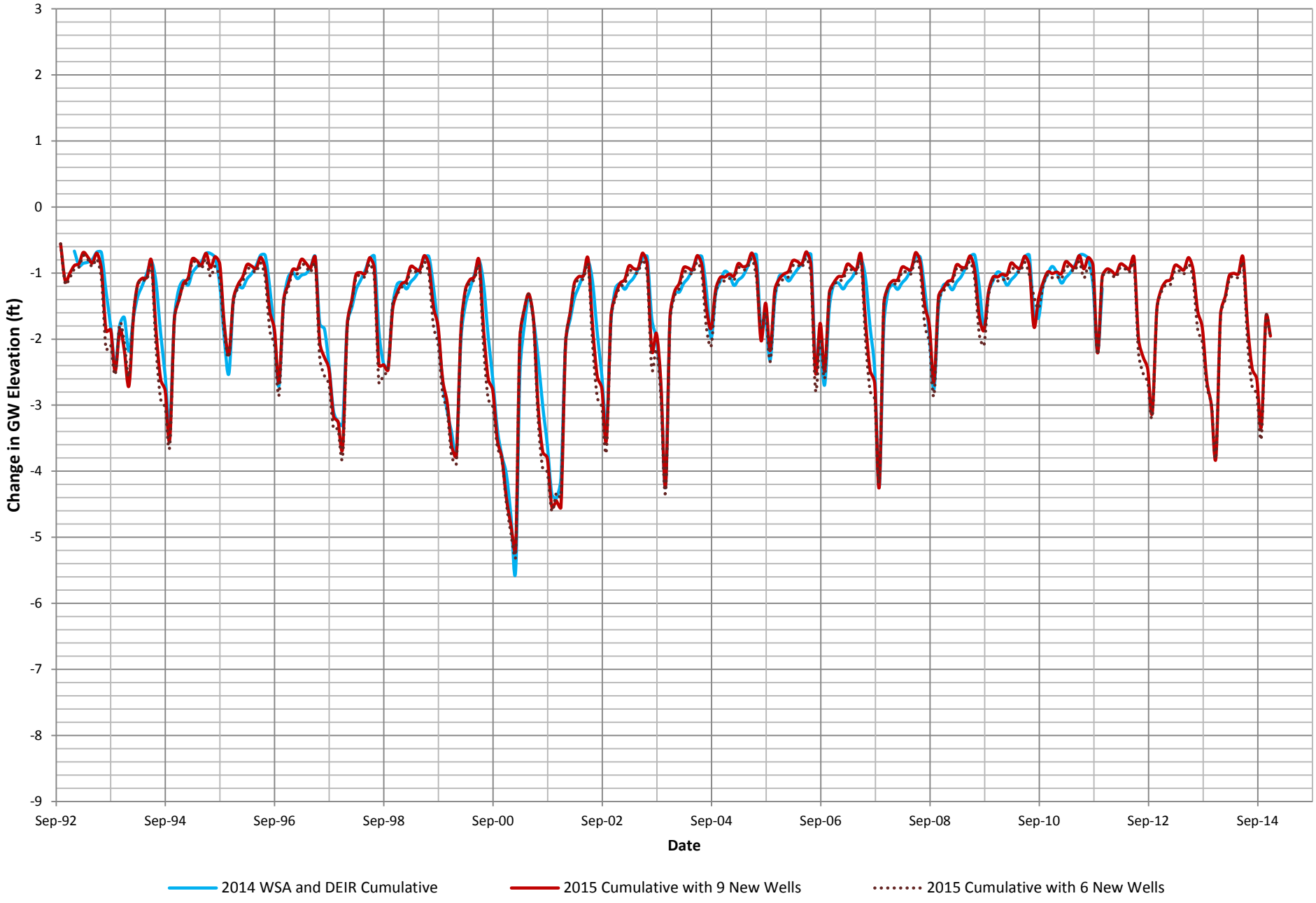
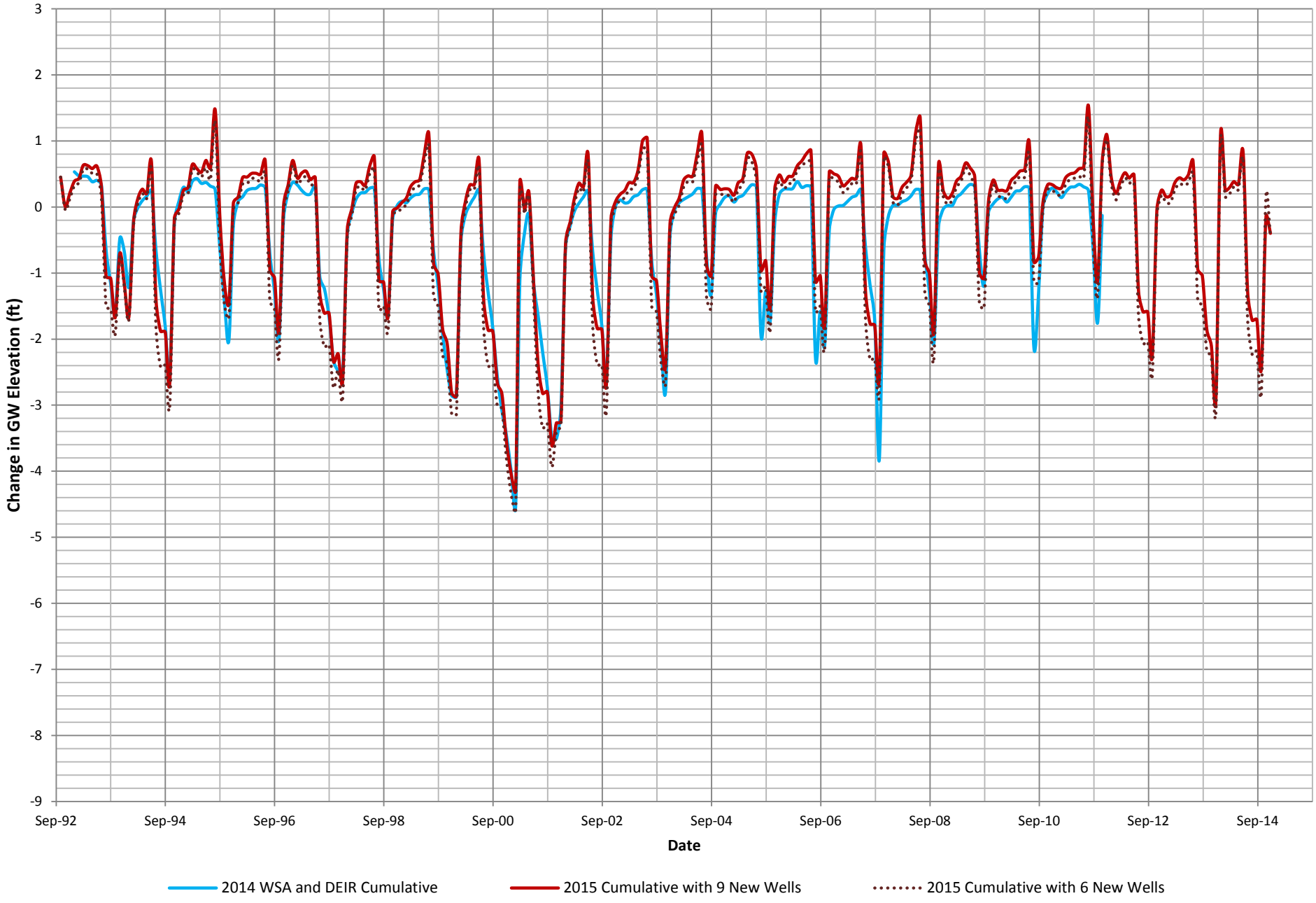
West Cell F Change in Groundwater Elevations, Future vs. Baseline
2015 WSA Update and DEIR Model Simulation Comparison



West Cell G Change in Groundwater Elevations, Future vs. Baseline
2015 WSA Update and DEIR Model Simulation Comparison



West Cell H Change in Groundwater Elevations, Future vs. Baseline
2015 WSA Update and DEIR Model Simulation Comparison



West Cell I Change in Groundwater Elevations, Future vs. Baseline
2015 WSA Update and DEIR Model Simulation Comparison