

Dr. Bob Harrington  
Inyo County Water Department  
135 South Jackson Street  
Independence, CA 93526

February 4, 2011

**RE: Summary of Hydrologic Monitoring Activities January 2011**  
Rose Valley, Inyo County, California  
Hay Ranch Project Conditional Use Permit #2007-03

Dear Dr. Harrington:

This letter is intended to summarize hydrologic monitoring activities conducted in January 2011 by TEAM Engineering & Management, Inc. (TEAM), related to the Hay Ranch Water Extraction Project and CUP #2007-03.

### **Phase 2: Startup Monitoring and Reporting**

With the initiation of pumping by Coso Operating Company (Coso) on December 25, 2009, the Hay Ranch Water Extraction Project entered into the Phase 2 Startup Monitoring and Reporting period as outlined in the Hydrologic Monitoring and Mitigation Plan (HMMP).

During the January 2011 monthly hydrologic data collection event at 30 monitoring locations in the Rose Valley area, static depth-to-water (DTW) measurements, one visual observation of the Little Lake Ranch Siphon Well Outflow and four sets of flow rates were collected by TEAM, as summarized in the attached table (Table 1). Data for this monthly field event was collected on January 19-20. Pressure transducer data were downloaded from 24 units, including one "BaroTroll" measuring barometric pressure. On January 4, a DTW measurement at LADWP 816 Well was taken by LADWP personnel.

With the completion of the permanent water tank in May 2010 at the Hay Ranch Property, groundwater flow from the Hay Ranch South Well, the project's primary production well, is being recorded at the HRS B Totalizer. This totalizer went on-line May 12, 2010 with an initial reading of 0 gallons. The HRS A Totalizer, which had captured all flow pumped from the Hay Ranch South Well before May 12, has been removed. The amount of groundwater recorded by HRS A for the Hay Ranch Project was 245,294,000 gallons (753 acre feet) before decommissioning. Groundwater pumped from the Hay Ranch North Well, the project's reserve production well, is being measured at the HRN C Totalizer. The HRN C Totalizer went online in May 2010 with an initial reading of 0 gallons.

The HRS B Totalizer read 504,269,000 gallons, and the HRN C Totalizer read 302,179,000 gallons on January 14, 2011. The combined totals from HRS A, HRS B, and HRN C represent approximately 1,051,742,000 gallons (3,228 acre feet) of groundwater extracted from the Hay Ranch property wells since December 25, 2009 (project initiation) through January 14, 2011.

The Hay Ranch Project CUP set 3,000 AF as the maximum amount of groundwater extraction allowed in the first year of project pumping. For the first year of project pumping (December 25, 2009, to December 24, 2010) approximately 974,970,000 gallons (2992 AF) of groundwater were extracted from the Hay Ranch property. During the second year of project pumping (December 25, 2010 to January 14, 2011)

approximately 76,772,000 gallons (236 AF) of groundwater have been extracted from the Hay Ranch property.

Figure 1 presents the combined amount of groundwater pumped from the Hay Ranch North and South wells from December 25, 2009 to January 14, 2011 in acre feet (AF) compared to a hypothetical pumping amount. The hypothetical pumping amount assumes a linear pumping rate of approximately 8.2 AF/day (equivalent to 3,000 AF/year) which starts on December 25, 2009 and projects into March 2011.

On January 14, 2011, Coso replaced the HRS B and HRN C manual totalizers with digital totalizers to allow for remote monitoring and control of project pumping. Daily groundwater extraction amounts are being totaled at each well by the digital totalizers' software. Coso is installing non-resettable, LCD readouts at HRS B and HRN C to allow for manual reads to confirm the digital data packages.

### **Dunmovin Trigger Level and Maximum Acceptable Drawdown**

In Table 3.1 of the HMMP for the Hay Ranch Project, Trigger Levels have been set for the one-year time period at specific monitoring wells. Approximately 13 months (1.08 years) has elapsed since the Hay Ranch Project's pumping was initiated. Based on data collected by TEAM during the December monitoring event, the groundwater elevation (GWE) in the Dunmovin Well has exceeded its one-year Trigger Level and also exceeded its Maximum Acceptable Drawdown (Table 2).

Groundwater elevations are within one-year Trigger Levels and above Maximum Acceptable Drawdowns at all other Hay Ranch Project monitoring wells which have baseline and trigger levels established.

The baseline groundwater elevation (GWE) for Dunmovin, set by Inyo County Water Department (ICWD) in January 2010, is 3252.73 feet. The GWE at Dunmovin as measured at 09:00 on January 19, 2011 was 3249.88 feet. The one-year Trigger Level for Dunmovin is 1.1 feet. The Dunmovin GWE has decreased by 2.85 feet compared to its baseline, exceeding its one-year Trigger Level drawdown by 1.75 feet. The Dunmovin GWE has also exceeded its Maximum Acceptable Drawdown level by 0.05 feet as of January 19, 2011. The maximum GWE recorded at Dunmovin Well was 3253.60 and occurred on January 21, 2010. The minimum GWE recorded at the Dunmovin Well was 3249.88 and occurred on January 19, 2011. ICWD and Coso were notified by TEAM in a timely manner regarding this continuing trigger level event.

Phase 3 Model Recalibration work was initiated in Spring 2010 with draft results of the Hay Ranch Project's recalibrated groundwater model submitted to ICWD in December 2010. During this Phase 3 work it was discovered that the Dunmovin Well location, used in the groundwater model and the HMMP for the Hay Ranch Project's Final EIR, was inaccurate. The location used in the groundwater model and HMMP listed the Dunmovin Well at 9,000 lateral feet from the Hay Ranch Production Wells. The actual location of the Dunmovin Well is approximately 6,000 lateral feet from the production wells, similar to the Cal Pumice Well's lateral distance from the production wells. The inaccurate location of the Dunmovin Well has been corrected in the Phase 3 Model Recalibration efforts. Once Phase 3 work is completed, reviewed, and accepted, new project Trigger Levels and Maximum Acceptable Drawdowns will be set for project wells. The Phase 3 Recalibration process, including review and finalization, is anticipated to be completed in March 2011.

### **Operational Notes**

The pressure transducer in HR 1A (RV60) experienced technical difficulties with power supply; as a result, the January 10-19, 2011 data was lost. This transducer was replaced with a new unit on January 20, 2011.

The pressure transducer installed in the Coso Springs flume was pulled, cleaned and recalibrated during the January 2011 field event to correct for erroneous upward pressure drift. This unit will be re-examined during the February field event and, if a similar upward drift in pressure occurs, the unit will be repaired or replaced.

Evidence of the large series of December storms that deposited more than 4.5 inches of precipitation at South Haiwee reservoir (according to LADWP data) was noted at several project monitoring points. The significant barometric lows accompanying the December storms were captured by the BaroTroll. The low pressures recorded were similar in magnitude to the January 2010 barometric lows that accompanied another large storm system. Several project wells displayed temporary groundwater elevation spikes that are likely the result of the low barometric pressures accompanying the December storms.

### **Data Transmittal**

TEAM posted updates to the "Coso" database on the ICWD web server. New Hay Ranch Project hydrographs in PDF form were uploaded to the ICWD website ([www.inyowater.org](http://www.inyowater.org)).

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If you have any questions or require additional information, please contact TEAM at your convenience.

Sincerely,

TEAM Engineering & Management, Inc.

Keith Rainville  
Staff Geologist

**TABLE 1**  
**Field Observations of Rose Valley Hydrologic Monitoring Points**  
**January 19-20, 2011**

Project Name:	Hay Ranch Project HMMP	Date: January 19-20, 2011
Location:	Rose Valley, Inyo County	
Observer(s):	K. Rainville	Page: 1 of 1

Well ID	Monitoring Point	Date	Time	DTW (ft)	Flow (cfs)	GWE (ft amsl)	Method	Transducer Log Interval	Notes
RV-10	Dews	01/19/11	14:26	231.30		3755.62	TEAM manual read	NA	
RV-20	LADWP 816	01/04/11	13:50	79.09		3435.97	LADWP manual read	NA	Data provided by LADWP
RV-30	Cal Pumice	01/19/11	8:47	253.89		3252.00	TEAM manual read	Hourly	
RV-40	Dunmovin	01/19/11	9:00	297.99		3249.88	TEAM manual read	NA	
RV-50	Hay Ranch North	01/14/11	—	NM	Yes	NM	TEAM manual read	NA	302,179,000 gallons (927 AF) pumped since 12/25/09
RV-60	Hay Ranch 1A	01/19/11	12:20	197.60		3234.57	TEAM manual read	Hourly	
RV-61	Hay Ranch 1B	01/19/11	12:33	229.64		3202.21	TEAM manual read	Hourly	
RV-62	Hay Ranch 1C	01/19/11	12:40	219.39		3212.11	TEAM manual read	Hourly	
RV-70	Hay Ranch South	01/14/11	—	NM	Yes	NM	TEAM manual read	NA	749,563,000 gallons (2300 AF) pumped since 12/25/09
RV-80	Hay Ranch 2A	01/19/11	13:41	198.49		3234.51	TEAM manual read	Hourly	
RV-81	Hay Ranch 2B	01/19/11	13:47	224.80		3207.83	TEAM manual read	Hourly	
RV-82	Hay Ranch 2C	01/19/11	13:31	210.89		3221.21	TEAM manual read	Hourly	
RV-90	Coso Jct Ranch	01/19/11	9:30	171.55		3231.58	TEAM manual read	Hourly	
RV-100	Coso Jct Store #1	01/19/11	9:45	144.58		3227.54	TEAM manual read	Hourly	
RV-110	Davis Ranch North Well	01/20/11	14:08	6.48		3886.52	TEAM manual read	Hourly	
RV-111	Davis Ranch South Well	01/20/11	13:46	11.24		3886.76	TEAM manual read	Hourly	
RV-112	Davis Ranch South Flow	01/20/11	13:56	NA	0.14	NA	TEAM manual read	Hourly	
RV-120	Red Hill Well (BLM)	01/19/11	10:50	139.89		3200.94	TEAM manual read	Hourly	
RV-130	G-36	01/19/11	10:33	180.08		3199.94	TEAM manual read	NA	
RV-140	Lego	01/19/11	10:23	222.09		3200.76	TEAM manual read	Hourly	
RV-150	Cinder Road	01/19/11	11:13	190.93		3187.03	TEAM manual read	Hourly	
RV-160	18-28 GTH	01/19/11	10:09	173.98		3188.60	TEAM manual read	Hourly	
RV-170	Fossil Falls Campground	01/19/11	11:42	141.01		3175.76	TEAM manual read	NA	
RV-180	LLR North Well	01/20/11	10:29	40.07		3159.03	TEAM manual read	Hourly	
RV-210	LLR Dock Well	01/20/11	10:44	6.16		3147.98	TEAM manual read	Hourly	
RV-220	LLR Stilling Well (lake surface)	01/20/11	10:55	3.70		3147.34	TEAM manual read	Hourly	
RV-230	LLR Little Lake Outflow	01/20/11	11:52	NA	1.03	NA	TEAM manual read	Hourly	
RV-240	LLR Coso Springs Flow	01/20/11	11:16	NA	0.36	NA	TEAM manual read	Hourly	
RV-245	LLR North Culvert Flow	01/20/11	12:15	NA	1.84	NA	TEAM manual read	Hourly	
RV-250	LLR Siphon Discharge	01/20/11	12:06	NA	Yes	NA	TEAM visual read	NA	Siphon Well flowing into Pond 2
RV-260	LLR Hotel Well	01/20/11	10:08	0.26		3138.52	TEAM manual read	Hourly	Pressure gauge reads 0 psi

NM - not measured; NA - not applicable; IO - Inoperative

DTW - Depth to water in feet below top of casing or other reference point; a negative DTW indicates that the groundwater elevation is above the surveyed reference point

GWE- Groundwater elevation in feet above mean sea level

**TABLE 2**  
**Hay Ranch Project Groundwater Baselines and Trigger Levels**  
**January 2011**

Well ID	Monitoring Point	Baseline GWE <sup>1</sup> (feet amsl)	Recent Date of Measurement	Recent GWE (feet amsl)	Recent GWE Compared to Baseline (feet)	Recent GWE Above Max DD <sup>2,6</sup> (feet)	Trigger Level At 1 year elapsed <sup>3,6</sup> (feet)	Recent GWE Compared to Trigger Level (feet)
RV-30	Cal Pumice	TBD <sup>4</sup>	01/19/11	3252.00	NA	NA	5.3	NA
RV-40	Dunmovin	3252.73	01/19/11	3249.88	-2.85	-0.05	1.1	-1.75
RV-90	Coso Jct Ranch	3230.65	01/19/11	3231.58	0.93	3.43	1.4	2.33
RV-100	Coso Jct Store #1	3227.59	01/19/11	3227.54	-0.05	2.25	1.2	1.15
RV-120	Red Hill Well	3200.66	01/19/11	3200.94	0.28	TBD <sup>5</sup>	TBD <sup>5</sup>	NA
RV-130	G-36	3198.35	01/19/11	3199.97	1.62	2.72	0.2	1.82
RV-140	Lego	3199.21	01/19/11	3200.76	1.55	2.65	0.2	1.75
RV-150	Cinder Road	3186.92	01/19/11	3187.03	0.11	0.81	0.2	0.31
RV-160	18-28 GTH	3187.67	01/19/11	3188.60	0.93	1.93	0.2	1.13
RV-180	LLR North Well	3158.88	01/20/11	3159.03	0.15	0.55	0.2	0.35

1) GWE: Groundwater elevation measured in feet above mean sea level. Baseline GWEs set 1/25/10 and approved by Inyo County Water Department

2) Max DD: Maximum Acceptable Drawdown from HMMP Table 3-1

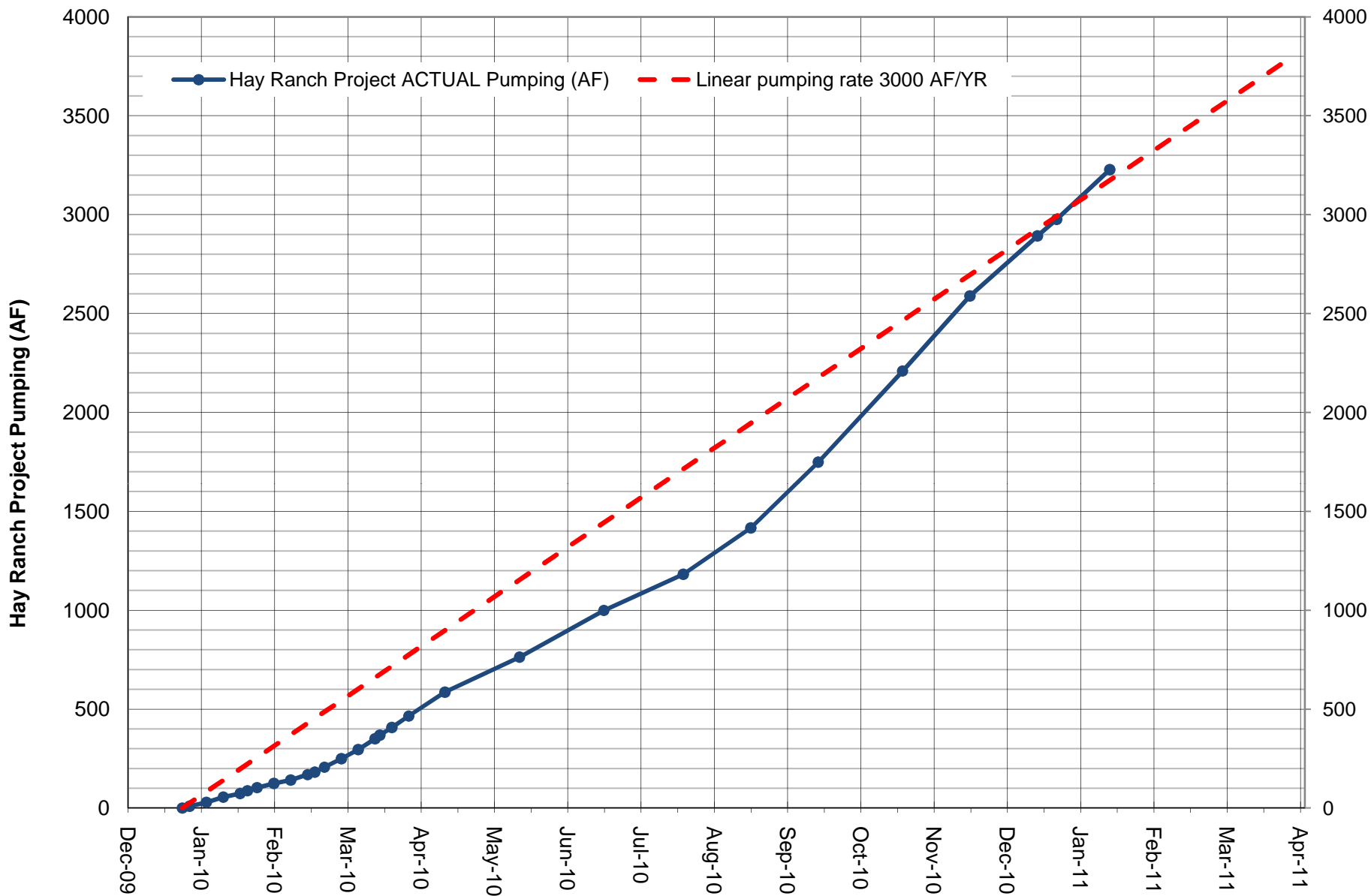
3) Trigger Level from HMMP Table 3-1

4) Cal Pumice Well baseline groundwater elevation will be set during Phase 3 Model Recalibration

5) Trigger Levels and Maximum Acceptable Drawdown levels for Red Hill Well will be set during Phase 3 Model Recalibration

6) From December 2010 to March 2011, Trigger Levels and Maximum Acceptable Drawdowns from HMMP Table 3-1 are under review as part of Phase 3 Model Recalibration

**FIGURE 1**  
HYPOTHETICAL AND ACTUAL HAY RANCH PROJECT PUMPING



Note: Coso Operating Co. initiated Hay Ranch Project pumping on 12/25/09.  
The "linear pumping rate" shown above is a hypothetical pumping rate of 8.2 AF/day (equivalent to 3000 AF per year).