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**COUNTY OF INYO
WATER DEPARTMENT**

May 29, 2004

Mr. Gene L. Coufal
Manager, Aqueduct Business Group
300 Mandich Street
Bishop, California 93514

Subject: Comments on LADWP's Proposed Operations and Pumping
Plan for the 2004-2005 Runoff Year

Dear Gene:

On May 19, 2004, LADWP provided the Inyo County Water Department with LADWP's proposed 2004-2005 Operations Plan and Pumping Program ("proposed plan"). The proposed plan calls for 92,000 acre-feet of groundwater to be pumped from the Owens Valley. The Water Agreement provides the County with ten days to provide comments on the proposed plan to LADWP. This letter presents the Inyo County Water Department's comments on the proposed plan.

To comply with the Drought Recovery Policy, and to avoid causing further decreases and changes in existing below-baseline vegetation conditions in many wellfields, the Water Department recommends that LADWP's groundwater pumping in 2004-2005 be limited to 60,820 acre-feet. Table 1 presents a comparison of LADWP's proposed groundwater pumping with the recommendations of the Water Department.

Table 1. Comparison Of LADWP'S Proposed Groundwater Pumping In 2004-2005 with the Amount of Groundwater Pumping Recommended by the Water Department (Acre-Feet)

Wellfield	LADWP Proposal	Water Department Recommendation
Laws	6,850	6,850
Bishop	12,000	12,000
Big Pine	28,850	18,300
Taboose-Aberdeen	12,580	300
Thibaut-Sawmill	13,800	13,800
Independence-Oak	8,000	6,000
Symmes-Shepherd	7,400	1,300
Bairs-Georges	970	970
Lone Pine	1,550	1,300
TOTALS	92,000	60,820

GENERAL COMMENTS

Changes in Groundwater Levels Under the Proposed Plan. The proposed plan lacks any analysis of the potential changes in groundwater levels that will result from the proposed groundwater pumping. Without such an analysis, it is impossible to conclude that the proposed plan is consistent with the vegetation protection goals of the Water Agreement. Moreover, the plan does not identify which wells will be operated and how much groundwater will be pumped from each well. The plan should provide this information so that the potential impacts of the proposed pumping can be better predicted.

Although the plan does not identify the specific wells that will be operated, the Water Department has conducted an analysis of the changes in the groundwater tables that will result from pumping as proposed by LADWP. The analyses of water table conditions are based regression models of water levels in indicator wells in selected wellfields and the USGS regional groundwater flow model for the Owens Valley (Danskin, W.R., *Evaluation of the Hydrologic System and Selected Water Management Alternatives in the Owens Valley*, California. USGS WSP 2070-H, 1998).

Table 2 shows a comparison of the April 1, 2004 groundwater tables to the baseline water levels. The baseline water level is the average April 1 water level for 1985, 1986, and 1987. As shown in Table 2, water levels at all indicator wells except Well 398T are below baseline.

Table 2. Depth to Water (DTW) at indicator wells, April 2004. (All data are in feet. A negative change from April 2003 indicates a declining water table; negative deviation from baseline indicates the water table is below baseline. Depths are from reference point.)

Well ID	DTW, April 2004	Change from April 2003	Baseline DTW	Deviation from Baseline in 2004
<i>Bairs George</i>				
398T	2.95	+2.76	6.38	+3.43
399T	3.31	+0.04	2.96	-0.35
400T	6.33	-0.26	6.32	-0.01
812T, BG2	15.45	+0.10	NA	
<i>Symmes Shepherd</i>				
401T	20.99	-1.83	17.87	-3.12
402T	10.53	-0.66	8.03	-2.50
510T	6.89	-0.79	4.98	-1.91
403T	7.15	-2.16	5.32	-1.83
404T	5.35	-0.92	3.55	-1.80
511T	7.45	-1.22	4.60	-2.85
447T	37.49	-4.13	22.20	-15.29
V009G, SS1	18.53	-3.38	NA	
646T, SS2	23.16	-2.62	NA	
561T, SS3	10.96	-2.00	NA	
811T, SS4	18.93	-1.31	NA	
<i>Independence Oak</i>				
407T	11.71	-1.61	7.57	-4.14
406T	4.26	-1.14	1.53	-2.73
408T	4.72	+0.33	3.13	-1.59

Well ID	DTW, April 2004	Change from April 2003	Baseline DTW	Deviation from Baseline in 2004
<i>Independence Oak</i>				
546T	6.56	+0.75	3.60	-2.96
809T, IO1	14.04	-1.87	NA	
854T, IO2	NA	NA	NA	
<i>Thibaut Sawmill</i>				
415T	22.27	-2.13	18.54	-3.73
507T	7.08	-1.34	3.92	-3.16
807T, TS1	21.22	-1.77	NA	
806T, TS2	14.27	-1.51	NA	
851T, TS3	11.81	-1.25	NA	
804T, TS4	8.53	-1.05	NA	
<i>Taboose Aberdeen</i>				
417T	33.42	-2.26	26.92	-6.50
418T	11.51	-1.51	8.18	-3.33
419T	11.05	-2.10	6.55	-4.50
421T	39.72	-1.57	34.31	-5.41
502T	13.58	-1.28	7.49	-6.09
504T	15.25	-1.97	10.78	-4.47
505T	24.99	-2.23	18.60	-6.39
849T, TA3	21.88	-2.03	NA	
586T, TA4	12.14	-1.71	NA	
801T, TA5	16.89	-0.52	NA	
803T, TA6	14.6	-2.13	NA	
<i>Big Pine</i>				
425T	21.52	-1.05	14.89	-6.63
426T	16.30	-0.62	11.57	-4.73
469T	25.09	-0.46	21.73	-3.36
798T, BP1	NA	NA	NA	
799T, BP2	21.16	+0.33	NA	
567T, BP3	19.78	-0.07	NA	
800T, BP4	19.58	-1.05	NA	
<i>Laws</i>				
107T	30.90	-0.95	24.00	-6.90
436T	11.25	-1.28	8.40	-2.85
438T	14.66	-0.03	9.61	-5.05
490T	16.14	-0.36	13.03	-3.11
492T	33.03	-0.53	32.83	-0.20
795T, LW1	24.34	-1.28	NA	
V001G, LW2	23.62	-1.64	NA	
840T, LW3	18.47	-0.79	NA	

The Water Department has predicted changes in water levels that will result from groundwater pumping under the proposed plan and that will result under the Water Department's recommended pumping (Table 3). Multiple linear regression models were applied to predict the effect of the pumping on the water table at indicator wells. These models use the observed relationship between pumping, runoff, and water levels to forecast future water levels. Predictions at monitoring sites were prepared using regression models of the relationship of water levels between a monitoring site and a nearby indicator well (Steinwand, A.L. and R.F. Harrington, *Simulation of*

Water Table Fluctuations at Permanent Monitoring Sites to Evaluate Groundwater Pumping, Inyo County Water Department Report, February 25, 2003).

All regression models were updated using data through the 2002-2003 runoff year. Multi-year simulations of water levels were performed using methods developed by Steinwand and Harrington (2003) to assess the probability the water level could attain specified target depths. Target depths for simulations of indicator wells were the average using the 1985-87 April water level (baseline). The monitoring site wells were installed after the baseline period, so target depths developed by Steinwand and Harrington (2003) based on soil water data and approximate rooting depths were used. To simulate water levels to April 2007, pumping in the 2005 and 2006 runoff years was assumed to be the minimum provided in the operations plan, and runoff was assumed to vary according to the historical record from 1935-2002.

Table 3. Predicted water level changes at indicator wells and monitoring sites under LADWP's proposed annual operations plan for 2005 and comparison with the amount of pumping recommended by Inyo County Water Department. (All DTW values are in feet and negative values denote a decline. Multit-year simulation of the probability of water level recovery to specified targets or baseline depths also shown.)

Station ID, Monitoring site	Predicted Change in DTW, 2004 to 2005		Predicted Deviation from Baseline		Probability of 2007 DTW Above Target (%)	
	LADWP	Inyo	LADWP	Inyo	LADWP	Inyo
<i>Bairs George</i>						
398T	-2.22	-2.22	+1.21	+1.21	96	96
399T	-0.17	-0.17	-0.52	-0.52	42	42
400T	-0.03	+0.03	-0.04	-0.04	77	77
<i>Symmes Shepherd</i>						
401T	-3.06	+0.06	-6.18	-3.06	23	34
402T	-0.41	+0.27	-2.91	-2.23	2	6
510T	-0.30	+0.31	-2.21	-1.60	5	10
403T	-1.33	+0.62	-3.16	-1.21	22	58
404T	-0.47	+0.28	-2.27	-1.52	7	18
511T	-0.28	+0.51	-3.13	-2.34	6	13
447T	-2.82	+1.40	-18.11	-13.89	<1	2
811T, SS4	-2.70	+0.28			19	29
646T, SS2	-3.85	-0.32			11	37
V009G, SS1	-3.07	+0.63			60	85
<i>Ind. Oak</i>						
407T	-0.45	+0.09	-4.59	-4.05	6	9
406T	-0.20	-0.03	-2.93	-2.76	5	5
408T	-0.42	-0.03	-2.01	-1.62	25	31
546T	-0.95	-0.60	-3.91	-3.56	2	2
<i>Thibaut Sawmill</i>						
415T	+0.01	+0.01	-3.72	-3.72	41	41
507T	+0.15	+0.15	-3.01	-3.01	1	1
<i>Taboose Aberdeen</i>						
417T	-0.92	+1.96	-7.42	-4.54	29	42
418T	-0.27	+1.06	-3.60	-2.27	22	52

Station ID, Monitoring site	Predicted Change in DTW, 2004 to 2005		Predicted Deviation from Baseline		Probability of 2007 DTW Above Target (%)	
	LADWP	Inyo	LADWP	Inyo	LADWP	Inyo
<i>Taboose Aberdeen</i>						
419T, TA1	-0.93	+2.18	-5.43	-2.32	53	78
421T	-0.89	+2.23	-6.30	-3.18	41	64
502T	+0.54	+1.76	-5.55	-4.33	19	19
504T	-1.11	+2.78	-5.58	-1.69	65	87
505T	-1.01	+1.90	-7.40	-4.41	9	17
803T, TA6	-1.06	+1.64			38	50
586T, TA4	-0.60	+1.80			43	70
801T, TA5	+1.00	+1.64			11	15
<i>Big Pine</i>						
425T	-0.99	+0.48	-7.62	-6.15	2	5†
426T	-0.65	+0.21	-5.38	-4.52	<1	2
469T	-0.14	+0.94	-3.50	-2.42	11	20
800T, BP4	-0.81	+0.52			31	50
567T, BP3	-2.11	-0.56			5	11
799T, BP2	-0.74	+0.36			<1	1
<i>Laws</i>						
107T	-0.94	-0.94	-7.84	-7.84	3	3
436T	-0.74	-0.74	-3.59	-3.59	3	3
438T	-0.56	-0.56	-5.61	-5.61	2	2
490T	-0.91	-0.91	-4.02	-4.02	2	2
492T	-2.61	-2.61	-2.81	-2.81	20	20
V001G, LW2	-3.32	-3.32			<1	<1
574T	+0.05	+0.05			<1	<1

†: lowest pumping amount simulated was 19000 acre-feet. Probability extrapolated from existing results and may have an estimation error of 1-2%

A comparison of the data presented in Tables 2 and 3 shows that under the proposed pumping program, the water levels in most indicator wells that are already below baseline are predicted to further decline from their current levels.

Drought Recovery Policy. The proposed plan states: “[T] his year’s pumping program is consistent with the management strategy of the Water Agreement...” However, the proposed plan does not include discussion of the “Drought Recovery Policy” (“DRP”) that was adopted by the Standing Committee in the early 1990s to serve as a management overlay to the Water Agreement.

The DRP provides in pertinent part:

The goal of this policy is that soil water within the rooting zone recover to a degree sufficient so that the vegetation protection goals of the Agreement are achieved. To this end, groundwater pumping during this drought, as well as the period of recovery, will be conducted in an environmentally conservative manner, taking into consideration soil water, water table, and vegetation conditions.

Further, soil water, water tables, and vegetation conditions will be monitored by the Technical Group...for purposes of evaluating the effectiveness of the existing well turn-off/turn-on provisions.

This policy is to provide guidance to the Standing Committee for establishing annual pumping programs during the current drought as well as during a period of recovery.

The Standing Committee will establish annual pumping programs based on an evaluation of current conditions, including soil moisture level, water table depth, degree of water table recovery, soil type, vegetation conditions, the results of studies pertaining to vegetation recovery, and compliance with the goals of the Agreement.

LADWP believes that the goals of the DRP have been attained, and that the DRP is no longer in effect in any area of the valley. The County disagrees and believes that the DRP remains in effect in areas of the wellfields identified below. In these areas, prior to the adoption of the DRP, groundwater pumping caused the water tables to be lowered and “disconnected” from the vegetation. As a result, vegetation conditions in these parcels declined below baseline levels. Importantly, the water tables have not “reconnected” with the vegetation by recovering to levels needed to recharge soil in the vegetation root zone sufficient to allow perennial vegetation cover to achieve baseline levels. See report titled: *Status of Re-Inventoried Vegetation Parcels According to the Drought Recovery Policy, 2003*, by Sara J. Manning, Ph.D. (hereinafter, *Manning 2004*). A copy of the report is being provided to LADWP concurrently with this letter. As required by the DRP, the Standing Committee is required to establish the pumping program for these wellfields with areas subject to the DRP.

WELLFIELD BY WELLFIELD COMMENTS

The following sections that address each wellfield contain a description of the vegetation conditions in the wellfield. In contrast to the described vegetation conditions in wellfields, the vegetation conditions at control sites (which are minimally affected by groundwater pumping) are far better. The disparity between wellfield parcels and control parcels demonstrates the affects of groundwater pumping within the wellfields. The condition of vegetation in these control sites is presented at the end of this section following the discussions of the conditions in each wellfield.

Laws Wellfield

The proposed plan calls for 6,850 acre-feet of groundwater pumping. Pumping during runoff year 2003-04 was 5,245 acre-feet. The proposed plan does not provide for the operation of either of the McNally canals.

Vegetation Conditions: Parcels LAW052, LAW062, LAW065, LAW082, LAW085, LAW112, and LAW137 were classified by the Water Department as subject to the DRP in 2003 (see *Manning 2004*). Further, the other six parcels in the wellfield that were re-inventoried in 2003 all had average perennial cover below baseline. Since the parcel re-inventory began in 1991, parcels LAW052, LAW062, LAW065, LAW082, and LAW085 have had perennial cover below baseline for all years in which the Water Department has collected transect data. An additional Alkali Meadow parcel was inventoried in 2003, LAW035, and its perennial cover was far below baseline.

During, and shortly after, the 1987-1992 drought, conditions throughout the Laws wellfield were poor in terms of both water table and vegetation cover until the mid to late 1990s. Water spreading, which raised water levels during the mid to late 1990s, resulted in water table and perennial cover recovery in some, but not all, parcels in the Laws wellfield. However, the general trend in both water tables and perennial cover has been downward in Laws since 1999. The trend in cover is occasionally disrupted in high precipitation years, such as 2003, but the increases caused by precipitation are temporary when not accompanied by water table recovery.

Given relatively low precipitation during the 2004 water year and generally declining water levels throughout the wellfield, 2004 perennial cover is likely to persist below baseline. This trend could be reversed in the future if management goals were to raise water levels during the coming years.

Water Table Conditions: Water levels in the Laws area indicator wells currently range from slightly below baseline to approximately seven feet below baseline. Water levels at the permanent monitoring sites at the beginning of the 2004 growing season were several feet below the root zone specified by the Green Book for management (LW1, -10.6; LW2, -15.6; LW3 -10.2.). If the McNally canals are not operated, and if the planned 6,850 acre-feet of pumping takes place, water tables at indicator wells are predicted to further decline by more than three feet, and water levels at the permanent monitoring sites are predicted to decline 3.32 feet at LW2 and only increase 0.05ft at LW3. Further, if the proposed pumping is conducted, the probability of reconnecting the water table with the root zone at the permanent monitoring site Laws2 by April 2007 is less than one percent, and the probability of raising the water table to baseline at four of the five indicator wells is three percent or less, and twenty percent at the fifth indicator well.

Recommended Operations in Laws: Groundwater pumping should not exceed 6,850 acre-feet from the wellfield to supply irrigation water for use in the wellfield. Also, in order to: (1) prevent the additional lowering of water tables in the wellfield, (2) stabilize water levels under parcels classified by the Water Department as subject to the DRP, and (3) avoid causing further decreases in the vegetation conditions at parcels with vegetation conditions below baseline, it is recommended that at least an amount of water equal to the amount pumped in the Laws wellfield in the 2004-2005 runoff year be diverted from the Owens River into the Lower McNally canal. Also, given the severe decline in vegetation parcels LAW052, LAW082, and LAW085, during this runoff year, it is recommended that water be diverted out of the canal, as was done in the past, to raise the water levels under these parcels.

Bishop Wellfield

The proposed plan calls for 12,000 acre-feet of groundwater pumping in accordance with the Hillside Decree. Pumping during runoff year 2003-04 was 11,884 acre-feet.

Vegetation Conditions: No parcels in the Bishop wellfield were reinventoried in 2003 due to Water Department personnel cutbacks (see *Manning* 2004). Previous data for Bishop showed two of the three reinventoried parcels as still subject to the DRP as of 2002. Based on generally declining water tables throughout the Bishop wellfield from 2001 to 2003 (see *Manning* 2004), it is not likely that vegetation in the DRP parcels reconnected with the water table during 2003. Given relatively low precipitation during the 2004 water year and generally declining water levels throughout the wellfield, 2004 perennial cover is likely to persist below baseline. This trend could be reversed in the future if management goals were to raise water levels during the coming years.

Water Table Conditions: Using the USGS regional groundwater flow model for the Owens Valley, it is estimated that water levels were below baseline as of April 2004 under all of the Bishop wellfield parcels, and will decline under the proposed pumping plan.

Recommended Operations in Bishop: Provided that the pumped groundwater is used to supply water for irrigation and other uses, which are located on the Bishop Cone downstream of the pumping wells, the pumping should not exceed 12,000 acre-feet. Also, because of an increase in pumping from replacement wells (in relation to the amount of pumping from these wells in recent years), the hydrologic conditions on the Cone have changed. Under such circumstances, during this runoff year, the Technical Group should conduct an evaluation of the changes and establish new monitoring and management on the Cone as it deems necessary. The Water Department has provided an outline of the protocol for such an evaluation to LADWP. Further, the highest annual pumping from Well 371 that has occurred prior to 2003-04 is 1,232 acre-feet; therefore, it is recommended that pumping from Well 371 be limited to 1,232 acre-feet until the evaluation is completed by the Technical Group.

Big Pine Wellfield

The proposed plan calls for 28,850 acre-feet of groundwater pumping. Pumping during runoff year 2003-04 was 26,400 acre-feet. The proposed plan states that "...pumping from the Big Pine Wellfield includes supply to Fish Springs Fish Hatchery and the town water system on a year round basis."

Vegetation Conditions: Parcels BGP162, FSP004, and FSP006 were classified by the Water Department as subject to the DRP in 2003 (see *Manning* 2004). Further, in the other three parcels in the wellfield that were re-inventoried in 2003, all had average perennial cover below baseline. Since the parcel re-inventory began in 1991, parcels BGP162 and FSP006 have had perennial cover below baseline for all years in which the Water Department has collected transect data. Given relatively low precipitation during the 2004 water year and generally declining water levels throughout the wellfield, 2004 perennial cover is likely to persist below baseline. This trend could be reversed in the future if management goals were to raise water levels during the coming years.

Water Table Conditions: Table 2 (concerning groundwater mining), on Page 2-3 of LADWP's proposed plan, appears to be based on a preliminary draft of the table that was supplied to LADWP by Randy Jackson on April 15, 2004. At the time of the submittal, Mr. Jackson requested additional runoff and pumping data. He made this request because the recharge calculations provided in the preliminary draft of Table 2 had not been updated since 1992 by the prescribed method on Page 114 of the Green Book.

Since the preliminary draft of Table 2 was submitted, Mr. Jackson has updated the table. The work involved in updating the table consisted of conducting the following activities and of then using the data in the update of the table:

- Pumping and Recharge for Water Years 1985-1989 were taken from the Green Book (Page 170)
- Pumping for Water Years 1990-2003 was taken from the Inyo County Water Department Pumping Well Data Base
- Recharge for Water Years 1990-1992 was taken from spreadsheets provided to the Water Department by LADWP (Green Book method).
- Recharge for Water Years 1993-2002 resulted from updating the original estimates using actual Owens Valley Water Year Runoff from the Inyo County Water Department Totals and Means Database and the regression equations developed for estimating recharge by wellfield in the Green Book (Page 114). (This activity produced a recharge estimate using the actual Owens Valley Water Year Runoff from the ICWD database for these years instead of forecasted runoff that was used previously.)
- Recharge estimates for Water Years 2003 and 2004 were based on the regression equations evaluated in the normal manner using forecasted April-September runoff from the April 1st Owens Valley Runoff Forecast and previous October through March estimated Owens Valley Runoff.
- The mining calculations were then revised using the data described above.

The updated mining table is attached to this letter. The updated table shows that the total pumping from the Big Pine well field area, over a 20 year period (2004 plus the 19 previous years), exceeds the total recharge to the well field during that 20 year period by 9,022 acre-feet.

In regard to groundwater mining, Section III.B of the Water Agreement provides:

The goal is to avoid long term groundwater mining from aquifers in Inyo County. This goal will be met by managing annual groundwater pumping so that the total pumping from any well field

area over a 20 year period (the then current year plus the 19 previous years) does not exceed the total recharge to the same well field area of the same 20 year period.

Beyond the issue of groundwater mining, water tables in the three Big Pine area indicator wells are between 0.02 to 6.90 feet below baseline conditions. Water levels at the permanent monitoring sites at the beginning of the 2004 growing season were several feet below the root zone specified by the Green Book for management (BP1, >-8.8; BP2, -7.4, BP3, -6.1, and BP4, -5.9). Using the USGS regional groundwater flow model for the Owens Valley, it is estimated that water levels were below baseline as of April 2004 under all of the DRP parcels and the parcels with below baseline vegetation conditions.

Under LADWP's proposed pumping plan, water tables are predicted to decline an additional 0.14 to 0.99 foot at indicator wells and 0.74 to 2.11 feet at three monitoring sites. In particular, water levels under vegetation parcels FSP004 and FSP006 are predicted to decline approximately 2.43 feet and 2.00 respectively if pumping is conducted as described in the proposed pumping plan. In particular, water levels under vegetation parcels FSP004 and FSP006 are predicted to decline approximately 2.43 feet and 2.00 respectively if pumping is conducted as described in the proposed pumping plan. Also, if the proposed pumping of 28,850 acre-feet is conducted, the probability of reconnecting the water table with the root zone at three permanent monitoring sites in this wellfield by April 2007 ranges from 1 to 50 percent and the probability of raising the water table to baseline at the indicator wells ranges from 2 percent to 20 percent one foot.

Recommended Operations in Big Pine: In view of the groundwater mining provisions of the Water Agreement, and the water table and vegetation conditions in the parcels described above, in order to: (1) prevent the additional lowering of water tables in the wellfield, (2) stabilize water levels under parcels classified by the Water Department as subject to the DRP, and (3) avoid causing further decreases in the vegetation conditions at parcels with vegetation conditions below baseline, it is recommended that pumping from the wellfield be kept to the absolute minimum required to supply the town water system and the Fish Springs Fish Hatchery (18,300 acre-feet.) Further, groundwater recharge operations should be commenced in this wellfield by LADWP. Finally, in the 2004-05 runoff year, the Water Department and LADWP should jointly update the Green Book recharge estimates and regression models used to determine groundwater mining limits.

Taboose-Aberdeen Wellfield

The proposed plan calls for 12,580 acre-feet of groundwater pumping. Pumping during runoff year 2003-04 was 12,736 acre-feet. The proposed plan calls for the pumping of exempt Well 118 and Well 349.

New Monitoring Well. As has been noted in prior years, the Water Department does not believe that the monitoring site linked to Well 349 is a reliable tool to be used to manage the operation of the well. Therefore, although the site may be in "ON" status, it does not indicate that the operation of the well will not cause impacts inconsistent with the goals of the Water Agreement. It should be noted, because the site is in "ON" status, Well 349 has been almost continuously operated at full capacity since May 2001.

At the June 7, 1999 Standing Committee meeting, the County expressed concern over the proposed operation of Well 349 and the need for three additional monitoring wells in the vicinity of this well in order to monitor the potential impacts resulting from the operation of the well. As reflected in the minutes of the June 7, 1999 meeting:

DWP indicated that it will include the request for three additional monitoring wells with Inyo County's previous request for additional monitoring wells, and will respond with a plan for installation of monitoring wells within approximately 30 days.

Only one new monitoring well has been installed in the vicinity of Well 349 since the June 1999 Standing Committee meeting. The Water Department continues to believe that at least one additional monitoring well is

necessary in the vicinity of Well 349 to insure that the operation of the well does not adversely affect groundwater dependent vegetation.

Vegetation Conditions: Parcels TIN068, BLK009, BLK021, BLK024, and BLK033 were classified by the Water Department as subject to the DRP in 2003 (see *Manning* 2004). All these parcels, except for parcel BLK024, had perennial cover below baseline levels (see *Manning* 2004 for a discussion of BLK024). In addition, one parcel (TIN064) had average perennial cover below baseline in 2003.

Increases in cover occurred during 2003 for some parcels in this wellfield and the increase is probably due to high precipitation during the 2003 water year. Since the parcel re-inventory began in 1991, parcels BLK002 and BLK021 have had perennial cover below baseline conditions for all years in which the Water Department has collected transect data, and BLK009 has had perennial cover below baseline in all but one year (the wet year, 1998). Based on general water table trends in the wellfield, regional April 2004 water levels, and relatively low 2004 water year precipitation, it is expected that cover in most of the parcels will decline in 2004. This trend could be reversed in the future if management goals were to raise water levels during the coming years.

Water Table Conditions: Water levels in the seven Taboose-Aberdeen indicator wells currently range from approximately 3.33 to 6.50 feet below baseline conditions. Moreover, using the USGS regional groundwater flow model for the Owens Valley, it is estimated that water levels were below baseline as of April 2004 under all of the DRP parcels, and under the parcels with below baseline vegetation conditions, except for BLK009. Water levels at the permanent monitoring sites at the beginning of the 2004 growing season were several feet below the root zone specified by the Green Book for management: TA3, -12.7; TA4, -5.4; TA5, -10.1; TA6, -7.7.

If the proposed pumping of 12,580 acre-feet is conducted, it is estimated that the water table would decline under all DRP parcels in the Taboose-Aberdeen wellfield. Further, water levels in most of the indicator wells are predicted to decline an additional 0.27 to 1.11 feet (however, water levels are predicted to increase at two indicator wells east of the Owens River). Also, under the proposed plan, the probability of reconnecting the water table with the root zone at the four permanent monitoring sites in this wellfield by April 2007 ranges from 9 to 43 percent, and the probability of raising the water table to baseline at the indicator wells is ranges from 19 percent to 65 percent. The probability of recovery in this wellfield is in general higher than other wellfields because the minimum pumping used for the analysis was zero.

Recommended Operations in Taboose-Aberdeen: In order to: (1) prevent the additional lowering of water tables in the wellfield, (2) stabilize water levels under parcels classified by the Water Department as subject to the DRP, and (3) avoid causing further decreases in the vegetation conditions at parcels with vegetation conditions below baseline, groundwater pumping in this wellfield should not exceed the amount required to supply the pond at Seely Springs, approximately 300 acre-feet.

Thibaut-Sawmill Wellfield

The proposed plan calls for 13,800 acre-feet of groundwater pumping. Pumping during runoff year 2003-04 was 14,169 acre-feet.

Vegetation Conditions: Parcels BLK075, BLK094, and IND029 were classified by the Water Department as subject to the DRP in 2003 (see *Manning* 2004). In the other four parcels in the wellfield that were re-inventoried in 2003, two, BLK069 and BLK099, had average perennial cover below baseline. Since the parcel re-inventory began in 1991, parcels BLK075 and BLK077 have had perennial cover below baseline conditions for all years in which the Water Department has collected transect data. BLK094 has had perennial cover below baseline in all but one year (the wet year, 1998-a result not corroborated by other information). Three parcels, IND029, BLK074, and IND035 showed 2003 perennial cover higher than baseline, but IND029 shows evidence of having converted from a grass-dominated meadow parcel to dominance by big sagebrush. BLK094, previously mapped as an Alkali Meadow during the baseline period, is in the process of losing grass cover and converting to a shrub-

dominated parcel. This type conversion is to be avoided under terms of the Water Agreement. Based on general water table trends in the wellfield, regional April 2004 water levels, and relatively low 2004 water year precipitation, it is expected that cover in the three DRP parcels will decline in 2004. This trend could be reversed in the future if management goals were to raise water levels during the coming years.

Water Table Conditions: Water levels in the Thibaut Sawmill area indicator wells currently range from 3.16 to 3.73 feet below baseline conditions. Using the USGS regional groundwater flow model for the Owens Valley, it is estimated that water levels were below baseline as of April 2004 under all of the DRP parcels and under the parcels with below baseline vegetation conditions. Water levels at the permanent monitoring sites at the beginning of the 2004 growing season were several feet below the root zone specified by the Green Book for management: TS1, -14.1; TS2, -7.3, TS3, -3.4, and TS4, -1.4.

Under the proposed plan, water levels are predicted to increase 0.01 to 0.15 feet. Also, if the proposed pumping of 13,800 acre-feet is conducted the probability of raising the water table to baseline by April 2007 at the indicator wells is ranges from 2 percent to 47 percent Further, it is estimated that under the proposed pumping plan the water table would decline beneath all DRP parcels in the Thibaut-Sawmill wellfield.

Recommended Operations in Thibaut-Sawmill: ; In order to: (1) prevent the additional lowering of water tables in the wellfield, (2) stabilize water levels under parcels classified by the Water Department as subject to the DRP, and (3) avoid causing further decreases in the vegetation conditions at parcels with vegetation conditions below baseline, groundwater pumping in this wellfield should not exceed 13,800 acre-feet

During previous test pumping of this well, there were indications that the operation of this well may affect the availability of water to the Thibaut Springs area. Therefore, Well 382 should not be operated until the Technical Group develops a plan for monitoring in the Thibaut Springs area so that the potential impacts of the operation of Well 382 on the spring area can be detected and managed to prevent adverse impacts.

Independence-Oak Wellfield

The proposed plan calls for 8,000 acre-feet of groundwater pumping. Pumping during runoff year 2003-04 was 11,759 acre-feet.

Vegetation Conditions: Parcels IND106 and IND111 were classified by the Water Department as subject to the DRP in 2003 (see *Manning* 2004). Since the parcel re-inventory began in 1991, parcel IND111 has had below baseline perennial cover for all but one year in which the Water Department has collected transect data (the wet year, 1998). Both IND011 and IND106 typically show perennial cover averaging above baseline. It is believed that the reason IND011 shows this trend is due to water table fluctuations that occur within and not below the root zone in recent years. There are no existing baseline transect data for IND106. The low water table beneath parcel IND106 since the baseline period, the poor conditions at the permanent monitoring transect located in the parcel (it was 28.4% in 1987 and 13.5% in 2003), and other information indicate that, unlike IND011, vegetation is not connected to the water table throughout the parcel. IND106 and IND111 have shown declining water tables since about 2000.

Based on general water table trends in the wellfield, regional April 2004 water levels, and relatively low 2004 water year precipitation, it is expected that cover in both DRP parcels will decline in 2004. This trend could be reversed in the future if management goals were to raise water levels during the coming years.

Water Table Conditions: Water levels in indicator wells currently range from 1.59 to 4.14 feet below baseline conditions. Water levels at the permanent monitoring sites at the beginning of the 2004 growing season were several feet below the root zone specified by the Green Book for management: IO1, -7.0; IO2, >-11.8. Using the USGS regional groundwater flow model for the Owens Valley, it is estimated that water levels under both of the DRP parcels were below baseline as of April 2004.

If the proposed pumping of 8,000 acre-feet is conducted, the probability of raising the water tables to baseline by April 2007 at the indicator wells ranges from 2 percent to 31 percent. Also, water levels are predicted to decline less than one half of a foot in the indicator wells. Further, the water table would decline beneath all DRP parcels in the Independence-Oak wellfield except IND111.

Recommended Operations for Independence-Oak: In order to: (1) minimize the additional lowering of water tables in the wellfield, (2) minimize the decline of water levels under parcels classified by the Water Department as subject to the DRP, and (3) avoid causing further decreases in the vegetation conditions at parcels with vegetation conditions below baseline, groundwater pumping in this wellfield should not exceed 6,000 acre-feet.

Symmes-Shepherd Well Field

The proposed plan calls for 7,400 acre-feet of groundwater pumping. Pumping during runoff year 2003-04 was 4,177 acre-feet.

Vegetation Conditions: Parcels IND132, IND133, IND139, IND231, and MAN007 were classified by the Water Department as subject to the DRP in 2003 (see *Manning* 2004). Only IND139 and MAN007 had 2003 perennial cover below baseline conditions. IND231 is analogous to IND106 (in the Independence-Oak wellfield) in that baseline transect data do not exist for this parcel and the baseline cover information is thus questionable. Cover in this parcel, as measured at the permanent transect located in the parcel, has persisted below, and usually far below, its 1987 level. It is unlikely the vegetation in this parcel is connected to the water table. It is probable that cover increased throughout the Symmes-Shepherd wellfield in 2003 due to relatively high precipitation during the 2003 water year. Since the parcel re-inventory began in 1991, IND139 has had perennial cover below baseline for all years in which the Water Department has collected transect data, and IND132, IND133, and MAN007 have had perennial cover below baseline in all but one year (1995 for MAN007 and 2003 for the other parcels).

Based on low water tables in the wellfield, regional April 2004 water levels, and relatively low 2004 water year precipitation, it is expected that cover in all DRP parcels will decline in 2004. This trend could be reversed in the future if management goals were to raise water levels during the coming years.

Water Table Conditions. Water levels in the seven Symmes-Shepherd area indicator wells currently range from 1.80 to 15.29 feet below baseline. Water levels at the permanent monitoring sites at the beginning of the 2004 growing season were several feet below the root zone specified by the Green Book for management for three sites (SS1, -2.4; SS2, -8.63; SS4, -5.3) and several feet above the root zone at one site (SS3, +3.8). Using the USGS regional groundwater flow model for the Owens Valley, it is estimated that water levels under all of the DRP parcels were below baseline as of April 2004.

If the proposed pumping of 7,400 acre-feet is conducted, water levels are predicted to decline up to an additional 0.28 feet to 3.85 feet depending on location. . Also, the probability of reconnecting the water table with the root zone at three permanent monitoring sites in this wellfield by April 2007 ranges from 11 to 60 percent, and the probability of raising the water table to baseline at the indicator wells is ranges from <1 percent to 23 percent Under the proposed plan, water levels are predicted to decline up to an additional 0.28 feet to 3.85 feet, depending on location. Further, it is estimated that under the proposed pumping plan, water tables will decline under all DRP parcels in the Symmes-Shepherd wellfield.

Recommended Operations for Symmes-Shepherd: In order to: (1) prevent the additional lowering of water tables in the wellfield, (2) stabilize water levels under parcels classified by the Water Department as subject to the DRP, and (3) avoid causing further decreases in the vegetation conditions at parcels with vegetation conditions below baseline, groundwater pumping in this wellfield should not exceed the operation of exempt Well

402 to the extent necessary to supply irrigation water--not to exceed a total of 1,300 acre-feet. With pumping limited to 1,300 acre-feet, it is predicted that the water tables will rise in the wellfield.

Bairs-Georges Well Field

The proposed plan calls for 970 acre-feet of groundwater pumping. Pumping during runoff year 2003-04 was 180 acre-feet.

It should be noted that the vegetation monitoring site for BG2 was burned in a wildfire in the spring of 2002; therefore, there is no effective on/off management for this site.

Vegetation Conditions: Perennial cover in parcel MAN037 has been consistently below baseline. Because of poor vegetation conditions caused by a low water table prior to the spring 2002 fire, very low cover was measured in MAN037 during the summer 2003 (14.6%, compared with baseline of 42%), and cover at the permanent monitoring site in this parcel, as measured by LADWP, was 1.8%. In contrast, a parcel in the Laws wellfield that was classified as free from the DRP constraints (LAW122), also completely burned in spring 2002. Because it had relatively high groundwater prior to and after the fire, its perennial cover quickly reestablished and was 54.8% in 2003, compared with baseline of 59.6%. The water table beneath MAN037 persists at an average depth that is low in the shrub root zone. This water level, although relatively stable since 1995, has been insufficient to fully recover 42% perennial cover throughout the parcel; a higher water table is needed to recover the stressed vegetation.

Water Table Conditions: Water levels in indicator wells currently range from 3.43 feet above baseline to 0.35 feet below baseline. Water level at the permanent monitoring site BG2 at the beginning of the 2004 growing season was 1.7 feet below the root zone specified by the Green Book for management.

Under the proposed plan, the water table is predicted to decline 0.03 to 2.22 feet in the indicator wells. Also, if the proposed pumping of 970 acre-feet is conducted, the probability of raising the water table to baseline at the indicator wells is 47 percent. Using the USGS regional groundwater flow model for the Owens Valley, it is estimated that under the proposed pumping plan water tables will decline under parcel MAN037.

Recommended Operations for Bairs-Georges: In the absence of a monitoring site for BG2, groundwater pumping should be managed very conservatively. Therefore, if the Technical Group agrees upon a protocol for testing of wells that affect flow in Reinhackle Spring, pumping in this wellfield should not exceed 970 acre-feet—the amount necessary to supply irrigation water from exempt Well 343 and to conduct the test

Lone Pine Well Field

The proposed plan calls for 1,550 acre-feet of groundwater pumping. Pumping during runoff year 2003-2004 was 1,176 acre-feet.

The final plan should state whether LADWP plans to pump any water to supply Diaz Lake from the Lone Pine wellfield.

Vegetation Conditions: One reinventoried parcel in the Lone Pine area, LNP045, has been classified as free from the DRP constraints. In 2003, its perennial cover was below baseline, and it has been below baseline since 2001.

Recommended Operations for Lone Pine: Groundwater pumping in this wellfield should be limited to an amount consistent with recent past practice--1,300 acre-feet.

Control Areas of Owens Valley

In contrast to the wellfield areas, perennial cover conditions in control parcels throughout the valley (where water tables are minimally affected by groundwater pumping), have averaged above baseline during all years except 1991 and 2002. Even though cover in 1991 and 2002 “averaged” slightly below baseline, it was virtually indistinguishable from baseline according to statistical techniques used to analyze the data. (This is also true of control conditions in 1992-1994 and 2003, which averaged statistically above baseline but were not significantly above baseline.) In 2003, average perennial cover for all control parcels was higher than baseline, and average total cover in 13 of the 18 reinventoried control parcels was above baseline. Thus, in non-wellfield groundwater dependent vegetation, perennial cover usually is at or above baseline. In contrast, in DRP parcels, the trend has been to remain below baseline.

E/M PROJECTS AND IN-VALLEY USES

The proposed plan states that there will be full irrigation supplies of 5 acre-feet per acre, and that native pasture E/M projects will receive 3 acre-feet per acre. The plan also states that there will be a reduction in supply to E/M projects of approximately 4,500 acre-feet. Specifically, the plan states that the LORP will be reduced 3,000 acre-feet, the Laws area ponds and pasturelands will be reduced 1,500 acre-feet. The pumping plan should describe the amount of water that will be provided to the Laws area ponds and pasturelands: McNally Ponds, the McNally Pasture east of the ponds (100 acres), the two McNally Pastures southeast of Laws (200 acres), the Laws-Poleta Pasture adjacent to and east of Highway 6 (160 acres), and the Laws-Poleta Pasture southeast of Laws (60 acres).

The Board of Supervisors (see page 17 of the Agreement) must approve the proposed reduction in the water supplies to the E/M projects.

The plan should include a commitment that even with the reduction in the water supply to the LORP, sufficient water will be released to the Owens River so that it does not dry up before reaching Owens Lake, as has occurred in past years

The proposed plan states that: “LADWP is currently evaluating a program to encourage water conservation on some irrigated lands leased from LADWP.” The final plan should state that unless the plan is modified as provided in Section V.D.5 of the Water Agreement, the program to encourage water conservation will not be implemented.

Finally, Table 9 of the proposed plan provides a summary of the water provided by LADWP for various uses within the valley from the 1985-1986 runoff year to the present. Since the Water Agreement requires that the water related uses that existed on LADWP lands during the 1981-82 runoff year be maintained, even though Table 6 in the proposed plan generally summarizes water uses in the Owen Valley in the 1981-82 runoff year and the expected uses in 2004, it would be helpful if Table 9 were to be revised to provide the specific amounts of water provided by LADWP for various uses including each E/M project and each mitigation measure within the valley from the 1981-82 runoff year to the present.

CONCLUSION

As shown above, groundwater pumping will lower water levels, (1) under parcels still subject to the DRP, (2) under monitoring sites where vegetation conditions are less than baseline conditions, and (3) under vegetation parcels where vegetation conditions are at less than baseline conditions. In order to avoid further reductions in the vegetation cover in these areas, groundwater pumping should be reduced to the levels recommended in these comments.

As required by the Agreement, a Technical Group meeting should take place for the purpose of attempting to resolve the concerns expressed in this letter regarding the proposed plan. Finally, as provided in the DRP, the Standing Committee must approve an operations plan for the areas that are still subject to the DRP; consequently, the plan for these areas may not be implemented until the Standing Committee has approved a plan for these areas.

Thank you for the opportunity to comment on the proposed plan. Please contact me if you have any questions.

Sincerely,

Greg James, Director
Inyo County Water Department

CC: Members of the Inyo County Board of Supervisors
Members of the Inyo County Water Commission
Inyo County Administrator
Inyo County Counsel