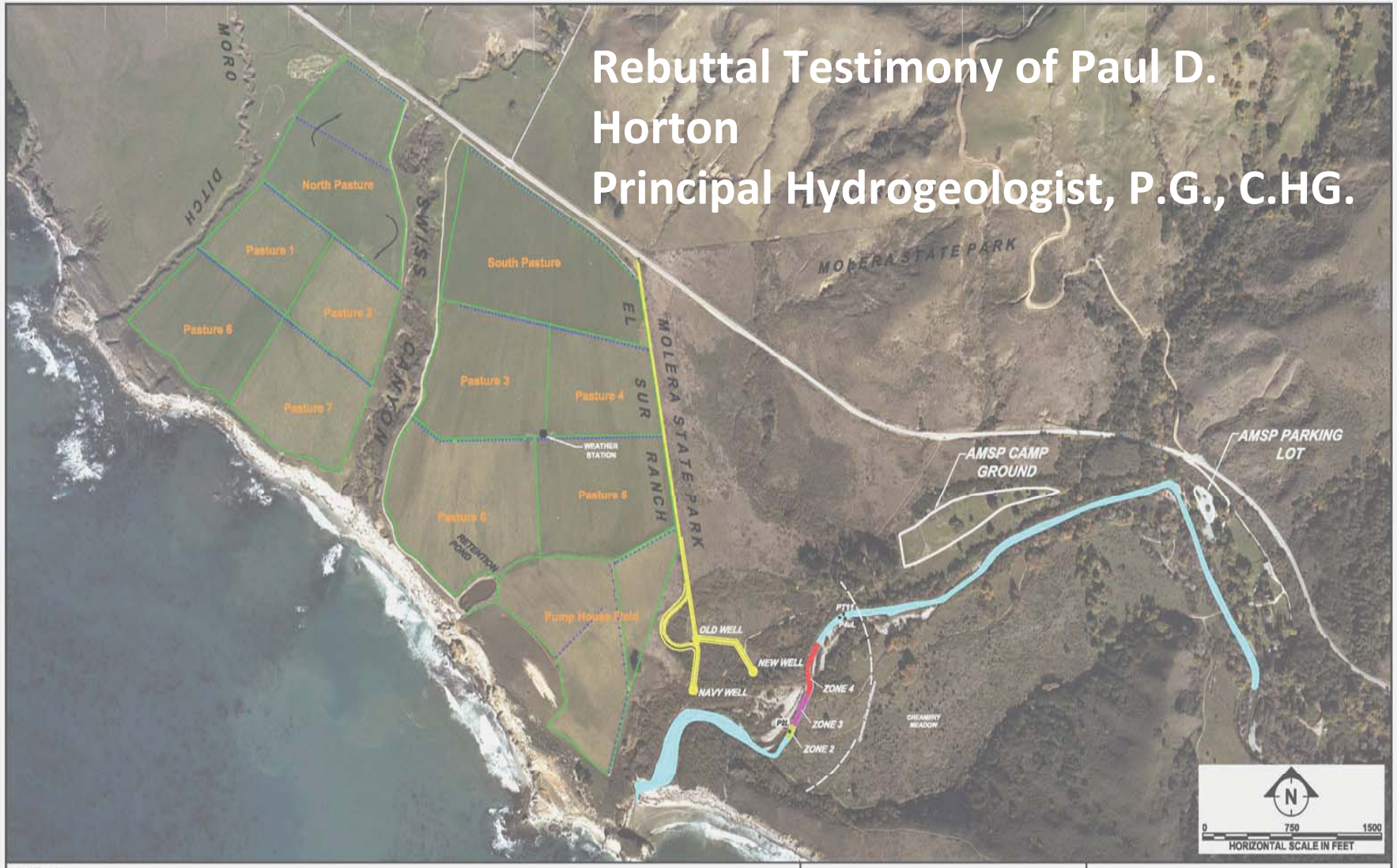
# Rebuttal Testimony of Paul D. Horton
# Principal Hydrogeologist, P.G., C.HG.




LEGEND
- Irrigation Valves
- Piping Runs (Easements)

Map provided by: Aerial Photomapping Services (photo date Dec-03)
Surveying provided by: Rasmussen Land Surveying, Inc.

EL SUR RANCH
BIG SUR, CALIFORNIA

EL SUR RANCH
AERIAL VIEW

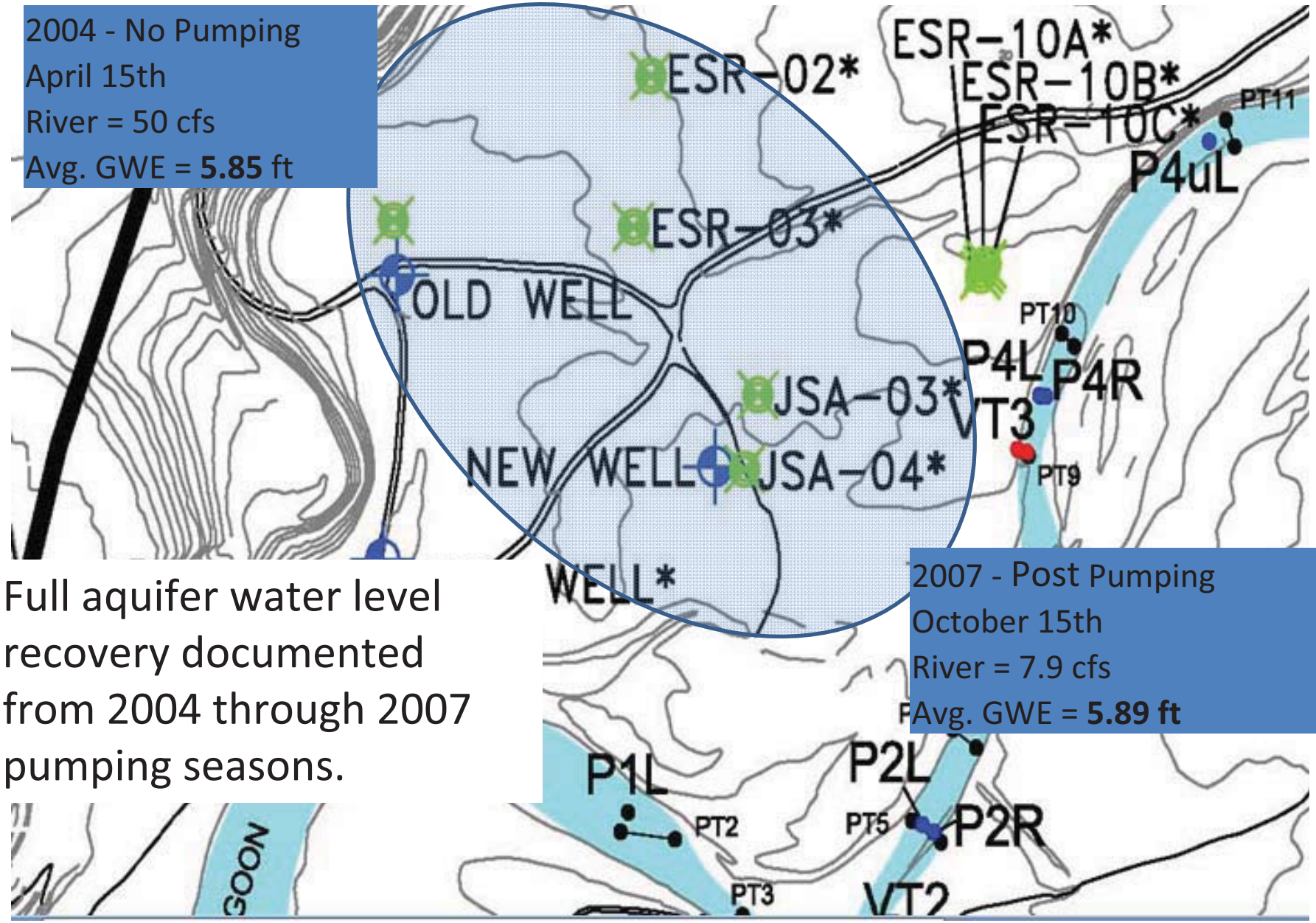
| PROJECT NO. | DATE | DRAWN BY: | APP. BY: |
|---|---|---|---|
| 01-ESR-007 | 05/15/11 | JP | PH |

SGI environmental
THE SOURCE GROUP, INC.
3451-C VINCENT ROAD
PLEASANT HILL, CA 94523

FIGURE 1-1

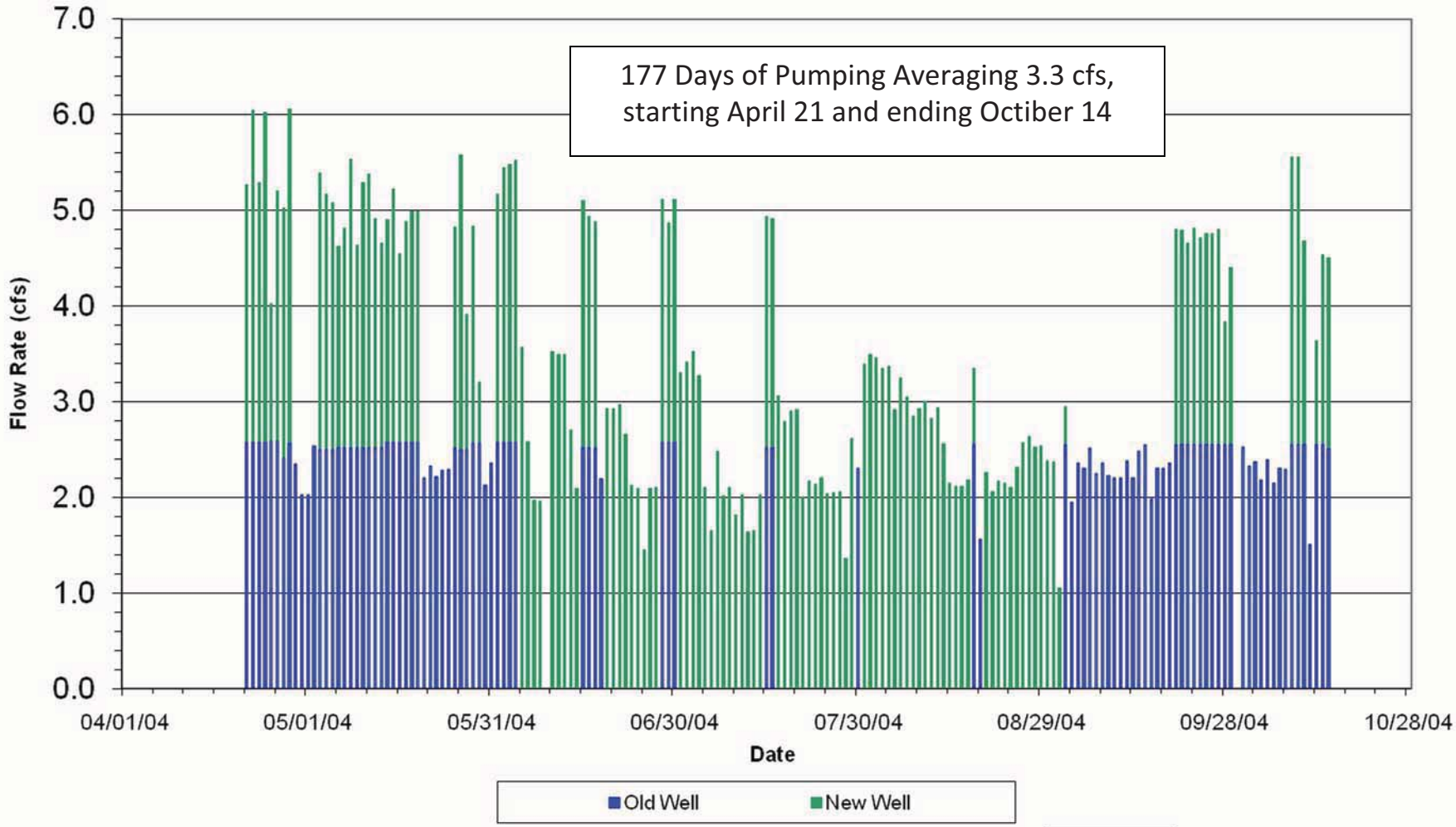
EXHIBIT ESR-2 Testimony of Paul D. Horton, PG., C.HG.

# Aquifer Water Levels Across the Seasons

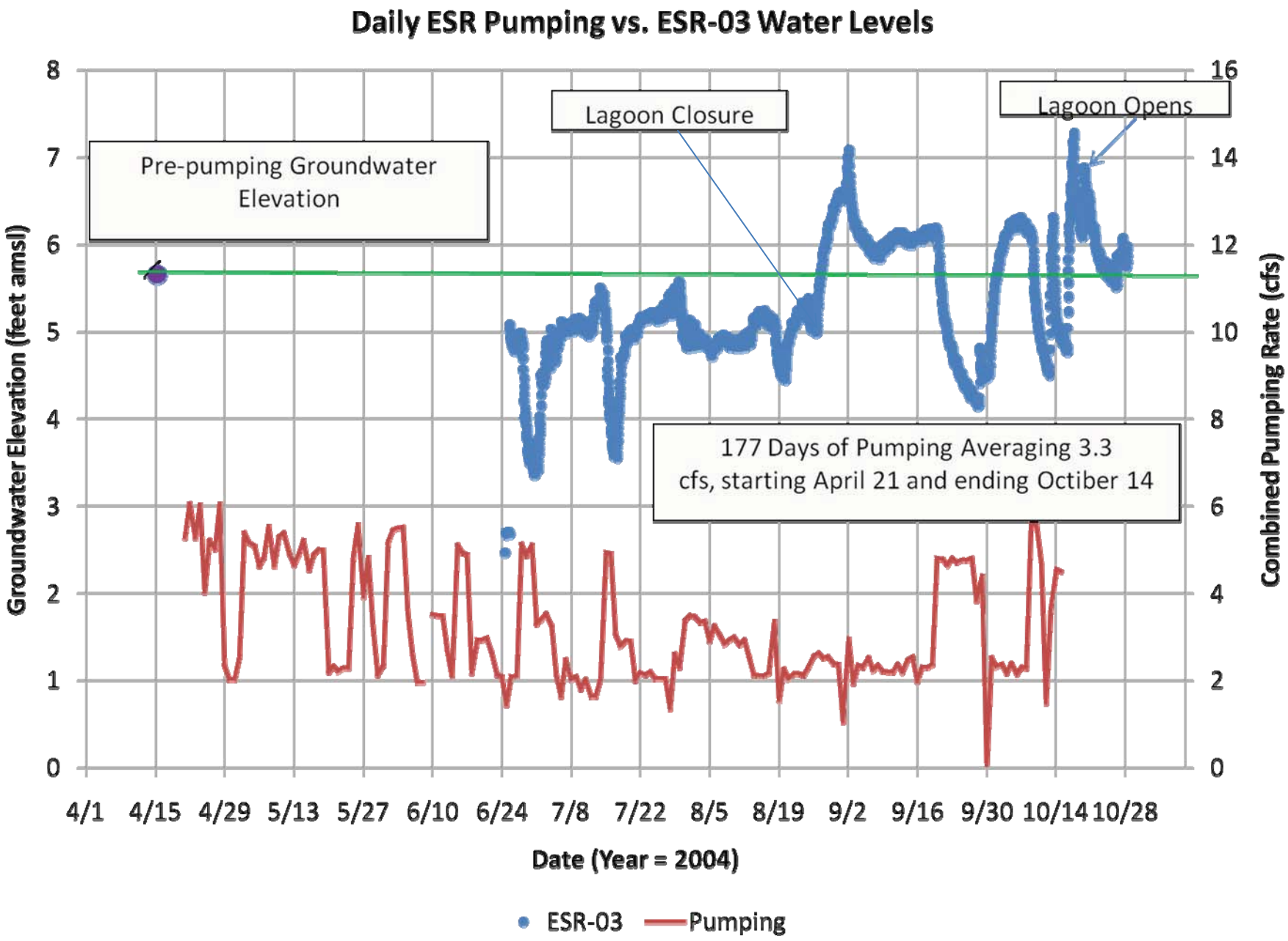



Full aquifer water level recovery documented from 2004 through 2007 pumping seasons.

**Figure 3-30**
**Daily Pumping Rate for El Sur Ranch - 2004**
El Sur Ranch




SGI environmental
THE SOURCE GROUP, INC.


Daily ESR Pumping vs. ESR-03 Water Levels
Groundwater Elevation (feet amsl)
Combined Pumping Rate (cfs)
Pre-pumping Groundwater Elevation
Lagoon Closure
Lagoon Opens
177 Days of Pumping Averaging 3.3 cfs, starting April 21 and ending Octiber 14
8
7
6
5
4
3
2
1
0
16
14
12
10
8
6
4
2
0
4/1
4/15
4/29
5/13
5/27
6/10
6/24
7/8
7/22
8/5
8/19
9/2
9/16
9/30
10/14
10/28
Date (Year = 2004)
ESR-03
Pumping

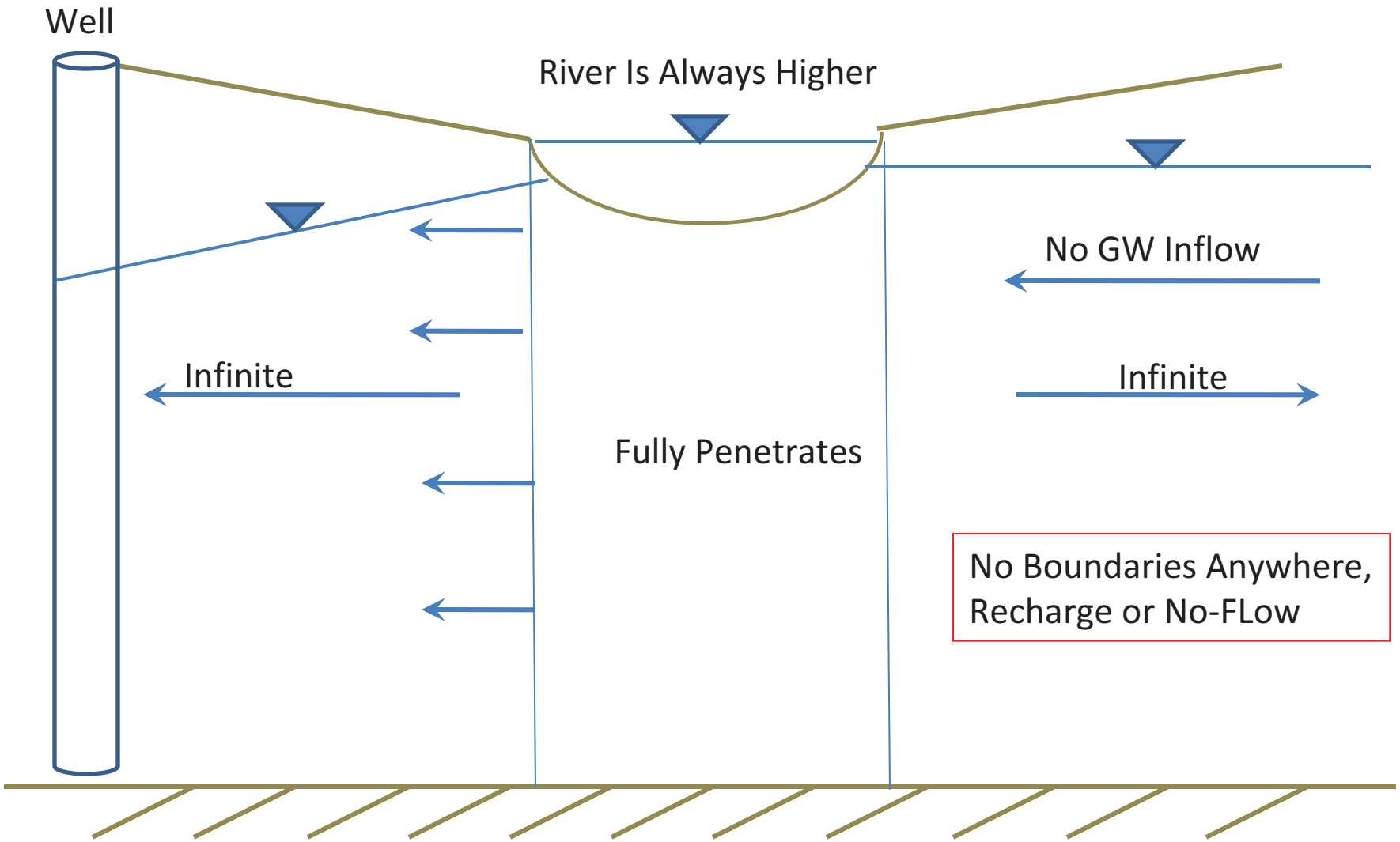
**SDF Model Application is Inappropriate.**

**1Ignores local conditions both recharge and no-flow boundaries.**

**2Violates own assumptions in its application here.**

1. **No significant other boundary conditions**
2. **River surface elevation remains higher than groundwater**
3. **No inflow of groundwater beyond river can occur**

# SDF Model Conceptual
# Jenkins Assumptions



# SDF Model Conceptual
# Hunt Assumptions

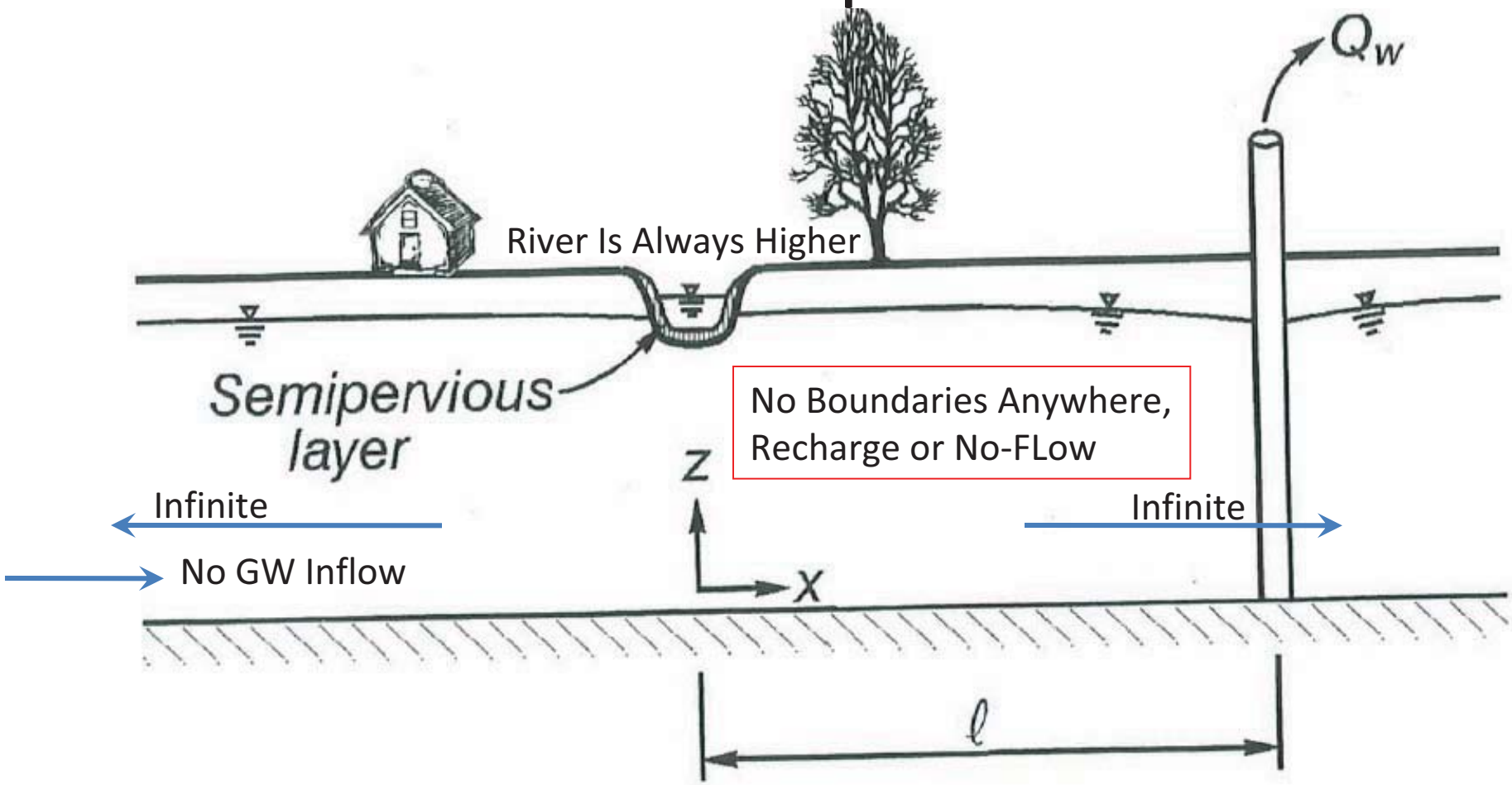
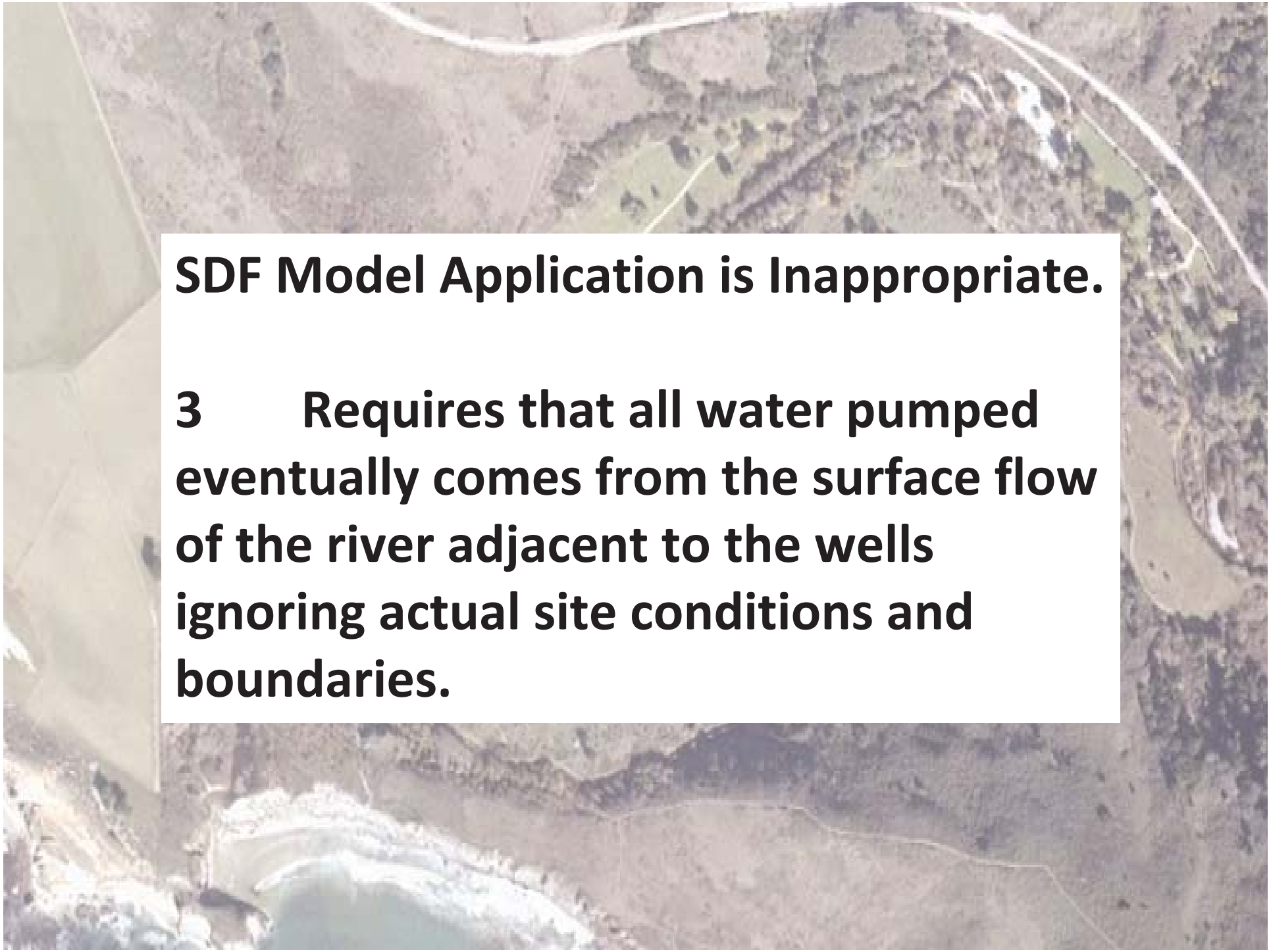



**Figure 3. Definition sketch for the problem considered herein.**



**SDF Model Application is Inappropriate.**

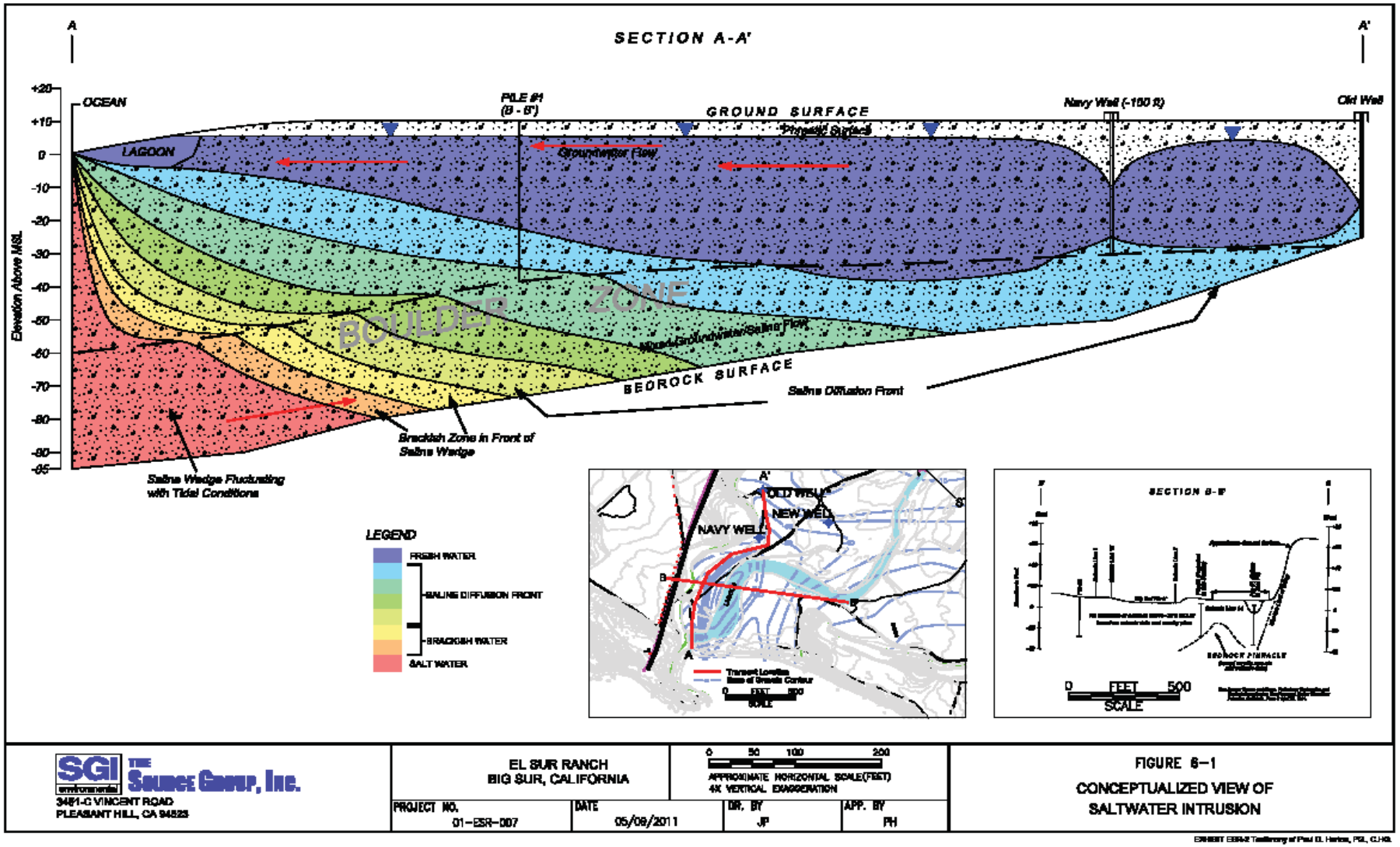
**3 Requires that all water pumped eventually comes from the surface flow of the river adjacent to the wells ignoring actual site conditions and boundaries.**

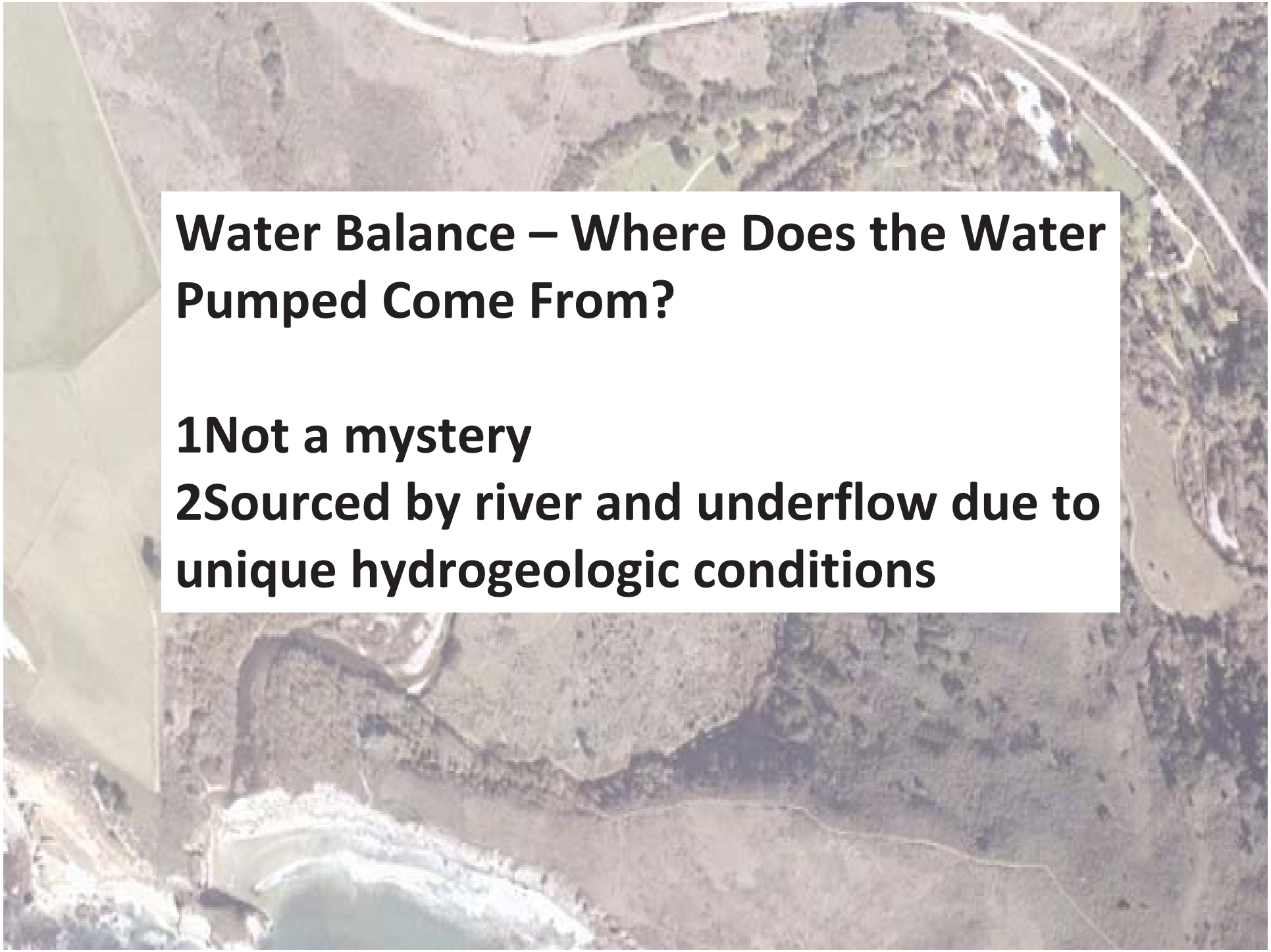
**Ignoring the ocean boundary is a major fault with application in this case.**

**Pumping near the mouth and the ocean reduces the hydraulic head at the ocean-aquifer interface thereby allowing capture of fresh water underflow that would have discharged to the ocean.**

**This is effectively a recharge boundary condition along the ocean interface under the lagoon.**

Combination of pumping Induced drawdown and tidal conditions creates situation allowing capture of underflow that would have discharged to the ocean.





# Water Balance – Where Does the Water Pumped Come From?

1Not a mystery

2Sourced by river and underflow due to unique hydrogeologic conditions

# Water Balance, 2.9 cfs Pumping

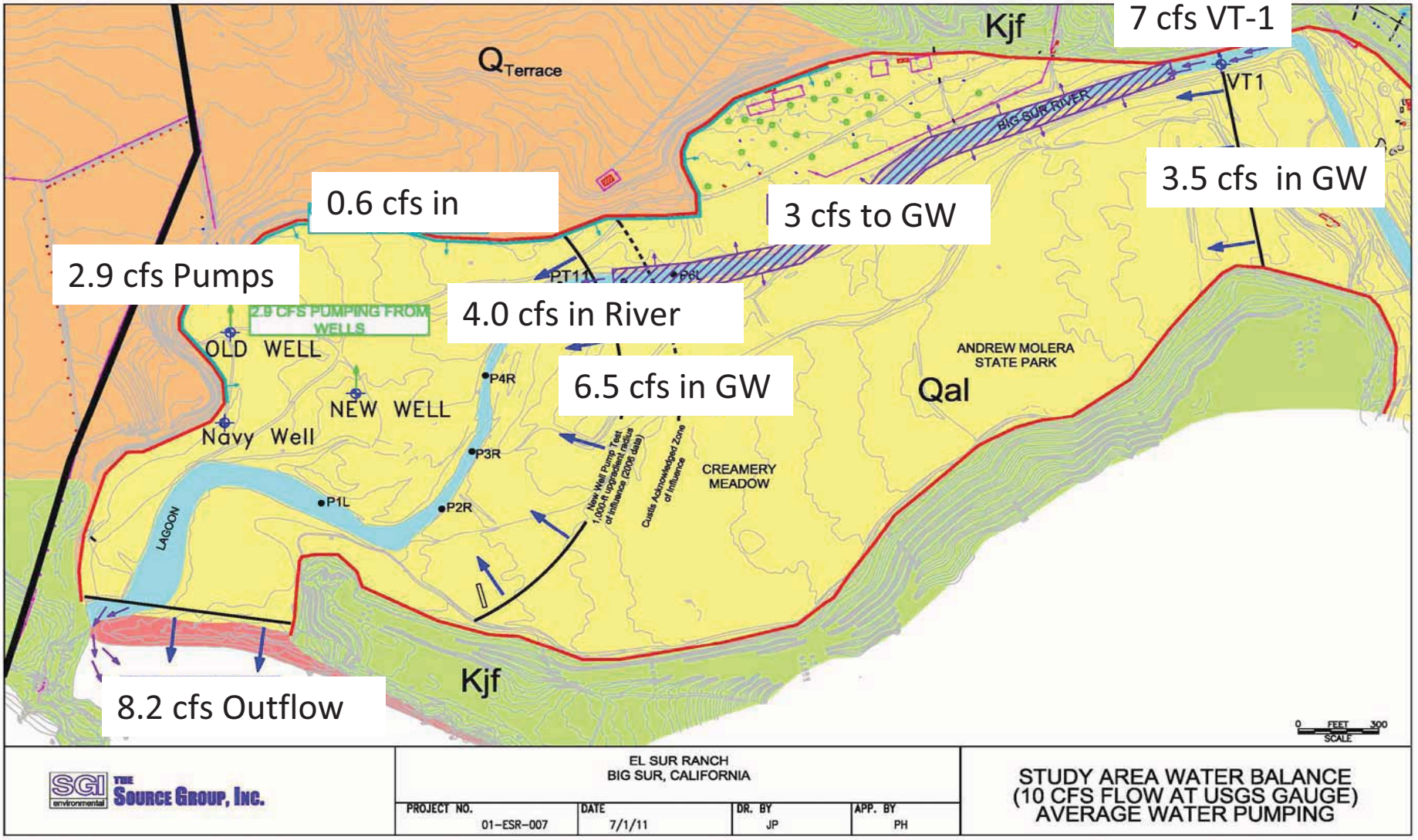
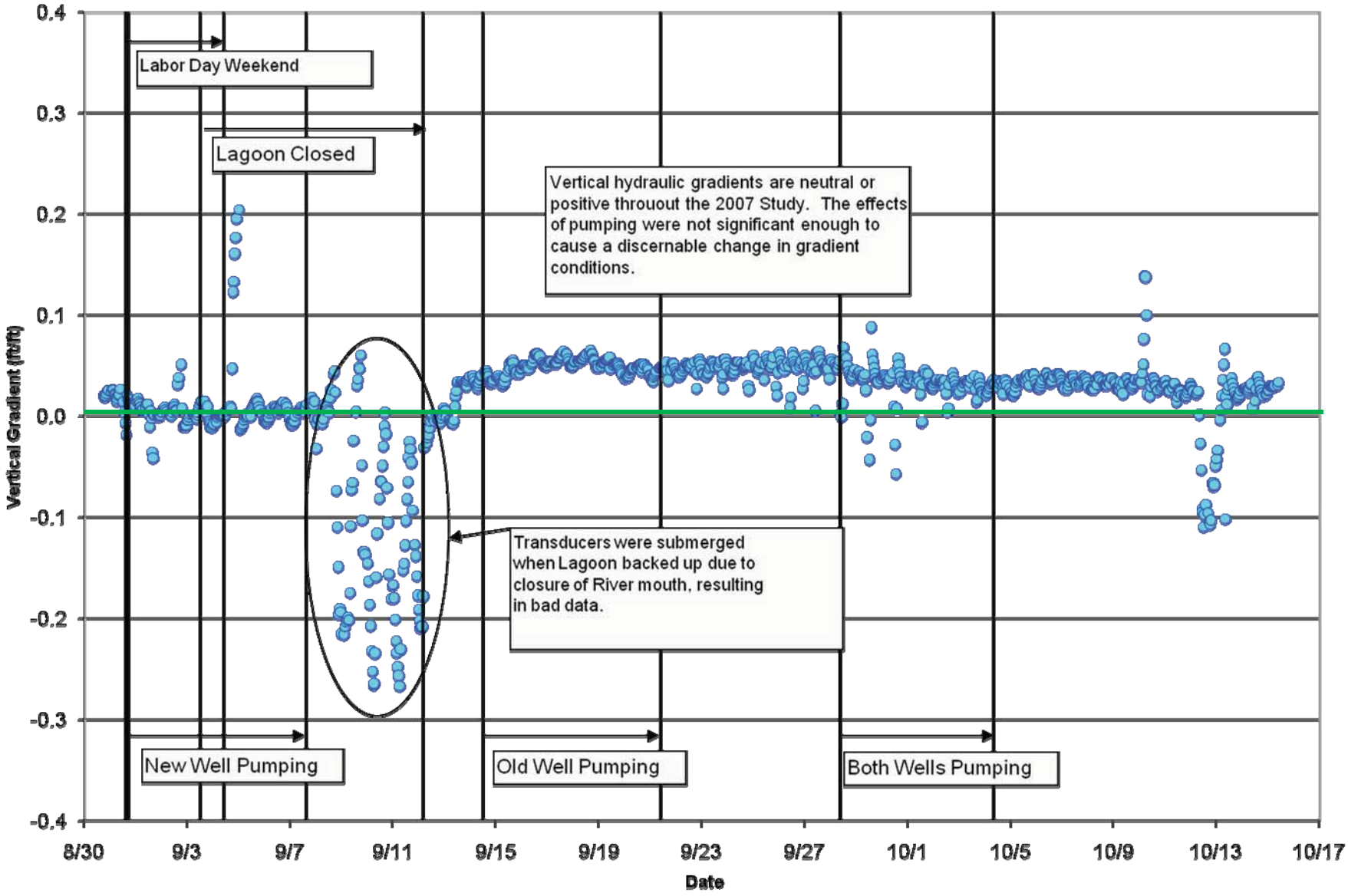
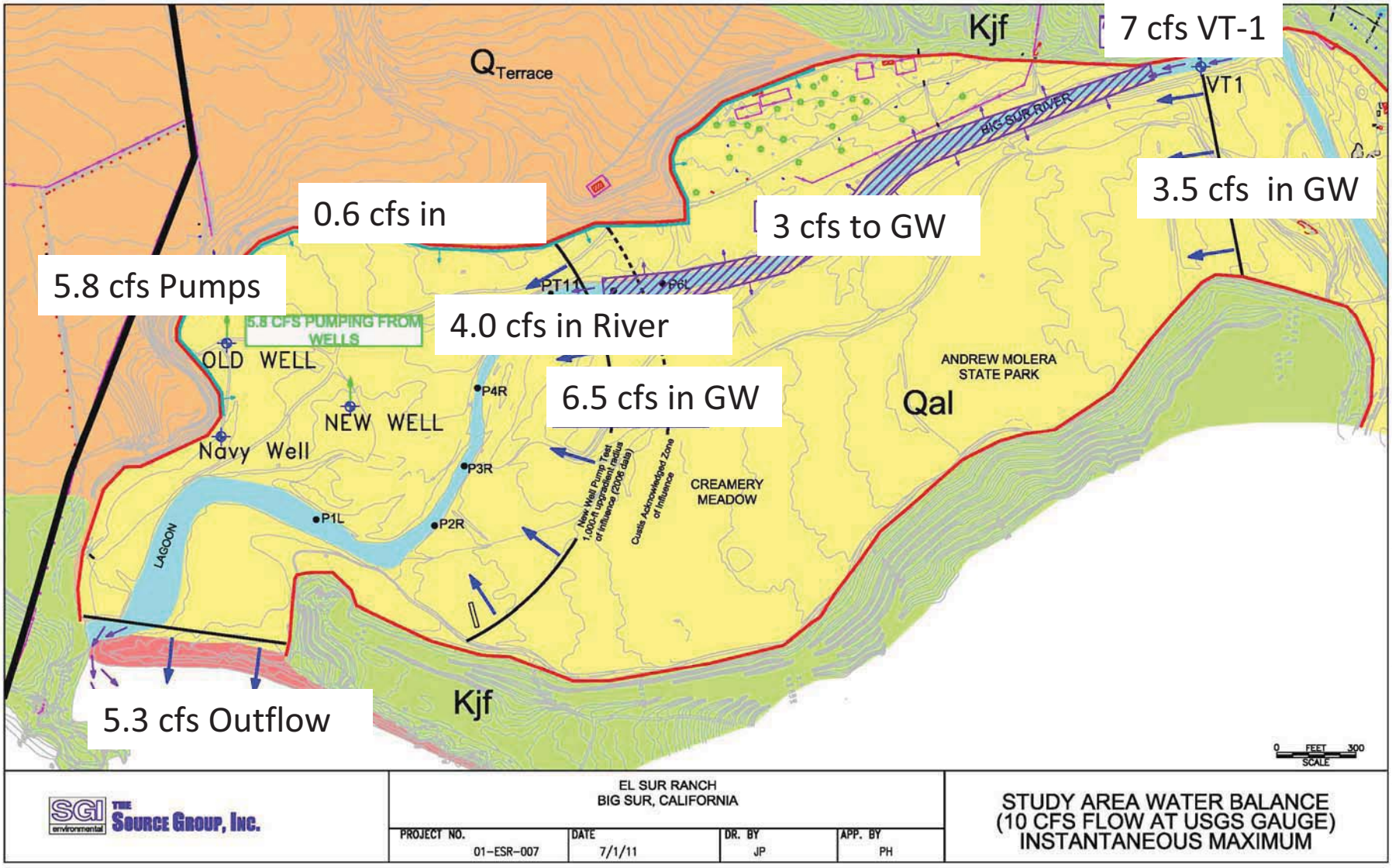


Figure 3-10 – 2008 Report
P1-L Vertical Gradient Across Riverbed

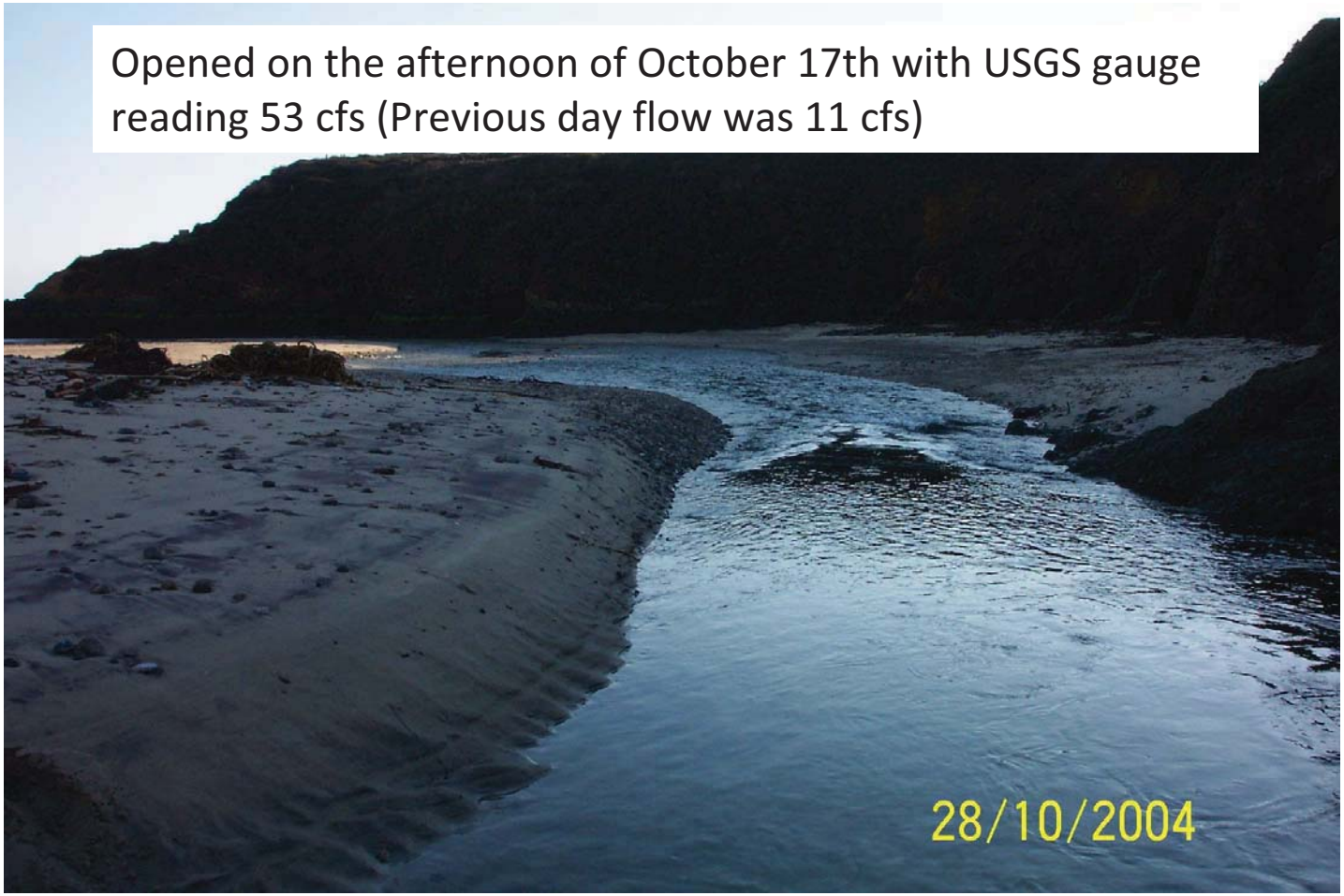


# Water Balance, 5.8 cfs Pumping



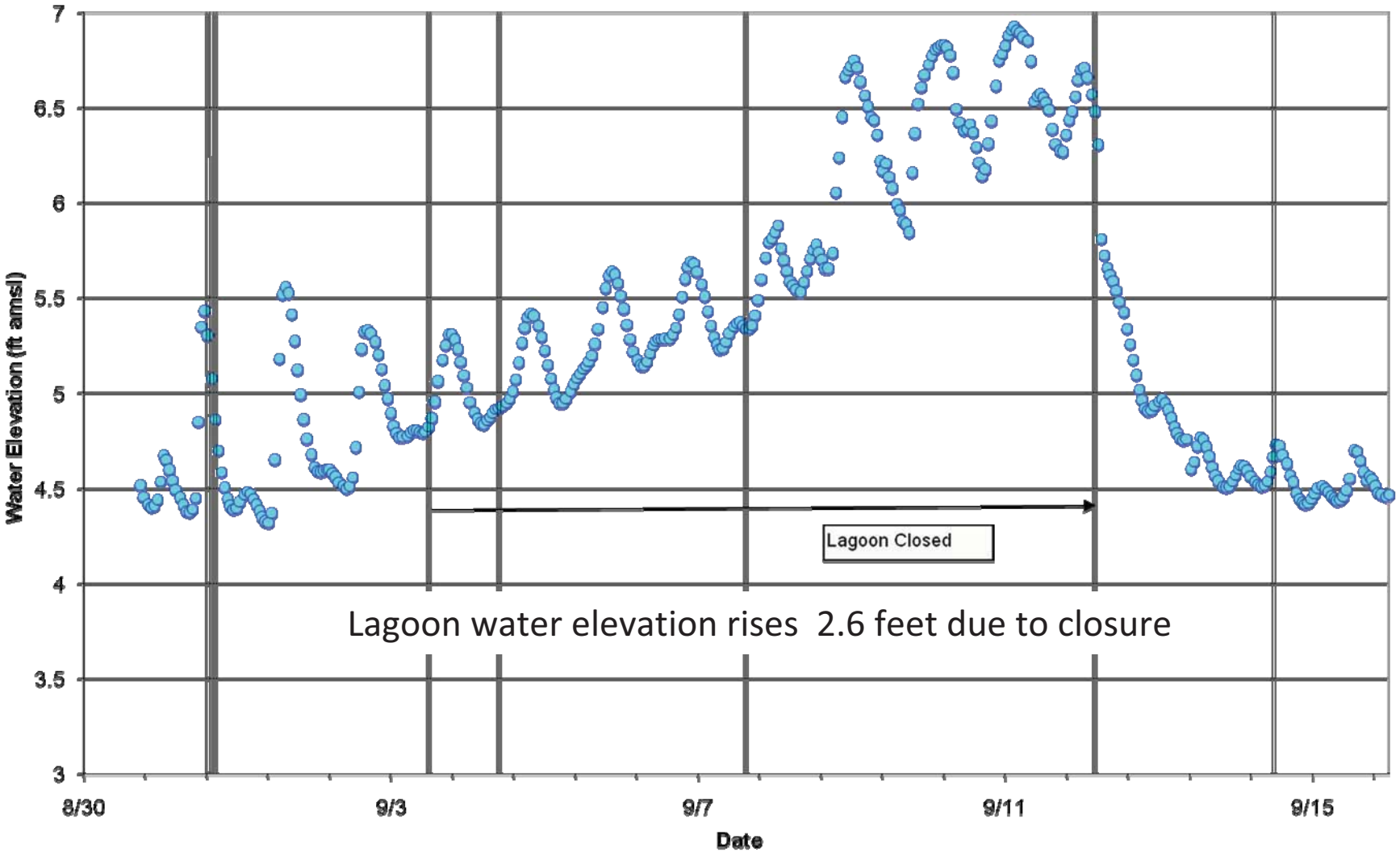
# 2004 Lagoon Closure

# 2004 Lagoon Open



# 2007 Lagoon Closure

## Appendix G - P1LS Hydrograph - 2007



# 2007 Lagoon Open

Lagoon Opened at 4 am September 12th with the low river flow at VT-2 of 3.4 cfs (USGS gauge flow of 6.3 cfs)