APPENDIX A TO SULLIVAN CREEK SETTLEMENT AGREEMENT

PM&E MEASURES FOR LICENSE SURRENDER AND SPECIAL USE AUTHORIZATION

APPENDIX A
Protection, Mitigation and Enhancement Measures
Settlement Agreement for Sullivan Creek Project
Surrender of FERC License No. 2225 and
Issuance of USDA Forest Service Special Use Authorization

Protection, Mitigation and Enhancement Measures

A. Sullivan Dam Operation and Maintenance and Sullivan Lake Reservoir Operation

1. Sullivan Dam Operation and Maintenance PUD shall be responsible for all operation and maintenance (O&M) of Sullivan Lake Dam, including applicable measures consistent with the Washington State Department of Ecology Dam Safety Program, the USFS Dam Management Program and/or FERC License Surrender Order. This will include:

   1.1. Developing and maintaining an O&M manual.

   1.2. Conducting regularly scheduled piezometer inspections and recordings.

   1.3. Conducting annual surficial inspections and maintaining records of findings and of actions taken to correct problem conditions.

   1.4. Submitting to the Department of Ecology and the USFS a copy of the annual inspection checklist and inspection findings. The annual report will be available to the Resource Committee upon request (either written or verbal).

   1.5. Developing, maintaining, and implementing an Emergency Action Plan (EAP) as directed by the appropriate agencies.

   1.6. Cooperating and participating in scheduled and/or unscheduled inspections by the Department of Ecology and USFS.

   1.7. PUD shall be responsible for application inspection fees charged by the Department of Ecology. Upon request (either written or verbal), PUD shall provide Resource Committee representatives access to Sullivan Dam and to pertinent Project records for the purpose of inspecting the facilities to determine compliance with these conditions; provided that Resource Committee representatives show proper credentials, give responsible notice of such inspections, and follow PUD's standard safety procedures when engaged in such inspections.

2. Cold Water Release from Sullivan Lake SCL and the PUD shall jointly undertake the funding of design, permitting, construction, monitoring, operation, and maintenance of a cold water release facility consisting of a 48 inch diameter pipe, with fish screens at the inlet and routed through one of the three existing low-level outlet gates at Sullivan Dam as provided in this section and the Cold Water Release Facility Plan in Appendix F to the Settlement Agreement (EES, February, 2010).

2.1. The PUD shall complete construction of the cold water release facility within three years of FERC's issuance of the License Surrender Order.

2.2. SCL shall be responsible for funding fifty percent (50%) of the actual design, permitting, and construction costs, and 50% of the projected monitoring, operation, and maintenance costs of the cold water release facility. PUD's share of the total costs shall be fifty percent (50%) of the actual costs of design, permitting and construction, and the remainder of the costs of monitoring, operation and maintenance over the term of the SUA. As provided in the Cold Water Release Memorandum of Agreement between SCL and the PUD, SCL shall pay its share of design costs and projected monitoring and O&M costs after final design, and SCL shall pay its share of permitting and construction costs after construction.

3. Temperature Gauges

3.1. Below Confluence Water Temperature Gauge To achieve the criteria for mixed water temperature after the confluence of Sullivan Creek and Outlet Creek described in section A.4. below, a continuous water temperature monitoring station (gauge) shall be installed and maintained by PUD on Sullivan Creek at least 300 feet downstream of the confluence with Outlet Creek.

3.2. Above Confluence Water Temperature Gauge A continuous water temperature monitoring station (gauge) shall be installed and maintained by PUD on Sullivan Creek upstream of its confluence with Outlet Creek.

4. Reservoir Level Operations and Requirements Upon completion of the cold water release facility, PUD shall operate Sullivan Lake Reservoir in the following manner each year:

4.1. Spring Operations

4.1.1. Each year PUD shall start refilling Sullivan Lake on or before April 1st and shall seek to achieve and maintain a full Sullivan Lake elevation of 2588.66 ft MSL (as measured at Sullivan Lake Dam) subject to hydrologic conditions, water availability and dam discharge flow requirements defined in sections A.6, A.9 and A.11. Refilling rates shall also be adjusted as necessary to accommodate the Harvey Creek Bedload Mobilization activities, as described in section A.9 below.

4.2. Summer Operations

4.2.1. During the summer period, defined as June 1 through Labor Day each year, the target Sullivan Lake level will be 2588.66 ft (full pool). Although lake level modeling indicates that in dry years the lake may not be completely full by June 1 and in wet years water may be spilled, PUD shall use its best efforts to reach and maintain that level.

4.2.2. PUD shall comply with the required minimum dam discharge flows during the summer period as described in section A.6.

4.2.3. PUD shall manage the discharges from the cold water pipe and the Sullivan Lake Dam gates: (1) to meet state water temperature standards (WAC 173-201A-200); (2) with the goal of preventing the daily average "below confluence water temperature" from exceeding 14 degrees C; and (3) with the goal of preventing the daily average "below confluence water temperature" from deviating from the daily average Sullivan Creek "above confluence water temperature" by more than 1 degree C, when daily average "above confluence water temperature" is less than 14 degrees C.

4.3. Fall Operations

4.3.1. Drawdown shall be initiated the day following Labor Day each fall and shall be conducted in the manner described below.

4.3.1.1. PUD shall manage the discharges from the cold water pipe and the Sullivan Lake Dam gates: (1) to meet state water temperature standards (WAC 173-201A-200); (2) with the goal of preventing the daily average "below confluence water temperature" from exceeding 14 degrees C; and (3) with the goal of preventing the daily average "below confluence water temperature" from deviating from the daily average Sullivan Creek "above confluence water temperature" by more than 1 degree C, when daily average "above confluence water temperature" is less than 14 degrees C.

4.3.1.1.1. PUD will strive to maintain the operation described in the goal (3) immediately above until fall turnover. Once fall turnover occurs in Sullivan Lake (mid-October), Sullivan Creek temperatures may fall below Outlet Creek temperatures by several degrees, and it may not be possible to maintain a 1 degree C water temperature difference.

4.3.1.2. Subject to the temperature constraints above, PUD shall strive to maximize discharge flows through the cold water pipe and minimize the use of the low-level gates at the dam during fall drawdown. When low level gates are used, releases shall be made from two gates simultaneously.

4.3.1.3. Discharge flows shall be ramped up no more than 80 cfs per day as measured at the Outlet Creek gauge.

4.3.1.4. PUD shall strive to reach a drawdown target lake water surface elevation of 2577 ft by no later than November 15. After November 15 PUD shall strive to release all water through the cold water pipe.

4.3.1.5. Discharge flows shall be forecasted and posted online one week in advance to support recreational use. To the extent consistent with other constraints in this subsection, drawdown will be managed to provide discharge flows between 180 and 220 cfs on at least 3 weekends in September or October to support whitewater paddling.

4.3.1.6. Down ramping rate when changing release flows shall not exceed 10 cfs per hour as measured at the Outlet Creek gauge.

4.3.1.7. To prevent thermal shock of the downstream system, flows shall be up ramped or down ramped to prevent waters below the confluence from changing daily average temperature more than 2 degrees C per day.

4.3.1.8. Drawdown shall be managed with the goal of reaching a lake water surface elevation of 2570.0 ft by December 31.

5. Interim Operations Following FERC's issuance of the Sullivan Creek License Surrender Order, and prior to the construction of the Cold Water Release Facility, PUD shall operate as follows:

5.1. Spring Operations

5.1.1. Each year PUD shall start refilling Sullivan Lake on or before April 1st and shall seek to achieve and maintain a full Sullivan Lake elevation of 2588.66 ft MSL (as measured at Sullivan Lake Dam) subject to hydrologic conditions, water availability and dam discharge flow requirements defined in sections A.6, A.9, A.11. Refilling rates shall also be adjusted as necessary to accommodate the Harvey Creek Bedload Mobilization activities, as described in section A.6, below.

5.2. Summer Operations

5.2.1. During the summer period, defined as June 1 through Labor Day each year, the target Sullivan Lake level will be 2588.66 ft (full pool). Although lake level modeling indicates that in dry years the lake may not be completely full by June 1 and in wet years water may be spilled, PUD shall use its best efforts to reach and maintain that level.

5.2.2. PUD shall comply with the required minimum dam discharge flows during the summer period as described in section A.6.

5.3. Fall Operations

5.3.1. PUD shall initiate drawdown the day following Labor Day each fall and shall operate in a manner that reaches the maximum flow target as quickly as possible, given the following constraints:

5.3.1.1. Discharge flows shall be managed to meet state water temperature standards (WAC 173-201A-200) and will under no circumstances cause the combined waters of Outlet Creek and Sullivan Creek as measured at "below confluence water temperature gauge" to exceed 16 degrees C.

5.3.1.2. PUD shall strive to reach a drawdown target lake water surface elevation of 2577 ft by no later than November 15.

5.3.1.3. Discharge flows will ramp up no more than 80 cfs per day but not to exceed a change of more than 2 degrees C in average daily temperature per day as measured at the below confluence water temperature gauge. This criterion shall be subject to monitoring and adaptive management, as approved by the Resource Committee.

5.3.1.4. Discharge maximum flow target shall be 200 cfs, except during periods of higher than average precipitation the maximum flow target shall be 225 cfs.

5.3.1.5. Down ramping rate shall not exceed 10 cfs per hour.

5.3.1.6. Drawdown shall be managed with the goal of reaching a Lake water surface elevation of 2570.0 ft by December 31.

6. <u>Sullivan Lake Dam Minimum Discharge Flows</u> Each year PUD shall maintain minimum discharge flows in Outlet Creek, measured by the Outlet Creek USGS gauging station, as follows:

6.1. June 1 through June 30, minimum discharge flows shall be 30 cfs.

6.2. July 1 through the end of fall drawdown (when elevation reaches 2570.0 ft), minimum discharge flows shall be 20 cfs.

6.3. From the date Sullivan Lake reaches elevation 2570.0 ft until the beginning of spring filling (per section A.4), discharge flows shall equal inflows from Harvey Creek.

6.4. From April 1 through May 31, minimum discharge flows shall be 10 cfs or inflows, whichever is less.

7. <u>Limitations Regarding Sullivan Lake Surface Elevations and Discharge Flow Requirements</u>

7.1. PUD shall comply with the Sullivan Lake water surface elevations and discharge flow requirements at all times; subject to short term deviations due to equipment failures, maintenance activities, electric and mechanical device limitations, safety inspections,

testing, natural disasters (floods), and Harvey Creek Bedload Mobilization activities described in section A.9, below.

7.2. PUD shall use the existing USGS stream gauge on Outlet Creek and install a new Sullivan Lake level recording gauge at Sullivan Dam to record data to demonstrate compliance with discharge flow requirements. If USGS ceases to maintain the Outlet Creek stream gauge, PUD will thereafter maintain the gauge.

8. Protecting Sport Fisheries

8.1. To assist in protecting sport fisheries in Sullivan Lake, PUD shall avoid fish entrainment at the Sullivan Lake Dam by screening the cold water intake pipe and managing lake discharge flows to minimize the use of the low level outlet gates in the dam. The screens shall meet NOAA design criteria of 0.2 feet per second (fps) approach velocity. These steps shall satisfy the WDFW requirements for a fish exclusionary device. PUD shall not be required to screen the dam low-level outlet gates.

8.2. To mitigate for fish entrainment that occurs due to spill over the dam or use of the unscreened low-level outlet gates, and for loss of productivity that occurs due to dam operations, PUD shall provide to WDFW pursuant to the MOA, included as Attachment 3, within one year of the issuance of the License Surrender Order, a one time initial payment of $200,000 (adjusted for inflation from 2010 as agreed upon between WDFW and PUD), and thereafter $20,000 annually for 17 years. Funds shall be used for fisheries management for Sullivan Lake and associated tributaries.

9. Harvey Creek Bedload Mobilization PUD shall manage Sullivan Lake surface elevations to facilitate the mobilization of Harvey Creek bedload consistent with the provisions of this Appendix and subject to future study and/or decision-making through consultation and approval of the Resource Committee.

These measures shall be referred to as the Harvey Creek Bedload Mobilization Project ("Harvey Creek Project"). The various lake operating scenarios to implement the Harvey Creek Project and the explanation of the basis for these measures are as described in the report entitled: "Sullivan Lake – Decisions About Filling and Draining Rates- An Interactive Approach" by EES Consulting, dated November 2009.

The Harvey Creek Project shall be implemented as summarized in the Decision Tree matrix (Exhibit 1) as follows:

9.1. PUD, in consultation with the Resource Committee, shall begin to examine available regional flow projections, snow pack data, and run-off forecasts by April 1 each year to determine if the spring run-off can reasonably be expected to be at least 120% of the long term average.

9.2. If the Resource Committee agrees, by April 20 each year, based on the forecasts above, that the forecasts predict it will be a 120% or greater spring run-off year, the decision

will be made to hold Sullivan Lake level at no more than elevation 2575.0 ft until May 20 of that year, and the operating provisions described below will be implemented.

9.3. Flows in Harvey Creek will be monitored. If before May 20, Harvey Creek reaches a flow of 250 cfs or more, when the flow begins to recede from its peak, the lake filling can resume at its normal rate.

9.4. On May 20, regardless of Harvey Creek flows, lake filling will resume at its normal rate.

9.5. After each year that the "lake level hold-down" is attempted as part of the Harvey Creek Project, the Resource Committee will meet after July 1 and examine the effectiveness of the lake level hold-down, whether or not the forecasts were correct, whether or not a high flow event actually occurred on Harvey Creek, and whether or not the Harvey Creek flow was adequate to move sediments and bedload, achieving the goal of reducing sediment buildup at the Harvey Creek stream entrance to the lake. After four lake level hold-downs, the Resource Committee will meet to evaluate whether or not further operating changes are warranted or whether the Harvey Creek Project should be discontinued.

9.6. PUD shall install a new stream gauge on Harvey Creek to USGS standards and shall operate and maintain this gauge to collect flow data required to implement the Harvey Creek Project.

10. <u>Recreation Mitigation Measures</u>

10.1. PUD shall, in consultation with Sullivan Lake dock and launch facility owners, evaluate the functionality of existing facilities under the operational regime of section A.11.

10.2. PUD shall, prior to beginning of operational changes under section A.11, mitigate all functional deficiencies for facilities that were in existence at the end of 2009.

10.3. Improvements to any USFS facilities must meet USFS standards and be approved by the USFS.

10.4. The PUD shall make all reasonable efforts to facilitate public recreational access to lower Sullivan Creek in the vicinity of Highway 31 for the life of the SUA. Efforts may include:

i) Negotiating land, easements, or binding agreements that provide access.
ii) Utilizing existing PUD property.
iii) Collaborating with WDOT during bridge reconstruction to assure access is provided.

10.5. The PUD shall construct and/or maintain simple parking facilities for at least two cars if property is available per subsection 10.4.i) or 10.4.ii) above, unless other parties adopt this responsibility by written agreement with the PUD.

10.6. Funding for subsection 10.4 and 10.5 above shall come from proceeds under the Water Supply Program, described in section A.11, subject to selection of the project for funding by the Resource Committee, in consultation with American Whitewater. Absent such funding, the PUD will also investigate the availability of additional sources of funding.

11. Water Supply Program PUD may sell or lease up to 5,000 acre feet (AF) of the useable storage in Sullivan Lake annually for use outside the Sullivan Creek drainage[1] between June 1 and August 31. The total of up to 5,000 AF includes water released under the new minimum discharge flow regime (described in section A.6 above) that is in excess of the old minimum flow of 10 cfs in Outlet Creek. PUD shall give priority consideration to the Columbia River Basin Water Supply Management Program.

For the purposes of this water supply program, the PUD shall release water at a rate described in Table 1, not to exceed 2.0 times the minimum discharge flow requirement of section A.6. Water shall be released at as steady a rate as possible, as measured by the day-to-day change in daily average cfs.

The higher discharge flows listed in Table 1 will occur in wet and average water years. In dry water years, the lower flows shown in Table 1 shall be released. Whether or not a dry year is occurring will be decided by May 20 each year by the Resource Committee utilizing adaptive management and the decision tree shown in Exhibit 2.

Table 1 shows the range of water supply discharge flows, which includes the minimum discharge flows (as described in section A.6).

Table 1. Water Supply Discharge Flows

Period*	Discharge Flow (cfs)
June Week 1	50-60
June Week 2	50-60
June Week 3	50-60
June Week 4	50-60
July Week 1	40-45
July Week 2	35-40
July Week 3	30-35
July Week 4	30-35

[1] In order to realize the environmental, habitat, and conservation benefits of water released under section A.11, *outside the Sullivan Drainage* means downstream (in the Pend Oreille River / Columbia River system) of the calculated range of thermal mixing of Sullivan Creek water into the Pend Oreille River or presumptively, river mile 26 on the Pend Oreille River.

Aug Week 1	30-35
Aug Week 2	30-35
Aug Week 3	30-35
Aug Week 4	30-35
Sept Week 1	30-35

*Week 4 of each calendar month above maybe longer than seven days. Week 1 of each calendar month begins on the first day of that month.

PUD shall manage the discharges shown in Table 1 above: (1) to meet state water temperature standards (WAC 173-201A-200); (2) with the goal of preventing the daily average "below confluence water temperature" from exceeding 14 degrees C; and (3) with the goal of preventing the daily average "below confluence water temperature" from deviating from the daily average Sullivan Creek "above confluence water temperature" by more than 1 degree C, when daily average "above confluence water temperature" is less than 14 degrees C.

12. Revenue PUD shall make all revenue from any sale or lease of water from Sullivan Lake immediately available for operation and maintenance of Sullivan Lake Dam and mitigation measures required under the License Surrender Order, SUA and/or conditions required under the Sullivan Creek Settlement Agreement. Said funds will be placed in a separate internal account held and managed by PUD for the purposes as stated above. Priority of the revenue funds will be given to operations and maintenance and mitigation measures. Remaining funds, if any, may be considered for use on future projects that are approved after consultation with the Resource Committee.

B. Mill Pond Dam Decommissioning Plan

1. PUD shall implement the final Mill Pond Dam Removal and Restoration Design Plan (Final Design Plan) upon FERC approval.

   The Final Design Plan shall be completed and filed with FERC within 24 months of FERC's issuance of the License Surrender Order. The Final Design Plan will be approved by the USFS and Ecology prior to filing it with FERC. The Final Design Plan shall be a refinement of the Mill Pond Decommissioning Plan in Appendix E to the Settlement Agreement (included as part of the Sullivan Creek License Surrender Application) and contain final site specific designs and adaptive management provisions as described in the Mill Pond Decommissioning Plan.

2. PUD shall be responsible for undertaking appropriate measures to mitigate for impacts to heritage resources as a result of removal of Mill Pond Dam. The PUD shall be responsible for an archaeological survey and monitoring within the Area of Potential Effect prior to and during stream restoration activities. The PUD will consult with the Washington State Historic Preservation Office, the USFS, FERC, Kalispel Tribe, and other entities required by Section 106 requirements to develop mitigation measures to address adverse effects of the proposed Mill Pond Dam removal to National Register of Historic Places eligible resources. The agreed upon mitigation measures will be expressed in a Memorandum of Agreement (MOA)

to be signed by the PUD, the USFS, SCL, the Kalispel Tribe, the Washington State Historic Preservation Officer and the Advisory Council on Historic Preservation (if they choose). Implementation of the MOA will conclude the Project's National Historic Preservation Act Section 106 requirements.

Exhibit 1: Decision Tree for Spring Filling Rate Adjustments to Facilitate Harvey Creek Bedload Mobilization per A.9

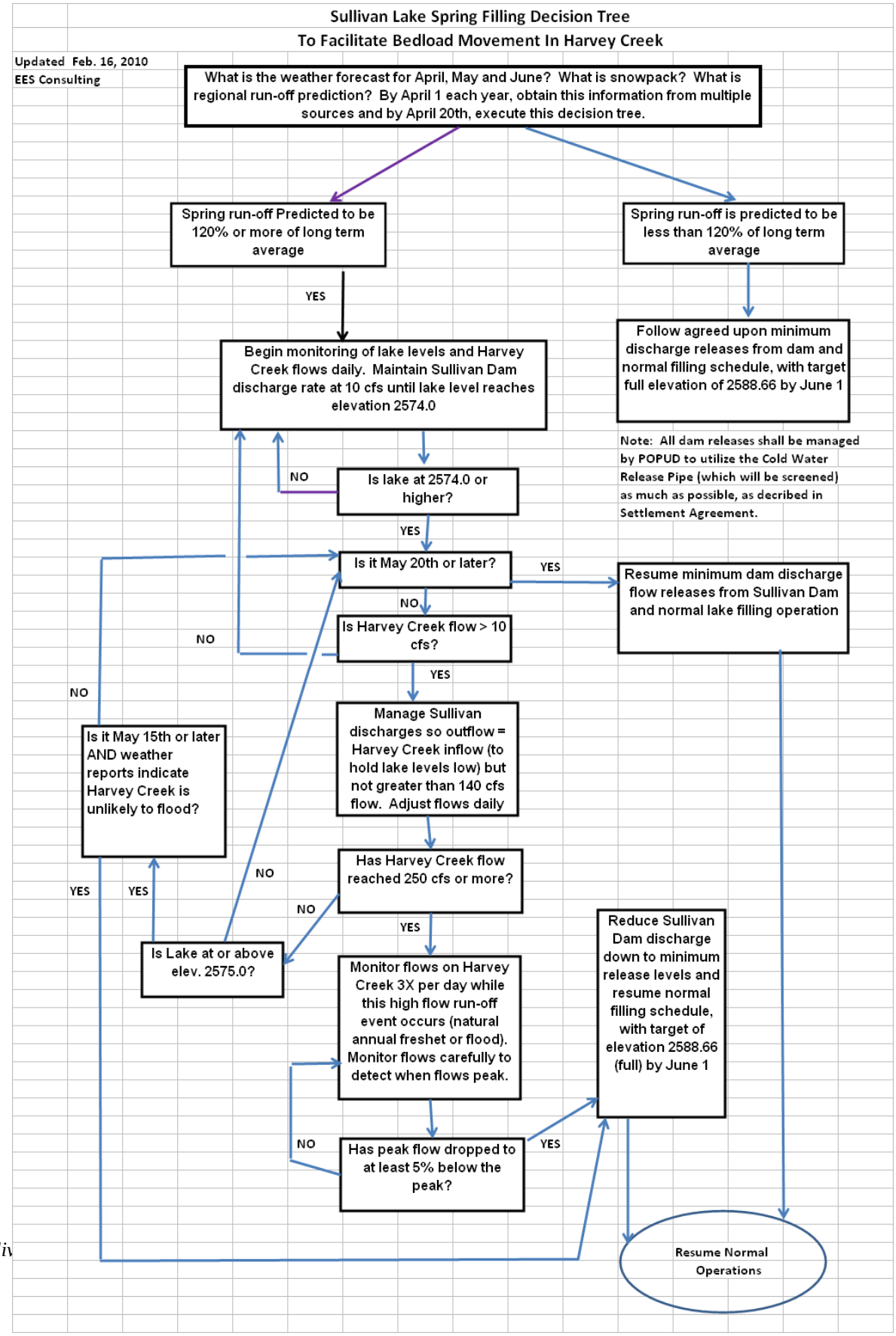
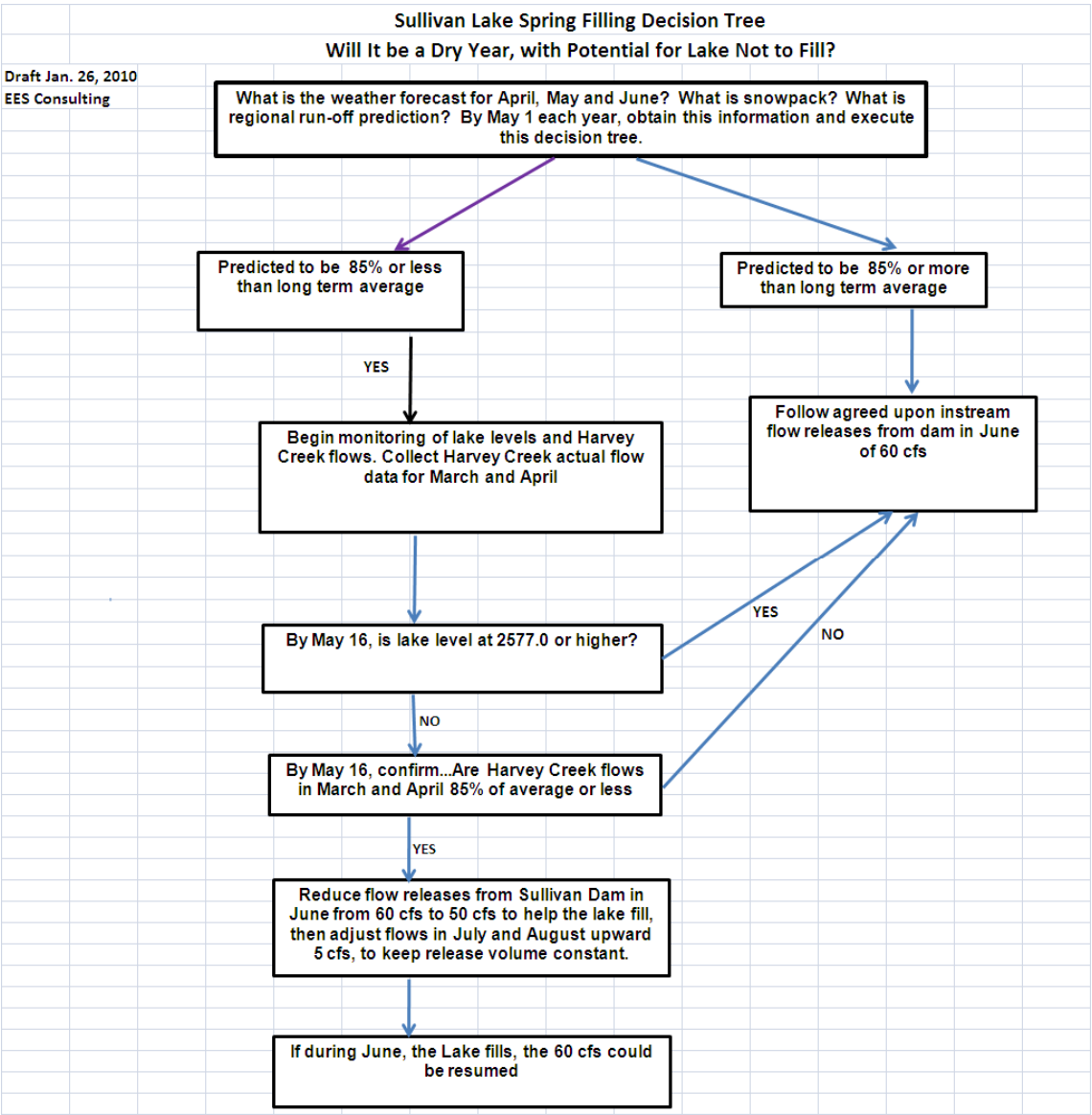
Exhibit 2: Decision Tree for Dry Year Flow Releases