

**MONO BASIN ONE YEAR TEMPORARY OPERATION PLAN**  
**November 1, 2010 through October 31, 2011**

This temporary operational plan is part of the Los Angeles Department of Water and Power (LADWP's) "Petition for Temporary Urgency Change" (Water Code 1435) request to the State Water Resources Control Board (SWRCB) to operate in the Mono Basin for one year by deviating from the original flow requirements of Decision 1631 and Order 98-05 for Rush, Lee Vining, Walker, and Parker creeks (Licenses 10191 and 10192).

The purpose of this one year operational plan is to test the feasibility of flow recommendations of the Synthesis Report submitted by the SWRCB-appointed Stream Scientists before the SWRCB makes final determination and amends LADWP licenses in the Mono Basin. Per Order 98-05, Section 1.b (2)(a) and (b), the Stream Scientists submitted the final Synthesis Report in April 2010, after considering comments from LADWP and interested parties on the draft report. The final report is a summary of the overall performance of Order 98-05's Stream Restorations Flows (SRFs) and baseflow hydrographs, and recommended actions deemed beneficial to further the stream ecosystem recovery and trout populations based on their 12-year monitoring program funded by LADWP.

Specifically, the purpose of this one year operational plan is to:

- 1) Implement certain Synthesis Report recommendations that can be immediately accomplished, as detailed below;
- 2) Test the feasibility of various operational approaches to achieving certain recommendations, as detailed below;
- 3) Gather operational and facility information to inform the facilitated process planned among the interested parties for 2011 and detailed in LADWP's letter to the State Water Board.

LADWP submits this request in order to take appropriate action subsequent to the submission to the State Water Board of the final Synthesis Report by the SWRCB-appointed Stream Scientists, as required in Order 98-05 Section 1.b (2)(a) and (b). The final report is a review of the overall performance of Order 98-05's Stream Restorations Flows (SRFs) and baseflow hydrographs, and it makes recommendations for changes deemed beneficial to further the stream ecosystem recovery and trout populations based on their 12-year monitoring program funded by LADWP.

The idea of testing was raised during the restoration meeting in Sacramento and was also suggested by the Stream Scientists in the final Synthesis Report. The purpose of the test would be to determine if operational questions raised by the Synthesis Report can be answered and lead to better recommendations. This temporary change will have no unreasonable effect upon fish, wildlife and other instream beneficial uses.

Testing will assist in finding answers to the following questions if runoff conditions allow:

**Operation**

- 1) Can LADWP maintain Grant Lake storage threshold of 20,000 AF between July and September as recommended and what are the impacts of this operation? This will of course depend on year-type and hydrology.
- 2) Can LADWP maintain Grant Lake at spillway elevation for at least a period of two-weeks prior to spill to facilitate significant spills? How close can LADWP get achieving the recommended high flows with/without the cooperation from SCE? How challenging is it to meet the specific time-periods of the new spill recommendations, for example coordination with Parker and Walker flows?
- 3) With restrictions on the export timing, can LADWP reasonably achieve 16,000 AF annual export?
- 4) To assess the operation difficulty in meeting diversion rates on Lee Vining Creek with existing facilities. A diversion rate flow regime has never been done and thus LADWP need to identify the issues with operating in such manner with existing facilities.
- 5) To identify the issues associated with transitioning Lee Vining Creek from a bypass flow regime to diversion flow-rate regime and vice-versa.
- 6) To test capacity of the new delivery system to Mono Return Ditch.
- 7) Develop a May 1 runoff forecast methodology.

**Monitoring**

- 1) Are there icing problems with the newly recommended lower winter base flows both in Lee Vining and Rush creeks?
- 2) What are the flow losses (if any) in the Lee Vining Conduit under the new flow conditions?
- 3) What effect does the Lee Vining Conduit have on water temperature?
- 4) What are the flow losses between the 5-Siphons and Rush Creek during flow augmentation?
- 5) Are there temperature changes between the 5-Siphons and Rush Creek?
- 6) How are side channels in Rush Creek (Channels 3D, 4, 8) and Lee Vining Creek (A-3, A-4) performing at various flow levels particularly after SEF peaks?

It is understood that this one year temporary operation plan will not fully answer all these questions. However, it would provide LADWP with some useful information about operational issues associated with the recommended flow regimes.

Since the plan is intended immediately upon State Water Board approval and continue through October 31, 2011, and runoff years are defined as April to March, two different runoff year-types will have to be dealt with. As such, depending on the May 1 runoff forecast of 2011, flow release schedules will be switched from a current Normal year-type schedule which will end in March 31,

2011 to the forecasted year-type schedule. This operation plan recognizes that some modifications to the year type schedule may be needed to answer the above questions.

## RUSH CREEK

Rush Creek operation will follow the recommendations as presented in the Synthesis Report for all year-types including a flow adjustment of 10 percent or 10 cubic feet per second (cfs), whichever is greater (Note that this was acceptable to the Stream Scientists). If the forecasted runoff year-type becomes Wet-Normal or above, the high snowmelt peaks (spills) component will require assistance from Southern California Edison (SCE) to spill or release excess water from one or more of their reservoirs. LADWP will approach SCE to allow to spill or to release any available water to upper Rush Creek within a certain period to help Grant Lake spill and will also seek to participate in SCE's license meetings with the USFS to coordinate planning.

The recommended high flows of 550 cfs (Wet-Normal), 650 cfs (Wet), and 750 (Extreme-Wet) down lower Rush Creek will be challenging to be fully achieved. This is because SCE has United States Forest Service (USFS) and Federal Energy Regulatory Commission (FERC) licenses, which necessitates that SCE accumulate and hold storage for recreation purposes during the summer months, and then drain the storage during the winter months before the inflows start arriving with the next spring runoff.

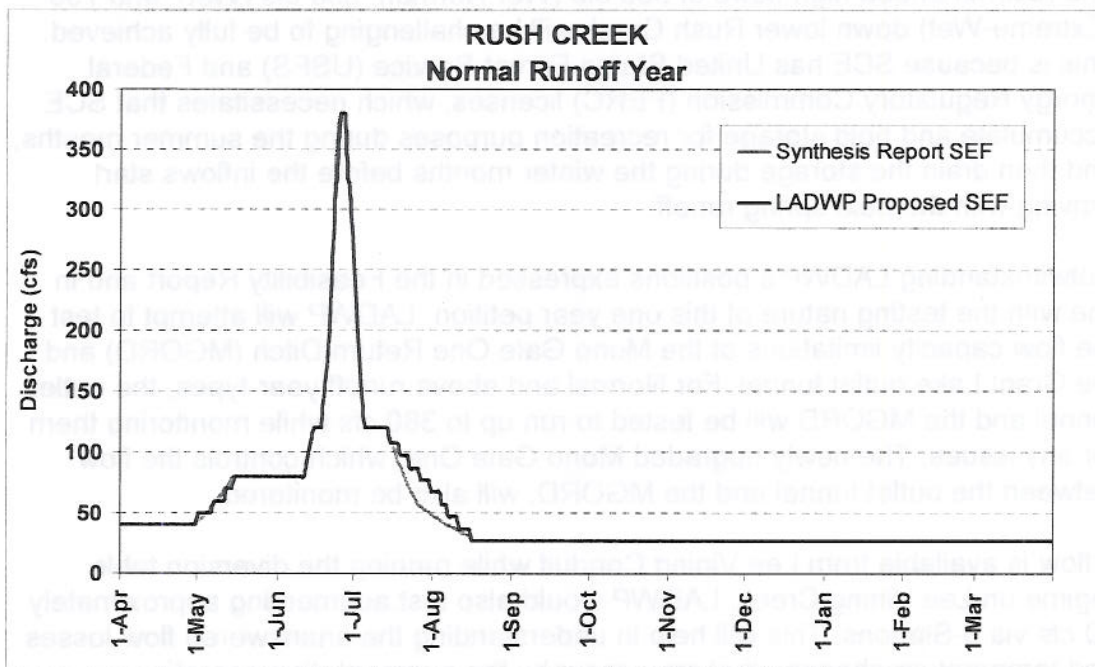
Notwithstanding LADWP's positions expressed in the Feasibility Report and in line with the testing nature of this one year petition, LADWP will attempt to test the flow capacity limitations of the Mono Gate One Return Ditch (MGORD) and the Grant Lake outlet tunnel. For Normal and above runoff year-types, the outlet tunnel and the MGORD will be tested to run up to 380 cfs while monitoring them for any issues. The newly upgraded Mono Gate One, which controls the flow between the outlet tunnel and the MGORD, will also be monitored.

If flow is available from Lee Vining Conduit while running the diversion table regime on Lee Vining Creek, LADWP would also test augmenting approximately 30 cfs via 5-Siphons. This will help in understanding the unanswered flow losses and temperature changes that may occur by the augmentation operation.

As an example, A Normal runoff year-type schedule and its associated hydrograph are below.

Rush Creek Hydrographs				
Runoff Year-type: <b>NORMAL</b>				
Start Date	End Date	Streamflow* (cfs)	Duration (days)	Ramping
April 1	April 30	40	30	
May 1	May 14	40 ▶ 80	14	10% or 10 cfs, whichever is greater
May 15	June 11	80	28	
June 12	June 15	80 ▶ 120	4	10% or 10 cfs, whichever is greater
June 15	June 18	120	4	
June 19	June 25	120 ▶ 380	7	20% or 10 cfs, whichever is greater
June 25	June 27	380	3	
June 28	July 5	380 ▶ 120	8	20% or 10 cfs, whichever is greater
July 5	July 14	120	10	
July 15	August 16	120 ▶ 27	33	10% or 10 cfs, whichever is greater
August 17	March 31	27	227	

\*The streamflows recommended and listed above are mid point of flow ranges that translate to a plus/minus stage height change of 2.5 percent (total of 5 percent) to allow for operational flexibility.



### Grant Storage Restrictions and Spill

The Synthesis Report recommendations call out for storage thresholds for Grant Lake. These are:

- 1) No peak flow releases and no export if Grant Lake storage falls below 11,500 acre-feet (AF),
- 2) Approximately 20,000 AF be maintained during July, August, and September for all runoff years,

- 3) In Wet-Normal, Wet, and Extreme-Wet runoff years, Grant Lake elevation be at spillway elevation (7,130 ft) for at least two weeks period to facilitate spill,
- 4) In drier runoff types, if Grant Lake storage falls below 25,000 AF by July 15, all available Lee Vining Creek diversions should be diverted into Rush Creek via the 5-Siphons to cool Rush Creek through September 15.

LADWP agrees with no peak flow releases if Grant Lake storage falls below 11,500 AF or is projected to fall below 11,500 AF (which is the existing requirement of Order 98-05), however, will not necessarily stop or delay the allowed 16,000 AF export. LADWP will delay export until peak operation on Rush Creek is complete before export is resumed.

The recommendation to cool Rush Creek by Lee Vining Creek water is planned for implementation in 2011 unless it impairs allowed annual export. LADWP will do its best to achieve the other two storage thresholds but all will depend on the available snowfall, the timing of the snowmelt, the inflow from Rush Creek and Lee Vining Conduit, precipitation (minus evaporation), and SCE's assistance in releasing stored runoff. It is worth mentioning also that the recommended diversion rates for Lee Vining Creek at flows higher than the current 54 cfs minimum will be in conflict with trying to fill up Grant Lake to spill and/or augment Rush Creek. This is because the diversion rate operation purpose is to reduce the diversion to Grant Lake and allow unregulated streamflow to pass through to lower Lee Vining Creek. Therefore, Lee Vining Conduit contribution to filling Grant Lake during the snowmelt season may be reduced.

### **LEE VINING CREEK**

Lee Vining Creek operation will be modified from the Order 98-05 rules to follow the Synthesis Report rules as described below. Accordingly the operation plan will be broken up into two separate periods: 1) Bypass period, and 2) Diversion period

#### **Bypass Period (November 1, 2010 – March 31, 2011)**

The bypass period will be operated exactly as recommended in the Synthesis Report (below table). This operation is similar to the existing operation where the Langemann gate is set to allow a constant flow to go down lower Lee Vining Creek and excess goes to the Conduit to end up in Grant Lake.

	Runoff Year-type						
	Dry	Dry-Normal I	Dry-Normal II	Normal	Wet-Normal	Wet	Extreme Wet
<b>Fall Baseflow (cfs)</b>							
October 1 – 15	16	16	16	20	28	28	30
October 16 – 31	16	16	16	18	24	24	28
November 1 – 15	16	16	16	18	22	22	24
November 16 – 30	16	16	16	18	20	20	20
<b>Winter Baseflow (cfs)</b>							
Dec. 1 – March 31	16	16	16	18	20	20	20

### Winter Flood Event

Winter flood events are rare but will not be ruled out. The last event occurred on Lee Vining Creek in January of 1997 where a flow above 500 cfs was recorded (flow increased from 51 cfs to 524 cfs in 3 days). These high flows transport tree trunks and boulders that could block the Lee Vining Conduit intake and/or the diversion facility at Lee Vining Creek. Extreme high flows could also damage the recording instruments and hence flow reading would not be obtained. Flow condition at the site will have to be safe before personnel will attempt to fix any problem.

For such an event, the Synthesis Report recommends the same threshold of 250 cfs (as Diversion Period of April to September) beyond which no diversion to occur. The report also recommends 10-20 percent hourly ramping to quickly go from winter baseflows to the sudden winter flood.

LADWP will make every effort to ramp to lower Lee Vining Creek flow at approximately 20 percent every few hours from the winter baseflow of 18 cfs (or the flow-through flow) to the highest and safest possible flow. LADWP will plan to pass through undiverted flows above 250 cfs and will probably have to adjust operation daily depending on incoming flow conditions.

### Diversion Period (April 1, 2011 – September 30, 2011)

For this period, LADWP operations will attempt to follow the Synthesis Report rules. However, precise compliance is not expected due to testing of operations and facility limitations. Operations will be conducted to maintain a minimum in-stream flow of 30 cfs in lower Lee Vining Creek or the actual instream flow, whichever is less.

The test goal in this period is to see how closely the current facility can be operated to the Synthesis Report rules. This will provide information that will help LADWP decide on modifications at the Lee Vining Creek diversion facility.

LADWP will follow its modified diversion rate table of 5 cfs increments as shown below. Every morning, around 9 AM, LADWP staff will check the flow at the flume at Lee Vining Creek 'Above Intake' facility, and depending on that flow, the Lee

Vining Conduit intake will be adjusted using stop-logs. The nearby Langemann gate in Lee Vining Creek will be positioned to maintain a set elevation so flows into the Conduit remain approximately as specified for the day per diversion table below.

With the current setup, the Langemann gate will be set in level control mode. This will allow the gate to maintain a constant upstream level, until a new set point is entered. Crew will need to adjust both this upstream setpoint, and add or remove stop logs as needed to achieve the desired flow down the Conduit. Due to the large pond upstream of the Intake structure, this adjustment could take a few hours to balance out each day. As the flow upstream changes throughout the day, the flow to both the Conduit and down Lee Vining Creek will change. We will not be able to maintain the exact flow down the conduit that is desired due to the existing infrastructure limitations. Additionally, increasing flow to the Conduit will be difficult at times due to the current setup. Crew hook into eye bolts on the stop logs under water. With potentially as much as 75 cfs flowing over the logs, this could prove difficult.

**Diversion Table  
Dry and Dry-Normal I**

Lee Vining Creek 'Above Intake' Flow (cfs)	Conduit Diversion (cfs)
<30	0
30 ≤ Q < 35	5
35 ≤ Q < 40	10
40 ≤ Q < 45	15
45 ≤ Q < 50	20
50 ≤ Q < 60	25
60 ≤ Q < 70	30
70 ≤ Q < 90	35
90 ≤ Q < 110	40
110 ≤ Q < 130	45
130 ≤ Q < 150	50
150 ≤ Q < 160	55
160 ≤ Q < 170	60
170 ≤ Q < 200	65
200 ≤ Q < 240	70
240 ≤ Q < 250	75
250 ≤ Q	0

**Diversion Table  
Dry-Normal II -- Extreme-Wet**

Lee Vining Creek 'Above Intake' Flow (cfs)	Conduit Diversion (cfs)
30 ≤ Q < 35	0
35 ≤ Q < 40	5
40 ≤ Q < 50	10
50 ≤ Q < 80	15
80 ≤ Q < 100	20
100 ≤ Q < 130	25
130 ≤ Q < 170	30
170 ≤ Q < 200	35
200 ≤ Q < 240	40
240 ≤ Q < 250	45
250 ≤ Q	0

This will be very challenging and will not be accurate because the current Langemann gate does not have the capability to be set with a diversion rate and excess water flow to lower Lee Vining Creek. Existing facility, allows a specified flow to pass down Lee Vining Creek and excess to go to the Conduit. A second Langemann gate or similar may need to be installed at the entrance of the Lee Vining Conduit to do an accurate automated diversion rate operation, but that will have to wait until the recommendations are adopted by SWRCB.

Flow may fluctuate during the day but diversion adjustment will only be done once a day in the morning. To make sure lower Lee Vining Creek has minimum flow when undesirable flow fluctuating occurs, LADWP will set the existing Langemann gate to allow a minimum of 30 cfs flow in lower Lee Vining Creek. If flow at 'Above Intake' is less than 30 cfs, then the entire volume will remain in the Creek without any diversion (i.e. flow-through).

Similarly, such sharp flow changes are possible during the transition from bypass operation to diversion rates operation and vice-a-versa. During such transitions, LADWP will follow the recommended 20 percent change per day for ramping to lower Lee Vining Creek to minimize undesirable drastic flow changes. This means that depending on the flow at transition time, as well as the forecasted year-type, actual start dates for bypass regime in October or diversion rate regime in April will vary, highlighting the need for flexibility in the timing of operational requirements.

## PARKER AND WALKER CREEKS

The Synthesis Report recommends "curtailment" of diversion from Parker and Walker creeks. Order 98-05 allows flow diversion in Dry year-types (which so far LADWP has not done by choice). For this one year temporary plan, Order 98-05 rules will continue to be followed. If diversions are made from Walker and Parker, advance discussion will be held with the Stream Scientists and parties on necessary associated actions in order to meet flow and temperature targets in the Rush Creek bottomlands.

Flow-through conditions for all runoff year-types, except in Dry year-types, will be followed. During a Dry year-type the following baseflows (as Order 98-05 requires) will be released down the creeks and the excess water will be diverted to Grant Lake:

	Oct. 1, 2010 to March 31, 2011	Apr. 1, 2011 to Sept. 30, 2011
<b>Parker</b>	6 cfs	9 cfs
<b>Walker</b>	4.5 cfs	6 cfs

Because there will be an emphasis to fill up Grant Lake to spill and the fact that there are specific timing window for the Rush Creek hydrographs, LADWP believes that it will difficult to coordinate Rush Creek flow releases with Parker and Walker creeks' peaks. The coordination purpose was to augment flood peak magnitude below the 'Narrows' (on Rush Creek) and improve flood peak timing relative to annual woody riparian seed release.



The Synthesis Report states that the 'Snowmelt Benches' are fixed dates and 'Snowmelt Flood' are dynamic dates within 'Snowmelt Benches' dates. LADWP will attempt to begin the 'Snowmelt Flood' releases to coincide with Parker and Walker peaks. This means if Parker and Walker creeks appear to be peaking early, LADWP will start ramping Rush Creek early (close to the start of 'Snowmelt Bench') and if they are peaking late, ramping of Rush Creek will be delayed. In Normal year-type, this window of delay flexibility is only 4 days and in Extreme-Wet years, its 17 days. The challenge will vary from year-type to year-type as well as varying hydrology within the similar year-types.

## **EXPORT**

Annual export out of Grant Lake will be unchanged at 16,000 AF for every runoff year-type when Mono Lake is between 6380 and 6391 feet above sea level, as is expected in 2011. However, depending on the runoff year-type, storage status of Grant Lake and the possibility of spilling, and maintenance activities, export schedule may be adjusted or delayed.

## **RUNOFF FORECAST**

LADWP will utilize May runoff forecast for RY2011. LADWP will develop a preliminary forecasting protocol and work with interested parties to review and finalize it in time for a May 1, 2011 forecast. The protocol will be tested in May 2011.

## **REPORTING**

LADWP will provide verbal and/or written updates to the State Water Board and interested parties on the status of the items in this one year temporary operating plan via already planned meetings in 2011 or, if necessary, conference calls and other methods. Changes to exports and flow changes due to operational tests will be reported to interested parties by email. For test items in this operating plan, interested parties will be included in planning discussions. As always, LADWP will formally notify the State Water Board of any license violations, should they occur.

## **MONITORING**

This temporary change will have no unreasonable effect upon fish, wildlife and other instream beneficial uses. For the purpose of this one year temporary operating plan, LADWP will continue to follow the monitoring requirements and agreements currently in place under D1631 and Order 98-05.

## **Grant Lake Reservoir**

### **1. Grant Lake Reservoir elevation and storage volume**

Grant Lake Reservoir elevation and storage will be continuously monitored through out Runoff Year (RY) 2011, and the elevation data will be posted on the LADWP website.

### **2. Grant Lake Reservoir water temperature**

Water temperature and dissolved oxygen concentrations are already being measured and will continue to be measured at one-meter depth intervals at the deepest part of the reservoir and adjacent to the MGORD's intake pipe at Grant Lake. Depth profiles samples will be collected around 14th day of each month from May until the Lake surface freezes and once during late winter when surface ice melts.

## **Mono Basin Tributaries**

### **1. Water Temperature**

Water temperature loggers (and duplicate backup loggers, Onset ProV2) are currently deployed at fifteen locations along Rush, Parker, Walker and Lee Vining creeks, and the Lee Vining Conduit at the head of the 5-Siphons Bypass and at the confluence of the 5-Siphons Bypass with Rush Creek. Water temperatures will continue to be recorded at one-hour intervals in RY 2011. Water temperature data will be reported annually in tabular and graphic formats in 2011 Mono Basin Compliance Report. Data will also be shared via the facilitated process planned for 2011

### **2. Groundwater Monitoring**

There are two piezometers (piezometers 8C-2 and 8C-8) equipped with data loggers in Rush Creek, and 16 piezometers in Rush and Lee Vining creeks monitored seasonally by Mono Lake Committee (MLC). Piezometers 8C-2 and 8C-8 will be continuously monitored with data loggers recording at hourly intervals through out RY 2011 in Rush Creek 8 Channel section (piezometers 8C-2 and 8C-8). Additionally, LADWP will add 6 new data loggers into piezometers on both Rush and Lee Vining Creeks. Groundwater data will be reported annually in tabular and graphic in the 2011 Mono Basin Compliance Report.

### **3. Stream Flow Gauging**

LADWP will continue to operate all existing gauging stations. LADWP will continue to report as usual report daily average flows on a real-time basis on the LADWP website for the following:

- 1) Rush Creek Dam site (Station 5013);
- 2) MGORD (Station 5007);
- 3) Lee Vining Creek above Intake (Station 5008);

- 4) Lee Vining Creek below Intake (Station 5009);
- 5) Parker Creek above Conduit (Station 5017);
- 6) Parker Creek below Conduit (Station 5003);
- 7) Walker Creek above Conduit (Station 5016);
- 8) Walker Creek below Conduit (Station 5002);
- 9) Grant Spill (Station 5078).

4. Synoptic Stream Discharge Measurements

LADWP hydrographers will conduct monthly synoptic stream discharge measurements on Rush, Parker, and Walker creeks to determine the extent of groundwater recharge or discharge downstream of the Narrows during different seasons and stream flow periods in RY 2011. The measurements will be taken during spring baseflow, spring bench, snowmelt bench, medium recession, slow recession, summer to winter baseflow periods. However, measurements will only be conducted as long as conditions are safe to do so.

There is a new flume at the confluence of Grant spillway channel and Rush Creek. If spill occurs, flow losses between spillway and Rush Creek will be assessed and measured to extent possible.

5. Winter Baseflow

The ice monitoring for the winter of 2010-2011 will continue to be conducted using SEF's baseflows for Rush and Lee Vining Creeks in two of the five sections (Sections D and F) established during the winter of 2009-2010, and a new section will be set up on Rush Creek upstream of the Parker Creek confluence. On Lee Vining Creek, the monitoring will be conducted along pool and riffle transects in Sections D and F. The same methodology from last season will be used on both Lee Vining and Rush creeks (see 2010 Compliance Report, Section 3, Fisheries Monitoring Report, Appendix C for more detail).

6. Sediment Bypass Operation

Walker and Parker Creek forebays will be resurveyed in the fall of 2010 to determine the effectiveness of the 2010 sediment bypass operations. The sediment bypass operations will be conducted in RY 2011 as described in the Sediment Bypass Plan.

7. Side Channel Maintenance

Side-channel maintenance on the 4Bii and 8 channels will continue as recommended by the Stream Scientists and approved by the SWRCB on October 6, 2008. LADWP will monitor monthly Channels 3D, 4, 8 (on Rush Creek) and A-3 and A-4 (on Lee Vining Creek) without committing to long term monitoring.

8. **Trout Population Metrics**  
The existing annual trout population sampling will be conducted in September 2011.
9. **Primary Productivity Study**  
The second year of the primary productivity study will be conducted in September of 2011. The methods and results of the 2010 sampling will be presented in the annual compliance report due on April 15, 2011.
10. **Pool Surveys**  
During the summer of 2011, the pool surveys will be repeated on Rush Creek from the shepherd's cabin to Mono Lake and on the 10,000 feet of Lee Vining Creek that was previously surveyed.