

---

**TABLE OF CONTENTS**


---

	Page
4.0 Proposed Action .....	4-1
4.1 Project Components .....	4-3
4.1.1 Large Dams and Reservoirs .....	4-4
4.1.2 Medium Dams and Reservoirs .....	4-4
4.1.3 Small Dams and Diversion Pools .....	4-4
4.1.4 Water Conveyance Systems .....	4-5
4.1.5 Powerhouses.....	4-5
4.1.6 Gaging Stations .....	4-5
4.1.6.1 Stream Gages .....	4-5
4.1.6.2 Diversion Flow Gages .....	4-7
4.1.6.3 Reservoir Gages .....	4-8
4.1.6.4 Powerhouse Gages.....	4-8
4.1.6.5 Leakage Weirs .....	4-8
4.1.7 Communication Lines and Powerlines.....	4-8
4.1.8 Photovoltaic Poles and Powerlines.....	4-8
4.1.9 Microwave Reflectors and Radio Towers .....	4-9
4.1.10 Disposal Areas .....	4-9
4.1.11 Sediment Augmentation Areas .....	4-9
4.1.12 Ancillary Facilities .....	4-10
4.1.13 Fences.....	4-10
4.1.14 Roads and Trails .....	4-10
4.1.14.1 Roads.....	4-10
4.1.14.2 Trails.....	4-11
4.1.15 Recreation Facilities .....	4-11
4.2 Project Boundary Modifications .....	4-14
4.3 Project Operations.....	4-15
4.3.1 Operating Objectives .....	4-15
4.3.2 Regulatory Requirements and Operating Agreements/Contracts.....	4-17
4.3.3 Consumptive Water and Power Demands.....	4-17
4.3.4 Water Management.....	4-17
4.3.5 Project Generation.....	4-17
4.4 Routine Facility Inspections, Testing, and Maintenance .....	4-18
4.4.1 Tunnel and Powerhouse Inspections, Testing, and Maintenance ....	4-18
4.4.2 Spillway Gate and Tainter Gate Testing .....	4-18
4.4.3 Vegetation Management .....	4-18

4.4.4	Pest Management .....	4-19
4.4.5	Noxious Weed Management .....	4-19
4.4.6	Sediment Management .....	4-19
4.4.6.1	Small Diversions.....	4-19
4.4.6.2	Medium Reservoirs .....	4-20
4.4.7	Slope Stabilization (Falling Rock Control) .....	4-21
4.4.8	Debris Management .....	4-21
4.4.9	Facility Painting .....	4-21
4.4.10	Pole Replacement/Retrofit.....	4-21
4.4.11	Road and Trail Maintenance.....	4-22
4.4.12	Recreation Facility Maintenance.....	4-22
4.5	New Environmental Programs, Measures, and Facilities .....	4-22
4.5.1	Aquatic Resources .....	4-22
4.5.1.1	Instream Flow and Reservoir Minimum Pool Measure .....	4-22
4.5.1.2	Aquatic Management and Monitoring Plans.....	4-23
4.5.2	Cultural Resources .....	4-26
4.5.2.1	Historic Properties Management Plan .....	4-26
4.5.3	Land Management.....	4-27
4.5.3.1	Transportation System Management Plan .....	4-27
4.5.3.2	Fire Prevention and Suppression Plan .....	4-27
4.5.4	Recreation Resources .....	4-28
4.5.4.1	Recreation Plan.....	4-28
4.5.4.2	Visual Resource Management Plan .....	4-29
4.5.5	Terrestrial Resources .....	4-29
4.5.5.1	Vegetation and Integrated Pest Management Plan .....	4-29
4.5.5.2	Bald Eagle Management Plan .....	4-29
4.6	Construction Projects .....	4-30
4.6.1	Hell Hole Reservoir Seasonal Storage Increase Improvement.....	4-30
4.6.2	Small Diversion Modifications.....	4-30
4.6.3	Outlet Works Modifications.....	4-31
4.6.4	Gage Construction.....	4-31

**List of Tables**

Table 4-1.	Proposed Action – Project Facilities and Features.
Table 4-2.	Proposed Action – Project Recreation Facilities and Features.
Table 4-3.	Project Gaging Stations and Weirs.
Table 4-4.	Proposed Action – Description of Routine Facility Inspections, Testing, and Maintenance Activities at Project Facilities and Features.
Table 4-5.	Proposed Action – Description of Routine Maintenance at Project Roads and Trails.
Table 4-6.	Proposed Action – Description of Routine Maintenance at Project Recreation Facilities and Features.

**List of Figures**

Figure 4-1.	Benefits of the Proposed Action.
Figure 4-2.	Resource Stewardship Provided by the Proposed Action.

**List of Maps**

Map 4-1a.	Duncan Creek, French Meadows Area.
Map 4-1b.	Hell Hole Area.
Map 4-1c.	Long Canyon Area.
Map 4-1d.	Middle Fork Interbay Area.
Map 4-1e.	Ralston, Oxbow Area.
Map 4-2a.	Land Jurisdictions in the Immediate Vicinity of the Middle Fork Project. Duncan Creek, French Meadows Area.
Map 4-2b.	Land Jurisdictions in the Immediate Vicinity of the Middle Fork Project. Hell Hole Area.
Map 4-2c.	Land Jurisdictions in the Immediate Vicinity of the Middle Fork Project. Long Canyon Area.
Map 4-2d.	Land Jurisdictions in the Immediate Vicinity of the Middle Fork Project. Middle Fork Interbay Area.
Map 4-2e.	Land Jurisdictions in the Immediate Vicinity of the Middle Fork Project. Ralston, Oxbow Area.
Map 4-3.	FERC Project Boundary Modifications (includes Maps 4-3a–o).

**List of Attachments**

Attachment 4-1. Middle Fork Project Power Purchase Contract.

Attachment 4-2. Joint Exercise of Powers Agreement for the Middle Fork Project Finance Authority.

Attachment 4-3. Resolution 08-16 of the Board of Directors of the Placer County Water Agency Establishing a Policy for the Distribution and Use of Net Power Sale Revenues from the Middle Fork American River Hydroelectric Project.

**List of Appendices**

Appendix A. Modified or New Facilities Construction Activities and Concept Designs.

## 4.0 PROPOSED ACTION

This section describes the Proposed Action analyzed in this Application for New License (License Application). The Proposed Action represents Placer County Water Agency's (PCWA) recommendations for continued operation and maintenance of the Middle Fork American River Project (MFP or Project), including new environmental programs, measures, and facilities. The Proposed Action considers input from state and federal resource agencies, Native American Tribes, non-governmental organizations, and members of the public acquired during extensive consultation activities completed for the relicensing of the MFP. However, the Proposed Action represents PCWA's recommendations for balancing developmental and non-developmental values associated with the MFP. The Proposed Action was developed by PCWA in collaboration with the MFP Finance Authority and Placer County. The key consideration in developing the Proposed Action was to ensure that future operation of the MFP maximizes the benefits to the people of Placer County. These benefits include power generation, consumptive water supply, system capability and reliability, public services, and resource stewardship (Figure 4-1). Environmental programs, measures, and facilities included in the Proposed Action were specifically developed to promote resource stewardship in the Middle Fork American River Watershed (Watershed). An overview of resource stewardship under the Proposed Action is provided in Figure 4-2.

PCWA is requesting renewal of its license to continue operation and maintenance of the MFP with a license term of 50 years (expiring on February 28, 2063). The new license term is based on the substantial costs associated with relicensing of the MFP; capital improvements; new environmental measures, programs, and facilities; and extensive monitoring and ongoing resource agency consultation to ensure continued resource protection over the term of the new license. The following describes the responsibility of PCWA and the County of Placer (County) to the people of Placer County, which guided the balancing of developmental and non-developmental values committed to in the Proposed Action.

PCWA was established by an Act of the California State Legislature in 1957 (Placer County Water Agency Act). The purpose of PCWA is to secure and develop water rights in Placer County to ensure an adequate water supply for the county's future economic development. PCWA is also charged with advocating for water resource issues throughout Placer County. PCWA is governed by a five-member elected Board of Directors that represents the entire geographic area of Placer County.

In 1961, Placer County voters, with over 95% approval, authorized a \$140 million revenue bond issue to fund the construction of the MFP. Today, the MFP serves as a multi-purpose water supply and hydro-generation project to benefit the people of Placer County. PCWA owns the MFP and operates it under a 50-year license from the Federal Energy Regulatory Commission (FERC or Commission) (FERC Project No. 2079) issued in February 1963. Prior to construction of the MFP, PCWA entered into a long-term (50-year) contract with Pacific Gas & Electric Company (PG&E) for the purchase of the power generated from the then proposed MFP (Attachment 4-1). The power purchase contract requires PG&E to provide funding for the operation and maintenance

of the MFP and for retirement of the revenue bonds sold to finance MFP construction, in return for all power produced. PCWA has both consumptive and power generation rights to the waters used by the MFP, issued by the State Water Resources Control Board (State Water Board) in 1963.

When PCWA was first formed, the Placer County Board of Supervisors served as the Agency Board of Directors. In 1974, the Act was amended to provide for an independently elected Board of Directors. The 1974 amendment also provided that PCWA and the County establish a business relationship for the purposes of approving future power sale contracts and the expenditure of power sale revenue. PCWA is the sole owner, operator, and Licensee for the MFP. In 2006, PCWA and the County formed the Middle Fork Project Finance Authority (Finance Authority) through a Joint Exercise of Powers Agreement for the purpose of efficiently administering the partnership functions of approving power sale contracts and budgeting the expenditure of power sale revenue. The structure of the PCWA/County partnership, as well as the manner in which net MFP proceeds are distributed to the PCWA and Agency, can be found in the Finance Authority originating documents (Attachment 4-2).

Beginning on May 1, 2013, PCWA and the County will begin to market energy under a new power sale agreement under the auspices of the Middle Fork Project Finance Authority Joint Powers Agreement. As shown in Exhibit E, Table 11-5, PCWA and the County anticipate that with the operating conditions included in the License Application, the MFP can produce an average of approximately \$17.6 million dollars of net annual benefit to the people of Placer County.

In June 2008, PCWA Board of Directors passed Resolution 08-16 establishing a policy for the distribution and use of net power sale revenues derived from the operation of the MFP (Attachment 4-3). The policy states that the PCWA intends to invest its portion of net MFP revenues into projects and programs that benefit the people of Placer County, consistent with its authorities under the Placer County Water Agency Act. The resolutions states that the type of projects that would be eligible for funding include: water supply, water supply reliability, water quality, ecosystem protection, recreation, public education, emergency financial aid, and energy system supply and reliability.

The County functions as a local government body to serve the needs of its residents. As geographical and political subdivisions of the state, the County serves a dual role, providing municipal services in the unincorporated areas and acting as administrative agents for state and federal government programs and services. The County provides a wide range of services to its residents, including public protection services, medical and health services, public assistance programs, sanitation services, the construction and maintenance of roads and infrastructure, environmental services, parks, libraries, and a variety of other general governmental services. Every resident of the County, directly or indirectly, benefits from these services. Most services performed by the County are provided for all residents, regardless of whether those residents live in cities or unincorporated areas. The County is governed by a five-member elected Board of Supervisors that represents the entire geographic area of Placer County. The County

anticipates that MFP revenues will be used in conjunction with other revenue sources to fulfill these responsibilities.

The people of Placer County expect PCWA and the County Government to be good stewards of the resources with which they are entrusted. This includes the infrastructure resources that have been constructed to serve water to residents of Placer County and the power generation resources of the MFP. The sale of MFP power will provide the financial resources that are needed to ensure the reliable future of facilities and help provide for the general welfare of the residents of Placer County. Stewardship also includes maintenance and enhancement of local environmental, cultural, and recreational resources, which benefit the people of Placer. This License Application represents PCWA's and the County's best effort to balance all of its stewardship responsibilities while returning the benefits of the MFP to the people of Placer County that made the original investment in its construction (Figure 4-1). To that end, PCWA and the County strongly believe that the rather sizable voluntary commitment of resources made to enhance the environmental, cultural, recreational, and other resources as specified in this License Application represents an appropriate use of revenue that would otherwise be distributed to the people of Placer County under the policies established by the PCWA Board of Directors and the Placer County Board of Supervisors (Figure 4-2).

#### **4.1 PROJECT COMPONENTS**

Using the No-Action Alternative described in Section 3.0 as a baseline, this section identifies changes that will occur to the MFP under the Proposed Action. These include:

- Addition, removal, and modification of Project components (Section 4.1);
- Revisions to the existing FERC Project boundary (Section 4.2);
- Changes in Project operations (Section 4.3);
- Modification of testing and routine Project maintenance activities (Section 4.4);
- New environmental programs, measures, and facilities designed to protect, maintain, or enhance environmental and cultural resources (Section 4.5); and
- Construction or modification of Project facilities (Section 4.6).

The following describes each of these changes to the MFP under the Proposed Action.

Project facilities and features and Project recreation facilities and features included under the Proposed Action are identified in Tables 4-1 and 4-2. Using Tables 3-2 and 3-3 from the No-Action Alternative as a baseline, Tables 4-1 and 4-2 have been updated to reflect changes that will occur under the Proposed Action (changes from the No-Action Alternative are shown in red). The location of Project facilities and features and Project recreation facilities and features included under the Proposed Action are

depicted on Maps 4-1a through 4-1e, and land jurisdictions in the immediate vicinity of the MFP are shown on Maps 4-2a through 4-2e.

Changes under the Proposed Action are described below, organized by facility type.

#### **4.1.1 Large Dams and Reservoirs**

- French Meadows Dam Outlet Works (modified)

French Meadows Dam Outlet Works will be modified as part of the French Meadows Outlet Works Modification to provide and monitor new minimum instream flows, pulse flows, and down ramp or spill flow requirements under the Proposed Action. In addition, two new gages will be installed to monitor compliance with instream flow requirements.

- Hell Hole Dam Outlet Works (modified)

Hell Hole Dam Outlet Works will be modified as part of the Hell Hole Dam Outlet Works Modification to provide and monitor new minimum instream flows, pulse flows, and down ramp or spill flow requirements under the Proposed Action. Hell Hole Dam will be modified as part of the Hell Hole Reservoir Seasonal Storage Increase Improvement by adding 6-foot-high crest gates on the existing Hell Hole Dam Spillway. These crest gates may be raised under certain conditions to increase Hell Hole Reservoir storage.

#### **4.1.2 Medium Dams and Reservoirs**

- Middle Fork Interbay Dam Outlet Works (modified)

Middle Fork Interbay Dam Outlet Works will be modified to meet new minimum instream flows.

- Ralston Afterbay Dam Outlet Works

A new gage will be installed at the Ralston Afterbay Dam Outlet Works to monitor minimum instream flows.

#### **4.1.3 Small Dams and Diversion Pools**

The following small diversions will be modified to increase natural sediment delivery and transport of bedload and fine material downstream: Duncan Creek, North Fork Long Canyon Creek, and South Fork Long Canyon Creek diversion dams. Activities at the small diversions include installation of self-cleaning wedge-wire screens at the dams, modification of the low-level outlets to release the required instream flows, and modification or installation of gages. The small diversion modifications will result in diversion pools that are slightly shallower and more riverine.

#### **4.1.4 Water Conveyance Systems**

There are no new or modified water conveyance systems under the Proposed Action.

#### **4.1.5 Powerhouses**

There are no new or modified powerhouses under the Proposed Action.

#### **4.1.6 Gaging Stations**

##### **4.1.6.1 Stream Gages**

The following gages will only be used to monitor instream flow requirements until new gages are installed (Table 4-3).

- Duncan Creek near French Meadows (interim)

The gage at Duncan Creek near French Meadows (USGS Gage No. 11427700) will continue to monitor minimum instream flows for compliance with the new license until the Duncan Creek Diversion Dam Modification is completed.

- Rubicon River below Hell Hole Dam (interim)

The gage at Rubicon River below Hell Hole Dam (USGS Gage No. 11428800) will monitor minimum instream flows for compliance with the existing license conditions until the Hell Hole Dam Outlet Works Modification is completed.

- North Fork Long Canyon Creek below Diversion Dam (interim)

The gage at North Fork Long Canyon Creek below Diversion Dam (USGS Gage No. 11433085) will monitor minimum instream flows for compliance with the existing license conditions until the North Fork Long Canyon Diversion Dam Modification is completed and the new gage at North Fork Long Canyon Creek below Diversion Dam is constructed.

- South Fork Long Canyon Creek below Diversion Dam (interim)

The gage at South Fork Long Canyon Creek below Diversion Dam (USGS Gage No. 11433065) will continue to monitor minimum instream flows for compliance with the existing license conditions until the South Fork Long Canyon Diversion Dam Modification is completed and the new gage at South Fork Long Canyon Creek below Diversion Dam is constructed.

- Middle Fork American River below Interbay Dam (interim)

The gage at Middle Fork American River below Interbay Dam (USGS Gage No. 11427770) will monitor minimum instream flows for compliance with the existing license conditions until the Middle Fork Interbay Dam Outlet Works Modification

is completed and the new gage at Middle Fork American River below Interbay Dam is constructed.

The following are new gages to be constructed as part of the Hell Hole Reservoir Seasonal Storage Increase Improvement or outlet works modifications under the Proposed Action.

- Middle Fork American River at French Meadows Dam (new)

The gages at Middle Fork American River at French Meadows Dam will be installed as part of the French Meadows Dam Outlet Works modification. Flow measurement equipment will monitor minimum instream flows, pulse flows, and down ramp of spill flows for compliance with the new license.

- Rubicon River at Hell Hole Dam Spillway (new)

The gage at Rubicon River at Hell Hole Dam Spillway will be installed as part of the Hell Hole Reservoir Seasonal Storage Increase Improvement to monitor pulse flows and down ramp of spill flows for compliance with the new license.

- Rubicon River at Hell Hole Dam (new)

The gages at Rubicon River at Hell Hole Dam will be installed as part of the Hell Hole Dam Outlet Works Modification. Flow measurement equipment will monitor minimum instream flows, pulse flows, and down ramp of spill flows for compliance with the new license.

- Middle Fork American River at Ralston Afterbay Dam (new)

The gage at Middle Fork American River at Ralston Afterbay Dam will be installed at the end of the existing outlet pipe during routine maintenance activities to monitor minimum instream flows for compliance with the new license.

The precise location of the following new gages has not been determined. Project-specific National Environmental Policy Act (NEPA) analysis will be conducted at a later date, and all necessary permits and approvals will be obtained prior to implementation of any construction activities.

- North Fork Long Canyon Creek below Diversion Dam (new)

The gage at North Fork Long Canyon Creek below Diversion Dam will be constructed downstream of the North Fork Long Canyon Diversion Dam to monitor minimum instream flows and pulse flows for compliance with the new license. The gage will also be used to collect real-time flow information for public dissemination.

- South Fork Long Canyon Creek below Diversion Dam (new)

The gage at South Fork Long Canyon Creek below Diversion Dam will be constructed downstream of the South Fork Long Canyon Diversion Dam to monitor minimum instream flows and pulse flows for compliance with the new license. The gage will also be used to collect real-time flow information for public dissemination.

- Middle Fork American River below Interbay Dam (new)

The gage at Middle Fork American River below Interbay Dam will be constructed downstream of Middle Fork Interbay Dam to monitor minimum instream flows and pulse flows for compliance with the new license. The gage will also be used to collect real-time flow information for public dissemination.

- North Fork American River above American River Pump Station (new)

The gage at North Fork American River above American River Pump Station will be constructed to monitor recreation flow releases on the North Fork American River, downstream of the Middle Fork American River confluence, and collect flow data for real-time flow dissemination to the public.

The remaining stream gages are existing gages that will be incorporated into the MFP.

- Rubicon River above Ralston Powerhouse (existing, added to MFP)

The gage at Rubicon River above Ralston Powerhouse is an existing gage that will be incorporated into the MFP. This gage will collect real-time flow data for public dissemination.

- Rubicon River above Ellicott Bridge (existing, added to MFP)

The gage at Rubicon River above Ellicott Bridge is an existing gage that will be incorporated into the MFP. This gage will collect real-time flow data for public dissemination.

#### **4.1.6.2 Diversion Flow Gages**

- Duncan Creek Diversion Tunnel (new)

The gage at Duncan Creek Diversion Tunnel will be constructed as part of the Duncan Creek Diversion Dam Modification to monitor minimum instream flows and pulse flows for compliance with the new license.

- North Fork Long Canyon Creek Diversion Tunnel (modified)

The gage at North Fork Long Canyon Creek Diversion Tunnel (USGS Gage No. 11433080) will be modified as part of the North Fork Long Canyon Diversion

Dam Modification to monitor minimum instream flows for compliance with the new license.

- South Fork Long Canyon Creek Diversion Tunnel (modified)

The gage at South Fork Long Canyon Creek Diversion Tunnel (USGS Gage No. 11433060) will be modified as part of the South Fork Long Canyon Diversion Dam Modification to monitor minimum instream flows for compliance with the new license.

#### **4.1.6.3 Reservoir Gages**

There are no new or modified reservoir gages under the Proposed Action.

#### **4.1.6.4 Powerhouse Gages**

- Oxbow Powerhouse Penstock (new)

The gage at Oxbow Powerhouse Penstock will be installed within the existing powerhouse penstock during routine maintenance activities to monitor operations of the Oxbow Powerhouse (ramping rate and maximum flows) for compliance with the new license.

#### **4.1.6.5 Leakage Weirs**

There are no new or modified leakage weirs under the Proposed Action.

#### **4.1.7 Communication Lines and Powerlines**

- Hell Hole Dam Spillway Crest Gates Control Building Powerline (new)

Hell Hole Dam Spillway Crest Gates Control Building Powerline will be constructed as part of the Hell Hole Reservoir Seasonal Storage Increase Improvement to provide power to the control building for operation of the spillway crest gates.

#### **4.1.8 Photovoltaic Poles and Powerlines**

The following pole-mounted photovoltaic arrays (also referred to as photovoltaic poles) and powerlines will be constructed to provide power to operate new gages. The precise location of the photovoltaic poles and powerlines has not yet been determined, with the exception of the pole and powerline at Duncan Creek. Therefore, Project-specific NEPA analysis will be conducted, and all required permits and approvals will be obtained, prior to installation of these poles and powerlines.

- Photovoltaic Pole and Powerline at Duncan Creek Gage at Diversion Tunnel (new)

- Photovoltaic Pole and Powerline at Middle Fork American River Gage below Interbay Dam (new)
- Photovoltaic Pole and Powerline at North Fork Long Canyon Creek Gage below Diversion Dam (new)
- Photovoltaic Pole and Powerline at South Fork Long Canyon Creek Gage below Diversion Dam (new)
- Photovoltaic Pole and Powerline at North Fork American River Gage above American River Pump Station (new)

The following photovoltaic poles and powerlines are existing and will be incorporated into the MFP.

- Photovoltaic Pole and Powerline at Rubicon River Gage above Ralston Powerhouse (existing, added to MFP)
- Photovoltaic Pole and Powerline at Rubicon River Gage above Ellicott Bridge (existing, added to MFP)

#### **4.1.9 Microwave Reflectors and Radio Towers**

There are no new or modified microwave reflectors or radio towers under the Proposed Action.

#### **4.1.10 Disposal Areas**

There are no new disposal areas under the Proposed Action. However, new disposal areas may be necessary during the term of the new license if the capacity of the existing disposal areas is exceeded. The actual location of any potential new disposal area has not yet been determined. Therefore, if it is determined that new disposal areas are necessary, Project-specific NEPA analysis will be conducted, and all required permits and approvals will be obtained prior to use of any new disposal areas.

#### **4.1.11 Sediment Augmentation Areas**

- Middle Fork Interbay Augmentation Areas (new)

Middle Fork Interbay Augmentation Areas (two locations) will be developed downstream of Middle Fork Interbay Dam to enhance natural sediment delivery and transport. Sediment of the suitable size, to benefit the aquatic ecosystem that is excavated from Middle Fork Interbay during sediment management activities will be placed at the augmentation areas.

- Junction Bar Augmentation Area (new)

Junction Bar Augmentation Area will be developed downstream of Indian Bar to enhance sediment delivery and transport. Sediment of the suitable size, to benefit the aquatic ecosystem that is excavated from Ralston Afterbay during sediment management activities will be placed at the augmentation area. A temporary construction bridge will be placed at the north end of Indian Bar and span the active channel and Willow Bar to provide access during each augmentation event.

The following augmentation area is existing and will be incorporated into the MFP.

- Indian Bar Augmentation Area (existing, added to MFP)

Indian Bar Augmentation Area is an existing augmentation area that will be incorporated into the MFP to enhance sediment delivery and transport under the Proposed Action. Sediment of the suitable size, to benefit the aquatic ecosystem that is excavated from Ralston Afterbay during sediment management activities will be placed at the augmentation area.

#### **4.1.12 Ancillary Facilities**

- Hell Hole Dam Spillway Crest Gates Control Building (new)

Hell Hole Dam Spillway Crest Gates Control Building will be constructed as part of the Hell Hole Reservoir Seasonal Storage Increase Improvement to house equipment to power the new spillway crest gates.

- Ralston Afterbay Sediment Removal Access Point (converted)

Ralston Afterbay Sediment Removal Access Point will be converted to the Ralston Afterbay Sediment Access Point Boat Launch to provide public boat launching access to the reservoir.

#### **4.1.13 Fences**

There are no new or modified Project fences under the Proposed Action.

#### **4.1.14 Roads and Trails**

##### **4.1.14.1 Roads**

- Hell Hole Dam Spillway Gates Road (new)

Hell Hole Dam Spillway Gates Road will be constructed as part of the Hell Hole Reservoir Seasonal Storage Increase Improvement to provide access to the new spillway gates.

#### 4.1.14.2 Trails

The following trails will be constructed to provide access to operate and maintain new MFP gages. The precise location of these new trails has not yet been determined. Therefore, Project-specific NEPA analysis will be conducted at a later date and all required permits and approvals will be obtained prior to implementation of any construction activities.

- North Fork Long Canyon Creek Gage below Diversion Dam Trail (new)

North Fork Long Canyon Creek Gage below Diversion Dam Trail is a new trail that will be constructed to provide access to the new North Fork Long Canyon Creek Gage below Diversion Dam.

- South Fork Long Canyon Creek Gage below Diversion Dam Trail (new)

South Fork Long Canyon Creek Gage below Diversion Dam Trail is a new trail that will be constructed to provide access to the new South Fork Long Canyon Creek Gage below Diversion Dam.

- Middle Fork American River Gage below Interbay Dam Trail (new)

Middle Fork American River Gage below Interbay Dam Trail is a new trail that will be constructed to provide access to the new Middle Fork American River Gage below Interbay Dam.

- North Fork American River Gage above American River Pump Station Trail (new)

North Fork American River Gage above American River Pump Station Trail is a new trail that will be constructed to provide access to the new North Fork American River Gage above American River Pump Station.

The following trail is existing and will be incorporated into the Project.

- Rubicon River Gage above Ralston Powerhouse Trail (existing, added to MFP)

Rubicon River Gage above Ralston Powerhouse Trail is an existing trail that provides access to the Rubicon River Gage above Ralston Powerhouse and is necessary for operation of the Project.

#### 4.1.15 Recreation Facilities

- Duncan Creek Diversion Primitive Recreation Site (new)

Duncan Creek Diversion Primitive Recreation Site will be developed under the Proposed Action to address sanitation issues in the Duncan Creek Diversion area and to reduce potential resource impacts related to dispersed recreation. Development of the site will include installation of the following features: one

single-unit accessible vault toilet, barrier rocks to limit vehicle use and camping to specific areas, and a bear-resistant garbage container.

- Ahart Campground (enhanced)

Ahart Campground will be enhanced under the Proposed Action to provide a potable water source for recreation visitors and to reduce dust, erosion, and sedimentation along the campground access and loop roads. Specific enhancements will include: installing a groundwater well and hand pump within the recreation facility, paving the campground road and spurs to reduce dust and erosion, and paving about 0.6 mile of Forest Road 96 from the end of the existing pavement to approximately 200 feet past the Ahart Campground entrance.

- Poppy Campground (reduced)

Poppy Campground will be reduced under the Proposed Action because the site is underutilized based on use data and capacity information. Reduction of the site will involve removing all of the tables, fire rings, stoves, and user-created fire rings from four sites and allowing vegetation in the vicinity of each removed campsite and along remnant trails to return to natural conditions.

- French Meadows Boat Ramp (enhanced)

Under the Proposed Action, French Meadows Boat Ramp will be extended up to 365 linear feet, to an elevation of about 5,175 feet, which is 25 vertical feet lower than the bottom of the existing boat ramp.

- McGuire Picnic Area and Beach (converted)

McGuire Picnic Area and Beach will be converted to the McGuire Group Campground under the Proposed Action due to low day-use levels. This conversion will involve removing all of the amenities at the existing picnic sites and reconfiguring the site for group use. Buoys and signage in the vicinity of the beach will be removed and the beach area will be allowed to return to natural conditions.

- McGuire Group Campground (new)

McGuire Picnic Area will be converted to the McGuire Group Campground to provide additional group camping opportunities. The campground will include two group camp sites. Development of the group campground will require the installation of new accessible picnic and serving tables, fire rings and benches, cooking grills, bear-resistant food storage lockers, signage, and barriers to delineate each site. The existing bathroom will be converted to meet accessibility standards or will be replaced.

- McGuire Boat Ramp and Associated Parking (modified)

McGuire Boat Ramp and Associated Parking Areas and the Poppy Campground Parking Area (and associated support facilities) will be consolidated due to low use levels. Consolidating these areas involves: removing the Poppy Campground Trailhead Parking Area and access road, installing barrier rock at the entrance to the Parking Area access road to prohibit future vehicle use, treating the surface of the road and parking area to allow for natural revegetation, removing one wood toilet building, replacing the existing vault toilet building, relocating water faucets, extending the Poppy Trail to one of the McGuire Boat Ramp Parking Areas, and relocating the trailhead signage and information boards.

- Hell Hole Campground (reduced)

Hell Hole Campground will be reduced under the Proposed Action due to low-use levels and to protect nearby sensitive resources. Reduction of the site will involve removing all tables, concrete and steel grills, fire pits, and site markers from two sites. The campsites will be allowed to naturally revegetate and a new barrier will be installed at the southeast boundary of the campground to limit recreation use to within the campground boundary.

- Upper Hell Hole Campground (removed)

Upper Hell Hole Campground will be removed under the Proposed Action due to low-use levels and to protect nearby sensitive resources. The following features will be removed: all tables, fire rings, masonry stoves, and user-created fire rings from sites 1–13; four pit toilets; and existing signage and information boards. Vegetation within the campground will be allowed to return to natural conditions.

- Hell Hole Boat Ramp (enhanced)

Under the Proposed Action, Hell Hole Boat Ramp will be extended up to 250 linear feet, to an elevation of about 4,485 feet, which is 45 vertical feet lower than the bottom of the existing boat ramp.

- Ralston Afterbay Picnic Area (reduced)

Ralston Afterbay Picnic Area will be reduced under the Proposed Action because the site is underutilized based on use data and capacity information. Reduction of the site will involve removing the table, pedestal grill, and signage from one site, and allowing the vegetation in the vicinity of the site and along the trail to the site to return to natural conditions.

- Ralston Afterbay Sediment Removal Access Point Boat Ramp (new)

Ralston Afterbay Sediment Removal Access Point will be improved to accommodate boat launching by the public. This includes delineating the boat

ramp and parking area with barrier rocks or other barrier devices, grading the ramp to remove large cobbles and rocks, and installing signage and barriers to limit parking and direct visitors to the Ralston Afterbay Picnic Area for additional parking.

- Indian Bar Rafting Access and General Parking (enhanced)

Indian Bar Rafting Access and General Parking will be enhanced under the Proposed Action to accommodate recreation use by commercial whitewater boaters and to improve conditions for other day use visitors. This enhancement includes installing an additional accessible vault toilet or modifying the existing vault toilet to accommodate peak use, installing powered ventilation systems in the existing toilets, reconstructing the existing boat ramp and installing a supplemental slide ramp downstream of the existing ramp, and installing a changing pavilion.

#### **4.2 PROJECT BOUNDARY MODIFICATIONS**

The FERC Project boundary will be modified under the Proposed Action as follows:

- Increase the boundary to include:
  - New Project facilities constructed as part of the Proposed Action;
  - Existing facilities added to the MFP that are necessary for operation and maintenance of the Project; and
  - Footprint of all Project recreation facilities.
- Decrease the boundary to remove excess lands currently within the existing FERC Project boundary that are not necessary for operation and maintenance of the MFP (particularly around Project reservoirs).

These revisions are depicted on Map 4-3 (includes Maps 4-3a–o). Detailed maps and specific parcel and acreage information is available in Exhibits A and G of this License Application.

Under the No-Action Alternative, the FERC Project boundary encompasses 4,554 acres of land including 1,883 acres within the Tahoe National Forest (TNF) and 1,385 acres within the Eldorado National Forest (ENF). The remainder of the MFP is located on PCWA-owned land or private land.

Under the Proposed Action, the revised FERC Project boundary will encompass 4,150 acres of land including 1,746 acres within the TNF and 1,306 acres within the ENF. The remainder of the MFP will be located on PCWA-owned land, private land, or land owned by the Bureau of Land Management.

### 4.3 PROJECT OPERATIONS

Overall, there are relatively minor modifications to Project operations under the Proposed Action. Under the Proposed Action, Project operations will be modified to comply with the Instream Flow and Reservoir Minimum Pool Measure (IFRM) (PCWA 2011a; SD A). This measure modifies Project operations compared to the No-Action Alternative by requiring:

- Higher minimum instream flow releases in the bypass and peaking reaches;
- Spring pulse flows in the bypass reaches;
- Down ramp of spill flows from May–July below Hell Hole Reservoir and French Meadows Reservoir;
- Modified ramping rates at Oxbow Powerhouse in the peaking reach;
- Cap on flow releases from Oxbow Powerhouse (Saturday of Memorial Day weekend to Labor Day) in Dry, Critical, and Extreme Critical water years;
- Consultation with representatives for the Tevis Cup and Western States 100 to identify and provide flows suitable for adequate trail crossing conditions (when flows are controllable by the MFP);
- Recreational flow releases in the peaking reach; and
- Modified minimum reservoir pool requirements in Hell Hole Reservoir and French Meadows Reservoir.

The Hell Hole Reservoir Seasonal Storage Increase Improvement also modifies Project operations by providing an additional 7,600 acre-feet (ac-ft) of storage in Hell Hole Reservoir.

#### 4.3.1 Operating Objectives

Under the Proposed Action, operating objectives of the MFP will continue to be met. The MFP will continue to be operated to meet the four objectives identified in Section 3.5.1, namely:

- Meet FERC license requirements that protect environmental resources and provide for recreation;
- Meet PCWA's consumptive water demands;
- Generate power to help meet California's energy demand and provide valuable support services required to maintain the overall quality and reliability of the state's electrical supply system; and

- Maintain Project facilities to ensure their continued availability and reliability.

In addition, the Proposed Action maintains the five key operating characteristics of the MFP that allow PCWA to meet its operating objectives. These characteristics are:

- Storage Flexibility—the flexibility to raise and lower reservoir levels (water storage) at different rates and times throughout the year subject to minimum storage level requirements. This flexibility allows:
  - Reasonable rates of drawdown through the summer to meet consumptive water demands and generate during periods of peak energy demand;
  - Evacuation of sufficient reservoir storage space in the fall to provide adequate storage capacity to manage the following spring runoff with minimum potential for spill; and
  - Higher levels of drawdown of the reservoirs under drought conditions so that consumptive water supply needs can be met.
- Combined Operation of Middle Fork and Ralston Powerhouses—the ability to operate the Middle Fork and Ralston powerhouses simultaneously over a range of flows and schedule periods. This capability is limited only by: (1) powerhouse maximum flow capacity; (2) minimum pool (storage) requirements in upstream reservoirs; and (3) flows necessary to meet minimum instream flow requirements.
- Operation of Oxbow Powerhouse and Ralston Afterbay—the ability to fluctuate Ralston Afterbay on a daily basis over a range of storage levels, so that releases to the Middle Fork American River below Oxbow Powerhouse meet minimum instream flow requirements and provide whitewater boating recreational opportunities without requiring operation of Middle Fork and Ralston powerhouses.
- Meet the Combined Patterns of Water and Energy Demand—the ability to meet the seasonal combined patterns of consumptive water demand and peak energy demand and weekly/daily peak energy demands. To meet these combined patterns of demand, the MFP must have:
  - The ability to release water from storage for downstream delivery at all times of the year in response to consumptive demand patterns; and
  - The ability to vary on a daily and hourly basis, releases through Middle Fork and Ralston powerhouses for power generation in response to changing electrical demand, grid needs, and water supply demand.
- Fall Maintenance—the ability to shutdown operations during the fall, after the peak energy and water supply demand period and during favorable runoff and weather conditions to perform annual maintenance.

### **4.3.2 Regulatory Requirements and Operating Agreements/Contracts**

Under the Proposed Action, the regulatory requirements affecting Project operations identified in Section 3.5.2 (i.e., water rights permits and license issued by the State Water Board) will remain in effect. New license conditions issued by FERC for the MFP will replace the existing license conditions. The Hell Hole Reservoir Seasonal Storage Increase Improvement requires a new water right from the State Water Board to allow for additional storage for power generation (non-consumptive use) at Hell Hole Reservoir.

Operating agreements/contracts affecting Project operations identified in Section 3.5.2 (i.e., water supply contracts and the Water Forum Agreement) will remain in effect with the exception of the existing power purchase contract, which expires on April 30, 2013. PCWA is currently negotiating a new power purchase contract, which will be in place prior to the expiration of the current PG&E contract. It is anticipated that the new contract will be from three to ten years in length, with provisions for renewal with the mutual agreement of both parties. This power purchase contract will be consistent with the FERC license conditions, water rights, and existing operating agreements/contracts and will not result in additional limitations or constraints in Project operations.

### **4.3.3 Consumptive Water and Power Demands**

Consumptive water and power demands are unchanged under the Proposed Action. An overview of consumptive water and power demands is provided in Section 3.5.3.

### **4.3.4 Water Management**

PCWA's overall water management strategy will not change substantially under the Proposed Action. An overview of water management is provided in Section 3.5.4.

A minor change in water management will occur as a result of the Hell Hole Reservoir Seasonal Storage Increase Improvement. This improvement will allow PCWA to utilize a portion of the existing flood control pool, above the present normal maximum operating water level, to store additional water during the spring and summer after the peak runoff period. An approximate 7,600-ac-ft increase in seasonal storage in the reservoir will be achieved by installing 6-foot-high crest gates on the existing dam spillway. In years when either French Meadows or Hell Hole reservoirs would have spilled, this improvement allows the MFP to capture additional water in storage in Hell Hole Reservoir, which can later be used to increase net annual energy generation. In all but the driest years, this improvement also allows the MFP to shift the timing of some generation from the spring runoff period to the summer peak energy demand period.

### **4.3.5 Project Generation**

Project generation will be reduced by 4.59% under the Proposed Action compared to the No-Action Alternative as a result of implementation of the new IFRM (PCWA 2011a; SD A) and construction of the Hell Hole Reservoir Seasonal Storage Increase Improvement. Annual net generation at MFP powerhouses is summarized in

Table 3-16. Annual net generation for French Meadows, Middle Fork, Ralston, and Oxbow powerhouses is based on 40 years of operation (1967–2006). Hell Hole Powerhouse began operation in 1983; therefore, annual net generation is based on 24 years of operation (1983–2006). Under the No-Action Alternative, the MFP’s annual average generation is 1,039,078 megawatt-hours (MWh), which represents the average net generation for the five Project powerhouses based on their respective period of record. Under the Proposed Action, the MFP will have an annual average generation of 991,384 MWh (a reduction of 47,694 MWh).

#### **4.4 ROUTINE FACILITY INSPECTIONS, TESTING, AND MAINTENANCE**

As identified in Tables 4-4, 4-5, and 4-6, under the Proposed Action, routine facility inspections, testing, and maintenance activities related to Project facilities and features, Project roads and trails, and Project recreation facilities and features are modified from the No-Action Alternative. These modifications include revisions in the location, timing, and methods for implementation of routine maintenance activities. In addition, the Proposed Action specifies additional programs and measures for protection of environmental and cultural resources. These modifications have been incorporated within various management plans, as described in Section 4.5 – Environmental Programs, Measures, and Facilities.

Changes in routine facility inspections, testing, and maintenance under the Proposed Action are summarized below.

##### **4.4.1 Tunnel and Powerhouse Inspections, Testing, and Maintenance**

Tunnel and powerhouse inspections, testing, and maintenance activities will remain the same as the No-Action Alternative.

##### **4.4.2 Spillway Gate and Tainter Gate Testing**

Spillway gate and tainter gate testing will remain the same under the Proposed Action at all facilities except Hell Hole Dam. At Hell Hole Dam, the new spillway crest gates installed as part of the Hell Hole Reservoir Seasonal Storage Increase Improvement will be inspected and tested annually.

##### **4.4.3 Vegetation Management**

As described in the Vegetation and Integrated Pest Management Plan (VIPMP) (PCWA 2011b; SD A), the following changes to vegetation management will occur under the Proposed Action:

- Implementation of vegetation management (trimming by hand, trimming with equipment, and/or herbicide use) at new Project facilities and features, Project roads and trails, and Project recreation facilities and features;
- Authorized application of herbicides and surfactants at existing Project facilities and features and Project roads where herbicides were not previously used; and

- Implementation of additional programs and measures to protect and enhance environmental and cultural resources during vegetation management.

#### **4.4.4 Pest Management**

As described in the VIPMP (PCWA 2011b; SD A), the following changes to pest management will occur under the Proposed Action:

- Implementation of physical rodent control (e.g., snap traps) and over-the-counter rodenticides (e.g., d-CON®) at new Project facilities;
- Authorized rodenticide use (e.g., fumigants) at Hell Hole and French Meadows dams; and
- Established methods for rodenticide use to reduce the risk of secondary poisoning of non-target species.

#### **4.4.5 Noxious Weed Management**

Noxious weed management was not a Project maintenance activity under the No-Action Alternative. However, as described in the VIPMP (PCWA 2011b; SD A), implementation of noxious weed management will result in the following changes under the Proposed Action:

- Required manual and chemical (herbicide use) noxious weed control;
- Establishment of protective buffers around streams, reservoirs, and other aquatic sites when applying herbicides;
- Implementation of measures to limit the introduction or spread of noxious weeds;
- Implementation of measures and programs to protect and enhance environmental resources during noxious weed management; and
- Required monitoring of noxious weed manual and chemical treatment sites.

#### **4.4.6 Sediment Management**

As described in the Sediment Management Plan (SMP) (PCWA 2011c; SD A), the following changes to sediment management at the small diversion pools and medium reservoirs will occur under the Proposed Action:

##### **4.4.6.1 Small Diversions**

Sediment management at small diversions (Duncan Creek Diversion, North Fork Long Canyon Diversion, and South Fork Long Canyon Diversion) will include interim and contingency sediment management and long-term routine maintenance.

Interim Sediment Management will be conducted at small diversions prior to modification of diversion dams. Similar to the No-Action Alternative, interim sediment management includes physical removal of sediment by heavy equipment during the low-flow period (late summer or fall) on an as-needed basis. However, under the Proposed Action, the following changes will occur:

- Implementation will only occur during the interim years between license issuance and completion of the infrastructure modifications;
- Reduced level of sediment removal activity (duration, extent of equipment needed, volume of sediment removed, and disposal area); and
- Implementation of additional measures to protect and enhance environmental and cultural resources during sediment management.

Contingency Sediment Management will be conducted following implementation of the small diversion modifications. Under the Proposed Action, implementation of contingency sediment management (physical removal with equipment) is considered to be unlikely, but may be necessary following implementation of the small diversion modifications. Contingency sediment management will result in the following changes from the No-Action Alternative:

- Reduced level of sediment removal activity (duration, extent of equipment needed, volume of sediment removed, and disposal area); and
- Implementation of additional measures to protect and enhance environmental and cultural resources during sediment management.

Long-term Routine Maintenance of the modified small diversions will change under the Proposed Action. Specifically, this includes the following:

- Substantially reduce the need for routine physical removal of sediment by heavy equipment;
- Reduce the need for trash rack cleaning; and
- Reduce monitoring of intakes during winter and spring storm event.

#### **4.4.6.2 Medium Reservoirs**

As described in the SMP (PCWA 2011c; SD A) the following changes to sediment management at the medium reservoirs will occur under the Proposed Action:

- Establishment of new augmentation areas (Middle Fork Interbay Augmentation Areas and Junction Bar Augmentation Area) and use of an existing augmentation area (Indian Bar Augmentation Area);

- Required sediment augmentation below Middle Fork Interbay and Ralston Afterbay;
- Required sediment transport monitoring at augmentation areas and replenishment of sediment transported from the area;
- Reduction in the volume of sediment stored and decreased need for additional sediment disposal areas; and
- Implementation of additional measures to protect and enhance environmental resources during sediment management activities.

#### **4.4.7 Slope Stabilization (Falling Rock Control)**

Slope stabilization activities will remain the same as the No-Action Alternative.

#### **4.4.8 Debris Management**

Following implementation of the small diversion infrastructure modifications, debris management may occur as part of contingency sediment management activities as described in the SMP (PCWA 2011c; SD A). This includes:

- Removal of accumulated sediment, woody debris, and/or vegetation within the existing diversion pool that restricts or threatens operations of the diversion facility or natural sediment transport downstream; and
- Large woody debris removed during contingency activities will either be placed downstream of the diversion or disposed of at an approved disposal area in consultation with resource agencies.

#### **4.4.9 Facility Painting**

Facility painting will remain the same as the No-Action Alternative except that PCWA will consult with the United States Department of Agriculture-Forest Service (USDA-FS or Forest Service) on the selection of appropriate colors per the Visual Resource Management Plan (VRMP) (PCWA 2011d; SD A).

#### **4.4.10 Pole Replacement/Retrofit**

As described in the Bald Eagle Management Plan (BEMP) (PCWA 2011e; SD A), the following changes to pole replacement/retrofit will occur under the Proposed Action:

- Scheduled replacement/retrofit of Project powerlines to meet Avian Power Line Interaction Committee (APLIC) Guidelines within 15 years of license issuance; and
- New powerline designs will be consistent with APLIC Guidelines.

#### **4.4.11 Road and Trail Maintenance**

As described in the Transportation System Management Plan (TSMP) (PCWA 2011f; SD A), the following changes to road and trail maintenance will occur under the Proposed Action:

- Required annual and periodic maintenance of new Project roads and trails;
- Established schedule for implementation of annual and periodic maintenance at existing and new roads and trails; and
- Implementation of additional programs and measures to protect and enhance environmental and cultural resources during annual and periodic road and trail maintenance.

#### **4.4.12 Recreation Facility Maintenance**

As described in the Recreation Plan (PCWA 2011g; SD A), the following changes to recreation facility maintenance will occur under the Proposed Action:

- Required annual and heavy maintenance of new Project recreation facilities;
- Established schedule for implementation of heavy maintenance at existing Project recreation facilities; and
- Implementation of additional programs and measures to protect and enhance environmental and cultural resources during annual and heavy maintenance.

### **4.5 NEW ENVIRONMENTAL PROGRAMS, MEASURES, AND FACILITIES**

This section identifies new environmental programs, measures, and facilities to be implemented under the Proposed Action that are designed to protect, maintain, or enhance environmental and cultural resources over the term of the new license. The following subsections provide a description of each environmental program and/or measure.

#### **4.5.1 Aquatic Resources**

##### **4.5.1.1 Instream Flow and Reservoir Minimum Pool Measure**

PCWA currently provides minimum instream flows (MIF) for aquatic habitat and protection of beneficial uses in accordance with existing FERC license conditions and permits issued by the State Water Board. The IFRM (PCWA 2011a; SD A) includes higher MIFs, spring pulse flows, down ramp of spill flows, modified operation of Oxbow Powerhouse (ramping rate, maximum flow release), required recreation flows, and modified reservoir minimum pool requirements.

#### 4.5.1.2 Aquatic Management and Monitoring Plans

PCWA will implement ten aquatic monitoring plans under the Proposed Action, these include:

- Flow and Reservoir Monitoring Plan (FRMP)

The FRMP (PCWA 2011h; SD A) identifies the methods used to document compliance and reporting of instream flow releases and reservoir levels specified in the new FERC License. Specifically, the FRMP (PCWA 2011h; SD A) addresses the following instream flow requirements:

- Minimum instream flows in the bypass and peaking reaches;
- Pulse flows in the bypass reaches;
- Recreation flow releases in the peaking reach;
- Ramping rates and maximum flow releases for Oxbow Powerhouse;
- Down ramping for spills from Hell Hole Dam and French Meadows Dam; and
- Minimum pool requirements in Hell Hole and French Meadows reservoirs.

- Fish Population Monitoring Plan (FPMP)

The FPMP (PCWA 2011i; SD A) describes methods, analyses, reporting, and agency consultation associated with collection of fish species composition, abundance, condition factor, and population age class structure data at select sites in the bypass and peaking reaches associated with the MFP over the term of the license. The FPMP (PCWA 2011i; SD A) also includes three shorter-term special purpose monitoring studies. Specific objectives of the FPMP (PCWA 2011i; SD A) are to:

- Monitor fish species composition, abundance, condition factor, and population age class structure at select sites in the bypass and peaking reaches associated with the MFP over the term of the license;
- Conduct young-of-the-year and juvenile fish targeted sampling in the Middle Fork American River peaking reach;
- Monitor hardhead movement in Ralston Afterbay in relation to Project operations; and
- Monitor fish entrainment at the Ralston Powerhouse and Oxbow Powerhouse intakes.

- Foothill Yellow-legged Frog Monitoring Plan (FYLFMP)

The FYLFMP (PCWA 2011j; SD A) describes methods and analyses for the periodic collection of foothill yellow-legged frog (FYLF) population data at select sites in the bypass and peaking reaches associated with the MFP over the term of the license. The FYLFMP (PCWA 2011j; SD A) also includes three special purpose monitoring studies. Specifically, the objectives of the FYLFMP (PCWA 2011j; SD A) are to:

- Monitor FYLF species abundance (egg masses, tadpoles, and young-of-the-year) in select locations in the bypass and peaking reaches, including tributaries;
- Document the approximate upstream distribution of FYLF in the Rubicon River and the Middle Fork American River (upstream of Ralston Afterbay);
- Determine the approximate timing of the initiation of FYLF breeding season in the Rubicon River and Middle Fork American River (upstream of Ralston Afterbay);
- Monitor FYLF initiation of breeding timing in relation to the pulse flow releases during the initial implementation years (Middle Fork American River and Rubicon River);
- Monitor FYLF in relation to flows during the annual fall maintenance outage during the initial implementation years (Middle Fork American River and Rubicon River); and
- Monitor FYLF in relation to potential flow changes during emergency power outages.

The FYLFMP (PCWA 2011j; SD A) also describes reporting requirements and agency consultation to be implemented.

- Geomorphology/Riparian Monitoring Plan (GRMP)

The GRMP (PCWA 2011k; SD A) describes monitoring and analyses of channel and sediment conditions and riparian vegetation data over the term of the new license. Specifically, the objectives of the GRMP (PCWA 2011k; SD A) are to monitor the following parameters at select sites in the bypass and peaking reaches:

- Channel and sediment conditions, including general channel shape, bank erosion, and fine sediment in pools; and
- Riparian vegetation communities, including species composition, age class structure, relative cover, vegetation community structure, position along the stream channel, and health.

The GRMP (PCWA 2011k; SD A) also describes reporting requirements and agency consultation to be implemented.

- Sediment Management Plan (SMP)

The SMP (PCWA 2011c; SD A) describes sediment management activities necessary for continued operation of the MFP at the three small diversion pools (Duncan Creek, North Fork Long Canyon Creek, and South Fork Long Canyon Creek) and two medium reservoirs (Middle Fork Interbay and Ralston Afterbay). Implementation of the SMP (PCWA 2011c; SD A) will result in improved system reliability, reduced facility maintenance, increased natural delivery and transport of sediment (bedload and suspended load) downstream of Project diversions, and enhanced aquatic and riparian habitat downstream of Project diversions.

The SMP (PCWA 2011c; SD A) includes measures to protect water quality and biological resources, prevent fires, and protect public/worker health during implementation of sediment management activities.

The SMP (PCWA 2011c; SD A) also includes several types of monitoring, including: turbidity monitoring at small diversions and medium reservoirs; methylmercury monitoring at Ralston Afterbay; sediment transport and channel sediment condition monitoring associated with the augmentation areas; and hardhead monitoring in Ralston Afterbay. In addition to monitoring, the SMP (PCWA 2011c; SD A) also describes reporting requirements and agency consultation associated with sediment management activities to be implemented over the term of the new license.

- Water Temperature Monitoring Plan (WTMP)

The WTMP (PCWA 2011i; SD A) describes methods and analyses for collection of water temperature data at select sites in bypass and peaking reaches associated with the MFP. This information will be used to characterize water temperatures within the studied reaches over time and will be used to aid interpretation of biological monitoring data. In addition, the WTMP also describes reporting requirements and agency consultation to be implemented over the term of the new license.

- Western Pond Turtle Monitoring Plan (WPTMP)

The WPTMP (PCWA 2011m; SD A) describes monitoring methods, data analyses, reporting requirements, and agency consultation associated with periodic collection of WPT distribution and abundance data in selected bypass and peaking reaches and Project reservoirs associated with the MFP during the term of the new license. The specific objectives of the WPTMP (PCWA 2011m; SD A) are to:

- Document the distribution of WPT in the vicinity of the MFP;

- Define existing WPT relative abundance and size/age class conditions; and
- Monitor WPT relative abundance and size/age class conditions at select sites in the bypass and peaking reaches, and Project reservoirs associated with the MFP, for the duration of the license.
- Water Quality Monitoring Plan (WQMP)

The WQMP (PCWA 2011n; SD A) describes monitoring methods and data analyses approaches for the periodic collection of water quality data in the bypass and peaking reaches and reservoirs associated with the MFP over the term of the new license. Water quality monitoring required as part of other monitoring plans (e.g., sediment management) and/or as part of Project construction activities will be conducted and reported as part of those activities and not the WQMP. The specific objective of the WQMP (PCWA 2011n; SD A) is to:

  - Monitor physical, chemical, and bacterial water quality conditions in the bypass reaches, the peaking reach, and Project reservoirs.

In addition, the WQMP (PCWA 2011n; SD A) also describes reporting requirements and agency consultation.

- Mercury Bioaccumulation Monitoring Plan (MBIOMP)

The MBIOMP (PCWA 2011o; SDA) describes monitoring methods, data analyses, reporting requirements, and agency consultation associated with periodic monitoring of methylmercury concentrations in sport fish muscle tissue at specified MFP reservoirs. Specifically, this includes monitoring methylmercury concentrations in sport fish muscle tissue in Hell Hole Reservoir, French Meadows Reservoir, Ralston Afterbay, and the Middle Fork American River near Otter Creek.

- Benthic Macroinvertebrate Monitoring Plan (BMIMP)

The BMIMP (PCWA 2011p; SDA) describes the monitoring and data analysis approaches for the periodic collection of benthic macroinvertebrates (BMI) data at select sites in the bypass and peaking reaches associated with the MFP. The BMIMP (PCWA 2011p; SDA) also defines reporting requirements and associated agency consultation.

## **4.5.2 Cultural Resources**

### **4.5.2.1 Historic Properties Management Plan**

The Draft Historic Properties Management Plan (HPMP) (PCWA 2011q; SD E) addresses the management of cultural resources that are eligible for inclusion on the National Register of Historic Places (NRHP). Specifically, the Draft HPMP

(PCWA 2011q; SD E) identifies measures that PCWA will implement at the four NRHP-eligible sites during operation and maintenance of the MFP and/or recreation use. This includes implementation of an Employee Resource Awareness Training Program, development of public education materials, and implementation of avoidance measures and providing notification to local Tribes prior to construction or ground-disturbing activities. The HPMP also includes conducting additional surveys at Hell Hole Reservoir, monitoring of NRHP-eligible sites; and implementing specific procedures if unavoidable impacts to cultural resources are identified.

In addition, the HPMP includes several measures that PCWA will implement that are not related to NRHP-eligible properties, as follows:

- PCWA will work with the USDA-FS and Native American Tribes to protect the cultural values of cultural resources that are located within MFP Area of Potential Effects (APE) but are not eligible for the NRHP, consistent with PCWA's existing cultural resources management policy.
- PCWA will implement specific measures (notification and signage) to avoid impacting traditional gathering areas should they be identified in the vicinity of the Project.
- PCWA will implement specific measures to protect a site located along a Project road from damage. This site is important to the Colfax Todd Valley Consoloidated Tribe.

All of these measures will be implemented in consultation with the USDA-FS and local Native American Tribes.

### **4.5.3 Land Management**

#### **4.5.3.1 Transportation System Management Plan**

The TSMP (PCWA 2011e; SD A) identifies PCWA's responsibilities over the term of the new license related to the operation and maintenance of: (1) Project roads and trails; and (2) Project recreation facility access roads. Specific commitments and measures identified in the TSMP (PCWA 2011e; SD A) include funding of land management agency administrative oversight activities, implementation of routine annual and periodic maintenance activities, documenting road and trail conditions, implementation of special road and trail projects, and conducting traffic counts. The TSMP (PCWA 2011e; SD A) also includes measures for the protection of environmental and cultural resources and consultation with appropriate land management agencies.

#### **4.5.3.2 Fire Prevention and Suppression Plan**

The Fire Prevention and Suppression Plan (FPSP) (PCWA 2011r; SD A) outlines the responsibility of PCWA and its contractors for fire prevention and suppression activities; sets up reporting and attack procedures in the event of a fire in the vicinity of the MFP; and ensures that fire prevention and suppression techniques are carried out in

accordance with federal, state, and local regulations. The FPSP (PCWA 2011r; SD A) includes fire prevention and fire suppression measures that will be implemented during Project operation, maintenance, and construction activities; specific fire response procedures and emergency coordination; and agency consultation requirements to be implemented over the term of the new license.

#### **4.5.4 Recreation Resources**

##### **4.5.4.1 Recreation Plan**

The Recreation Plan (PCWA 2011g; SD A) identifies PCWA's responsibilities related to the management of recreation resources associated with the MFP over the term of the new license. The Recreation Plan (PCWA 2011g; SD A) specifies the measures/commitments that PCWA will implement related to: (1) operation, maintenance, and enhancement of Project recreation facilities; and (2) enhancement of Project recreation opportunities. Specific measures and commitments identified in the Recreation Plan (PCWA 2011g; SD A) include:

- Funding of land management agency administrative oversight;
- Routine annual and heavy maintenance of Project recreation facilities;
- Removal, reduction, consolidation, conversion, enhancement, and improvements to select Project recreation facilities;
- Periodic recreation use monitoring; and
- Resource protection and enhancement measures.

Specific measures included in the Recreation Plan (PCWA 2011g; SD A) that are designed to enhance Project recreation opportunities include:

- Dissemination of real-time flow information in the bypass and peaking reaches;
- Dissemination of reservoir water surface elevation information;
- Development and distribution of recreation opportunity marketing information;
- Fish stocking in large Project reservoirs; and
- Trail enhancements.

The Recreation Plan (PCWA 2011g; SD A) also includes an implementation schedule and specifies PCWA's commitments regarding consultation with the land management agencies over the term of the new license.

#### **4.5.4.2 Visual Resource Management Plan**

The VRMP (PCWA 2011d; SD A) identifies and describes the measures that PCWA will implement over the term of the new license to help improve the existing visual condition of select MFP facilities with respect to USDA-FS objectives, standards, and guidelines. In addition, the VRMP describes how PCWA will consult and coordinate with the USDA-FS when implementing future projects that have the potential to affect visual resources on Forest Service lands, including modification of existing MFP facilities or the construction of new MFP facilities.

#### **4.5.5 Terrestrial Resources**

##### **4.5.5.1 Vegetation and Integrated Pest Management Plan**

The VIPMP (PCWA 2011b; SD A) describes vegetation management (i.e., trimming by hand or with equipment and use of herbicides, surfactants, and fungicides) and pest management activities (i.e., noxious weed management and rodent control) to be implemented at Project facilities and features, Project roads and trails, and Project recreation facilities and features, as well as measures for the enhancement and/or protection of environmental and cultural resources during implementation of these activities.

Pest management conducted under the VIPMP (PCWA 2011b; SD A) includes both noxious weed management and rodent control. The noxious weed management program includes manual/chemical treatment of noxious weeds, measures to reduce the introduction or spread of noxious weeds and implementation of noxious weed training program. This program will enhance habitat for native plant and wildlife species in the MFP and could promote establishment of new special-status plant populations through improved habitat conditions by reducing competition with invasive noxious weeds.

Rodent control, which includes both physical control (e.g., snap traps) and rodenticide use (over-the-counter rodenticides and fumigants), is necessary to protect the structural integrity of dams and prevent rodent infestations in building interiors. The VIPMP (PCWA 2011b; SD A) includes specific rodenticide application methods to be used to protect water quality and prevent secondary poisoning of raptors and other scavengers.

The VIPMP (PCWA 2011b; SD A) also includes several additional measures to enhance environmental resources including conducting special-status plant and noxious weed inventory surveys, implementation of an Environmental Training Program (ETP), and consulting annually with resource agencies.

##### **4.5.5.2 Bald Eagle Management Plan**

The BEMP (PCWA 2011e; SD A) addresses management of the bald eagle during routine maintenance and operation of the MFP. Specifically, the BEMP (PCWA 2011e; SD A) describes methods for evaluation and reporting for all power poles/powerlines involved in electrocution of a bald eagle or other raptor; reporting protocols for bald

eagle and other raptor mortalities; implementation of raptor safe design configuration for all new and/or replaced power poles/powerlines; measures to protect nests; and implementation of an ETP. The BEMP (PCWA 2011e; SD A) also includes methods for conducting annual bald eagle nest monitoring and five-year bald eagle nest and roost surveys to document newly occupied bald eagle territories or nesting activity in the vicinity of the MFP. In addition, the BEMP (PCWA 2011e; SD A) describes reporting requirements, and agency consultation to be implemented over the term of the new license.

Implementation of the BEMP (PCWA 2011e; SD A) will reduce the risk of bald eagle or other raptor electrocution on Project power poles/powerlines, increase monitoring of bald eagle nests and winter roosts in the vicinity of the MFP, and protect future bald eagle nests or roosts that may be identified during the term of the new license.

#### **4.6 CONSTRUCTION PROJECTS**

Under the Proposed Action, several construction projects will be implemented to improve operations and maintenance of the Project, enhance environmental resources, and/or meet the requirements specified in new environmental programs and measures. The construction projects include modifications to existing and construction of new Project facilities and features. The location of each modified/new Project facility is depicted on Maps 4-1a through 4-1e. Refer to Appendix A – Modified or New Facilities Construction Activities and Concept Designs for detailed information on construction activities and schedule, associated BMPs and avoidance and protection measures (as applicable), and concept design drawings for each modified/new facility. Cost information associated with each modified/new facility is included in Section 11.0 – Economic Analysis. The objective of each of these construction projects is briefly described below.

##### **4.6.1 Hell Hole Reservoir Seasonal Storage Increase Improvement**

The Proposed Action includes construction of the Hell Hole Reservoir Seasonal Storage Increase Improvement. The objective of this improvement is to seasonally increase the storage capacity of Hell Hole Reservoir. The improvement will utilize a portion of the existing flood control pool, above the present normal maximum operating water level, to store additional water during the spring and summer after the peak of the runoff period. An approximate 7,600 ac-ft increase in seasonal storage in the reservoir will be achieved by installing 6-foot-high crest gates on the existing dam spillway. The crest gates may be raised between April 15 and October 30 to increase reservoir storage.

##### **4.6.2 Small Diversion Modifications**

The Proposed Action includes modification of Duncan Creek, North Fork Long Canyon, and South Fork Long Canyon diversion dams to:

- Improve MFP system reliability;

- Increase natural sediment delivery and transport of bedload and fine material downstream of the small diversions;
- Enhance aquatic and riparian habitat downstream of the small diversions by re-establishing sediment connectivity; and
- Reduce operation and maintenance costs by reducing the need for manual debris removal and periodic sediment removal from each diversion.

#### **4.6.3 Outlet Works Modifications**

The Proposed Action includes modification of outlet works at French Meadows Dam, Hell Hole Dam, and Middle Fork Interbay Dam. The purpose of these modifications is to enhance the ability of the outlet works to release new instream flow requirements, and where appropriate, install new gages to collect flow data necessary for documenting compliance under the new license.

#### **4.6.4 Gage Construction**

The Proposed Action includes modification of existing gages and construction of new gages to monitor flows for compliance with the new license and collect flow data for real-time flow dissemination to the public. Modifications will occur at existing Project facilities (i.e., dam outlet works, spillways, diversion tunnels, and penstocks). New gage construction will occur along stream/river locations in the bypass and peaking reaches and includes installation of pole-mounted photovoltaic arrays (referred to as photovoltaic poles) and powerlines to provide power, and development of a new trail to provide access. The precise location of the new gages, trails, and photovoltaic poles and powerlines along stream/river locations has not yet been determined. Project-specific NEPA analysis will be conducted at a later date for these gages and all necessary permits and approvals will be obtained prior to implementation of any construction activities.

#### **LITERATURE CITED**

- Placer County Water Agency (PCWA). 2011a. Instream Flow and Reservoir Minimum Pool Measure. Available in PCWA's Application for New License – Supporting Document A.
- \_\_\_\_\_. 2011b. Vegetation and Integrated Pest Management Plan. Available in PCWA's Application for New License – Supporting Document A.
- \_\_\_\_\_. 2011c. Sediment Management Plan. Available in PCWA's Application for New License – Supporting Document A.
- \_\_\_\_\_. 2011d. Visual Resource Management Plan. . Available in PCWA's Application for New License – Supporting Document A.

- \_\_\_\_\_. 2011e. Bald Eagle Management Plan. Available in PCWA's Application for New License – Supporting Document A.
- \_\_\_\_\_. 2011f. Transportation System Management Plan. Available in PCWA's Application for New License – Supporting Document A.
- \_\_\_\_\_. 2011g. Recreation Plan. Available in PCWA's Application for New License – Supporting Document A.
- \_\_\_\_\_. 2011h. Flow and Reservoir Monitoring Plan. Available in PCWA's Application for New License – Supporting Document A.
- \_\_\_\_\_. 2011i. Fish Population Monitoring Plan. Available in PCWA's Application for New License – Supporting Document A.
- \_\_\_\_\_. 2011j. Foothill Yellow-Legged Frog Monitoring Plan. Available in PCWA's Application for New License – Supporting Document A.
- \_\_\_\_\_. 2011k. Geomorphology/Riparian Monitoring Plan. Available in PCWA's Application for New License – Supporting Document A.
- \_\_\_\_\_. 2011l. Water Temperature Monitoring Plan. Available in PCWA's Application for New License – Supporting Document A.
- \_\_\_\_\_. 2011m. Western Pond Turtle Monitoring Plan. Available in PCWA's Application for New License – Supporting Document A.
- \_\_\_\_\_. 2011n. Water Quality Monitoring Plan. Available in PCWA's Application for New License – Supporting Document A.
- \_\_\_\_\_. 2011o. Mercury Bioaccumulation Monitoring Plan. Available in PCWA's Application for New License – Supporting Document A.
- \_\_\_\_\_. 2011p. Benthic Macroinvertebrate Monitoring Plan. Available in PCWA's Application for New License – Supporting Document A.
- \_\_\_\_\_. 2011q. Draft Historic Properties Management Plan. Available in PCWA's Application for New License – Supporting Document E.
- \_\_\_\_\_. 2011r. Fire Prevention and Suppression Plan. Available in PCWA's Application for New License – Supporting Document A.

## **TABLES**

**Table 4-1. Proposed Action – Project Facilities and Features.**

<b>Dams, Reservoirs, and Diversion Pools</b>
<b>Large Dams</b>
French Meadows Dam and Outlet Works (modified)
Hell Hole Dam and Outlet Works (modified)
<b>Medium Dams</b>
Middle Fork Interbay Dam and Outlet Works (modified)
Ralston Afterbay Dam and Outlet Works
<b>Small Dams</b>
Duncan Creek Diversion Dam (modified)
North Fork Long Canyon Diversion Dam (modified)
South Fork Long Canyon Diversion Dam (modified)
<b>Large Reservoirs</b>
French Meadows Reservoir
Hell Hole Reservoir
<b>Medium Reservoirs</b>
Middle Fork Interbay
Ralston Afterbay
<b>Small Diversion Pools</b>
Duncan Creek Diversion Pool (modified)
North Fork Long Canyon Diversion Pool (modified)
South Fork Long Canyon Diversion Pool (modified)
<b>Water Conveyance Systems</b>
<b>Tunnels</b>
Duncan Creek - Middle Fork Tunnel
French Meadows - Hell Hole Tunnel
Hell Hole - Middle Fork Tunnel
Middle Fork - Ralston Tunnel
Ralston - Oxbow Tunnel
<b>Diversion Pipes and Drop Inlets</b>
North Fork Long Canyon Diversion Pipe and Drop Inlet
South Fork Long Canyon Diversion Pipe and Drop Inlet
<b>Surge Shafts and Adits</b>
Brushy Canyon Adit
Hell Hole - Middle Fork Tunnel Surge Shaft and Tank
Middle Fork - Ralston Tunnel Surge Shaft and Tank
<b>Removable Sections and Portals</b>
Duncan Creek - Middle Fork Tunnel Portal
French Meadows - Hell Hole Tunnel Removable Section
Hell Hole - Middle Fork Tunnel Removable Section
Middle Fork - Ralston Tunnel Removable Section
North Fork Long Canyon Crossing Removable Section
<b>Intakes and Gatehouses</b>
Duncan Creek - Middle Fork Tunnel Intake
French Meadows - Hell Hole Tunnel Gatehouse
French Meadows - Hell Hole Tunnel Intake
Hell Hole - Middle Fork Tunnel Gatehouse
Hell Hole - Middle Fork Tunnel Intake
Middle Fork - Ralston Tunnel Intake and Gatehouse
Ralston - Oxbow Tunnel Intake

**Table 4-1. Proposed Action – Project Facilities and Features (continued).**

<b>Water Conveyance Systems (continued)</b>
<b>Penstocks and Valve Houses</b>
French Meadows Powerhouse Penstock and Butterfly Valve House
Middle Fork Powerhouse Penstock and Butterfly Valve House
Ralston Powerhouse Penstock and Butterfly Valve House
<b>Powerhouses, Switchyards, and Substations</b>
French Meadows Powerhouse and Switchyard
Hell Hole Powerhouse
Hell Hole Substation
Middle Fork Powerhouse and Upper and Lower Switchyards
Ralston Powerhouse and Switchyard
Oxbow Powerhouse and Switchyard
<b>Gaging Stations and Weirs</b>
<b>Stream Gages and Weirs</b>
Duncan Creek near French Meadows (USGS Gage No. 11427700) (interim) <sup>1</sup>
Duncan Creek below Diversion Dam (USGS Gage No. 11427750)
Middle Fork American River at French Meadows (USGS Gage No. 11427500)
Middle Fork American River at French Meadows Dam (new) <sup>2</sup>
Rubicon River at Hell Hole Dam Spillway (HHDS) (new) <sup>2</sup>
Rubicon River below Hell Hole Dam (USGS Gage No. 11428800) (interim) <sup>1</sup>
Rubicon River at Hell Hole Dam (new) <sup>2</sup>
North Fork Long Canyon Creek below Diversion Dam (USGS Gage No. 11433085) (interim) <sup>1</sup>
North Fork Long Canyon Creek below Diversion Dam (NFLCC) (new) <sup>2</sup>
South Fork Long Canyon Creek below Diversion Dam (USGS Gage No. 11433065) (interim) <sup>1</sup>
South Fork Long Canyon Creek below Diversion Dam (SFLCC) (new) <sup>2</sup>
Middle Fork American River below Interbay Dam (USGS Gage No. 11427770) (interim) <sup>1</sup>
Middle Fork American River above Middle Fork Powerhouse (USGS Gage No. 11427760)
Middle Fork American River below Interbay Dam (MFARIB) (new) <sup>2</sup>
Middle Fork American River near Foresthill (USGS Gage No. 11433300)
Middle Fork American River at Ralston Afterbay Dam (new) <sup>2</sup>
Rubicon River above Ralston Powerhouse (RRRP) (existing, added to MFP) <sup>3</sup>
North Fork American River above American River Pump Station (NFARPS) (new) <sup>2</sup>
Rubicon River above Ellicott Bridge (RREB) (existing, added to MFP) <sup>3</sup>
<b>Diversion Gages</b>
Duncan Creek Diversion Tunnel (DCDT) (new) <sup>2</sup>
North Fork Long Canyon Creek Diversion Tunnel (USGS Gage No. 11433080) (modified)
South Fork Long Canyon Creek Diversion Tunnel (USGS Gage No. 11433060) (modified)
<b>Reservoir Gages</b>
French Meadows Reservoir (USGS Gage No. 11427400)
French Meadows Reservoir Staff Gage
Hell Hole Reservoir (USGS Gage No. 11428700)
Hell Hole Reservoir Staff Gage
Middle Fork Interbay Reservoir
Ralston Afterbay Reservoir
<b>Powerhouse Gages</b>
French Meadows Powerhouse (USGS Gage No. 11427200)
Middle Fork Powerhouse (USGS Gage No. 11428600)
Ralston Powerhouse (USGS Gage No. 11427765)
Oxbow Powerhouse (USGS Gage No. 11433212)
Oxbow Powerhouse Penstock (OXBPP) (new) <sup>2</sup>

**Table 4-1. Proposed Action – Project Facilities and Features (continued).**

<b>Gaging Stations and Weirs (continued)</b>
<b>Leakage Weirs</b>
French Meadows Dam Leakage Weirs Nos. 1-6
Hell Hole Dam Leakage Weir
<b>Project Communication Lines and Powerlines</b>
<b>French Meadows Area</b>
French Meadows Dam Generator Building to French Meadows Dam Outlet Works Powerline
French Meadows Dam Generator Building to French Meadows Dam Spillway Gates Powerline
<b>Hell Hole Area</b>
French Meadows Powerhouse to French Meadows Powerhouse Penstock and Butterfly Valve House Communication Line/Powerline
French Meadows Powerhouse and Switchyard to Hell Hole - Middle Fork Tunnel Gatehouse, Dormitory Facility, Operator's Cottages, and Hell Hole Powerhouse Communication Line/Powerline
Dormitory and Cottages Water Supply Tank Powerline
Hell Hole Powerhouse to Rubicon River Gage below Hell Hole Dam Communication Line/Powerline
Hell Hole Dam Spillway Crest Gates Control Building Communication Line/Powerline (new) <sup>2</sup>
<b>Middle Fork Interbay Area</b>
Middle Fork Powerhouse to Middle Fork Powerhouse Butterfly Valve House Communication Line/Powerline
Middle Fork Powerhouse Butterfly Valve House to Radio Repeater near Hell Hole - Middle Fork Tunnel Surge Tank (underground) Communication Line/Powerline
Middle Fork Powerhouse to Middle Fork - Ralston Tunnel Intake and Gatehouse Communication Line/Powerline
Middle Fork Powerhouse to Middle Fork American River Gage above Middle Fork Powerhouse Communication Line/Powerline
<b>Ralston - Oxbow Area</b>
Ralston - Oxbow Tunnel Intake to Ralston Powerhouse Communication Line
Ralston Powerhouse to Ralston Powerhouse Butterfly Valve House Communication Line/Powerline
Ralston Afterbay Dam Generator Building to Ralston - Oxbow Tunnel Intake Communication Line/Powerline
Oxbow Powerhouse to Ralston Afterbay Dam Generator Building Communication Line/Powerline
<b>Photovoltaic Poles and Powerlines</b>
Photovoltaic Poles and Powerline at Duncan Creek Gage near French Meadows
Photovoltaic Pole and Powerline at Duncan Creek Gage below Diversion Dam
Photovoltaic Pole and Powerline at Duncan Creek Gage at Diversion Tunnel (new) <sup>2</sup>
Photovoltaic Pole and Powerline at Middle Fork American River Gage at French Meadows
Photovoltaic Pole and Powerline at Middle Fork American River Gage above Middle Fork Powerhouse
Photovoltaic Pole and Powerline at Middle Fork American River Gage below Interbay Dam (new) <sup>2</sup>
Photovoltaic Pole and Powerline at North Fork Long Canyon Creek Gage below Diversion Dam
Photovoltaic Pole and Powerline at North Fork Long Canyon Creek Gage below Diversion Dam (new) <sup>2</sup>
Photovoltaic Pole and Powerline at South Fork Long Canyon Creek Gage below Diversion Dam
Photovoltaic Pole and Powerline at South Fork Long Canyon Creek Gage below Diversion Dam (new) <sup>2</sup>
Photovoltaic Pole and Powerline at Rubicon River Gage above Ralston Powerhouse (existing, added to MFP) <sup>4</sup>
Photovoltaic Pole and Powerline at Middle Fork American River Gage near Foresthill
Photovoltaic Pole and Powerline at North Fork American River Gage above American River Pump Station (new) <sup>2</sup>
Photovoltaic Pole and Powerline at Rubicon River Gage above Ellicott Bridge (existing, added to MFP) <sup>4</sup>
<b>Microwave Reflectors and Radio Towers</b>
Passive Microwave Reflector Station above Middle Fork Interbay
Radio Communications Tower near French Meadows - Hell Hole Tunnel Gatehouse
Radio Communications Tower and Repeater near Hell Hole - Middle Fork Tunnel Surge Shaft and Tank
Passive Microwave Reflector Station above Ralston Afterbay
<b>Disposal Areas</b>
Duncan Creek Diversion Sediment Disposal Area
North Fork Long Canyon Crossing Sediment Disposal Area
Middle Fork Interbay Sediment Disposal Area

**Table 4-1. Proposed Action – Project Facilities and Features (continued).**

<b>Disposal Areas (continued)</b>
Ralston Ridge Sediment Disposal Area
<b>Sediment Augmentation Areas</b>
Middle Fork Interbay Augmentation Areas (new)
Junction Bar Augmentation Area (new)
Indian Bar Augmentation Area (existing, added to MFP) <sup>4</sup>
<b>Ancillary Facilities</b>
French Meadows Dam Generator Building
French Meadows Dam Staging Area
Dormitory Facility
Dormitory and Cottages Water Supply Tank
Hell Hole Staging Areas
Operator Cottages and Shop
Hell Hole Dam Spillway Crest Gates Control Building (new) <sup>2</sup>
Ralston Afterbay Dam Generator Building
Storage Building at Middle Fork - Ralston Tunnel Surge Shaft and Tank
<del>Ralston Afterbay Sediment Removal Access Point (converted)<sup>5</sup></del>
<b>Project Fences</b>
<b>Slope Fences</b>
French Meadows Powerhouse Penstock Rock Fence
French Meadows Powerhouse Slope Fence
Long Canyon Crossing Slope Fence
Middle Fork Powerhouse Upper Switchyard Slope Fence
Middle Fork Interbay Dam Slope Fence
Ralston Powerhouse Penstock and Butterfly Valve House Slope Fences
Ralston Powerhouse Slope Fence
Oxbow Powerhouse Slope Fence
<b>Public Safety Fences</b>
Dormitory Facility Barrier Fence
Hell Hole Dam General Parking Area Barrier Fence
North Fork Long Canyon Crossing Removable Section Barrier Fence
<b>Project Roads</b>
<b>Duncan Creek Area</b>
Duncan Creek Diversion Intake Road
Duncan Creek Diversion Dam Road
Duncan Creek Diversion Pool Road
<b>French Meadows Area</b>
Duncan Creek - Middle Fork Tunnel Portal Road
French Meadows - Hell Hole Tunnel Gatehouse Road
French Meadows Dam Outlet Works and South Leakage Weir Road
French Meadows Dam Staging Area and Spillway West Access Road
French Meadows Spillway East Access Road
French Meadows Dam North Leakage Weir Road
French Meadows Campground Water Supply Facility Access Road
<b>Hell Hole Area</b>
Hell Hole Dam and Powerhouse Road
Rubicon River Gage below Hell Hole Dam Road
Hell Hole Dam Leakage Weir Road
Hell Hole Dam Spillway Northern Access Point Road
French Meadows - Hell Hole Tunnel Portal Road
French Meadows Powerhouse Road

**Table 4-1. Proposed Action – Project Facilities and Features (continued).**

<b>Project Roads (continued)</b>
<b>Hell Hole Area (continued)</b>
Hell Hole - Middle Fork Tunnel Gatehouse Road
Dormitory Facility Road
Operator Cottages and Shop Road
Spur on North Side of Operator Cottages
Spur on South Side of Operator Cottages
Hell Hole Dam Spillway Discharge Channel Road Spur to Communication Line/Powerline
Hell Hole Dam Spillway Discharge Channel Road
Big Meadows Campground Water Supply Facility Access Road
Hell Hole Dam Spillway Gates Road (new) <sup>2</sup>
<b>Long Canyon Area</b>
North Fork Long Canyon Diversion North Road
North Fork Long Canyon Diversion South Road
North Fork Long Canyon Diversion Drop Inlet Road
South Fork Long Canyon Diversion and Drop Inlet Road
South Fork Long Canyon Diversion and Drop Inlet Cutoff Road
South Fork Long Canyon Diversion Drop Inlet Access Road
North Fork Long Canyon Crossing Removable Section North Road
North Fork Long Canyon Crossing Removable Section South Road
Middle Meadows Group Campground Water Supply Facility Access Road
<b>Middle Fork Interbay Area</b>
Middle Fork Interbay Dam Road
Middle Fork Interbay Dam to Powerhouse Road
Middle Fork Powerhouse Butterfly Valve House Road
Middle Fork Powerhouse Penstock and Butterfly Valve House Road
Middle Fork Powerhouse Upper Switchyard Road
<b>Ralston - Oxbow Area</b>
Brushy Canyon Adit Road
Ralston Powerhouse Butterfly Valve House Road
Ralston Afterbay Dam Access Road
Indian Bar Access Road
Oxbow Powerhouse Road
Ralston - Oxbow Tunnel Intake Road
Ralston Afterbay Private Boat Ramp Road
Ralston Afterbay Dam and Access Point Road
<b>Project Trails</b>
<b>Duncan Creek Area</b>
Duncan Creek Diversion Dam North Trail
Duncan Creek Diversion Dam South Trail
Photovoltaic Poles and Powerline at Duncan Creek Gage near French Meadows Trail
Duncan Creek Gage near French Meadows Trail
Duncan Creek Gage below Diversion Dam Trail
<b>Long Canyon Area</b>
North Fork Long Canyon Creek Gage below Diversion Dam Trail (new) <sup>2</sup>
South Fork Long Canyon Creek Gage below Diversion Dam Trail (new) <sup>2</sup>
<b>Middle Fork Interbay Area</b>
Middle Fork American River Gage above Middle Fork Powerhouse Trail
Passive Microwave Reflector Station above Middle Fork Interbay Trail
Middle Fork American River Gage below Interbay Dam Trail (new) <sup>2</sup>

**Table 4-1. Proposed Action – Project Facilities and Features (continued).**

<b>Project Trails (continued)</b>
<b>Ralston Afterbay Area</b>
Passive Microwave Reflector Station above Ralston Afterbay Trail
Rubicon River Gage above Ralston Powerhouse Trail (existing, added to MFP) <sup>3</sup>
North Fork American River Gage above American River Pump Station Trail (new) <sup>2</sup>

<sup>1</sup>Existing gage to remain in place until infrastructure modification is complete.  
<sup>2</sup>This facility or feature will be constructed under the Proposed Action.  
<sup>3</sup>Existing gage or trail now required for Project operation and maintenance.  
<sup>4</sup>Existing facility that has been added to the Project.  
<sup>5</sup>Converted to Ralston Afterbay Sediment Removal Access Point Boat Ramp.

**Table 4-2. Proposed Action – Project Recreation Facilities and Features.**

<b>Duncan Area</b>
Duncan Creek Diversion Primitive Recreation Site (new)
<b>French Meadows Area</b>
Ahart Campground (enhanced)
Coyote Group Campground
Poppy Campground (reduced)
French Meadows Campground
Gates Group Campground
Lewis Campground
French Meadows Picnic Area
French Meadows Boat Ramp (enhanced)
French Meadows Dump Station
<del>McGuire Picnic Area and Beach (converted)<sup>1</sup></del>
McGuire Group Campground (new)
McGuire Boat Ramp and Associated Parking (modified)
<b>Hell Hole Area</b>
Big Meadows Campground
Hell Hole Campground (reduced)
<del>Upper Hell Hole Campground (removed)</del>
Hell Hole Vista
Hell Hole Boat Ramp (enhanced)
Hell Hole General Parking Area and Hell Hole Boat Ramp Parking Area
<b>Ralston Afterbay Area</b>
Ralston Picnic Area (reduced)
Ralston Picnic Area Cartop Boat Ramp
Ralston Afterbay Sediment Removal Access Point Boat Ramp (new) <sup>2</sup>
Indian Bar Rafting Access and General Parking (enhanced)
<b>Long Canyon Area</b>
Middle Meadows Group Campground
<b>Project Recreation Facility Water Supplies</b>
Dolly Creek Water Supply
French Meadows Campground Water Supply
Big Meadows Campground Water Supply
Middle Meadows Group Campground Water Supply

<sup>1</sup>This facility will be converted to the McGuire Group Campground.

<sup>2</sup>This facility replaces the Ralston Afterbay Sediment Removal Access Point.

**Table 4-3. Project Gaging Stations and Weirs.**

	MIF	Pulse Flow	Down Ramp of Spill Flows	Operations of Oxbow Powerhouse (ramping rate/max flow)	Recreation Flow Releases	Reservoir Minimum Pool	Real-Time <sup>1</sup>	Gage Type
<b>Gaging Stations and Weirs</b>								
<b>Stream Gages and Weirs</b>								
Duncan Creek near French Meadows (USGS Gage No. 11427700) (interim) <sup>2</sup>	X							Gage/Weir
Duncan Creek below Diversion Dam (USGS Gage No. 11427750)	X	X					X	Gage/Weir
Middle Fork American River at French Meadows (USGS Gage No. 11427500)	X <sup>3</sup>	X	X				X	Gage/Weir
Middle Fork American River at French Meadows Dam (new) <sup>4</sup>	X	X	X					TBD <sup>6</sup>
Rubicon River at Hell Hole Dam Spillway (HHDS) (new) <sup>4</sup>		X	X					Gage/Weir
Rubicon River below Hell Hole Dam (USGS Gage No. 11428800) (interim) <sup>2</sup>	X							Gage/Weir
Rubicon River at Hell Hole Dam (new) <sup>4</sup>	X	X	X					TBD <sup>6</sup>
North Fork Long Canyon Creek below Diversion Dam (USGS Gage No. 11433085) (interim) <sup>2</sup>	X							Gage/Weir
North Fork Long Canyon Creek below Diversion Dam (NFLCC) (new) <sup>4</sup>	X	X					X	Gage
South Fork Long Canyon Creek below Diversion Dam (USGS Gage No. 11433065) (interim) <sup>2</sup>	X							Gage/Weir
South Fork Long Canyon Creek below Diversion Dam (SFLCC) (new) <sup>4</sup>	X	X					X	Gage
Middle Fork American River below Interbay Dam (USGS Gage No. 11427770) (interim) <sup>2</sup>	X							TBD <sup>6</sup>
Middle Fork American River above Middle Fork Powerhouse (USGS Gage No. 11427760)							X	Gage
Middle Fork American River below Interbay Dam (MFARIB) (new) <sup>4</sup>	X	X					X	Gage
Middle Fork American River near Foresthill (USGS Gage No. 11433300)	X			X	X		X	Gage
Middle Fork American River at Ralston Afterbay Dam (new) <sup>4</sup>	X							TBD <sup>6</sup>
Rubicon River above Ralston Powerhouse (RRRP) (existing, added to MFP) <sup>5</sup>							X	Gage
North Fork American River above American River Pump Station (NFARPS) (new) <sup>4</sup>					X		X	Gage
Rubicon River above Ellicott Bridge (RREB) (existing, added to MFP) <sup>5</sup>							X	Gage
<b>Diversion Gages</b>								
Duncan Creek Diversion Tunnel (DCDT) (new) <sup>4</sup>	X	X						Sonar
North Fork Long Canyon Creek Diversion Tunnel (USGS Gage No. 11433080) (modified)	X							Sonar
South Fork Long Canyon Creek Diversion Tunnel (USGS Gage No. 11433060) (modified)	X							Sonar
<b>Reservoir Gages</b>								
French Meadows Reservoir (USGS Gage No. 11427400)						X	X	Storage Recorder
French Meadows Reservoir Staff Gage								Staff Gage
Hell Hole Reservoir (USGS Gage No. 11428700)						X	X	Storage Recorder
Hell Hole Reservoir Staff Gage								Staff Gage
Middle Fork Interbay Reservoir								Storage Recorder
Ralston Afterbay Reservoir								Storage Recorder
<b>Powerhouse Gages</b>								
French Meadows Powerhouse (USGS Gage No. 11427200)								Electrical
Middle Fork Powerhouse (USGS Gage No. 11428600)								Electrical
Ralston Powerhouse (USGS Gage No. 11427765)								Electrical
Oxbow Powerhouse (USGS Gage No. 11433212)								Electrical
Oxbow Powerhouse Penstock (OXBPP) (new) <sup>4</sup>				X				TBD <sup>6</sup>

**Table 4-3. Project Gaging Stations and Weirs.**

	MIF	Pulse Flow	Down Ramp of Spill Flows	Operations of Oxbow Powerhouse (ramping rate/max flow)	Recreation Flow Releases	Reservoir Minimum Pool	Real-Time <sup>1</sup>	Gage Type
<b>Gaging Stations and Weirs</b>								
<b>Leakage Weirs</b>								
French Meadows Dam Leakage Weirs Nos. 1-6								Weir
Hell Hole Dam Leakage Weir								Weir

**Notes:**

<sup>1</sup>Real-time flows from stream gages are measures at 15-minute intervals and flows at reservoir gages are measured daily.

<sup>2</sup>Existing gage to remain in place until infrastructure modification is completed.

<sup>3</sup>Interim gage to be replaced with Middle Fork American River Gages at French Meadows Dam Outlet Works for MIF only. This gage will be maintained as part of the MFP to monitor pulse flows, down ramp of spill flows, and collect real-time flow data.

<sup>4</sup>This facility or feature will be constructed under the Proposed Action.

<sup>5</sup>Existing gage, now required for Project operations.

<sup>6</sup>Type of gage installed to be determined during final design.

**Table 4-4. Proposed Action – Description of Routine Facility Inspections, Testing, and Maintenance Activities at Project Facilities and Features.**

Project Facility or Feature [Items in red represent a change from the No-Action Alternative]	Inspections, Testing, and Maintenance Activities																				
	Inspections & Maintenance		Vegetation Management			Pest Management				Sediment Management				Slope Stabilization (Falling Rock Control)		Debris Management			Facility Painting	Pole Replacement/Retrofit	
										Small Diversions		Medium Reservoirs									
	Tunnel and Powerhouse Inspection, Testing, and Maintenance	Spillway & Tainter Gate Testing	Trimming by Hand	Trimming w/Equipment	Herbicide Use	Noxious Weed Management <sup>1</sup>	Physical Rodent Control (snap traps)	Over-the-Counter Rodenticide Use	Rodenticide Use - Fumigants	Physical Removal w/Equipment	Interim Sediment Mgmt.	Contingency Sediment Mgmt.	Physical Removal w/Equipment	Sediment Augmentation	Sediment Disposal	Gunite (erosion control)	Rock Removal/Fence Repair	Large Woody Debris			Cleaning Trash Racks
<b>Dams, Reservoirs, and Diversion Pools</b>																					
<b>Large Dams</b>																					
French Meadows Dam and Outlet Works (modified)		A	A		A	X			X												
Hell Hole Dam and Outlet Works (modified)	A <sup>2</sup>	A	A		A	X			X												
<b>Medium Dams</b>																					
Middle Fork Interbay Dam and Outlet Works (modified)		A	A						X												
Ralston Afterbay Dam and Outlet Works		A	A						X												
<b>Small Dams</b>																					
Duncan Creek Diversion Dam (modified)			A																		
North Fork Long Canyon Diversion Dam (modified)			A		X																
South Fork Long Canyon Diversion Dam (modified)			A																		
<b>Large Reservoirs</b>																					
French Meadows Reservoir																				X	
Hell Hole Reservoir																	I		X		
<b>Medium Reservoir</b>																					
Middle Fork Interbay												I		I <sup>3</sup>			I	R	X		
Ralston Afterbay												I		I <sup>3</sup>			I	R	X		

**Table 4-4. Proposed Action – Description of Routine Facility Inspections, Testing, and Maintenance Activities at Project Facilities and Features (continued).**

Project Facility or Feature [Items in red represent a change from the No-Action Alternative]	Inspections, Testing, and Maintenance Activities																				
	Inspections & Maintenance		Vegetation Management			Pest Management				Sediment Management				Slope Stabilization (Falling Rock Control)		Debris Management			Facility Painting	Pole Replacement/Retirofit	
	Tunnel and Powerhouse Inspection, Testing, and Maintenance	Spillway & Tainter Gate Testing	Trimming by Hand	Trimming w/Equipment	Herbicide Use	Noxious Weed Management <sup>1</sup>	Physical Rodent Control (snap traps)	Over-the-Counter Rodenticide Use	Rodenticide Use - Fumigants	Small Diversions		Medium Reservoirs		Physical Removal w/Equipment	Sediment Augmentation	Sediment Disposal	Gunite (erosion control)	Rock Removal/Fence Repair			Large Woody Debris
										Physical Removal w/Equipment	Interim Sediment Mgmt.	Contingency Sediment Mgmt.	Physical Removal w/Equipment						Sediment Augmentation		
<b>Dams, Reservoirs, and Diversion Pools (continued)</b>																					
<b>Small Diversion Pools</b>																					
Duncan Creek Diversion Pool																					
Pre-modification of diversion dam			A																	R	*
Post modification of diversion dam			A										I								
North Fork Long Canyon Diversion Pool																					
Pre-modification of diversion dam			A			X														R	
Post modification of diversion dam			A			X															
South Fork Long Canyon Diversion Pool																					
Pre-modification of diversion dam			A			X														R	
Post modification of diversion dam			A			X															
<b>Water Conveyance Systems</b>																					
<b>Tunnels</b>																					
Duncan Creek - Middle Fork Tunnel																					
French Meadows - Hell Hole Tunnel																					
Hell Hole - Middle Fork Tunnel																					
Middle Fork - Ralston Tunnel																					
Ralston - Oxbow Tunnel	A																				
<b>Diversion Pipes and Drop Inlets</b>																					
North Fork Long Canyon Diversion Pipe and Drop Inlet			A																		
South Fork Long Canyon Diversion Pipe and Drop Inlet			A																		

**Table 4-4. Proposed Action – Description of Routine Facility Inspections, Testing, and Maintenance Activities at Project Facilities and Features (continued).**

Project Facility or Feature [Items in red represent a change from the No-Action Alternative]	Inspections, Testing, and Maintenance Activities																			
	Inspections & Maintenance		Vegetation Management			Pest Management			Sediment Management			Slope Stabilization (Falling Rock Control)		Debris Management			Facility Painting	Pole Replacement/Retrofit		
	Tunnel and Powerhouse Inspection, Testing, and Maintenance	Spillway & Tainter Gate Testing	Trimming by Hand	Trimming w/Equipment	Herbicide Use	Noxious Weed Management <sup>1</sup>	Physical Rodent Control (snap traps)	Over-the-Counter Rodenticide Use	Rodenticide Use - Fumigants	Small Diversions			Medium Reservoirs		Gunite (erosion control)	Rock Removal/Fence Repair			Large Woody Debris	Cleaning Trash Racks
										Physical Removal w/Equipment	Interim Sediment Mgmt.	Contingency Sediment Mgmt.	Physical Removal w/Equipment	Sediment Augmentation			Sediment Disposal			
<b>Water Conveyance Systems (continued)</b>																				
<b>Surge Shafts and Adits</b>																				
Brushy Canyon Adit			A			X														
Hell Hole - Middle Fork Tunnel Surge Shaft and Tank			A																	I
Middle Fork - Ralston Tunnel Surge Shaft and Tank			A			X														I
<b>Removable Sections and Portals</b>																				
Duncan Creek - Middle Fork Tunnel Portal			A																	I
French Meadows - Hell Hole Tunnel Removable Section			A																	I
Hell Hole - Middle Fork Tunnel Removable Section			A			X														I
Middle Fork - Ralston Tunnel Removable Section			A																	I
North Fork Long Canyon Crossing Removable Section			A			X														I
<b>Intakes and Gatehouses</b>																				
Duncan Creek - Middle Fork Tunnel Intake			A																	
French Meadows - Hell Hole Tunnel Gatehouse			A																	
French Meadows - Hell Hole Tunnel Intake			A																	
Hell Hole - Middle Fork Tunnel Gatehouse			A																	
Hell Hole - Middle Fork Tunnel Intake			A																	
Middle Fork - Ralston Tunnel Intake and Gatehouse			A			X														
Ralston - Oxbow Tunnel Intake			A			X														

**Table 4-4. Proposed Action – Description of Routine Facility Inspections, Testing, and Maintenance Activities at Project Facilities and Features (continued).**

Project Facility or Feature [Items in red represent a change from the No-Action Alternative]	Inspections, Testing, and Maintenance Activities																			
	Inspections & Maintenance		Vegetation Management			Pest Management			Sediment Management				Slope Stabilization (Falling Rock Control)		Debris Management			Facility Painting	Pole Replacement/Retrofit	
	Tunnel and Powerhouse Inspection, Testing, and Maintenance	Spillway & Tainter Gate Testing	Trimming by Hand	Trimming w/Equipment	Herbicide Use	Noxious Weed Management <sup>1</sup>	Physical Rodent Control (snap traps)	Over-the-Counter Rodenticide Use	Rodenticide Use - Fumigants	Small Diversions		Medium Reservoirs		Gunite (erosion control)	Rock Removal/Fence Repair	Large Woody Debris	Cleaning Trash Racks			Log Booms
										Physical Removal w/Equipment	Interim Sediment Mgmt.	Contingency Sediment Mgmt.	Physical Removal w/Equipment					Sediment Augmentation	Sediment Disposal	
<b>Water Conveyance Systems (continued)</b>																				
<b>Penstocks and Valve Houses</b>																				
French Meadows Powerhouse Penstock and Butterfly Valve House			A		A															I
Middle Fork Powerhouse Penstock and Butterfly Valve House			A		A	X								I						I
Ralston Powerhouse Penstock and Butterfly Valve House			A		A															I
<b>Powerhouses, Switchyards, and Substations</b>																				
French Meadows Powerhouse and Switchyard	A		A		A	X	X	X												
Hell Hole Powerhouse	A		A			X	X	X												
Hell Hole Substation			A			X	X	X												
Middle Fork Powerhouse and Upper and Lower Switchyards	A		A		A	X	X	X												
Ralston Powerhouse and Switchyard	A		A		A	X	X	X												
Oxbow Powerhouse and Switchyard	A		A		A	X	X	X												
<b>Gaging Stations and Weirs</b>																				
<b>Stream Gages and Weirs</b>																				
Duncan Creek near French Meadows (USGS Gage No. 11427700) (interim) <sup>4</sup>			A																	
Duncan Creek below Diversion Dam (USGS Gage No. 11427750)			A																	
Middle Fork American River at French Meadows (USGS Gage No. 11427500)			A																	

**Table 4-4. Proposed Action – Description of Routine Facility Inspections, Testing, and Maintenance Activities at Project Facilities and Features (continued).**

Project Facility or Feature [Items in red represent a change from the No-Action Alternative]	Inspections, Testing, and Maintenance Activities																			
	Inspections & Maintenance		Vegetation Management			Pest Management			Sediment Management				Slope Stabilization (Falling Rock Control)		Debris Management			Facility Painting	Pole Replacement/Retrofit	
	Tunnel and Powerhouse Inspection, Testing, and Maintenance	Spillway & Tainter Gate Testing	Trimming by Hand	Trimming w/Equipment	Herbicide Use	Noxious Weed Management <sup>1</sup>	Physical Rodent Control (snap traps)	Over-the-Counter Rodenticide Use	Rodenticide Use - Fumigants	Small Diversions		Medium Reservoirs		Gunite (erosion control)	Rock Removal/Fence Repair	Large Woody Debris	Cleaning Trash Racks			Log Booms
										Physical Removal w/Equipment	Interim Sediment Mgmt.	Contingency Sediment Mgmt.	Physical Removal w/Equipment					Sediment Augmentation	Sediment Disposal	
<b>Gaging Stations and Weirs (continued)</b>																				
<b>Stream Gages and Weirs (continued)</b>																				
Middle Fork American River at French Meadows Dam (new) <sup>5</sup>																				
Rubicon River at Hell Hole Dam Spillway (HHDS) (new) <sup>5</sup>																				
Rubicon River below Hell Hole Dam (USGS Gage No. 11428800) (interim) <sup>4</sup>			A																	
Rubicon River at Hell Hole Dam (new) <sup>5</sup>																				
North Fork Long Canyon Creek below Diversion Dam (USGS Gage No. 11433085) (interim) <sup>4</sup>			A																	
North Fork Long Canyon Creek below Diversion Dam (NFLCC) (new) <sup>5</sup>			A																	
South Fork Long Canyon Creek below Diversion Dam (USGS Gage No. 11433065) (interim) <sup>4</sup>			A																	
South Fork Long Canyon Creek below Diversion Dam (SFLCC) (new) <sup>5</sup>			A																	
Middle Fork American River below Interbay Dam (USGS Gage No. 11427770) (interim) <sup>4</sup>			A																	
Middle Fork American River above Middle Fork Powerhouse (USGS Gage No. 11427760)			A																	

**Table 4-4. Proposed Action – Description of Routine Facility Inspections, Testing, and Maintenance Activities at Project Facilities and Features (continued).**

Project Facility or Feature [Items in red represent a change from the No-Action Alternative]	Inspections, Testing, and Maintenance Activities																			
	Inspections & Maintenance		Vegetation Management			Pest Management				Sediment Management				Slope Stabilization (Falling Rock Control)		Debris Management			Facility Painting	Pole Replacement/Retirofit
										Small Diversions		Medium Reservoirs								
	Tunnel and Powerhouse Inspection, Testing, and Maintenance	Spillway & Tainter Gate Testing	Trimming by Hand	Trimming w/Equipment	Herbicide Use	Noxious Weed Management <sup>1</sup>	Physical Rodent Control (snap traps)	Over-the-Counter Rodenticide Use	Rodenticide Use - Fumigants	Physical Removal w/Equipment	Interim Sediment Mgmt.	Contingency Sediment Mgmt.	Physical Removal w/Equipment	Sediment Augmentation	Sediment Disposal	Gunite (erosion control)	Rock Removal/Fence Repair	Large Woody Debris	Cleaning Trash Racks	Log Booms
<b>Gaging Stations and Weirs (continued)</b>																				
<b>Stream Gages and Weirs (continued)</b>																				
Middle Fork American River below Interbay Dam (MFARIB) (new) <sup>5</sup>			A																	
Middle Fork American River near Foresthill (USGS Gage No. 11433300)			A																	
Middle Fork American River at Ralston Afterbay Dam (new) <sup>5</sup>																				
Rubicon River above Ralston Powerhouse (RRRP) (existing, added to MFP) <sup>6</sup>			A																	
North Fork American River above American River Pump Station (NFARPS) (new) <sup>5</sup>			A																	
Rubicon River above Ellicott Bridge (RREB) (existing, added to MFP) <sup>6</sup>			A																	
<b>Diversion Gages</b>																				
Duncan Creek Diversion Tunnel (DCDT) (new) <sup>5</sup>																				
North Fork Long Canyon Creek Diversion Tunnel (USGS Gage No. 11433080) (modified)																				
South Fork Long Canyon Creek Diversion Tunnel (USGS Gage No. 11433060) (modified)																				
<b>Reservoir Gages</b>																				
French Meadows Reservoir (USGS Gage No. 11427400)																				

**Table 4-4. Proposed Action – Description of Routine Facility Inspections, Testing, and Maintenance Activities at Project Facilities and Features (continued).**

Project Facility or Feature [Items in red represent a change from the No-Action Alternative]	Inspections, Testing, and Maintenance Activities																			
	Inspections & Maintenance		Vegetation Management			Pest Management			Sediment Management				Slope Stabilization (Falling Rock Control)		Debris Management			Facility Painting	Pole Replacement/Retrofit	
									Small Diversions		Medium Reservoirs									
	Tunnel and Powerhouse Inspection, Testing, and Maintenance	Spillway & Tainter Gate Testing	Trimming by Hand	Trimming w/Equipment	Herbicide Use	Noxious Weed Management <sup>1</sup>	Physical Rodent Control (snap traps)	Over-the-Counter Rodenticide Use	Rodenticide Use - Fumigants	Physical Removal w/Equipment	Interim Sediment Mgmt.	Contingency Sediment Mgmt.	Physical Removal w/Equipment	Sediment Augmentation	Sediment Disposal	Gunite (erosion control)	Rock Removal/Fence Repair	Large Woody Debris	Cleaning Trash Racks	Log Booms
<b>Gaging Stations and Weirs (continued)</b>																				
<b>Reservoir Gages (continued)</b>																				
French Meadows Reservoir Staff Gage																				
Hell Hole Reservoir (USGS Gage No. 11428700)																				
Hell Hole Reservoir Staff Gage																				
Middle Fork Interbay Reservoir																				
Ralston Afterbay Reservoir																				
<b>Powerhouse Gages</b>																				
French Meadows Powerhouse (USGS Gage No. 11427200)																				
Middle Fork Powerhouse (USGS Gage No. 11428600)																				
Ralston Powerhouse (USGS Gage No. 11427765)																				
Oxbow Powerhouse (USGS Gage No. 11433212)																				
Oxbow Powerhouse Penstock (OXBPP) (new) <sup>6</sup>																				
<b>Leakage Weirs</b>																				
French Meadows Dam Leakage Weirs Nos. 1-6			A																	
Hell Hole Dam Leakage Weir			A			X														

**Table 4-4. Proposed Action – Description of Routine Facility Inspections, Testing, and Maintenance Activities at Project Facilities and Features (continued).**

Project Facility or Feature [Items in red represent a change from the No-Action Alternative]	Inspections, Testing, and Maintenance Activities																			
	Inspections & Maintenance		Vegetation Management			Pest Management				Sediment Management				Slope Stabilization (Falling Rock Control)		Debris Management			Facility Painting	Pole Replacement/Retirofit
										Small Diversions		Medium Reservoirs								
	Tunnel and Powerhouse Inspection, Testing, and Maintenance	Spillway & Tainter Gate Testing	Trimming by Hand	Trimming w/Equipment	Herbicide Use	Noxious Weed Management <sup>1</sup>	Physical Rodent Control (snap traps)	Over-the-Counter Rodenticide Use	Rodenticide Use - Fumigants	Physical Removal w/Equipment	Interim Sediment Mgmt.	Contingency Sediment Mgmt.	Physical Removal w/Equipment	Sediment Augmentation	Sediment Disposal	Gunite (erosion control)	Rock Removal/Fence Repair	Large Woody Debris	Cleaning Trash Racks	Log Booms
<b>Project Communication Lines and Powerlines</b>																				
<b>French Meadows Area</b>																				
French Meadows Dam Generator Building to French Meadows Dam Outlet Works Powerline			A			X														S
French Meadows Dam Generator Building to French Meadows Dam Spillway Gates Powerline			A																	S
<b>Hell Hole Area</b>																				
French Meadows Powerhouse to French Meadows Powerhouse Penstock and Butterfly Valve House Communication Line/Powerline			A		A															S
French Meadows Powerhouse and Switchyard to Hell Hole - Middle Fork Tunnel Gatehouse, Dormitory Facility, Operator's Cottages, and Hell Hole Powerhouse Communication Line/Powerline			A																	S
Dormitory and Cottages Water Supply Tank Powerline			A																	S
Hell Hole Powerhouse to Rubicon River Gage below Hell Hole Dam Communication Line/Powerline			A																	S
Hell Hole Dam Spillway Crest Gates Control Building Communication Line/Powerline (new) <sup>5</sup>																				
<b>Middle Fork Interbay Area</b>																				
Middle Fork Powerhouse to Middle Fork Powerhouse Butterfly Valve House Communication Line/Powerline			A		A															S

**Table 4-4. Proposed Action – Description of Routine Facility Inspections, Testing, and Maintenance Activities at Project Facilities and Features (continued).**

Project Facility or Feature [Items in red represent a change from the No-Action Alternative]	Inspections, Testing, and Maintenance Activities																			
	Inspections & Maintenance		Vegetation Management			Pest Management			Sediment Management				Slope Stabilization (Falling Rock Control)		Debris Management			Facility Painting	Pole Replacement/Retrofit	
	Tunnel and Powerhouse Inspection, Testing, and Maintenance	Spillway & Tainter Gate Testing	Trimming by Hand	Trimming w/Equipment	Herbicide Use	Noxious Weed Management <sup>1</sup>	Physical Rodent Control (snap traps)	Over-the-Counter Rodenticide Use	Rodenticide Use - Fumigants	Small Diversions		Medium Reservoirs		Gunite (erosion control)	Rock Removal/Fence Repair	Large Woody Debris	Cleaning Trash Racks			Log Booms
										Physical Removal w/Equipment	Interim Sediment Mgmt.	Contingency Sediment Mgmt.	Physical Removal w/Equipment					Sediment Augmentation	Sediment Disposal	
<b>Project Communication Lines and Powerlines (continued)</b>																				
<b>Middle Fork Interbay Area (continued)</b>																				
Middle Fork Powerhouse Butterfly Valve House to Radio Repeater near Hell Hole - Middle Fork Tunnel Surge Tank (underground) Communication Line/Powerline			A			X														S
Middle Fork Powerhouse to Middle Fork - Ralston Tunnel Intake and Gatehouse Communication Line/Powerline			A			X														S
Middle Fork Powerhouse to Middle Fork American River Gage above Middle Fork Powerhouse Communication Line/Powerline			A			X														S
<b>Ralston - Oxbow Area</b>																				
Ralston - Oxbow Tunnel Intake to Ralston Powerhouse Communication Line			A			X														S
Ralston Powerhouse to Ralston Powerhouse Butterfly Valve House Communication Line/Powerline			A		A	X														S
Ralston Afterbay Dam Generator Building to Ralston - Oxbow Tunnel Intake Communication Line/Powerline			A			X														S
Oxbow Powerhouse to Ralston Afterbay Dam Generator Building Communication Line/Powerline			A			X														S
<b>Photovoltaic Poles and Powerlines</b>																				
Photovoltaic Poles and Powerline at Duncan Creek Gage near French Meadows			A																	

**Table 4-4. Proposed Action – Description of Routine Facility Inspections, Testing, and Maintenance Activities at Project Facilities and Features (continued).**

Project Facility or Feature [Items in red represent a change from the No-Action Alternative]	Inspections, Testing, and Maintenance Activities																			
	Inspections & Maintenance		Vegetation Management			Pest Management			Sediment Management				Slope Stabilization (Falling Rock Control)		Debris Management			Facility Painting	Pole Replacement/Retirofit	
	Tunnel and Powerhouse Inspection, Testing, and Maintenance	Spillway & Tainter Gate Testing	Trimming by Hand	Trimming w/Equipment	Herbicide Use	Noxious Weed Management <sup>1</sup>	Physical Rodent Control (snap traps)	Over-the-Counter Rodenticide Use	Rodenticide Use - Fumigants	Small Diversions		Medium Reservoirs		Gunite (erosion control)	Rock Removal/Fence Repair	Large Woody Debris	Cleaning Trash Racks			Log Booms
										Physical Removal w/Equipment	Interim Sediment Mgmt.	Contingency Sediment Mgmt.	Physical Removal w/Equipment					Sediment Augmentation	Sediment Disposal	
<b>Project Communication Lines and Powerlines (continued)</b>																				
<b>Photovoltaic Poles and Powerlines (continued)</b>																				
Photovoltaic Pole and Powerline at Duncan Creek Gage below Diversion Dam			A																	
Photovoltaic Pole and Powerline at Duncan Creek Gage at Diversion Tunnel (new) <sup>5</sup>			A																	
Photovoltaic Pole and Powerline at Middle Fork American River Gage at French Meadows			A																	
Photovoltaic Pole and Powerline at Middle Fork American River Gage above Middle Fork Powerhouse			A																	
Photovoltaic Pole and Powerline at Middle Fork American River Gage below Interbay Dam (new) <sup>5</sup>			A																	
Photovoltaic Pole and Powerline at North Fork Long Canyon Creek Gage below Diversion Dam			A																	
Photovoltaic Pole and Powerline at North Fork Long Canyon Creek Gage below Diversion Dam (new) <sup>5</sup>			A																	
Photovoltaic Pole and Powerline at South Fork Long Canyon Creek Gage below Diversion Dam			A																	
Photovoltaic Pole and Powerline at South Fork Long Canyon Creek Gage below Diversion Dam (new) <sup>5</sup>			A																	
Photovoltaic Pole and Powerline at Rubicon River Gage above Ralston Powerhouse (existing, added to MFP) <sup>7</sup>			A																	

**Table 4-4. Proposed Action – Description of Routine Facility Inspections, Testing, and Maintenance Activities at Project Facilities and Features (continued).**

Project Facility or Feature <i>[Items in red represent a change from the No-Action Alternative]</i>	Inspections, Testing, and Maintenance Activities																			
	Inspections & Maintenance		Vegetation Management			Pest Management			Sediment Management				Slope Stabilization (Falling Rock Control)		Debris Management			Facility Painting	Pole Replacement/Retrofit	
	Tunnel and Powerhouse Inspection, Testing, and Maintenance	Spillway & Tainter Gate Testing	Trimming by Hand	Trimming w/Equipment	Herbicide Use	Noxious Weed Management <sup>1</sup>	Physical Rodent Control (snap traps)	Over-the-Counter Rodenticide Use	Rodenticide Use - Fumigants	Physical Removal w/Equipment	Interim Sediment Mgmt.	Contingency Sediment Mgmt.	Physical Removal w/Equipment	Sediment Augmentation	Sediment Disposal	Gunite (erosion control)	Rock Removal/Fence Repair			Large Woody Debris
<b>Project Communication Lines and Powerlines (continued)</b>																				
<b>Photovoltaic Poles and Powerlines (continued)</b>																				
Photovoltaic Pole and Powerline at Middle Fork American River Gage near Foresthill			A																	
Photovoltaic Pole and Powerline at North Fork American River Gage above American River Pump Station (new) <sup>5</sup>			A																	
Photovoltaic Pole and Powerline at Rubicon River Gage above Ellicott Bridge (existing, added to MFP) <sup>7</sup>			A																	
<b>Microwave Reflectors and Radio Towers</b>																				
Passive Microwave Reflector Station above Middle Fork Interbay			I																	
Radio Communications Tower near French Meadows - Hell Hole Tunnel Gatehouse			I																	
Radio Communications Tower and Repeater near Hell Hole - Middle Fork Tunnel Surge Shaft and Tank			I																	
Passive Microwave Reflector Station above Ralston Afterbay			I			X														
<b>Disposal Areas</b>																				
Duncan Creek Diversion Sediment Disposal Area																				
North Fork Long Canyon Crossing Sediment Disposal Area						X														
Middle Fork Interbay Sediment Disposal Area						X														
Ralston Ridge Sediment Disposal Area						X														

**Table 4-4. Proposed Action – Description of Routine Facility Inspections, Testing, and Maintenance Activities at Project Facilities and Features (continued).**

Project Facility or Feature [Items in red represent a change from the No-Action Alternative]	Inspections, Testing, and Maintenance Activities																			
	Inspections & Maintenance		Vegetation Management			Pest Management			Sediment Management				Slope Stabilization (Falling Rock Control)		Debris Management			Facility Painting	Pole Replacement/Retrofit	
	Tunnel and Powerhouse Inspection, Testing, and Maintenance	Spillway & Tainter Gate Testing	Trimming by Hand	Trimming w/Equipment	Herbicide Use	Noxious Weed Management <sup>1</sup>	Physical Rodent Control (snap traps)	Over-the-Counter Rodenticide Use	Rodenticide Use - Fumigants	Small Diversions		Medium Reservoirs		Gunite (erosion control)	Rock Removal/Fence Repair	Large Woody Debris	Cleaning Trash Racks			Log Booms
										Physical Removal w/Equipment	Interim Sediment Mgmt.	Contingency Sediment Mgmt.	Physical Removal w/Equipment					Sediment Augmentation	Sediment Disposal	
<b>Sediment Augmentation Areas</b>																				
Middle Fork Interbay Augmentation Areas (new)																				
Junction Bar Augmentation Area (new)			A			X														
Indian Bar Augmentation Area (existing, added to MFP) <sup>7</sup>			A			X														
<b>Ancillary Facilities</b>																				
French Meadows Dam Generator Building			A		A		X	X												I
French Meadows Dam Staging Area					I	X														
Dormitory Facility			A		A		X	X												I
Dormitory and Cottages Water Supply Tank			A		I		X	X												I
Hell Hole Staging Areas					A															
Operator Cottages and Shop			A		A	X	X	X												I
Hell Hole Dam Spillway Crest Gates Control Building (new) <sup>5</sup>			A				X	X												
Ralston Afterbay Dam Generator Building			A		A	X	X	X												I
Storage Building at Middle Fork - Ralston Tunnel Surge Shaft and Tank			A		A	X														
<del>Ralston Afterbay Sediment Removal Access Point (converted)<sup>9</sup></del>																				
<b>Project Fences</b>																				
<b>Slope Fences</b>																				
French Meadows Powerhouse Penstock Rock Fence															A					
French Meadows Powerhouse Slope Fence			I			X									A					

**Table 4-4. Proposed Action – Description of Routine Facility Inspections, Testing, and Maintenance Activities at Project Facilities and Features (continued).**

Project Facility or Feature [Items in red represent a change from the No-Action Alternative]	Inspections, Testing, and Maintenance Activities																			
	Inspections & Maintenance		Vegetation Management			Pest Management				Sediment Management				Slope Stabilization (Falling Rock Control)		Debris Management			Facility Painting	Pole Replacement/Retrofit
	Tunnel and Powerhouse Inspection, Testing, and Maintenance	Spillway & Tainter Gate Testing	Trimming by Hand	Trimming w/Equipment	Herbicide Use	Noxious Weed Management <sup>1</sup>	Physical Rodent Control (snap traps)	Over-the-Counter Rodenticide Use	Rodenticide Use - Fumigants	Small Diversions		Medium Reservoirs		Gunite (erosion control)	Rock Removal/Fence Repair	Large Woody Debris	Cleaning Trash Racks	Log Booms		
										Physical Removal w/Equipment	Interim Sediment Mgmt.	Contingency Sediment Mgmt.	Physical Removal w/Equipment						Sediment Augmentation	Sediment Disposal
<b>Project Fences</b>																				
<b>Slope Fences</b>																				
Long Canyon Crossing Slope Fence			I												A					
Middle Fork Powerhouse Upper Switchyard Slope Fence					I	X									A					
Middle Fork Interbay Dam Slope Fence															A					
Ralston Powerhouse Penstock and Butterfly Valve House Slope Fences					I	X									A					
Ralston Powerhouse Slope Fence					I	X									A					
Oxbow Powerhouse Slope Fence					I	X									A					
<b>Public Safety Fences</b>																				
Dormitory Facility Barrier Fence															A					
Hell Hole Dam General Parking Area Barrier Fence						X									A					
North Fork Long Canyon Crossing Removable Section Barrier Fence						X									A					

A = Activity occurs on an annual basis.

I = Activity occurs on an infrequent basis.

R = Completed as-needed during diversion season.

S = Scheduled retrofit or replacement.

X = Activity occurs or ancillary facility is present.

<sup>1</sup>Indicates areas where manual and chemical treatment of target noxious weed populations will be implemented. Manual and chemical treatments may be completed at other locations during the term of the license if new target noxious weed populations are identified during inventory surveys.

<sup>2</sup>Inspection of 1,000 feet of outlet conduit.

<sup>3</sup>Sediment augmentation will be implemented at Middle Fork Interbay Augmentation Areas, Junction Bar Augmentation Area, and Indian Bar Augmentation Area; and sediment disposal will occur at Project sediment disposal areas or other agency-approved disposal areas.

<sup>4</sup>Existing gage to remain in place until infrastructure modification is complete.

<sup>5</sup>This facility or feature will be constructed under the Proposed Action.

<sup>6</sup>Existing gage or trail now required for Project operation and maintenance.

<sup>7</sup>Existing facility that has been added to the Project.

<sup>8</sup>Material excavated from medium reservoirs will be placed at this sediment augmentation area.

<sup>9</sup>Converted to Ralston Afterbay Sediment Removal Access Point Boat Ramp.

**Table 4-5. Proposed Action – Description of Routine Maintenance at Project Roads and Trails.**

Project Road or Trail [Items in red represent a change from the No-Action Alternative]	Vegetation Management			Pest Mgmt	Periodic Road and Trail Maintenance <sup>3</sup>
	Annual Road and Trail Maintenance <sup>1</sup>	Trimming by Hand	Trimming w/Equipment	Herbicide Use	
<b>Project Roads</b>					
<b>Duncan Creek Area</b>					
Duncan Creek Diversion Intake Road	X	A	A		X
Duncan Creek Diversion Dam Road	X	A	A		X
Duncan Creek Diversion Pool Road	X	A	A		X
<b>French Meadows Area</b>					
Duncan Creek - Middle Fork Tunnel Portal Road	X	A	A		X
French Meadows - Hell Hole Tunnel Gatehouse Road	X	A	A	I	X
French Meadows Dam Outlet Works and South Leakage Weir Road	X	A	A	A	X
French Meadows Dam Staging Area and Spillway West Access Road	X	A	A		X
French Meadows Spillway East Access Road	X	A	A		X
French Meadows Dam North Leakage Weir Road	X	A	A		X
French Meadows Campground Water Supply Facility Access Road	X	A	A		X
<b>Hell Hole Area</b>					
Hell Hole Dam and Powerhouse Road	X	A		A	X
Rubicon River Gage below Hell Hole Dam Road	X	A	A		X
Hell Hole Dam Leakage Weir Road	X	A	A		X
Hell Hole Dam Spillway and Northern Access Point Road	X	A	A		X
French Meadows - Hell Hole Tunnel Portal Road	X	A	A		X
French Meadows Powerhouse Road	X	A	A		X
Hell Hole - Middle Fork Tunnel Gatehouse Road	X	A	A		X
Dormitory Facility Road	X	A	A		X
Operator Cottages and Shop Road	X	A	A		X
Spur on North Side of Operator Cottages	X	A	A		X
Spur on South Side of Operator Cottages	X	A	A		X
Hell Hole Dam Spillway Discharge Channel Road Spur to Communication Line/Powerline	X	A	A		X
Hell Hole Dam Spillway Discharge Channel Road	X	A	A		X
Big Meadows Campground Water Supply Facility Access Road	X	A	A		X
Hell Hole Dam Spillway Gates Road (new) <sup>4</sup>	X				X

**Table 4-5. Proposed Action – Description of Routine Maintenance at Project Roads and Trails (continued).**

Project Road or Trail [Items in red represent a change from the No-Action Alternative]	Annual Road and Trail Maintenance <sup>1</sup>	Vegetation Management			Pest Mgmt	Periodic Road and Trail Maintenance <sup>3</sup>
		Trimming by Hand	Trimming w/Equipment	Herbicide Use	Noxious Weed Management <sup>2</sup>	
<b>Project Roads (continued)</b>						
<b>Long Canyon Area</b>						
North Fork Long Canyon Diversion North Road	X	A	A			X
North Fork Long Canyon Diversion South Road	X	A	A			X
North Fork Long Canyon Diversion Drop Inlet Road	X	A	A			X
South Fork Long Canyon Diversion and Drop Inlet Road	X	A	A			X
South Fork Long Canyon Diversion and Drop Inlet Cutoff Road	X	A	A			X
South Fork Long Canyon Diversion Drop Inlet Access Road	X	A	A			X
North Fork Long Canyon Crossing Removable Section North Road	X	A	A		X	X
North Fork Long Canyon Crossing Removable Section South Road	X	A	A		X	X
Middle Meadows Group Campground Water Supply Facility Access Road	X	A	A			X
<b>Middle Fork Interbay Area</b>						
Middle Fork Interbay Dam Road					X	
Middle Fork Interbay Dam to Powerhouse Road	X	A	A		X	X
Middle Fork Powerhouse Butterfly Valve House Road	X	A	A			X
Middle Fork Powerhouse Penstock and Butterfly Valve House Road	X	A	A	A	X	X
Middle Fork Powerhouse Upper Switchyard Road	X	A	A		X	X
<b>Ralston - Oxbow Area</b>						
Brushy Canyon Adit Road	X	A	A		X	X
Ralston Powerhouse Butterfly Valve House Road	X	A	A	A	X	X
Ralston Afterbay Dam Access Road	X	A	A		X	X
Indian Bar Access Road	X	A	A		X	X
Oxbow Powerhouse Road	X	A	A		X	X
Ralston - Oxbow Tunnel Intake Road	X	A	A		X	X
Ralston Afterbay Private Boat Ramp Road	X	A	A			X
Ralston Afterbay Dam and Access Point Road	X	A	A		X	X

**Table 4-5. Proposed Action – Description of Routine Maintenance at Project Roads and Trails (continued).**

Project Road or Trail [Items in red represent a change from the No-Action Alternative]	Annual Road and Trail Maintenance <sup>1</sup>			Vegetation Management		Pest Mgmt	Periodic Road and Trail Maintenance <sup>3</sup>
	Trimming by Hand	Trimming w/Equipment	Herbicide Use	Noxious Weed Management <sup>2</sup>			
<b>Project Trails</b>							
<b>Duncan Creek Area</b>							
Duncan Creek Diversion Dam North Trail	X	A					X
Duncan Creek Diversion Dam South Trail	X	A					X
Photovoltaic Poles and Powerline at Duncan Creek Gage near French Meadows Trail	X	A					X
Duncan Creek Gage near French Meadows Trail	X	A					X
Duncan Creek Gage below Diversion Dam Trail	X	A		I			X
<b>Long Canyon Area</b>							
North Fork Long Canyon Creek Gage below Diversion Dam Trail (new) <sup>4</sup>	X	A					X
South Fork Long Canyon Creek Gage below Diversion Dam Trail (new) <sup>4</sup>	X	A					X
<b>Middle Fork Interbay Area</b>							
Middle Fork American River Gage above Middle Fork Powerhouse Trail	X	A				X	X
Passive Microwave Reflector Station above Middle Fork Interbay Trail	X	A					X
Middle Fork American River Gage below Interbay Dam Trail (new) <sup>4</sup>	X	A					X
<b>Ralston Afterbay Area</b>							
Passive Microwave Reflector Station above Ralston Afterbay Trail	X	A				X	X
Rubicon River Gage above Ralston Powerhouse Trail (existing, added to MFP) <sup>5</sup>	X	A					X
North Fork American River Gage above American River Pump Station Trail (new) <sup>4</sup>	X	A					X

A = Activity occurs on an annual basis.

I = Activity occurs on an infrequent basis.

X = Activity occurs or ancillary facility is present.

<sup>1</sup>Annual maintenance generally includes, but is not limited to, the following types of activities: debris removal; vegetation management; noxious weed control; basic repairs, including filling of potholes; maintenance of erosion control features such as culverts, drains, ditches, and water bars; repair, replacement, or installation of access control structures such as posts, cables, rails, gates, and barrier rock; repair and replacement of signage; and snow removal and sanding.

<sup>2</sup>Indicates areas where manual and chemical treatment of target noxious weed populations will be implemented. Manual and chemical treatments may be completed at other locations during the term of the license if new target noxious weed populations are identified during inventory surveys.

<sup>3</sup>Periodic maintenance generally includes, but is not limited to, the following types of activities: placement or replacement of culverts and other drainage features; bridge deck or ford replacement; major road repairs; grading; sealing; resurfacing; road replacement; and hazard tree removal.

<sup>4</sup>This facility or feature will be constructed under the Proposed Action.

<sup>5</sup>Existing gage or trail now required for Project operation and maintenance.

**Table 4-6. Proposed Action – Description of Routine Maintenance at Project Recreation Facilities and Features.<sup>1</sup>**

Recreation Facility or Feature <i>[Items in red represent a change from the No-Action Alternative]</i>	Recreation Facility Annual Maintenance <sup>2</sup>	Vegetation Management		Pest Mgmt	Recreation Facility Heavy Maintenance <sup>4</sup>
		Trimming by Hand	Fungicide Use	Noxious Weed Management <sup>3</sup>	
<b>Duncan Area</b>					
Duncan Creek Diversion Primitive Recreation Site (new)	X	A			X
<b>French Meadows Area</b>					
Ahart Campground (enhanced)	X	A	I		X
Coyote Group Campground	X	A	I		X
Poppy Campground (reduced)	X	A	I		X
French Meadows Campground	X	A	I		X
Gates Group Campground	X	A	I		X
Lewis Campground	X	A	I		X
French Meadows Picnic Area	X	A	I		X
French Meadows Boat Ramp (enhanced)	X	A	I	X	X
French Meadows Dump Station	X				X
McGuire Picnic Area and Beach (converted) <sup>5</sup>	<del>X</del>				<del>X</del>
McGuire Group Campground (new)	X	A	I		X
McGuire Boat Ramp and Associated Parking (modified)	X	A	I		X
<b>Hell Hole Area</b>					
Big Meadows Campground	X	A	I	X	X
Hell Hole Campground (reduced)	X	A	I		X
Upper Hell Hole Campground (removed)	<del>X</del>	<del>A</del>	<del>I</del>		<del>X</del>
Hell Hole Vista	X	A	I		X
Hell Hole Boat Ramp (enhanced)	X	A		X	X
Hell Hole General Parking Area and Hell Hole Boat Ramp Parking Area	X	A		X	X
<b>Ralston Afterbay Area</b>					
Ralston Picnic Area (reduced)	X	A		X	X
Ralston Picnic Area Cartop Boat Ramp	X	A		X	X
Ralston Afterbay Sediment Removal Access Point Boat Ramp (new) <sup>6</sup>	X	A		X	X
Indian Bar Rafting Access and General Parking (enhanced)	X	A		X	X
<b>Long Canyon Area</b>					
Middle Meadows Group Campground	X	A	I	X	X
<b>Project Recreation Facility Water Supplies and Associated Maintenance Trails</b>					
Dolly Creek Water Supply	X	I			X
French Meadows Campground Water Supply	X	I			X
Big Meadows Campground Water Supply	X	I			X
Middle Meadows Group Campground Water Supply	X	I			X

A = Activity implemented annually throughout the year.

I = Activity implemented on an infrequent basis.

X = Activity is implemented.

<sup>1</sup>Project recreation facility and feature maintenance includes maintenance of recreation facility access roads at Project recreation facilities.

<sup>2</sup>Annual maintenance includes: site cleaning; basic repairs and maintenance of facility features; garbage clean-up; signing; toilet cleaning and restocking; toilet pumping; graffiti removal; removal of debris from boat ramps; basic maintenance of pathways; routine testing of water supplies; annual winterizing and opening activities; and hazard tree

<sup>3</sup>Indicates areas where manual and chemical treatment of target noxious weed populations will be implemented. Manual and chemical treatments may be completed at other locations during the term of the license in new target noxious weed populations are identified during inventory surveys.

<sup>4</sup>Heavy maintenance includes: repair and resurfacing of parking areas and spurs; repair or replacement of barrier structures and devices; repair and/or replacement of site/facility amenities; repair and replacement of signage, information boards, and fee tubes; repair, maintenance, and painting of bathroom structures; repair and maintenance of potable water supplies and distribution lines; repair and maintenance of septic systems; repair and sealing of boat ramps; repair or installation of retaining walls; site leveling and removal of obstacles; fuels reduction; and maintenance of pathways.

<sup>5</sup>This facility will be converted to the McGuire Group Campground.

<sup>6</sup>This facility replaces the Ralston Afterbay Sediment Removal Access Point.

## **FIGURES**

**Figure 4-1. Benefits of the Proposed Action.**

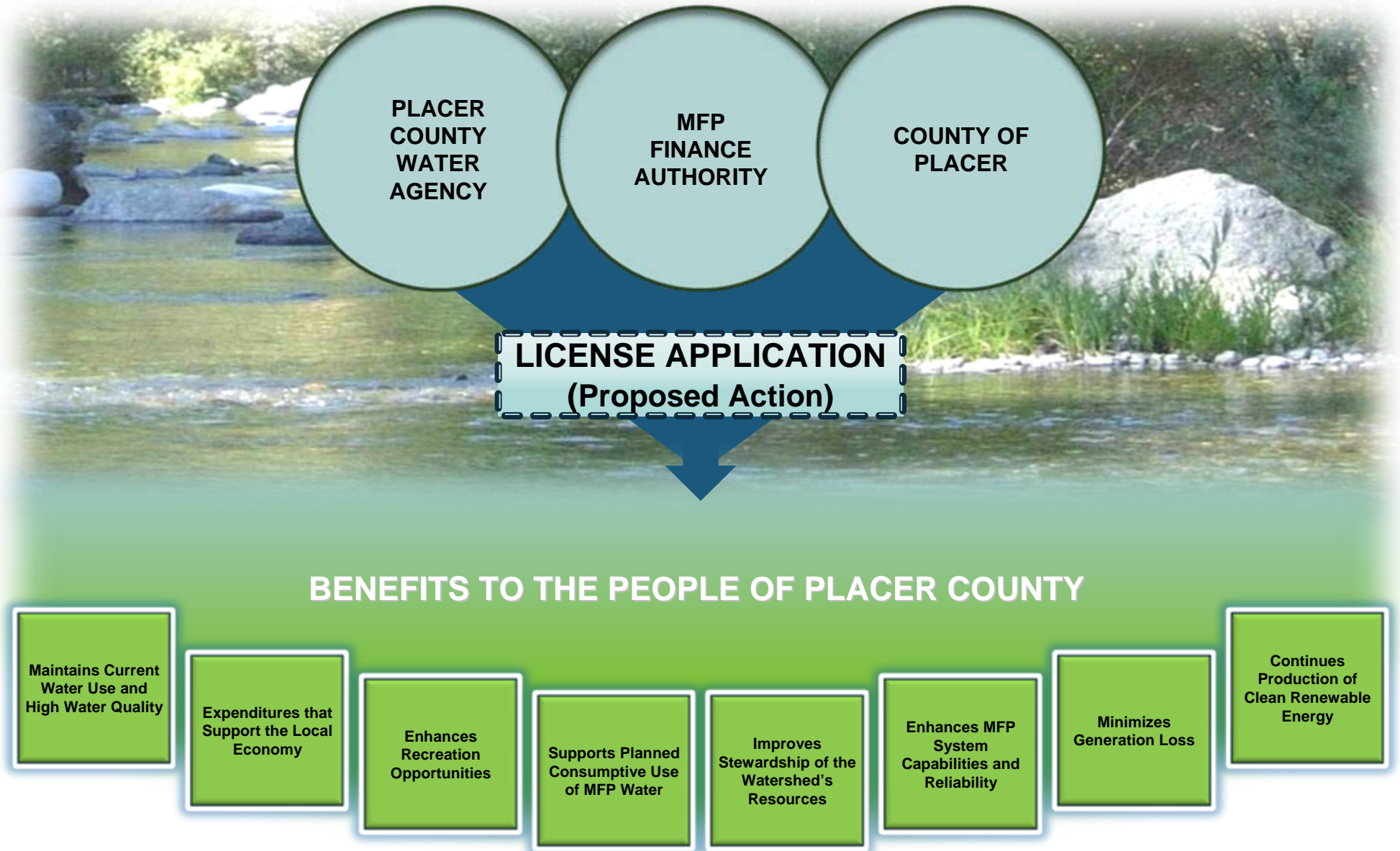


Figure 4-2. Resource Stewardship Provided by the Proposed Action.

# RESOURCE STEWARDSHIP



**MAPS**

**ATTACHMENT 4-1**

**Middle Fork Project Power Purchase Contract**

# MIDDLE FORK PROJECT POWER PURCHASE CONTRACT

THIS CONTRACT made this 30th day of April, 1963, by and between PACIFIC GAS AND ELECTRIC COMPANY, hereinafter referred to as "Pacific," and PLACER COUNTY WATER AGENCY, hereinafter referred to as "Placer,"

## WITNESSETH THAT:

1. This contract includes Appendix A, Definitions; Appendix B, Requirements and General Specifications for Middle Fork Project; Appendix C, Operation and Maintenance Requirements; and Appendix D, Storage Requirements for Determination of *Full Operation Date*. For clearness, words or phrases defined in Appendix A, other than proper names, are italicized in the text.

2. Placer shall construct at its own risk and expense, and shall be the sole owner (under Federal Power Commission License) of, the *project*. Placer shall design, construct, purchase and install all structures, equipment, and facilities to meet the requirements and specifications of Appendix B. The *project* shall be substantially equal in quality and design of materials, and in equipment and facilities provided, to those which Pacific has installed in its hydroelectric projects during the past 10 years on Feather River, Stanislaus River and Kings River. Pacific shall make available to Placer for inspection, at Pacific's San Francisco office, plans and specifications of said plants of Pacific, and Placer may inspect any of such plants.

Placer shall submit to Pacific from time to time, and as soon as possible, the plans and specifications of all portions of the *project*. Pacific shall have the right to inspect all work performed by or for Placer in constructing elements of the *project*. Neither approval of, nor failure by Pacific to approve, any plans or specifications, or inspection of any work hereunder, shall relieve Placer of the responsibility of meeting the requirements and general specifications set forth in Appendix B, nor shall Pacific be responsible for strength, details of design, adequacy or capability of any structure, facility or work.

3. Placer shall acquire and, to the extent that it can do so with money available from payments made by Pacific pursuant to paragraph 9 (b) and from money available in the operation and maintenance fund as provided in Appendix C-7, shall maintain ownership of all lands, easements, flowage rights, water rights, Federal and State licenses and permits, and all other rights and privileges necessary for the foregoing purposes and for the operation and

maintenance of its works and facilities in accordance with Appendix C.

4. On and after the *full operation date*, Placer, to the extent that it can do so with money available from payments made by Pacific pursuant to paragraph 9 (b) and from money available in the operation and maintenance fund as provided in Appendix C-7, (a) shall operate, maintain, and carry third-party bodily injury and property damage liability insurance, and property insurance on the *project* substantially in accordance with the practice followed by Pacific with respect to its hydroelectric projects under Federal Power Commission License, and shall carry mechanical breakdown and use and occupancy insurance on the *project*, (b) shall replace structures, facilities and equipment of the *project* whenever they no longer are capable of reliably or economically performing the service for which they were designed, and (c) shall operate such switching facilities as Pacific may install from time to time at the *power plants* of the *project*.

5. Pacific shall construct, own, operate and maintain at its own risk and expense transmission lines required to transmit the power generated by each *power plant* of the *project* into Pacific's transmission network. Pacific shall acquire all lands, easements, Federal and State permits and all other rights and privileges necessary to carry out its obligations under this paragraph.

6. Placer shall schedule the date of first delivery of power for each *power plant* of the *project* and notify Pacific thereof in writing 24 months in advance of the scheduled date for each such plant. Pacific shall complete transmission lines to each *power plant* within 24 months after receiving said notice.

7. Placer shall sell and deliver to Pacific during the term of this contract all the electric power and energy generated by the *power plants* of the *project*, except energy delivered to Pacific pursuant to paragraph 14, and except the power and energy delivered by Placer for *project power plant use*. Delivery of power and energy to Pacific shall be at Placer's high tension disconnect switch at each *power plant*, except for such power and energy as Pacific shall request to be delivered to it for transmission at generator voltage, in which case such protective devices as Placer deems necessary shall be installed by Pacific at its expense.

8. Prior to the *full operation date*, but only after Placer has fully reimbursed Pacific for energy pur-

suant to paragraph 14, Pacific shall pay Placer each month \$.0027 per kilowatt-hour for energy delivered to Pacific hereunder during the preceding month.

9. Following the *full operation date* and until the termination of this contract, Pacific shall pay Placer for all power and energy delivered hereunder as follows:

(a) at the semiannual rate of \$2,612,500 through June 30, 1982; \$2,562,500 from July 1, 1982 through June 30, 1997; and \$2,512,500 after July 1, 1997, and, in addition,

(b) at the monthly rate of \$41,667 through June 30, 1982; \$50,000 from July 1, 1982 through June 30, 1997; and \$58,333 after July 1, 1997.

10. Payments under paragraph 9 (a) shall be due and payable each May 15 and November 15 for the semiannual periods ending on the next succeeding June 30 and December 31, respectively. The first payment shall be prorated according to the ratio of the number of days for which payment is to be made to the number of days in the semiannual period for which payment otherwise would be due. Payments under paragraph 9 (b) for each month or part thereof shall be due and payable on the fifteenth day of the following month; provided that, at the option of Pacific, the first such payment shall not be made until the total amount of money in the Operation and Maintenance Fund established pursuant to Appendix C is less than \$1,000,000. Payments under paragraph 8 shall be due and payable each month within 15 days after receipt of invoice.

11. (a) Subject to the provisions of paragraphs 16 and 17, Pacific's obligation under paragraph 9 (a) shall not be dependent upon all or any part of the *project* continuing to be capable of operation, nor shall its obligation under paragraph 9 (a) be dependent upon the ability of Pacific to take energy produced by or made available from the *project*. This provision, however, shall not be deemed to relieve Placer of any of its obligations hereunder.

(b) Pacific may offset against any amounts due from it to Placer hereunder any amounts due to Pacific from Placer by reason of this contract or any breach thereof, except that no offset shall be applied by Pacific to reduce the payments due from it to Placer under the provisions of paragraph 9 (a).

12. Placer shall defend its water rights necessary or useful to operation of the *project* and shall not voluntarily convey, transfer or in any manner encumber any of such rights without the written consent of Pacific.

13. Consistent with Placer's use for *project* purposes Placer shall permit all roads, lands, rights of way and road structures owned or controlled by it for *project* purposes to be used by Pacific, without additional cost or expense, for construction, installation, operation and maintenance of any works or facilities of Pacific now in existence or hereafter constructed or installed. Consistent with Pacific's

use for its own purposes, Pacific shall permit use by Placer of Pacific's roads and rights of way without cost or expense for the purpose of constructing, maintaining and operating facilities of the *project*.

14. Placer shall reimburse Pacific as provided in this paragraph for dependable capacity and for non-dependable capacity and all energy not delivered by the United States to Pacific but for which Pacific has paid the United States under that certain agreement between Pacific, the United States, and Placer made to enable Placer more readily to meet the *storage* criteria set forth in Appendix D. In order to make such reimbursement (a) Placer shall pay Pacific each month an amount equal to that so paid by Pacific to the United States for non-dependable capacity and energy, (b) Placer shall pay Pacific each month \$2.00 per kilowatt for dependable capacity which would have been available to Pacific if Placer had not stored water pursuant to said agreement, and (c) after Placer's *power plants* become *operable*, Placer shall, in order to compensate Pacific for non-dependable capacity and energy generated by Pacific in lieu of United States generation, deliver to Pacific without charge three-quarters of a kilowatt-hour for each kilowatt-hour for which the United States is so credited. No reduction in *storage*, or release of water available for *storage*, shall be made to accomplish such delivery before the *storage* requirements of Appendix A-18 have been achieved. If full delivery of such energy has not been made by April 1, 1967, Placer shall reimburse Pacific for the balance by a cash payment of \$.0025 per kilowatt-hour for which Placer has not reimbursed Pacific pursuant to subparagraph (c) above.

15. Placer shall indemnify Pacific, its officers, agents, and employees against all loss, damage, expense, and liability to third persons for injury to or death of person or injury to property, proximately caused by Placer's construction, ownership, operation, or maintenance of, or by failure of, any of Placer's works or facilities used in connection with the *project*. Placer shall, on Pacific's request, defend any suit asserting a claim covered by this indemnity. Placer shall pay any costs that may be incurred by Pacific in enforcing this indemnity.

Pacific shall indemnify Placer, its officers, agents, and employees against all loss, damage, expense, and liability to third persons for injury to or death of person or injury to property, proximately caused by Pacific's construction, ownership, operation, or maintenance of, or by failure of, any of Pacific's works or facilities used in connection with the *project*. Pacific shall, on Placer's request, defend any suit asserting a claim covered by this indemnity. Pacific shall pay any costs that may be incurred by Placer in enforcing this indemnity.

16. This contract shall be effective upon due execution by the parties hereto.

17. Placer intends to finance construction of the *project* by the issue and sale of revenue bonds, and

Placer shall proceed diligently with all necessary action to complete such financing; provided, that Placer shall not be required to accept or agree to any conditions or obligations in connection with any such financing which it deems unreasonably burdensome. If Placer shall have proceeded diligently but shall not have completed such financing on terms satisfactory to it and awarded *project* construction contracts prior to October 1, 1963, this contract shall thereupon terminate and neither party shall have any further obligation to the other under this contract or be liable to the other by reason of any expenses incurred or obligations undertaken for the performance by it of this contract or for any damages suffered as a result of the termination of this contract.

Upon completion of such financing Placer shall furnish Pacific with a certificate to that effect. Such certificate shall be binding and conclusive upon Placer and thereafter there shall be no termination of Placer's obligations under this contract by reason of any provisions of this paragraph.

18. Except as provided in paragraph 17, this contract shall remain in effect so long as Placer shall hold a license under the Federal Power Act and other necessary rights for the *project* permitting full performance by it of this contract but not beyond 50 years from the date of this contract or beyond December 31 of the year in which Placer completes retirement of all *project bonds*, whichever occurs first. Termination of this contract as a result of the loss by Placer of rights necessary for the full performance of this contract with respect to the *project* shall not affect obligations of either party accrued hereunder prior to such termination,

but no further obligation shall accrue subsequent to the date of such termination and final payments as of the date of termination shall be prorated as may be appropriate.

19. No voluntary assignment of this contract, except for security purposes in connection with Placer's financing of the *project*, shall be effective without the written consent of Pacific.

20. Any dispute that may arise hereunder between Placer and Pacific shall, upon the written request of either party to the other, be submitted to and decided by arbitration. Each of the parties shall, within 30 days after giving or receiving such written notice, appoint one arbitrator. If either party fails to appoint an arbitrator within such time, he shall be appointed by a Superior Court of the State of California in accordance with the California Code of Civil Procedure. At any time that either arbitrator concludes they cannot agree, the two arbitrators shall appoint a third arbitrator or, if they cannot agree upon a third arbitrator, he shall be appointed by said Superior Court in accordance with said code. A decision by two of the arbitrators shall be binding on the parties. If a decision cannot be reached within 90 days after appointment of the third arbitrator, on written notice by either party to the other, the arbitrators' authority shall terminate and either party may submit the matter to an appropriate court for decision.

Each party shall bear the expenses and fees of the arbitrator appointed by it and its own expenses involved in the arbitration. The expenses and fees of the third arbitrator and all other expenses of arbitration shall be borne equally by Pacific and Placer.

IN WITNESS WHEREOF, on the date first above written, the parties hereto have subscribed this contract by their officers thereunto duly authorized.

[Seal]

PLACER COUNTY WATER AGENCY

By

Frank Paoli  
Chairman of the Board of Directors

and

By

Robert Adams  
Secretary of the Board of Directors

[Seal]

PACIFIC GAS AND ELECTRIC COMPANY

By

W. S. Gable  
Vice-President and General Manager

and

By

W. R. [Signature]  
Secretary

## Appendix A

### DEFINITIONS

When used in this contract the following terms shall have the meanings hereinafter set forth:

#### Facilities to Be Constructed and Owned by Placer

##### A-1 PROJECT

A development in Placer County, California, using the waters of the Middle Fork of American River, the Rubicon River and their tributaries upstream from the vicinity of Oxbow Bar, and including the Duncan Creek Diversion from Duncan Creek to Middle Fork of American River at French Meadows, French Meadows Reservoir, Hell Hole Reservoir, Middle Fork-Ralston Interbay, Ralston Afterbay, French Meadows Power Plant, Middle Fork Power Plant, Ralston Power Plant, Oxbow Power Plant, Long Canyon Diversions, American River Diversion, dams, *project communication facilities*, *project headquarters* and *project roads*, tools, operation and maintenance equipment, including motor vehicles, and all necessary appurtenances for each of the foregoing.

##### A-2 DUNCAN CREEK DIVERSION

A diversion dam on Duncan Creek, a tunnel leading to French Meadows Reservoir, and appurtenant facilities.

##### A-3 FRENCH MEADOWS RESERVOIR

The reservoir resulting from the construction of a dam on the Middle Fork of American River immediately downstream from French Meadows, and appurtenant facilities.

##### A-4 HELL HOLE RESERVOIR

The reservoir resulting from the construction of a dam on the Rubicon River immediately downstream from Hell Hole, and appurtenant facilities.

##### A-5 MIDDLE FORK-RALSTON INTERBAY

The reservoir resulting from the construction of a dam on the Middle Fork of American River about four miles downstream from the junction of Duncan Creek with the Middle Fork of American River, and appurtenant facilities.

##### A-6 RALSTON AFTERBAY

The reservoir resulting from the construction of a dam on the Middle Fork of American River at Oxbow Bar, about one mile downstream from the junction of the Rubicon River with the Middle Fork of American River, and appurtenant facilities.

##### A-7 FRENCH MEADOWS POWER PLANT

A *power plant* on the Rubicon River at Hell Hole Reservoir.

##### A-8 MIDDLE FORK POWER PLANT

A *power plant* on the Middle Fork of American River at Middle Fork-Ralston Interbay.

##### A-9 RALSTON POWER PLANT

A *power plant* on the Rubicon River at Ralston Afterbay.

##### A-10 OXBOW POWER PLANT

A *power plant* on the Middle Fork of American River at Oxbow Bar.

##### A-11 LONG CANYON DIVERSIONS

Dams and hydraulic conduits diverting waters from the North Fork of Long Canyon and from the South Fork of Long Canyon and discharging into shafts which connect with the tunnel from Hell Hole Reservoir to Middle Fork Power Plant, and appurtenant facilities.

##### A-12 AMERICAN RIVER DIVERSION

A diversion facility on the North Fork of American River, a tunnel to Auburn Ravine, pumping facilities to discharge water from the North Fork of American River into the tunnel, and appurtenant facilities.

##### A-13 PROJECT COMMUNICATION FACILITIES

Facilities, adaptable for application of metering and control channels, required for communication among units of the *project* and for interconnection with Pacific's communication system.

##### A-14 PROJECT HEADQUARTERS

The office, warehouses, garages and other structures necessary for personnel and equipment required for the operation and maintenance of the *project*.

##### A-15 PROJECT ROADS

Such roads as are necessary to make the units of the *project* readily accessible for proper operation and maintenance; also such additional roads as are required under license from the Federal Power Commission.

#### Other Terms Used Herein

##### A-16 STORAGE

The amount of water held in *project* reservoirs.

##### A-17 OPERABLE

(a) With respect to a *power plant*: Having all features and equipment operating simultaneously in such condition and adjustment that the plant is capable of continuous delivery into Pacific's trans-

mission lines at its full capacity for the then existing head of water. The date on which a plant becomes *operable* shall occur only after satisfactory completion of start-up tests. This date must be confirmed by satisfactory completion of efficiency and performance tests, which shall be conducted as soon as possible and shall commence not later than 30 days after the first delivery of power from the plant. For the purpose of this paragraph, one of the performance tests which shall follow the start-up tests shall include the satisfactory operation of each plant under the conditions of Appendix C-1 for a period of at least 30 days.

(b) With respect to dams, tunnels, conduits, and all other elements of the *project*, including *power plants*: Being completed in all features and being capable of maintaining simultaneously such continuity of performance as is necessary for the reliable operation of the *project*.

#### A-18 FULL OPERATION DATE

Whichever of the following dates is the first to occur after June 1, 1966, and after all elements of the *project* other than American River Diversion are *operable*:

(a) The first day when the *storage* in both French Meadows and Hell Hole Reservoirs is equal to or greater than the *storage* as provided in Appendix D or the pro rata *storage* for days other than the end of month as determined by straight-line interpolation; provided, that, if the required *storage* is achieved prior to April 1, 1967, *full operation date* shall occur on the earlier of (1) April 1, 1967 or (2) when full reimbursement in energy has been made to Pacific for those obligations incurred by Placer, as of the date such *storage* was achieved, pursuant to Paragraph 14; or

(b) July 1, 1968.

#### A-19 ELEVATION

Height in feet above United States Geological Survey datum.

#### A-20 POWER PLANT

A hydroelectric generating facility, including a pressure tunnel, a penstock, a powerhouse, and appurtenant facilities.

#### A-21 PROJECT POWER PLANT USE

Use of electric power solely for operating and maintaining the powerhouses, penstock valves and dam gates and valves, and not for *project head-*

*quarters*, or for *project* pumping at American River Diversion or any other purpose.

#### A-22 PROJECT BONDS

Revenue bonds, including any refunding bonds, issued by Placer to meet its obligations under this contract.

#### A-23 PROJECT CONSTRUCTION COSTS

*Project* costs of construction, including cost of acquisition of sites and easements, clearing, engineering and legal services, financial advisers, funded bond interest, application, permit and license fees and costs, inspection, insurance premiums, costs relating to obtaining water for the initial filling of *project* reservoirs, including reimbursement of Pacific pursuant to paragraph 14, trustees' fees, bond paying agent fees, and all other costs incident to planning, investigation, authorization, financing and construction of the facilities, and salaries of the *project* manager and *project* operating personnel incurred prior to the *full operation date*. However, this term shall not include costs incurred by Placer prior to January 1, 1963 in excess of \$1,865,000.

#### A-24 FRENCH MEADOWS COMPLEX

All elements of the work from and including a diversion dam on Duncan Creek, a tunnel leading therefrom to French Meadows Reservoir, the French Meadows Dam and spillway, and all appurtenant works.

#### A-25 HELL HOLE COMPLEX

All elements of the work from the French Meadows Dam to Hell Hole tunnel and to and including Hell Hole Dam, spillway and appurtenant works, but excepting the French Meadows Powerhouse. The Hell Hole Complex also includes (1) connection, either through completed permanent works or through temporary works approved by Placer's Engineer in charge of construction, between the French Meadows Dam to Hell Hole tunnel and the Hell Hole Reservoir, so as to permit conveyance of water, to the full capacity of the tunnel, from French Meadows Reservoir to Hell Hole Reservoir, (2) Long Canyon dams and all appurtenances, and (3) tunnel from Hell Hole Reservoir to the Middle Fork Power Plant penstock, including all appurtenances, to and including the valve at the upstream end of the Middle Fork penstock, so as to permit conveyance of water from the Long Canyon Diversions to Hell Hole Reservoir.

## Appendix B

# REQUIREMENTS AND GENERAL SPECIFICATIONS FOR MIDDLE FORK PROJECT

The following requirements and specifications cover the general conditions for major structures, equipment and facilities for the *project*. In addition to those herein described the *project* shall contain all structures and facilities needed for the development of water and power and for the operation and maintenance of the *project*. Requirements and specifications herein contained may be changed by mutual consent of the parties.

It is essential to the economic feasibility of the *project* and of this contract that there be a minimum of lost generation caused by breakdowns of equipment and unnecessary delays in accomplishing repairs and replacements. Both in equipment design and in the time necessary to have replacements delivered, all equipment must be such that it can be repaired, and have replacements made, within a period of time substantially similar to that required for repairs and replacements of similar equipment which Pacific has installed in its hydroelectric projects during the past 10 years on Feather River, Stanislaus River and Kings River.

All suppliers of equipment (a) shall be experienced in the manufacture of the class, size and rating of the various components specified herein, and (b) shall agree and give written assurances acceptable to Placer and approved by Pacific, prior to execution of the construction contracts, that they will have available and maintain within the continental United States for the duration of this contract a factory trained engineering service organization capable of providing prompt and competent technical assistance in making necessary replacements of, repairs to, or alterations of said equipment. All equipment supplied shall be substantially equal in quality and design of materials to such similar equipment which Pacific has installed in its above-mentioned hydroelectric projects.

Suppliers of equipment under this Appendix shall, at Pacific's option, prior to execution of the construction contract, agree (1) to furnish and deliver to Placer, without charge, all parts required to replace defective parts until three years after the *full operation date*, but this requirement shall not enlarge in any other manner the seller's obligations under the usual required equipment warranties, (2) to maintain during the term of this contract within California an adequate supply of spare parts for parts normally requiring replacement in addition to those required by subsequent paragraphs of this appendix, (3) to consign such additional spare parts to Placer, and (4) to make available to Placer, at agreed prices, parts so consigned.

The supplier shall furnish to Placer, at Pacific's option, complete design and shop detail drawings for all equipment, in four (4) copies, with all notes, titles and instructions in form acceptable to Pacific.

All equipment and parts used and all measurements or dimensions shown on the drawings shall conform to standards acceptable to Pacific.

### B-1 DAMS AND RESERVOIRS

(a) *General for all Dams and Reservoirs.* All dams and appurtenances shall be designed and constructed according to accepted engineering principles and must be approved by the appropriate state and federal agencies. Dams shall include appropriate cutoffs and grout curtains and all the features of dams shall be so constructed as to minimize leakage. Crest gates shall provide a minimum of one foot of freeboard above maximum operating level and shall be provided with water seals to prevent leakage. All dams not having crest gates shall have the permanent spillway crest set one foot above the maximum operating level except in the case of the Duncan Creek Diversion dam and the Long Canyon Diversion dams hereinafter further specified. All dams shall be provided with a log boom protecting the spillway and intake.

All gates or valves for discharge of water or for sluicing from reservoirs or diversion pools shall be power operated unless specifically excluded. All gates and valves shall be capable of continuous operation and, wherever practicable, shall be equipped for hand as well as power operation. All sluiceways shall be steel lined. In addition to the facilities specifically required by this appendix, all dams shall be provided with separate facilities to permit bypass of water for fish and stream maintenance as prescribed by the Federal Power Commission license for the *project*. Each outlet from the reservoir or diversion pools shall be provided with a trashrack with facilities for its cleaning.

(b) *Duncan Creek Diversion Dam.* Duncan Creek Diversion dam shall be situated in Section 24, Township 15 North, Range 13 East, M.D.B.&M. It shall have an ungated overpour spill crest set at an elevation not less than one foot above the water level required to deliver through the Duncan Creek Diversion tunnel 400 cubic feet per second into French Meadows Reservoir when French Meadows Reservoir is at elevation 5238. For the purpose of sluicing stream bed deposits from in front of the adjacent tunnel intake, the dam shall be equipped with a manually operated sluice gate not less than five feet in diameter, the invert of which is not more than

five feet above the original stream bed. The fish release valve shall be large enough to permit the discharge of 8 cubic feet per second when water level is at elevation 5260.75 under normal operating conditions and shall be located adjacent to and at least two feet above the invert level of the sluice. Provision shall be made for sluicing surface debris from the front of the intake trashrack.

(c) *French Meadows Reservoir*. French Meadows dam shall be situated in Sections 25 and 36, Township 15 North, Range 13 East, M.D.B.&M. The reservoir shall have an active capacity of not less than 123,800 acre feet between maximum storage level at elevation 5262 and minimum storage level at elevation 5125, at which elevation the dormant storage shall be about 8,700 acre feet. Not more than the top 19 feet of storage shall be subject to spillway gate control. The upstream invert of the outlet structure shall be set at a level which will permit unwatering the reservoir for maintenance. Outlet capacity shall be not less than 850 cubic feet per second when the reservoir level is at elevation 5125. A main discharge valve and a guard valve or gate shall be provided. The free discharge valves and structure shall be suitable for continuous discharge at full range of head and openings and shall be equipped for both power and manual operation.

(d) *Hell Hole Reservoir*. Hell Hole dam shall be situated in Sections 16 and 21, Township 14 North, Range 14 East, M.D.B.&M. The reservoir shall have an active capacity of not less than 201,200 acre feet between maximum storage level at elevation 4629 and minimum storage level at elevation 4340, at which storage level the dormant storage shall be approximately 5,800 acre feet. The spillway shall not be gated. The outlet invert shall be set at a level which will permit the unwatering of the reservoir for maintenance. A main discharge valve and a guard valve or gate shall be provided. The free discharge valves and structure shall be suitable for continuous discharge at full range of head and openings and shall be equipped for both power and manual operation.

(e) *Middle Fork-Ralston Interbay*. Middle Fork-Ralston Interbay dam shall be situated in Section 35, Township 14 North, Range 12 East, M.D.B.&M. The reservoir shall have a maximum storage level at elevation 2529 and contain not less than 132 acre feet between said level and the minimum storage level at elevation 2502. Not more than the top 19 feet of storage shall be subject to automatic spillway gate control. The spillway shall be capable of discharging, when all crest gates are open, an estimated maximum flow of 37,400 cubic feet per second with maximum water level at elevation 2533.5. The dam shall be equipped with a sluice gate, not less than five feet in diameter, the invert of which is not more than five feet above the original stream bed, for sluicing stream bed deposits from in front of

the tunnel intake. The above mentioned sluice shall be located with its trashrack not greater than 150 feet from the nearest point of the diversion tunnel intake. The fish release valve shall be capable of discharging 23 cubic feet per second with the water level in the reservoir at minimum elevation and shall be located adjacent to the left abutment and at least two feet above the invert level of the sluice. Gate hoist equipment shall be set at an elevation which will permit floods to pass without damaging the hoist equipment.

(f) *Ralston Afterbay*. Ralston Afterbay dam shall be situated in Sections 3 and 4, Township 13 North, Range 11 East, M.D.B.&M. The reservoir shall have a maximum storage level at elevation 1178 and contain not less than 1,580 acre feet between said level and the minimum storage level at elevation 1155, at which storage level the dormant storage shall be approximately 1,120 acre feet. Not more than the top 29 feet shall be subject to automatic spillway gate control. The outlet invert shall be set at a level which will permit unwatering the reservoir for maintenance. The outlet capacity shall not be less than 900 cubic feet per second when the reservoir level is at elevation 1140. A sluice gate shall be provided. A power operated fish release valve capable of discharging 75 cubic feet per second shall be provided to maintain the downstream release at the value specified in the Federal Power Commission license during periods when Oxbow power plant is shut down. The release through the fish release valve shall be manually adjustable from zero to 75 cubic feet per second. Gate hoist equipment shall be set at an elevation which will permit floods to pass without damaging the hoist equipment.

(g) *Long Canyon Diversions*.

- (1) North Fork of Long Canyon Diversion dam shall be situated in Section 24, Township 14 North, Range 13 East, M.D.B.&M. It shall have an ungated spill crest set at an elevation not less than one foot above the water level required to divert 100 cubic feet per second into a diversion structure leading to a shaft connecting with the Hell Hole-Middle Fork tunnel when Hell Hole Reservoir is at maximum storage level. The diversion structure shall be located adjacent to the dam and shall be equipped with a manually operated control gate. The dam shall be equipped with a manually operated sluice gate, not less than three feet in diameter, for sluicing stream bed deposits from in front of the diversion structure. The fish release valve shall be large enough to permit the discharge of two cubic feet per second when the water surface is at the elevation of the invert of the diversion structure, and shall be located adjacent to and above the invert level of the sluice.

- (2) South Fork of Long Canyon Diversion dam shall be situated in Section 24, Township 14 North, Range 13 East, M.D.B.&M. It shall have an ungated spill crest set at an elevation not less than one foot above the water level required to divert 200 cubic feet per second into a diversion structure leading to a shaft connecting with the Hell Hole-Middle Fork tunnel when Hell Hole Reservoir is at maximum storage level. The diversion structure shall be located adjacent to the dam and shall be equipped with a manually operated control gate. The dam shall be equipped with a manually operated sluice gate, not less than three feet in diameter, for sluicing stream bed deposits from in front of the diversion structure. The fish release valve shall be large enough to permit the discharge of five cubic feet per second when the water surface is at the elevation of the invert of the diversion structure, and shall be located adjacent to and at least two feet above invert level of the sluice.

(h) *American River Diversion*. Diversion works which shall be situated in Sections 22 and 23, Township 12 North, Range 8 East, M.D.B.&M.

## B-2 FLOW TUNNELS AND FLOW TUNNEL INTAKES

(a) *General for Flow Tunnels*. The grade and capacity of tunnels shall be based on an unlined tunnel with the value of Manning's "n" assumed at not less than 0.030 for the design area on the basis of the tunnel flowing full. Where lined sections are required, they shall be proportioned to give less head loss than unlined sections. Lining shall be required where (1) permanent supports are used, (2) cracks or seams that may cause rock falls exist, or (3) rock conditions are not suitable for permanently unlined tunnel section. Vehicle access at one end and personnel and supply access at the other shall be provided to permit inspection and maintenance.

(b) *Duncan Creek Flow Tunnel*. The intake shall be located adjacent to the dam and shall be provided with a trashrack and a manually operated tunnel gate. Provision shall be made for efficient and convenient cleaning of the trashrack. A minimum of 40 feet of concrete lined tunnel shall extend downstream from the intake. The capacity shall be not less than 400 cubic feet per second when French Meadows Reservoir is at elevation 5238 and the water level at Duncan Creek dam is one foot below the crest of the dam. The tunnel invert at French Meadows Reservoir shall be 30 feet below maximum storage level of French Meadows Reservoir.

(c) *American River Diversion Tunnel to Auburn Ravine*. The capacity shall not be less than 375 cubic feet per second. Structures for the reduction

of turbulence shall be provided at the tunnel intake and outlet.

## B-3 POWER INTAKES AND TUNNELS

(a) *General for all Power Intakes*. Intakes with power operated gates or valves and with suitable trashrack area and bar spacing shall be provided for all power tunnels. Provision shall be made for convenient and efficient cleaning of trashracks. Main gates shall be capable of opening or closing against maximum unbalanced pressure. Where valves are not installed at the upper end of penstocks, the main intake gates or valves must close automatically when the flow exceeds a fixed per cent estimated to be between 110 per cent and 125 per cent of the normal peak flow in the tunnel. Automatic closure of gates or valves shall be signalled at the respective powerhouses.

(b) *General for all Power Tunnels*. Tunnels shall be designed to withstand the full head which will be imposed on them and shall be lined (1) in all locations where permanent supports are used, (2) in locations where cracks or seams might permit leakage or cause rock falls, or (3) where rock conditions are not suitable for a permanently unlined pressure tunnel section. Adits, if used, shall have a fully grouted plug, and tunnel lining shall be provided adjacent to the adit as necessary to minimize leakage and prevent blowouts. The plug shall be a minimum of 25 feet long and shall be provided with an access door not less than 7 feet by 7 feet in dimension. Vehicle access into each tunnel except Oxbow shall be provided at the downstream portal and at adits, and personnel and supply access shall be provided at each end and at adit doors in order to permit inspection and maintenance. The physical tunnel grade shall be established so that the hydraulic grade line will be at a safe level above the tunnel and penstock assuming a fully unlined tunnel of roughness corresponding to a value of Manning's "n" of not less than 0.035 on the design section and for the condition of full power load demand plus 10 per cent as described under paragraph B-4. The tunnel sizes specified in subsequent paragraphs are the design sizes and are, with the exception of Oxbow, for unlined sections of horseshoe shape having horizontal inverts and vertical walls to the spring line. Concrete linings shall be of a dimension and shape having less head loss than the unlined section with the roughness of the lined sections assumed equal to a value of Manning's "n" of 0.015. Transition from lined to unlined sections shall be gradual in order to minimize transition losses. A minimum length of 50 feet of lined section is required downstream from the intake. Unlined tunnel sections having equivalent or better hydraulic properties may be used in place of those specified; however, maximum velocity in such tunnels shall not exceed 6 feet per second at the design flow. A drain shall be provided in the bottom of the tunnel at the downstream portal. At the penstock portals, steel

lining is required at least to the point where depth of ground cover equals the static head. Other steel or reinforced concrete lining shall be used as necessary. A rock and sand storage trap shall be installed at the lower end of each tunnel in order to prevent rock and sand from reaching the penstocks. No unlined tunnel or unlined surge tank shall be used between the storage traps and the penstocks.

(c) *French Meadows-Hell Hole Tunnel.* The unlined section shall not be smaller than a 12 foot 4 inch by 12 foot 4 inch horseshoe, and the invert at the intake shall not be higher than *elevation 5117*. The design capacity shall be 400 cubic feet per second.

(d) *Hell Hole-Middle Fork Tunnel.* The unlined section shall not be smaller than a 13 foot 5 inch by 13 foot 5 inch horseshoe, and the invert at the intake shall not be higher than *elevation 4305*. The design capacity shall be 836 cubic feet per second.

(e) *Middle Fork-Ralston Tunnel.* The unlined section shall not be smaller than a 13 foot 5 inch by 13 foot 5 inch horseshoe, and the invert at the intake shall not be higher than *elevation 2481*. The design capacity shall be 836 cubic feet per second.

(f) *Oxbow Tunnel.* The main intake gate shall be hydraulically operated and shall close automatically when the flow exceeds a fixed per cent estimated to be between 110 per cent and 125 per cent of normal peak flow in the tunnel, or by remote control from Oxbow powerhouse. The tunnel shall be lined and the section shall not be smaller than a 10 foot 7 inch by 11 foot 5½ inch horseshoe and the invert at the intake shall not be higher than *elevation 1145*. The design capacity shall be 1,000 cubic feet per second.

#### B-4 SURGE TANKS

(a) Surge tanks shall be located at or near the upper end of all penstocks except at French Meadows and Oxbow powerhouses.

(b) Surge tanks shall be of non-spilling design and of sufficient diameter to stabilize the water surface in the tank during plant operation.

(c) The tanks shall permit acceleration from zero flow to 110 per cent of *power plant* design flows, and shall permit deceleration of flows from 110 per cent of *power plant* design flows to zero flow. The tanks shall be adequate for the foregoing flow acceleration in one minute and the foregoing flow deceleration in two minutes, except at French Meadows Power Plant, where the system shall be adequate for such foregoing flow changes occurring in three minutes.

(d) In all cases, both for acceleration and deceleration, the surge tanks shall be adequate for flow change occurring within the time specified or for any longer length of time. Valves located downstream from each surge tank shall be adjusted to closing times which will not create surges in the

tank greater than those caused by the foregoing flow changes.

(e) For the specified flow and acceleration conditions, the tanks shall be suitable for minimum water surface at forebay or reservoir assuming high friction values. For deceleration conditions, the tanks shall be suitable for maximum water surface at forebay or reservoir assuming low friction values. Conservatively long lengths of lined tunnel shall be assumed for design of surge tanks.

#### B-5 PENSTOCKS

(a) *General for all Penstocks.* The design and fabrication of penstocks shall conform to "American Society of Mechanical Engineers Rules for Construction of Unfired Pressure Vessels," 1962 Edition, as amended through 1962, except where it may differ from the following requirements and limitations. Pressures for the design of penstocks shall include proper allowance for surge and water hammer. In any event the allowance for water hammer shall not be less than 10 per cent of the maximum static head at the turbine diminishing linearly in proportion to the developed length of the water column to zero at the maximum static water level in the surge tank. All longitudinal and circumferential welded penstock joints shall be butt welded and radiographed. The fully fabricated units containing welding shall be stress-relieved. Field welding on the penstock shall not be permitted. Penstock stress shall not exceed one fourth of the ultimate stress with welds assumed to be 100 per cent efficient. The interior of all penstocks shall be shop coated with hot coal tar enamel and application on all straight sections shall be by the spinning process. In establishing the head losses in subheadings (b), (c), (d) and (e) following, the interior roughness of coal tar lining shall be assumed to correspond to a value of Manning's "n" of 0.011. Penstock piers and anchors shall rest on bedrock where feasible. Where anchors or piers are located on erodable material, the penstock trench shall be gunited or concreted to preclude any possibility of undermining the piers or anchors. Adequate drainage shall be provided.

A penstock shutoff valve shall be installed at or immediately below the tunnel portal at French Meadows Power Plant, Middle Fork Power Plant and Ralston Power Plant. These valves shall be arranged so that they may be operated from the powerhouses for closing only and so that they may be adjusted to close automatically when the flow exceeds a fixed per cent estimated to be between 110 and 125 per cent of the normal maximum flows. These installations shall be equipped with appurtenant features such as bypass valves, air valves or standpipes, and drains.

(b) *French Meadows Penstock.* The French Meadows penstock shall be so proportioned that the head loss between the downstream portal of the

tunnel and the turbine inlet shall not exceed 7 feet when delivering 400 cubic feet per second to the turbine.

(c) *Middle Fork Penstock.* The Middle Fork penstock shall be so proportioned that the head loss between the downstream portal of the tunnel and the turbine inlet shall not exceed 38 feet when delivering 836 cubic feet per second to the turbine.

(d) *Ralston Penstock.* The Ralston penstock shall be so proportioned that the head loss between the downstream portal of the tunnel and the turbine inlet shall not exceed 13 feet when delivering 836 cubic feet per second to the turbine.

(e) *Oxbow Penstock.* The Oxbow penstock shall be so proportioned that the combined tunnel and penstock head loss between the upstream portal of the tunnel and the turbine inlet shall not exceed 2 feet when delivering 1,000 cubic feet per second to the turbine.

#### B-6 POWER PLANT INSTALLATION

(a) *General for all Power Plants.* Each plant shall be capable of starting and operating for the purpose of testing transmission lines without being connected to or dependent upon the transmission system constructed by Pacific pursuant to this contract.

(b) *French Meadows Power Plant.* The plant shall have an installed capacity that will generate and have an input to the transmission line of not less than 12,900 kilowatts at an effective head of 503 feet with water use of not more than 370 cubic feet per second.

(c) *Middle Fork Power Plant.* The plant shall have a two unit installed capacity that will generate and have an input to the transmission line of not less than 98,000 kilowatts at an effective head of 1,647 feet with water use of not more than 836 cubic feet per second.

(d) *Ralston Power Plant.* The plant shall have an installed capacity that will generate and have an input to the transmission line of not less than 75,600 kilowatts at an effective head of 1,250 feet with water use of not more than 836 cubic feet per second.

(e) *Oxbow Power Plant.* The plant shall have an installed capacity that will generate and have an input to the transmission line of not less than 5,750 kilowatts at an effective head of 83 feet with water use of not more than 977 cubic feet per second.

#### B-7 TURBINES AND RELATED EQUIPMENT

(a) *General for all Turbines and Related Equipment.* All turbines and related equipment, including but not limited to turbine shutoff valves, pressure regulators and governors, shall be equal in completeness of features and quality of design and materials in all respects to recent installations in Pacific's Kings, Stanislaus and Feather River proj-

ects. The overspeeds of the units on load rejection of the maximum turbine output shall be limited to not more than 30 per cent. Spare parts for turbines and related equipment shall be provided to the same extent as in Pacific's said recent installations.

(b) *French Meadows Turbine.* The turbine shall be of the vertical Francis type. The turbine shall be rated not less than 24,000 hp, 450 rpm, at an effective head of 597 feet when passing not more than 405 cubic feet per second, and shall operate successfully over a variable static head of from 517 feet to 655 feet. The turbine shall be designed for "best gate" efficiency at or above 85 per cent of rated capacity. It shall develop not less than 18,400 hp at 503 feet net effective head when passing not more than 370 cubic feet per second.

The turbine shall be provided with a shutoff valve and with a pressure regulator capable of continuous bypass of 100 per cent of the turbine discharge capacity under maximum turbine output. The regulator shall be mechanically coupled to the turbine and shall be adjustable for either synchronous bypass or water saving operation.

(c) *Middle Fork Turbines.* The two turbines shall each be of the vertical shaft, multinozzle impulse type. Each shall be rated not less than 82,000 hp, 400 rpm, at an effective head of 1,832 feet when passing not more than 442 cubic feet per second. The turbines shall be designed for "best gate" efficiency at or above 90 per cent of rated capacity.

The turbines shall operate successfully over a variable static head of 1,806 feet to 2,096 feet. Each turbine shall develop not less than 69,300 hp at 1,647 feet net effective head when passing not more than 418 cubic feet per second. Each turbine shall be provided with a shutoff valve.

(d) *Ralston Turbine.* The turbine shall be of the vertical shaft, multinozzle impulse type. It shall be rated not less than 106,000 hp, 240 rpm, at an effective head of 1,250 feet when passing not more than 836 cubic feet per second. The turbine shall be designed for "best gate" efficiency at or above 90 per cent of rated capacity. The turbine shall be designed to pass an expected flow of 920 cubic feet per second at the specified effective head. The turbine shall be provided with a shutoff valve.

(e) *Oxbow Turbine.* The turbine shall be of the vertical Francis type. It shall be rated not less than 8,800 hp, 200 rpm, at an effective head of 87 feet when passing not more than 1,000 cubic feet per second. The turbine shall be designed for "best gate" efficiency at or above 90 per cent of rated capacity.

The turbine shall be equipped with a pressure regulator capable of continuous bypass of 100 per cent of the turbine discharge capacity under maximum turbine output. The regulator shall be mechanically coupled to the turbine and shall be adjustable for either synchronous bypass or water saving operation.

## B-8 GENERATORS AND RELATED EQUIPMENT

(a) *General for all Generators and Related Equipment.* All generators and related equipment, including but not limited to exciters, storage batteries and voltage regulators shall be equal in completeness of features and quality of design and materials in all respects to recent installations in Pacific's Kings, Stanislaus and Feather River projects. Spare parts for generators and related equipment shall be provided to the same extent as in Pacific's said recent installations. All generators shall be designed to withstand, without damage or distortion, the forces resulting from overspeed not less than 10 per cent in excess of the maximum turbine runaway speed. All generator ratings shall be on the basis of 60° C rise.

(b) *French Meadows Generator.* The rating of the generator shall be 4,160 volts, 0.90 power factor lagging, 1.10 short circuit ratio, 60 cycles, 3 phase, 450 rpm, Class B insulation, and not less than 17,000 kva.

(c) *Middle Fork Generators.* The rating of each generator shall be 13,800 volts, 0.90 power factor lagging, 1.10 short circuit ratio, 60 cycles, 3 phase, 400 rpm, Class B insulation, and not less than 61,000 kva.

(d) *Ralston Generator.* The rating of the generator shall be 13,800 volts, 0.90 power factor lagging, 1.10 short circuit ratio, 60 cycles, 3 phase, 240 rpm, Class B insulation, and not less than 88,000 kva.

(e) *Oxbow Generator.* The rating of the generator shall be 4,160 volts, 0.90 power factor lagging, 1.10 short circuit ratio, 60 cycles, 3 phase, 200 rpm, Class B insulation, and not less than 7,300 kva.

## B-9 MAIN TRANSFORMERS

(a) *General for all Main Power Transformers.* All main power transformers shall be 60 cycles, oil-insulated, equal in completeness of features and in quality of design and materials in all respects to recent installations in Pacific's Kings, Stanislaus and Feather River projects. Transformers shall be provided with lightning arresters adjacent to the high voltage terminals. All transformer ratings shall be on the basis of 55° C rise. As used in this paragraph BIL refers to Basic Impulse Insulation Level.

(b) *French Meadows Transformers.* The transformer shall be 69 kv insulation class full BIL, with a three phase bank rating of not less than 17,000 kva. The high voltage winding shall be grounded wye with the following full capacity taps:

36,370/63,000 Y  
35,510/61,500 Y  
34,640/60,000 Y  
33,780/58,500 Y  
32,910/57,000 Y

The low voltage winding shall be 4,160 volts, delta connected. The impedance at rated kva and

voltage, and within standard tolerances, shall be not more than 10.4 per cent.

(c) *Middle Fork Transformers.* The transformer bank shall consist of three single phase transformers and one spare transformer. The transformers shall be 230 kv auto-transformers with a 63 kv auto tap and a 13.8 kv tertiary winding.

The transformers shall be rated at 230 kv with not less than 825 kv BIL and with full 69 kv insulation class BIL on the 63 kv tap. The three phase bank rating shall be not less than 139,000 kva.

The 230 kv voltage winding shall be grounded wye with the following full capacity taps:

138,500/240,000 Y  
135,500/235,000 Y  
132,800/230,000 Y  
129,900/225,000 Y  
127,000/220,000 Y

and the following 17,000 kva capacity auto taps:

36,370/63,000 Y  
35,510/61,500 Y

The tertiary winding shall be 13,800 volts delta connected with not less than 122,000 kva capacity.

The impedances between windings at rated kva and voltage shall be not more than normal minimum standards and within tolerable limits.

(d) *Ralston Transformers.* The transformer shall be rated 230 kv with not less than 825 kv BIL and with a three phase bank rating of not less than 88,000 kva. The high voltage winding shall be grounded wye with the following full capacity taps:

138,500/240,000 Y  
135,500/235,000 Y  
132,800/230,000 Y  
129,900/225,000 Y  
127,000/220,000 Y

The low voltage winding shall be 13,800 volts, delta connected. The impedance at rated kva and voltage, and within standard tolerances, shall be not more than 12.5 per cent.

(e) *Oxbow Transformers.* The transformer shall be 69 kv insulation class full BIL, with a three phase bank rating of not less than 7,300 kva. The high voltage winding shall be grounded wye with the following capacity taps:

38,100/66,000 Y  
37,200/64,500 Y  
36,370/63,000 Y  
35,510/61,500 Y  
34,640/60,000 Y

The low voltage winding shall be 4,160 volts, delta connected. The impedance at rated kva and voltage, and within standard tolerances, shall be not more than 10.4 per cent.

## B-10 STATION POWER FACILITIES AND OTHER EQUIPMENT

Station power facilities and all other auxiliary equipment for all *project* plants shall be equal in completeness of features and in quality of design and materials in all respects to recent installations in Pacific's Kings, Stanislaus and Feather River projects.

The normal source of station power for each plant shall be from the generator bus. Each plant shall be provided with an emergency power supply which shall be either a standby engine-generator set or a transformer bank connecting to a reliable distribution circuit, the latter being the preferred system.

Line circuit breakers shall be provided with an overhead structure and the required disconnect bypass, and ground switches to which Pacific's transmission lines will be connected.

Adequate facilities shall be installed for modern relay protection of transmission lines constructed by Pacific pursuant to this contract.

## B-11 PROJECT COMMUNICATION FACILITIES

Adequate communication facilities shall be provided to insure reliable and efficient operation and maintenance of the *project*. All *project communication facilities* shall be equal in completeness of features and in quality of design and materials in all respects to recent installations in Pacific's Kings, Stanislaus and Feather River projects. The basic communication system requirements are specified herein.

Communication between the powerhouses of the *project* and to *project headquarters* shall be by a combination of power line carrier equipment and a microwave radio system.

A VHF radio system shall be provided for communication to the French Meadows Reservoir area and to *project* vehicles while at any *project* location or on any access road thereto. *Project* vehicles shall be equipped with mobile radio systems as necessary for *project* operation.

Communication shall be extended by aerial cable from the various powerhouse communication terminals to all operating points of the *project* not covered by the power line carrier, microwave, or VHF radio systems.

Dial-type telephone equipment shall be provided at *project headquarters* and French Meadows powerhouse for an integrated network with Pacific's dial system.

Interconnection between Placer's communication system and Pacific's communication system shall be made (1) by power line carrier to Pacific's Gold Hill Substation, and (2) by microwave radio to Pacific's microwave installation at Auburn.

All components of Placer's communication system which are interconnected with Pacific's communication system shall be compatible with the equipment owned by Pacific.

A communication study prepared by Placer shall be made available to Pacific for review before any final engineering design is started.

All communications equipment shall be DC operated or AC with 100 per cent standby power equipment. The microwave radio system shall be provided with 100 per cent RF standby equipment. All standby equipment shall be connected for automatic transfer operation.

All communication equipment shall be covered by separate specifications and shall be furnished with the manufacturer's recommended test equipment. Spare parts for routine maintenance shall be provided. Wherever possible, integral systems shall be from the same manufacturer; however, responsibility for correct operation shall be assigned to all manufacturers supplying equipment for integral systems. Specifications shall include requirements for field acceptance tests.

Regular commercial telephone service shall be provided at Ralston Power Plant.

## B-12 AUTOMATIC POWER PLANT FACILITIES

(a) *General for all Project Power Plants.* The control, metering, protective and alarm systems for all *project* plants shall be equal in completeness of features and in quality of design and materials in all respects to recent installations in Pacific's Kings, Stanislaus and Feather River projects.

Ralston powerhouse shall be designated as the master station for control of all other plants of the *project*. Normal operation shall be with French Meadows Power Plant and Middle Fork Power Plant under remote automatic supervisory control from Ralston powerhouse, and with Oxbow Power Plant under automatic float control from the Ralston Afterbay.

(b) *French Meadows Power Plant.* French Meadows Power Plant shall be designed for manual control, local automatic control, and remote automatic supervisory control with a transfer means to select the method of control. Normal operation shall be by remote automatic supervisory control from Ralston powerhouse. The control shall not interfere with the full and free operation of the governor so that the unit, when detached from the system at the powerhouse or at a remote point, can maintain close frequency regulation on the load being supplied. Separate alarm indications shall be transmitted to Ralston powerhouse by the supervisory control equipment for, but not limited to, the following:

- (1) Unit shutdown
- (2) Unit separation
- (3) Miscellaneous station alarms.

(c) *Middle Fork Power Plant.* Middle Fork Power Plant shall be designed for manual control, local automatic control and remote automatic supervisory control with a transfer means for selection of the method of control. Normal operation shall be by remote automatic supervisory control from Ralston

powerhouse. The load control for each unit shall be designed for manual control and for float control from the Middle Fork-Ralston Interbay. A transfer means to select either manual load control or float control shall be provided both at Middle Fork powerhouse (when the plant is on manual or local automatic control), and at Ralston powerhouse (when the plant is on remote automatic supervisory control).

A unit load under float control shall be so regulated as to maintain automatically the interbay water level within a pre-selected and adjustable range.

Neither the manual nor the float controlled load control shall interfere with the full and free operation of the governor so that a unit when detached from the system at the powerhouse, or at a remote point, may maintain close frequency regulation on the load being supplied.

Separate alarm indications shall be transmitted to Ralston powerhouse by the supervisory control equipment for, but not limited to, the following:

- (1) Unit shutdown
- (2) Unit separation
- (3) Operation of the 220 kv circuit breaker
- (4) Operation of the 60 kv circuit breaker
- (5) Miscellaneous station alarms.

(d) *Ralston Power Plant.* Ralston powerhouse shall be continuously attended with an operator on duty at all times. In addition to the control of Ralston Power Plant, the operator shall normally have full remote automatic supervisory control of French Meadows Power Plant and Middle Fork Power Plant. Facilities shall be installed at Ralston powerhouse for receiving and transmitting all communications necessary for supervisory control, telemetering, supervisory indications, and alarms as required for safe and reliable operation of all powerhouses, dams, and appurtenances within the project.

Ralston Power Plant unit load control shall be designed for manual control and for float control from the Middle Fork-Ralston Interbay with a transfer means to select either control.

The unit load under float control shall be so regulated as to maintain automatically the interbay water level within a pre-selected and adjustable range.

Neither the manual nor the float controlled load control shall interfere with the full and free operation of the governor so that the unit when detached from the system at the powerhouse, or at a remote point, may maintain close frequency regulation on the load being supplied.

(e) *Oxbow Power Plant.* Oxbow Power Plant shall be designed for manual control, local automatic control, and for automatic float control with a transfer means to select the method of control. Normal operation shall be by automatic float control from the Ralston Afterbay water level.

The automatic float control system shall operate to start the unit when the Ralston Afterbay water level rises above a pre-selected level and to control the load on the unit to maintain the water level within a pre-selected and adjustable range. Unit shutdown and separation from the transmission system shall occur when the Ralston Afterbay water level falls below a pre-selected level and the load on the unit has been reduced to zero.

The float control shall automatically transfer from the turbine to the pressure regulator to maintain flow if the required flow through the turbine is interrupted for any reason.

An adjustable rate of change of flow device shall be provided to limit the rate of change of the combined plant flow so that the rate of change of the downstream river level is within the limit specified in the Federal Power Commission license.

Neither the manual nor the float controlled load control shall interfere with the full and free operation of the governor so that the unit when detached from the system at the *power plant*, or at a remote point, may maintain close frequency regulation on the load being supplied.

Oxbow powerhouse generation in kilowatt-hours shall be telemetered to Ralston powerhouse.

Separate alarm indications shall be transmitted to Ralston powerhouse for, but not limited to, the following:

- (1) Unit shutdown
- (2) Unit separation
- (3) Miscellaneous station alarms.

(f) *Middle Fork-Ralston Interbay.* The interbay high and low water level alarm signals shall be provided from a float mechanism at the interbay dam. The high and low alarm signals shall be transmitted to Middle Fork powerhouse by aerial cable and repeated to Ralston powerhouse as a separate alarm indication.

The interbay spillway crest gates shall be provided with automatic float controls capable of maintaining the interbay water level within a pre-selected and adjustable range below elevation 2530 feet under all conditions except flood flows which exceed the total discharge capacity of the spillway crest gates.

The position of each spillway crest gate shall be transmitted to Middle Fork powerhouse by aerial cable and repeated to Ralston powerhouse at a selected point of the Middle Fork powerhouse supervisory control equipment.

Supervisory indications and alarms shall indicate the initial opening and final closing operation for each of the spillway crest gates.

Facilities shall be provided at or near the interbay dam which will limit the rate of rise of interbay downstream water level to an acceptable safe limit under all but flood conditions. Such facilities shall consist of reliable and fail-safe controls or struc-

tures, or both, which will automatically regulate the rate of change of downstream water level within acceptable limits.

(g) *Ralston Afterbay*. The afterbay high and low water level alarm signals shall be transmitted to Oxbow powerhouse from a float mechanism at the Ralston Afterbay dam and to Ralston powerhouse from a float mechanism near Ralston powerhouse.

The afterbay spillway crest gates shall be provided with automatic float controls capable of maintaining the afterbay water level within a pre-selected and adjustable range below elevation 1178 feet under all but flood flows which exceed the total discharge capacity of the spillway crest gates. Gate operating timing devices shall be provided so that the rate of change of downstream water level will be within the limits specified in the Federal Power Commission license under all but flood conditions. A transfer means for selection of either manual control or automatic float control of the gates shall be provided.

An alarm shall indicate the initial opening of any crest gate. The alarm shall be transmitted to Oxbow powerhouse and repeated to Ralston powerhouse as a separate alarm indication.

#### B-13 GAGES AND METERS

(a) *General for all Reservoirs—Water Levels.*

- (1) Staff gages shall be provided at all reservoirs. Water level recorders operated by float mechanism shall be installed for all reservoirs except Duncan Creek and Long Canyon Diversion reservoirs.
- (2) French Meadows Reservoir. The water level in French Meadows Reservoir shall be telemetered to Ralston powerhouse by radio. The system shall be interrogated by time clock control and shall have digital type readout. The radio telemetering equipment shall be battery operated with capacity for three months operation at  $-10^{\circ}$  Fahrenheit.
- (3) Hell Hole Reservoir. The water level in Hell Hole Reservoir shall be transmitted to French Meadows powerhouse by aerial cable and then to Ralston powerhouse by the French Meadows powerhouse supervisory control equipment as a selected telemetered quantity. The water level shall be displayed at Ralston powerhouse on digital type readout equipment.
- (4) Middle Fork-Ralston Interbay. A water level transmitting device with an operating range of 5 feet shall be provided for float control of the load at both Middle Fork powerhouse and Ralston powerhouse. The water level signal for load control shall be transmitted to Middle Fork powerhouse by cable and repeated from Middle Fork powerhouse to Ralston

powerhouse as a continuous telemetered quantity. An interbay water level transmitting device for indication shall be capable of transmitting the water level over the complete operating range. The water level signal shall be transmitted to Middle Fork powerhouse by aerial cable and then to Ralston powerhouse as a selected telemetered quantity on the Middle Fork powerhouse supervisory control equipment.

- (5) Ralston Afterbay. A water level transmitting device with an operating range of approximately 5 feet shall be provided for automatic float control of Oxbow powerhouse. The float mechanism shall be located at the Ralston Afterbay dam and the water level signal shall be transmitted to Oxbow powerhouse by aerial cable as a continuous telemetered quantity.

A water level transmitting device with an operating range of 15 feet shall be provided for afterbay water level indication at Ralston powerhouse. The float mechanism shall be located near Ralston powerhouse and the water level signal shall be transmitted to Ralston powerhouse by cable.

(b) *Stream Flow*. The following itemized stations and recorders shall be installed to measure stream flow. Additional recorders shall also be installed as required by the Federal Power Commission. Stations shall be located immediately downstream from reservoir spillways for the locations specified below, except for items (1), (5) and (8).

- (1) Duncan Creek Diversion Inflow
- (2) Duncan Creek Diversion Dam
- (3) French Meadows Dam
- (4) Hell Hole Dam
- (5) Middle Fork above Interbay
- (6) Middle Fork-Ralston Interbay Dam
- (7) Ralston Afterbay Dam
- (8) North Fork of the Middle Fork above confluence with the Middle Fork
- (9) North and South Fork of Long Canyon Dams

The recorders shall be located at sites which will provide consistent and accurate measurement in the full range of expected flows. The stream flow from station (5) above shall be telemetered to Middle Fork powerhouse by aerial cable and then to Ralston powerhouse as a selected telemetered quantity on the Middle Fork powerhouse supervisory control equipment.

(c) *Conduit Flow*. Recorders, with associated staff gages where applicable, shall be installed to provide a continuous record of flow in

- (1) French Meadows Reservoir-French Meadows Power Plant Tunnel
- (2) Hell Hole Reservoir-Middle Fork Power Plant Tunnel
- (3) Middle Fork-Ralston Interbay-Ralston Power Plant Tunnel
- (4) Oxbow Power Plant Penstock
- (5) North and South Fork of Long Canyon Diversions.

Recorded flow at points (1), (2), (3) and (4) above may be measured at the powerhouses with suitable recording devices.

(d) *Power Plant Meters.* In addition to the normal installation of transmission and generator meters, the following installations shall be made at each plant:

- (1) For registration of delivery of power from the *project* to Pacific, a watt-hour meter with demand register and with provision for adjustment to equivalent values at the high tension delivery point, and a recording wattmeter.
- (2) For registration of delivery of power from Pacific to the *project*, a watt-hour meter with demand register and with provision for adjustment to equivalent values at the high tension delivery point.
- (3) For registration of delivery of power for *project power plant use*, a watt-hour meter with demand register.
- (4) For registration of *project power plant* voltage, a recording voltmeter.

Meters specified above for items (1), (2) and (4) are to be connected to the low tension side of the main transformer bank. The meter specified above for item (3) is to be connected to the load side of the station service transformer bank.

#### B-14 START-UP, EFFICIENCY AND PERFORMANCE TESTS

(a) A complete testing and checking program shall be outlined and scheduled well in advance of the delivery of first power. The program shall include checks on equipment guarantees and general checking of all components of plants and facilities and the interrelated functions of the various facilities. The generating units shall be tested insofar as practical to their full capability and the settings of the protective devices shall be coordinated with the practical limits of the unit. All checks and tests shall be thoroughly documented and included in a comprehensive test report so that the proper functioning of all facilities and equipment under all normal and emergency operating conditions shall be known and so that the necessary information shall be available for the proper operation of the *project*.

(b) Performance and efficiency tests for the *project* turbine and generator units shall be made by

Placer in the presence of Pacific's representatives as soon as possible and shall commence not later than thirty (30) days after first delivery of power at each of the *power plants*. Measurement of water shall be by either the Gibson or Allen Salt Velocity method. The efficiency tests shall be thoroughly documented and included in a comprehensive efficiency test report.

(c) All records obtained in all tests and checks shall be made available to Pacific. Placer shall provide Pacific with four (4) copies of all test reports.

#### B-15 PERMANENT ROADS

The following permanent roads are required and shall be constructed for satisfactory operation and maintenance of the *project*:

- (a) To all dams and tunnel intake structures including Duncan Creek and Long Canyon.
- (b) To the downstream portal of all power tunnels, all tunnel adits and to all powerhouses.
- (c) To the station attendants' cottage near French Meadows powerhouse and the lake tender's cottage at French Meadows Reservoir.
- (d) To radio station sites.

A heliport shall be established at or near the radio station sites, French Meadows Reservoir, French Meadows powerhouse and Middle Fork powerhouse. Suitable access shall be provided from the heliport to the related facility.

All *project roads*, excepting those leading to adits, shall be drained, graded and gravel surfaced, as necessary, to maintain access to all plants and dams during normal year-round operation, and shall be suitable for a mobile crane of 50-ton loading and for moving transformers into and out of powerhouses.

#### B-16 HOUSING AND BUILDINGS

The yard level at each powerhouse shall be above the maximum flood stage. At Oxbow powerhouse the yard level shall be above the water level which would be created by the building of the proposed Auburn Reservoir.

A cottage shall be provided at French Meadows Reservoir for housing a lake tender required for water regulation and general duties at this isolated location.

Cottages shall be provided in the vicinity of French Meadows powerhouse for two station attendants and their families. A bunk house and cook house fitted and equipped for a minimum of twelve men shall be provided near French Meadows powerhouse for maintenance personnel.

A *project headquarters* shall be constructed in the vicinity of Foresthill to provide (1) office space furnished for at least four men, (2) a garage shop for maintenance and housing of a minimum of 16 pieces of automotive equipment, (3) a small shop and welding area of approximately 1,000 square

feet equipped for hydroelectric production maintenance work, and (4) storage, tool room and wash-room facilities.

Radio station buildings shall be constructed with separate rooms for electronic and engine-generator equipment.

Each powerhouse deck shall be designed to support a gantry crane capable of lifting a shaft and rotor, and also to support a 50 ton mobile crane used for maintenance purposes.

#### **B-17 OPERATION AND MAINTENANCE TOOLS AND EQUIPMENT**

On the *full operation date*, the *project* shall be equipped with necessary machine and hand tools, unused new vehicles and road maintenance equipment and other equipment and supplies purchased by Placer and required for operation and maintenance of the *project*.

#### **B-18 DRAWINGS, SPECIFICATIONS, AND OTHER INFORMATION**

Placer shall submit to Pacific from time to time, and as soon as possible, three (3) copies of all contracts, specifications, and drawings for the *project*. Pacific shall have the right to inspect all work performed by or for Placer in constructing the *project*.

Within six (6) months following the *full operation date*, Placer shall provide Pacific with three (3) copies of all drawings, which shall have been brought up to date; not less than three (3) copies of all manufacturers' drawings and instruction books; and copies, or originals, of all pertinent correspondence and data. All manufacturers' drawings and instruction books and all other drawings for the *project* shall be numbered and indexed by Placer.

*Appendix C*

**OPERATION AND MAINTENANCE REQUIREMENTS**

The following provisions shall govern the operation and maintenance of the *project*, except as may otherwise be agreed upon from time to time by both parties.

**I Operation**

**C-1 GENERAL**

Placer shall operate the *project*, insofar as is consistent with Placer supplying water for domestic and irrigation uses within Placer County and with Placer complying with agreements between it and the United States Bureau of Reclamation dated February 20, 1963, and agreements containing limitations upon operations no more restrictive than the terms contained in letters of commitment from Mr. H. P. Dugan, Regional Director of the United States Bureau of Reclamation, to Mr. Frank Paoli, Chairman of the Placer County Water Agency dated February 23, 1962, and July 16, 1962, in accordance with schedules, which shall be furnished from time to time by Pacific, for impounding, release and use of water through *power plants* of the *project* up to their full generating capabilities. Placer shall, consistent with the requirements of paragraph 4 of this contract, from time to time make such changes in *project* facilities as may be concluded are reasonably required to improve economy of operation and shall employ only such personnel as are concluded to be reasonably necessary to operate and maintain the *project* in an economic manner. Pacific and Placer shall exchange information necessary for effective and economic operation of the *project*.

An operator shall be stationed at Ralston Power Plant for 24-hour operation of the *project* plants on a seven day per week basis. Additional personnel, together with radio-equipped vehicles, shall be provided for daily routine operation and maintenance.

Operation shall be such that reservoir water levels shall be kept at maximum levels consistent with schedules for water releases. Operation shall be such that spilling at each dam shall be kept to a minimum.

The *project* shall be staffed a minimum of 30 days prior to the date of first delivery of power by a *project power plant* with competent and trained operating personnel or such personnel shall be in training under a qualified person. Such personnel shall include any physical or technical personnel considered essential to the minimum organization mutually agreed upon under provisions of the contract. Placer shall appoint and have in charge at all times of *project* operations and maintenance a *project* manager technically qualified, trained and thoroughly experienced in the operation and maintenance of hydroelectric works, who shall have full

authority to act for Placer in all matters relating to the *project*. His duties shall include obtaining and passing on the qualifications of other *project* personnel. The first *project* manager shall be appointed at least 6 months prior to the first delivery of power by a *project power plant*.

**C-2 SPECIFIC REQUIREMENTS FOR DIVERSION OF WATER**

Placer shall limit its diversion each year from American River to the following amounts:

Year(s)	Acre Feet Diverted Each Year
1967 through 1971 .....	5,000
1972 through 1976 .....	15,000
1977 through 1981 .....	20,000
1982 through 1986 .....	25,000
1987 through 1991 .....	30,000
1992 through 1996 .....	55,000
1997 through 2001 .....	90,000
2002 through 2006 .....	155,000
2007 through 2011 .....	237,000

For each year, the monthly distribution of water diverted shall be within the following range:

January ... 0 to 5%	July ..... 13 to 19%
February .. 0 to 5%	August .... 13 to 16%
March ..... 2 to 6%	September .. 12 to 13%
April ..... 5 to 10%	October ... 4 to 8%
May ..... 9 to 16%	November .. 0 to 6%
June ..... 12 to 19%	December .. 0 to 5%

**C-3 REQUIREMENTS FOR THE SUPPORT OF FISH LIFE AND FOR RECREATION AND MINIMUM STORAGE LIMITATIONS**

(a) After the *full operation date*, Placer shall limit the voluntary release of water to the stream for the purpose of supporting fish life and recreation to the following amounts at the several points of diversion:

(1) *Duncan Creek at Duncan Creek Diversion*. During normal water years, the natural flow, or 8 cubic feet per second, whichever is less. During dry water years, the natural flow, or 4 cubic feet per second, whichever is less.

(2) *Middle Fork of American River at French Meadows Dam*. During normal water years, 8 cubic feet per second. During dry water years, 4 cubic feet per second.

(3) *Rubicon River at Hell Hole Dam*.

(i) During the following periods within a normal water year:

	Cubic Feet Per Second
June 1 through July 25 .....	20
July 26 through August 5 .....	15
August 6 through October 31 .....	10
November 1 through January 31 .....	14
February 1 through May 31 .....	20

(ii) During the following periods within a dry water year:

	Cubic Feet Per Second
June 1 through December 31 .....	8
January 1 through March 25 .....	6
March 26 through May 31 .....	8

(4) *Long Canyon at Long Canyon Diversions.*

(i) South Long Canyon Creek. During normal water years, 5 cubic feet per second, or the natural flow, whichever is less. During dry water years, 2.5 cubic feet per second, or the natural flow, whichever is less.

(ii) North Long Canyon Creek. During all types of years, 2 cubic feet per second, or the natural flow, whichever is less.

(5) *Middle Fork American River at Middle Fork-Ralston Interbay.* During normal water years, 23 cubic feet per second, or the natural flow, whichever is less. During dry water years, 12 cubic feet per second, or the natural flow, whichever is less.

(6) *Middle Fork American River at Ralston Afterbay Dam.* During all types of years, such release as will result in a flow of 75 cubic feet per second, measured immediately below the confluence of the North Fork of the Middle Fork and the Middle Fork of the American River.

(7) *North Fork American River at American River Diversion.* During all types of years, 75 cubic feet per second.

For the purposes of this subparagraph (a), a water year extends from June 1 through May 31 of the calendar year following. A water year shall be deemed dry if the estimated unimpaired seasonal runoff of American River at Folsom Dam from the preceding October 1 to September 30 of each calendar year, as estimated on or about April 1 by the California Department of Water Resources, is 1,000,000 acre feet or less. All other years shall be deemed normal water years. If no such estimate is available, such runoff shall be estimated by the parties.

(b) Whenever required by operation under this contract storage may be reduced to the following amounts:

(1) In a year in which the estimated total unimpaired runoff is more than 2,000,000 acre feet,

Reservoir	June 1-Sept 30 (Acre Feet)	Oct 1-May 31 (Acre Feet)
French Meadows .....	60,000	50,000
Hell Hole .....	70,000	50,000

(2) In a year in which the estimated total unimpaired runoff is less than 2,000,000 acre feet, and more than 1,200,000 acre feet,

Reservoir	June 1-Sept 30 (Acre Feet)	Oct 1-May 31 (Acre Feet)
French Meadows .....	60,000	25,000
Hell Hole .....	70,000	25,000

(3) In a year in which the estimated total unimpaired runoff is less than 1,200,000 acre feet,

Reservoir	June 1-Sept 30 (Acre Feet)	Oct 1-May 31 (Acre Feet)
French Meadows .....	28,000	8,700
Hell Hole .....	26,000	5,500

For the purposes of this subparagraph (b), the estimated total unimpaired runoff shall be determined in the same manner as it was determined for the purposes of subparagraph (a), using the same runoff period. The estimated total unimpaired runoff as so determined shall govern the storage requirements for the twelve-month period beginning on the June 1 next following the said April 1 estimate and extending through the succeeding May 31.

## II Maintenance

### C-4 SCHEDULING

Placer shall notify Pacific of contemplated maintenance work which would affect operation of the project, and shall cooperate with Pacific in scheduling the work by advancing or postponing the time of performance so as not unnecessarily to cause power loss or inconvenience to Pacific. Such maintenance work shall be completed in the shortest possible time and, if requested by Pacific, shall be performed on a 24-hour day basis, including Sundays and holidays.

### C-5 INSPECTION

Placer shall make such inspections, investigations and tests, both routine and extraordinary, as are called for by the best engineering and operating practice and shall afford Pacific full opportunity to inform itself as to the condition of the project and the elements thereof by giving Pacific notice and opportunity to join with Placer in inspections, investigations and tests, by submission to Pacific of copies of reports as to the results thereof and by giving Pacific access to Placer's properties for the purpose of any inspections, investigations and tests which Pacific may desire to perform independently of Placer. Pacific shall be given full opportunity to

inspect the performance of any maintenance work on the *project* by Placer, its employees, agents and contractors.

### III Performance by Pacific

#### C-6 OPERATION AND MAINTENANCE

Placer shall have no obligation to perform under this appendix or to operate or maintain the *project* pursuant to paragraphs 3 and 4 of this contract, or to repay any sums paid by Pacific or interest thereon, except to the extent that Placer can do so with money received from payments made by Pacific pursuant to paragraph 9 (b) of this contract and with money deposited in the operation and maintenance fund pursuant to paragraph C-7. At any time when the operation and maintenance fund is exhausted and moneys received by Placer pursuant to paragraph 9 (b) of this contract are not sufficient to pay the operation and maintenance cost of the *project* and withdrawals by Pacific under paragraph C-12, Pacific shall pay Placer each month such additional sums as may reasonably and necessarily be required to pay such costs; provided, that in lieu of making such additional payments, or in the event Placer fails or is unable to operate or maintain the *project* or any of the units thereof in accordance with this contract, Pacific may upon reasonable notice to Placer, which may be 24 hours or less in case of urgency, enter upon, operate and maintain the *project* or such unit thereof as may be necessary, for and on behalf of Placer, but at Pacific's own cost and expense. In such event, Placer hereby employs Pacific to act as such operator and hereby consents and agrees that Pacific may enter upon the *project* and act as such operator, until Placer shall provide satisfactory assurance that it is able to and will perform satisfactory operation and maintenance of the *project*. Pacific's determination as to the necessity for, and manner of, operation and maintenance, and as to the amount of expenses incurred hereunder, in the event Pacific shall take over such operation and maintenance, shall be conclusive in the absence of bad faith.

### IV Operation and Maintenance Fund

#### C-7 ESTABLISHMENT OF FUND

To provide assurance of proper operation and maintenance of the *project*, and to enable performance of the obligations provided for in this appendix and in paragraphs 3 and 4 of this contract, Placer shall establish an operation and maintenance fund under a trust agreement with a trustee chosen by mutual agreement of the parties hereto.

#### C-8 TRUSTEE

The trustee shall be a bank or trust company authorized to do and doing business in the State of California and having capital and surplus and undivided profits of at least \$50,000,000.

#### C-9 DEPOSITS

Placer shall deposit in said fund (a) promptly upon the sale of *project bonds*, the sum of \$1,500,000 (b) promptly upon receipt, all moneys received under paragraph 8 of this contract; (c) on each January 1 and July 1, any amount remaining from moneys received the preceding six months under paragraph 9 (b) of this contract, after payment of costs incurred pursuant to paragraphs 3 and 4 of this contract; (d) upon confirmation of the *full operation date*, any balance remaining in the *project* Construction Fund pursuant to Section 3.03 of Resolution No. 63-11 of Placer after provision for payment of all *project construction costs*; (e) on each June 1 and December 1 after January 1, 1967, one-half of the excess, if any, by which power payments received pursuant to paragraph 9 (a) hereof on the next preceding May 15 or November 15, as the case may be, plus liquidated damages and proceeds from water insurance received in lieu of such power payments, exceeds the amounts required to pay interest on and principal of *project bonds* on the next succeeding January 1 or July 1, as the case may be, until a total sum of \$50,000 has been so deposited, after which all of said excess shall be so deposited; and (f) after the *full operation date*, promptly upon receipt, all moneys received from *project* property and mechanical breakdown insurance, but such deposits shall at all times be separately accounted for and shall not be considered as part of any balance in said fund for the purposes of sections (d) and (e) above.

#### C-10 WITHDRAWALS

Withdrawals may be made from said fund only as provided in the following paragraphs.

#### C-11 WITHDRAWALS BY PLACER

Placer shall be entitled to withdraw money from said fund to pay (a) debts incurred pursuant to paragraphs 3 and 4 of this contract and C-1 of this appendix, including premiums for insurance not required by paragraph 4 including such deductible provisions as are agreed upon by the parties, and (b) any other charges included from time to time within the Federal Power Commission Uniform System of Accounts prescribed for Public Utilities and Licensees, including taxes, if any, imposed on any interest which Placer may be found to have in the *project*; and (c) moneys required to pay Pacific pursuant to paragraph 14. Placer shall not be entitled to withdraw money from said fund or from payments made by Pacific pursuant to paragraph 9 (b) of this contract to pay (a) compensation and expenses of Placer's officers, directors or non-*project* personnel in any year exceeding \$4,000, (b) compensation of personnel in excess of that paid by California public agencies for similar services, (c) any costs connected with the American River Diversion, (d) any costs properly allocable to irri-

gation and domestic water purposes, (e) any costs of recreation facilities not required by Federal Power Commission License, or (f) any costs incurred pursuant to paragraphs 15 and 20. For each authorized withdrawal, Placer shall, by written certificate signed by the Chairman of its Board of Directors or other authorized representative, certify to the trustee of said fund the amount actually expended or owing and Pacific shall, by written certificates signed by its President or other authorized representative, certify to said trustee that such payment is a proper charge under this contract. Upon receipt of such certificates said trustee shall thereupon be empowered to pay said amounts.

#### C-12 WITHDRAWALS BY PACIFIC

Pacific shall be entitled to withdraw money from said fund to pay (a) its cost of operation and maintenance incurred at any time pursuant to paragraph C-6 of this appendix, calculated in accordance with Pacific's established billing procedure as outlined in Pacific's Auditing Department Standard Practice No. 117.1-1 as hereafter amended, or superseded, (b) taxes, if any, imposed on any interest in the *project* which Pacific may be found to have under this contract or imposed on the sale or delivery of power and energy pursuant to this contract, and (c) interest at a rate equal to the most recent rate of return found to be reasonable by the Public Utilities Commission of the State of California on Pacific's Electric Department rate base, on any amount owed to Pacific by said fund to reimburse Pacific for said costs or taxes, such interest to accrue until the time when moneys are available in said fund to pay said debt. For each such withdrawal Pacific shall, by written certificate signed by its President or its authorized representative, certify to the trustee of said funds the amount for which it is entitled to payment and Placer shall, by written certificate signed by its Chairman of its board of directors or other authorized representative, certify to said trustee that such payment is a proper charge under this contract. Upon receipt of such certificates said trustee shall thereupon be empowered to pay said amounts.

#### C-13 TERMINATION

Upon the termination of this contract, all amounts remaining in said fund shall be paid to Placer, except that any amount that Pacific may be entitled to by reason of paragraph C-12 of this appendix shall be withheld upon Pacific's certificate alone and retained until the respective rights of Placer and Pacific shall be finally ascertained.

#### C-14 RELIANCE BY TRUSTEE

Said trustee, in all matters relating to the operation of and withdrawals from said fund shall be entitled to rely upon the certificates of Placer and Pacific and shall not be obligated to make an independent determination of the facts certified.

#### C-15 INVESTMENT

Any portion of said fund may be invested in United States government securities at the direction of Placer or in other securities as may be agreed upon by Placer and Pacific. All interest and other income received from such investment after the *full operation date* shall be deposited in and become a part of said fund.

#### C-16 EXPENSES OF TRUSTEES

The expenses and fees of the bond trustee or fiscal agent and bond paying agents and the expenses and fees of the trustee in connection with the handling of the operation and maintenance fund shall be paid therefrom.

#### C-17 FINANCIAL STATEMENTS

Within fifteen days after each January 1 and July 1, the trustee shall submit to Placer and Pacific an itemized account showing the status of said fund and all disbursements made therefrom during the preceding six calendar months. Placer shall submit to Pacific each month an itemized account showing all disbursements made from moneys received under paragraph 9 (b) of this contract during the preceding month and from moneys deposited into said fund and shall make its books and records available for monthly audit by Pacific.

Appendix D

**STORAGE REQUIREMENTS FOR  
DETERMINATION OF FULL OPERATION DATE**

Minimum amounts of *storage* in thousand acre feet at the end of the month in Placer's French Meadows and Hell Hole reservoirs:

Month	French Meadows	Hell Hole
January .....	87	137
February .....	80	125
March .....	75	123
April .....	97	151
May .....	122	200
June .....	132.5	207
July .....	122	190
August .....	112	175
September .....	108	168
October .....	104	162
November .....	100	156
December .....	96	150

For the purpose of determining whether the applicable minimum *storage* level has been reached, water in *storage* at any time shall be deemed to be an amount equal to the sum of (1) *storage*, and (2) water which Placer was not permitted to retain in *storage* in years other than dry years (as defined below) pursuant to that agreement between the United States, Placer and Pacific permitting Placer more readily to meet the *storage* criteria set forth in this appendix; provided, that the credit allowed in (2) above shall apply only (a) if *full operation date* has not otherwise occurred as a result of actual *storage* by April 1, 1967, and (b) if French Meadows Complex is completed and able to store water by November 15, 1964, and Hell Hole Complex is completed and able to store water by November 15, 1965. The term "dry year," as used in this paragraph, shall apply to any period commencing on October 1 and ending on the following September 30 during which the natural inflow to Folsom reservoir for the period commencing with the intervening April 1 through the following September 30 is less than 700,000 acre feet.

If the forecast by the United States, pursuant to said agreement, of water available for mandatory water requirements and generation indicates that only sufficient generation is available to support the Central Valley Project mandatory water requirements and dependable capacity, water shall not be made available to the Agency for *storage*. If such forecast indicates that water previously stored pursuant to Article 9 (b) of said agreement (after the latest date when water was stored pursuant to Ar-

ticle 9 (a) of said agreement) must be released to prevent reduction of said dependable capacity caused by such *storage*, the Agency at request of the United States shall release water so previously stored pursuant to said Article 9 (b).

The foregoing provisions shall apply unless, at the request of Pacific, the United States consents otherwise in accordance with procedures to be established by United States and Pacific. Pacific agrees that under such procedures said dependable capacity will be deemed not to be reduced as the result of such *storage*.

The following *storage* capacity tables shall be used in the determination of gross *storage* capacity:

**FRENCH MEADOWS RESERVOIR**

Elevation	Acre Feet	Elevation	Acre Feet
5,280 .....	159,420	5,160 .....	27,660
5,270 .....	144,240	5,150 .....	21,430
5,260 .....	129,810	5,140 .....	15,830
5,250 .....	116,170	5,130 .....	10,900
5,240 .....	103,400	5,120 .....	6,840
5,230 .....	91,460	5,110 .....	3,770
5,220 .....	80,230	5,100 .....	1,620
5,210 .....	69,730	5,090 .....	480
5,200 .....	59,940	5,080 .....	130
5,190 .....	50,730	5,070 .....	40
5,180 .....	42,230	5,060 .....	10
5,170 .....	34,580	5,050 .....	0

**HELL HOLE RESERVOIR**

Elevation	Acre Feet	Elevation	Acre Feet
4,650 .....	234,132	4,450 .....	50,527
4,640 .....	221,075	4,440 .....	44,720
4,630 .....	208,389	4,430 .....	39,215
4,620 .....	196,091	4,420 .....	34,080
4,610 .....	184,193	4,410 .....	29,292
4,600 .....	172,728	4,400 .....	24,808
4,590 .....	161,751	4,390 .....	20,623
4,580 .....	151,340	4,380 .....	16,773
4,570 .....	141,551	4,370 .....	13,354
4,560 .....	132,377	4,360 .....	10,438
4,550 .....	123,669	4,350 .....	7,946
4,540 .....	115,266	4,340 .....	5,835
4,530 .....	107,107	4,330 .....	4,157
4,520 .....	99,161	4,320 .....	2,908
4,510 .....	91,433	4,310 .....	1,985
4,500 .....	83,941	4,300 .....	1,236
4,490 .....	76,699	4,290 .....	600
4,480 .....	69,710	4,280 .....	198
4,470 .....	63,003	4,270 .....	48
4,460 .....	56,609	4,260 .....	0

**ATTACHMENT 4-2**

**Joint Exercise of Powers Agreement for the  
Middle Fork Project Finance Authority**

JOINT EXERCISE OF POWERS AGREEMENT FOR THE  
MIDDLE FORK PROJECT FINANCE AUTHORITY

THIS AGREEMENT (this "Joint Exercise of Powers Agreement") is dated as of January 10, 2006, by and between the County of Placer, a political subdivision duly organized and existing under the laws of the State of California (the "County"), and the Placer County Water Agency, a public agency duly organized and existing pursuant to the Placer County Water Agency Act (California Statutes 1957, Chapter 1234 as amended) (the "Agency"):

WITNESSETH:

WHEREAS, the Agency and the County through the Placer County Water Agency Act are responsible for approving new contracts for the sale of electrical energy from the Middle Fork American River Hydroelectric Project (MFP) and the spending of revenue there from for the benefit of the people of Placer County. Section 7.3 of the Agency Act provides in part: "No contract for the sale of electrical energy shall be executed, nor shall any revenues received pursuant to any contract for the sale of electrical energy entered into after January 1, 1975, be spent, unless previously approved by the board of supervisors of the county."; and,

WHEREAS, the Agency and the County each serve all of the people of Placer County exclusively, and the jurisdictional boundaries of the Agency and the County are coterminous, and as such the Agency and the County desire to pursue opportunities related to the MFP for the benefit of their common constituents; and,

WHEREAS, the Agency owns and operates the MFP pursuant to license no. 2079 issued by the Federal Energy Regulatory Commission (FERC) on March 13, 1963. This license is due to expire on February 28, 2013. It is in the interests of both the County and the Agency, as well as the landowners and inhabitants of Placer County, that the Agency acquire and be granted a new FERC license when the current license expires so that the Agency can continue to own and operate the Project to provide water, hydroelectric power, recreation and other benefits for the people of Placer County. In order to obtain such a new license, the Agency needs to conduct a variety of procedures, studies and negotiations with interested stakeholders and make improvements and modifications to its power generation system; and,

WHEREAS, the Agency operates the MFP pursuant to the provisions of an existing Power Purchase Contract with Pacific Gas and Electric Company (PG&E) which is due to expire on February 28, 2013; and,

WHEREAS, the County and the Agency have incurred costs and will continue to incur costs in the pursuit of the purposes set forth herein and desire to have these costs financed through this Middle Fork Project Finance Authority; and,

WHEREAS, the County and the Agency from time to time undertake the financing and refinancing of such public purposes of the County and the Agency as are set forth herein, and the County and the Agency wish to form a joint powers authority under the Joint Exercise of Powers

Law of the State of California (constituting Chapter 5 of Division 7 of Title 1 of the Government Code of the State of California) for the purpose of establishing a vehicle which may reduce local borrowing costs and promote the greater use of financial instruments and mechanisms.

NOW, THEREFORE, in consideration of the above premises and of the mutual promises herein contained, the County and the Agency do hereby agree as follows:

ARTICLE I

DEFINITIONS

Section 1.01 Definitions: Unless the context otherwise requires, the words and terms defined in this Article shall, for the purpose hereof, have the meanings herein specified.

“Act” means Articles 1 through 4 (commencing with section 6500) of Chapter 5, Division 7, Title 1 of the California Government Code of the State of California.

“Agreement” means this Joint Exercise of Powers Agreement, as originally entered into or as amended from time to time.

“Agency” means the Placer County Water Agency.

“Agency Act” means the Placer County Water Agency Act, Stats. 1957, c. 1234, as amended.

“Agency Board of Directors” means the Board of Directors of the Placer County Water Agency.

“Annual Budget” means a plan of financial operations reported through a system and structure of accounts, which detail the planned and expected expenditures and revenues for a given fiscal year.

“Annual Expenditure Draw Schedule” means a schedule outlining the expected amounts and dates of expenditures for the fiscal year reflecting cash requirements for the Annual Budget.

“Authority” means the Middle Fork Project Finance Authority established pursuant to Section 2.02 of the Agreement.

“Bond Law” means the Marks-Roos Local Bond Pooling Act of 1985, being Article 4 of the Act (commencing with section 6584), as now or hereafter amended.

“Board of Directors” or “Board” means the Board of Directors of the Middle Fork Project Finance Authority referred to in Section 2.03, which shall be the governing body of the Authority.

“Board of Supervisors” means the Board of Supervisors of the County of Placer.

“Bonds”, means bonds, notes or other obligations of the Authority issued pursuant to the Bond Law or pursuant to any other provision of law which may be used by the Authority for the authorization and issuance of bonds, notes or other obligations to finance or refinance costs, including but not limited to studies, procedures, improvements and modifications to the Agency’s Middle Fork Project.

“Directors” mean the representatives of the County and the Agency constituting the Board of Directors pursuant to Section 2.03.

“Executive Director” means the Executive Director of the Authority appointed pursuant to Section 3.02.

“Fiscal Year” shall be the same as the calendar year, the period from January 1 to and including December 31.

“Future Electrical Energy Sales” means any sale of electrical energy or related services entered into by the Agency after the approval of the Authority.

“Middle Fork Project” or “MFP” means the Agency’s Middle Fork American River Hydroelectric Project, which presently is and will continue to be owned and operated by the Agency pursuant to FERC Project No. 2079 and any new license granted to the Agency by FERC.

“Parties” means the Agency and the County collectively.

“Secretary” means the Secretary of the Authority appointed pursuant to Section 3.03.

“Treasurer” means the Treasurer of the Authority appointed pursuant to Section 3.04.

## ARTICLE II

### GENERAL PROVISIONS

Section 2.01 Purpose: The purpose of this Agreement is to establish an Authority to serve the mutual interests of the County and the Agency, exclusively, to provide for the financing of studies, programs, procedures, projects, services, improvements, modifications, and other costs that may be required to obtain a new FERC license or which may be completed under the current or subsequent FERC license of the MFP by the Agency, to approve Future Electrical Energy Sales, and to distribute the revenues from Future Electrical Energy Sales.

Section 2.02 Creation of Authority: Pursuant to the Act, there is hereby created a public entity to be known as the “Middle Fork Project Finance Authority”. The Authority shall

be a public entity separate and apart from the County and the Agency, and shall administer this Agreement.

Section 2.03 Board of Directors: A Board of Directors consisting of four (4) Directors shall administer the Authority, unless and until such number is changed by amendment of this Agreement. The Board shall be known as the "Board of Directors of the Middle Fork Project Finance Authority". The persons duly elected or appointed from time to time (or the designee, if applicable) to the following positions shall be the members of and shall constitute the Board:

- (a) Two members of the Placer County Board of Supervisors selected by the Board of Supervisors; and,
- (b) Two members of the Board of Directors of the Placer County Water Agency selected by the Agency Board of Directors.
- (c) The Agency Board of Directors and the County Board of Supervisors may each designate an alternate from their respective Boards who shall have the full authority to act in the absence of a designated representative to the Authority Board.

Section 2.04 Meetings of the Board:

- (a) Regular Meetings: The Board shall provide for its regular meetings; provided, however, that at least one regular meeting shall be held each year. The date, hour and place of the holding of regular meetings shall be fixed by resolution of the Board and a copy of such resolution shall be filed with the County and the Agency.
- (b) Special Meetings: Special meetings of the Board may be called in accordance with the provisions of section 54956 of the Government Code of the State of California.
- (c) Call, Notice and Conduct of Meetings: All meetings of the Board, including without limitation, regular, adjourned regular and special meetings, shall be called, noticed, held and conducted in accordance with the provisions of the Ralph M. Brown Act of the Government Code of the State of California.

Section 2.05 Minutes: The Secretary shall cause minutes to be kept of the meetings of the Board and shall, as soon as possible after each meeting, cause a copy of the minutes to be forwarded to each Director, the Executive Director, and to the County, and to the Agency.

Section 2.06 Voting: All voting power of the Authority shall reside in the Board and each Board member shall have one vote.

Section 2.07 Quorum; Required Votes; Approvals: Directors holding a majority of the votes shall constitute a quorum for the transaction of business (3 Directors constitute a quorum so long as there are only 4 total), except that less than a quorum may adjourn from time to time. The affirmative votes of at least three of the Directors present at any meeting at which a quorum is present shall be required to take any action by the Board.

Section 2.08 Bylaws: The Board may adopt, from time to time, such bylaws, rules and regulations for the conduct of its meetings as are necessary for the purposes hereof.

Section 2.09 Dispute Resolution: In the event that the Board is deadlocked on any issue, including approval of the Authority's budgets, the issue will be referred to both full Boards of the Agency and the County for resolution. Those Boards shall mutually select a third party arbitrator, funded in equal portions by the Parties to conduct an advisory arbitration. The arbitrator shall make a recommendation to each Board on the disputed issue. If either Board rejects the recommended resolution, it shall do so during a public hearing, and shall, at the conclusion of that hearing, make written findings of fact as to why the recommended resolution was not accepted. Any dispute not resolved by the two Boards shall be referred by the two Boards for binding arbitration pursuant to the provisions of Title 9 of Part 3 of the California Code of Civil Procedure (Section 1280 et. seq.). If a final decision determines that too much money was allocated to the Agency under the first priority in Section 6.04(a), the Agency shall refund that amount to the Authority out of the funds subsequently allocated to the Agency under the third priority in Section 6.04(a).

Section 2.10 MFP System: The Agency shall continue to own, manage, operate and maintain the MFP. The MFP shall be operated in conformance with the FERC license, all other regulatory requirements and any power sale contract requirements. The first priority in the operation of the MFP shall be to provide a reliable supply of water from the MFP to the lands and inhabitants of Placer County while generating revenues from the sale of electrical energy sufficient to pay debt service on Bonds. The second priority shall be to maximize the revenues from the sale of electrical energy. The third priority shall be the sale of water, to water customers outside of Placer County. It is understood by the Parties that revenue from the sale of water from the MFP by the Agency shall not be used to support the operations and maintenance costs of the MFP. It is further understood by the Parties that as provided for in the Agency Act, the Agency, with the prior approval of the Authority, shall enter into contracts for the sale of future electrical energy and related services. The revenue from the sale of future electrical energy contracts and related services shall be payable directly to the Authority for deposit into the Authority's bank account and the Authority shall distribute those revenues as provided in Article VI of this Agreement.

### ARTICLE III

#### OFFICERS AND EMPLOYEES

Section 3.01 Chair, Vice-Chair: The Board shall elect a Chair and Vice-Chair from among the Directors. These officers shall perform the duties normal to said offices. Unless

otherwise provided by the Board, the Chair shall sign all contracts on behalf of the Authority, and shall perform such other duties as may be imposed by the Board. The Vice-Chair shall sign contracts and perform all of the Chair's duties in the absence of the Chair.

Section 3.02 Executive Director: The Agency General Manager, or the General Manager's designee, shall serve as the Executive Director. The Executive Director shall administer the day-to-day affairs of the Authority and shall execute the policies and directives of the Board.

Section 3.03 Secretary: The County Executive Officer, or the County Executive Officer's designee, shall serve as the Secretary. The Secretary shall countersign all contracts signed by the Chair or Vice-Chair on behalf of the Authority, shall have the duties and obligations set forth in Section 2.05 of this Agreement, and perform such other duties as may be imposed by the Board, cause a copy of this Agreement to be filed with the Secretary of State pursuant to the Act and the Secretary shall have charge of, handle and have access to all other records of the Authority.

Section 3.04 Treasurer: Pursuant to section 6505.6 of the Act, the Placer County Water Agency Director of Finance is hereby designated as the Treasurer of the Authority. The Treasurer shall be the depository, shall have custody of all of the accounts, funds and money of the Authority from whatever source, shall have the duties and obligations set forth in sections 6505 and 6505.5 of the Act and shall assure accountability of all funds and reporting of all receipts and disbursements of the Authority. As provided in section 6505 and section 6505.6 of the Act, the Treasurer shall make arrangements with a certified public accountant or firm of certified public accountants for the annual audit of accounts and records of the Authority. Pursuant to section 6505.1 of the Act, the Treasurer shall have charge of, handle and have access to any property of the Authority.

Section 3.05 Bonding Persons Having Access to Records: From time to time, the Board may designate persons, in addition to the Executive Director, the Secretary and the Treasurer, having charge of, handling or having access to any records, funds or accounts of the Authority, and the respective amounts of the official bonds of the Executive Director, the Secretary and the Treasurer and such other persons pursuant to section 6505.1 of the Act.

Section 3.06 Legal Advisor: The Counsel for the Agency shall act as the legal advisor of the Authority, and shall perform such duties as may be prescribed by the Board.

Section 3.07 Employees, Consultants and Contractors: The Board shall have the power by resolution to appoint and employ such other employees, consultants and independent contractors as may be necessary for the purposes of this Agreement.

All of the privileges and immunities from liability, exemption from laws, ordinances and rules, all pension, relief, disability, workers' compensation and other benefits which apply to the activities of officers, agents, or employees of a public agency when performing their respective functions shall apply to the officers, agents or employees of the Authority to the same degree and

extent while engaged in the performance of any of the functions and other duties of such officers, agents or employees under this Agreement.

None of the officers, agents, or employees directly employed by the Board shall be deemed, by reason of their employment by the Board to be employed by the County or the Agency or, by reason of their employment by the Board, to be subject to any of the requirements of the County or the Agency. The Board may adopt and implement such personnel rules and compensation plans, as it deems appropriate for its direct employees, consultants and contractors.

Section 3.08 Assistant Officers: The Board may by resolution provide for the appointment of additional officers of the Authority who may or may not be Directors, as the Board shall from time to time deem appropriate.

## ARTICLE IV

### POWERS

Section 4.01 General Powers: The Authority shall exercise in the manner herein provided the powers of each of the County and the Agency as necessary to the accomplishment of the purposes of this Agreement, subject to the restrictions set forth in Section 4.04. As provided in the Act, the Authority shall be a public entity separate from the County and the Agency.

Section 4.02 Power to Issue Bonds: The Authority shall have all of the powers provided in the Act and in the Bond Law, including the power to issue Bonds thereunder.

Section 4.03 Specific Powers: The Authority is hereby authorized, in its own name, to do all acts necessary for the exercise of the foregoing powers, including but not limited to, any or all of the following:

- (a) To make and enter into contracts and agreements;
- (b) To employ agents, employees, consultants or contractors;
- (c) To sue and be sued in its own name;
- (d) To issue Bonds and otherwise to incur debts, liabilities or obligations and to provide for repayment thereof;
- (e) To review and approve the Annual Budget submitted by the Agency, and to make appropriations and expenditures for the purposes hereof;
- (f) To transfer money consistent with the Annual Budget to the County or the Agency for the purposes hereof;

- (g) To review and approve contracts for the sale of electrical energy or related services from the MFP prior to Agency execution of those contracts.
- (h) To apply for, accept, receive and disburse grants, loans and other aids from any agency of the United States of America or of the State of California;
- (i) To invest any money held by the Treasurer on behalf of the Authority pursuant to section 6505.5 of the Act which is not required for the immediate necessities of the Authority, as the Authority determines is advisable, in the same manner and upon the same conditions as local agencies, pursuant to section 53601 of the Government Code of the State of California;
- (j) To carry out and enforce all the provisions of this Agreement;
- (k) To make and enter into agreements, assignments and other documents of any nature whatsoever as may be necessary or convenient in the exercise of its powers hereunder or under the Act or the Bond Law;
- (l) To exercise any and all other powers as may be provided in the Act or in the Bond Law.
- (m) To distribute the revenues from the sale of Future Electrical Energy Sales pursuant to Article VI of this Agreement.

Section 4.04 Restrictions on Exercise of Powers: The powers of the Authority shall be exercised in the manner provided in the Act and in the Bond Law; and, except for those powers set forth in the Bond Law, shall be subject (in accordance with section 6509 of the Act) to the restrictions upon the manner of exercising such powers that are imposed upon the Agency in the exercise of similar powers.

Section 4.05 Obligations of Authority: The debts, liabilities and obligations of the Authority shall not be the debts, liabilities and obligations of the County or the Agency.

## ARTICLE V

### METHODS OF PROCEDURE

Section 5.01 Assumption of Responsibilities by the Authority: As soon as practicable after the date of execution of this Agreement, the Directors shall give notice (in the manner required by Section 2.04) of the organizational meeting of the Board. At said meeting the Board

shall provide for its regular meetings as required by Section 2.04 and elect a Chair and Vice-Chair.

Section 5.02 Delegation of Powers: The County and the Agency hereby delegate to the Authority the power and the duty necessary to carryout the purposes hereof.

## ARTICLE VI

### CONTRIBUTION; EXPENDITURES; ACCOUNTS AND REPORTS; FUNDS

Section 6.01 General: This agreement is intended to apply to two distinct time periods: prior to the termination of the existing Power Purchase Contract with PG&E in 2013; and after the termination of the existing Power Purchase Contract with PG&E. Prior to 2013 PG&E is responsible to fund the cost of the operation and maintenance and debt service of the MFP and there will be no net revenue from the sale of electrical energy available to the Authority. Therefore, the parties will be looking to the Authority primarily to provide sufficient funds through the issuance of public debt for the Agency's relicensing effort, including reimbursement of Agency and County relicensing expenses incurred prior to the formation of the Authority, and potentially for betterment projects that are determined to be necessary for the Agency to accept a new license for the MFP in 2013. The security for this debt will be future revenues from the sale of energy, or alternatively, the power generation assets of the MFP, which are expected to begin providing revenue to the Authority sufficient to cover the cost of operations, maintenance and debt service after new agreements for the sale of the electrical energy are entered into by the Agency after the termination of the existing Power Purchase Contract with PG&E.

After the expiration of the existing Power Purchase Contract with PG&E in 2013 the Authority will assume an additional role which is to fulfill the obligations of the Agency and the County under the Agency Act to jointly approve any Future Electrical Energy Sales or Contracts and to jointly approve the expenditure of funds received from the sale of electrical energy from the MFP. The Authority is thus charged with the responsibility to allocate the revenue received from the sale of electrical energy from the MFP to assure that there is sufficient funding made available to the Agency to meet its responsibilities to operate and maintain the MFP in a manner that assures the continuation of the benefits of the MFP to the residents of Placer County in perpetuity, to repay any debts that the Authority may owe, and then to distribute any net revenues to the County and the Agency in the manner provided herein.

Section 6.02 Contributions: With the approval of this Agreement, the County and the Agency commit to the Authority, in trust, all future revenues from the sale of energy from the MFP received subsequent to the termination of the existing Power Purchase Contract with PG&E or should the Agency not be granted a new license by FERC, the Agency commits to the Authority, in trust, all future revenues from the sale or lease of any of the MFP facilities for generation of electrical energy up to the amount needed to retire any debt incurred by the Authority for financing the efforts of the County and the Agency to relicense the MFP.

The County and the Agency may also in the appropriate circumstance when required hereunder: (a) make contributions from their own funds for the purposes set forth herein, (b) make payments of public funds to defray the cost of such purposes, (c) make advances of public funds for such purposes, such advances to be repaid as provided herein, or (d) use their personnel, equipment or property in lieu of other contributions or advances. The provisions of Government Code section 6513 are hereby incorporated into this Agreement by reference.

Section 6.03 Expenditures – Prior to the expiration of the existing Power Purchase Contract with PG&E in 2013:

(a) Pre-2013 Annual Budget: The Agency, in consultation with the County, shall annually prepare/update and submit to the Authority for its review and approval a budget for relicensing activities and for reimbursements and betterment projects, if any. The budget shall include funding necessary for current-year planned expenses and estimates of future year expenditures through the completion of the license process. The budget shall identify amounts for consulting or construction contracts which span more than one fiscal year. Each annually submitted budget shall include an actual vs. budgeted comparison for the prior fiscal year.

Once the Annual Budget is approved by the Authority, funds for the so approved current year expenses and multi-year contracts shall be appropriated and encumbered for those designated purposes and the expenditure of those funds shall be deemed authorized and the Authority shall distribute those funds as expenses are incurred for the purposes indicated. The Authority is authorized and directed to raise the funds necessary to fund approved projects through the issuance of Bonds payable from revenue from Future Electrical Energy Sales or revenue from the sale or lease of any of the MFP facilities.

Section 6.04 Expenditures – After the expiration of the existing Power Purchase Contract with PG&E in 2013:

(a) Expenditure Priorities: Expenditures of revenue from the sale of electrical energy by the Authority shall be consistent with the following ordered list of spending priorities:

First: Basic operation and maintenance of the MFP. This shall include all activities necessary to keep the MFP in operation consistent with prudent utility practices, including compliance with all contract and regulatory requirements, the maintenance of prudent operating reserves, and the repayment of any debt incurred by the Authority.

Second: Additions and betterments. This shall include MFP major improvement projects, and the funding of emergency reserves and project sinking fund accounts for future replacements. This shall include expenditures and projects necessary for the long term operational and financial stability of the MFP but which in any given year could be postponed if necessary due to insufficient funds.

Third: Equal distribution to the County and the Agency of all remaining power revenues after funding of the priorities listed above.

(b) Annual Budget: The Agency, in consultation with the County, shall annually, on or before October 1 each year, prepare and submit to the Authority for its review a budget for the operation and maintenance of the Middle Fork Project. The budget shall include funding necessary for current-year planned expenses, estimates of future year expenditures for four years into the future and a forecast of electrical energy revenues for each year. The budget shall distinguish between planned expenditures for the basic operation and maintenance of the MFP, and for additions and betterment projects. The budget shall identify amounts for consulting or construction contracts which span more than one fiscal year.

Once a budget is approved by the Authority, funds for the so approved current year expenses and multi-year contracts shall be appropriated and encumbered for those designated purposes and the expenditure of those funds shall be deemed authorized and the Agency/County may request those funds as expenses are incurred for the purposes indicated and the Authority Treasurer may draw on such appropriated funds for payment to the Agency/County and for payment of obligations of the Authority that become due.

(c) Failure to Approve the Annual Budget: If the Authority fails to approve the Annual Budget by November 30 each year the matter shall be referred for dispute resolution as provided in Section 2.09.

While the dispute is pending resolution the Authority shall continue to fully appropriate and encumber funds for the basic operation and maintenance of the MFP, debt service, and to ensure the completion of any authorized consulting or construction contracts that will extend beyond the end of the current fiscal year as submitted as if the budget had been approved. However, if there is any dispute concerning any amount in the Annual Budget for additions and betterments, the amount in dispute shall be sequestered and shall not be distributed to the parties until the dispute has been resolved.

(d) Retained Funds: The Authority shall not retain any funds received from the sale of electrical energy longer than one year except as provided in this section. Those funds which the Authority receives that are not appropriated or encumbered under the Annual Budget, debt service, or sequestered pending resolution of a dispute, shall be distributed equally to the County and to the Agency.

Section 6.05 Annual Expenditure Draw Schedule: To facilitate the timely availability of funds to pay for MFP costs, the Agency, in consultation with the County, shall annually submit to the Board along with the Annual Budget an Annual Expenditure Draw Schedule noting the approximate dates and estimated amounts of expenditures for the coming fiscal year. The Annual Expenditure Draw Schedule shall be updated from time-to-time and provided to pertinent financial individuals to ensure that approved and encumbered funds can be made available as needed to pay project costs as needed.

Section 6.06 Accounts and Reports: To the extent not covered by the duties assigned to a trustee or agent chosen by the Authority, the Treasurer shall establish and maintain such funds and accounts as may be required by generally accepted accounting practices or by any provision of any resolution, indenture or trust agreement or other related documents entered into with respect to the proceeds of any Bonds issued by the Authority. The books and records of the Authority in the hands of a trustee or agent or the Treasurer shall be open to inspection at all reasonable times by representatives of the County and the Agency. The Treasurer, within 180 days after the close of each Fiscal Year, shall give a complete written report of all financial activities, including a copy of the annual audit as specified in Section 3.04 above, for such fiscal year to the County and the Agency to the extent such activities are not covered by the report of such trustee or agent. The trustee or agent appointed under any resolution, indenture or trust agreement or other related documents shall establish suitable funds, furnish financial reports and provide suitable accounting procedures to carry out the provision of sale resolution, indenture or trust agreement or other related documents entered into with respect to the proceeds of any Bonds issued by the Authority. Said trustee or agent may be given such duties in said resolution, indenture or trust agreement as may be desirable to carry out this Agreement.

Section 6.07 Funds: Subject to the applicable provisions of any instrument or agreement which the Authority may enter into, which may provide for a trustee to receive, have custody of and disburse Authority funds, the Treasurer of the Authority shall receive, have custody of and disburse Authority funds in accordance with generally accepted accounting practices, and shall make the disbursements required by this Agreement or to carry out any of the provisions or purposes of this Agreement.

## ARTICLE VII

### TERM

Section 7.01 Term: This Agreement shall become effective, and the Authority shall come into existence, as of the date first set forth above, and this Agreement and the Authority shall thereafter continue in full force and effect at least so long as any Bonds or other debt remain outstanding.

Section 7.02 Termination of the Authority: Either party may terminate the Authority after the full retirement of the Authority's debt, upon 6 months notice. Either party may fund the retirement of the Authority's debt for the purpose of terminating the Authority. However, the parties recognize that beyond the financing of the MFP re-licensing, this agreement provides an orderly mechanism for meeting requirements of the Agency Act, as stated under the first WHEREAS of this Agreement, and this Agreement may also provide an efficient mechanism for accomplishing other matters of common importance throughout the duration of the FERC license.

Section 7.03 Disposition of Assets: Upon termination of this Agreement, all property of the Authority, both real and personal, shall be divided among the parties hereto in such manner as shall be agreed upon by the parties.

ARTICLE VIII

MISCELLANEOUS PROVISION

Section 8.01 Notices: Notices hereunder shall be in writing and shall be sufficient if delivered to:

Placer County  
175 Fulweiler Avenue, Room 206  
Auburn, CA 95603  
Attention: County Executive Officer

Placer County Water Agency  
144 Ferguson Road  
P.O. Box 6570  
Auburn, CA 95604  
Attention: Agency General Manager

Section 8.02 Section Headings: All section headings in this Agreement are for convenience of reference only and are not to be construed as modifying or governing this language in the section referred to or to define or limit the scope of any provision of this Agreement.

Section 8.03 Consent: Wherever in this Agreement any consent or approval is required, the same shall not be unreasonably withheld.

Section 8.04 Law Governing: This Agreement is made in the State of California under the constitution and laws of the State of California, and is to be so construed.

Section 8.05 Amendments: This Agreement may be amended at any time, or from time to time, except as limited by contract with the owners of Bonds issued by the Authority or by applicable regulations or laws of any jurisdiction having authority, by one or more supplemental agreements executed by both of the parties to this Agreement either as required in order to carry out any of the provisions of this Agreement or for any other purpose in pursuance or extension of the purposes of this Agreement.

Section 8.06 Enforcement by Authority: The Authority is hereby authorized to take any or all legal or equitable actions, including but not limited to injunction and specific performance, necessary or permitted by law to enforce this Agreement.

Section 8.07 Severability: Should any part, term or provision of this Agreement be decided by any court of competent jurisdiction to be illegal or in conflict with any law of the State of California, or otherwise be rendered unenforceable or ineffectual, the validity of the remaining portions or provisions shall not be affected thereby.

Section 8.08 Successors: This Agreement shall be binding upon and shall inure to the benefit of the successors of the County or the Agency, respectively. Neither the County nor the Agency may assign any right or obligation hereunder without the written consent of the other.

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed and attested by their proper officers thereunto duly authorized and their official seals to be hereto affixed, on the day and year set opposite the name of each of the parties.

PLACER COUNTY

  
Chairman

ATTEST;

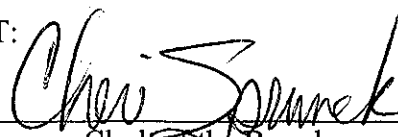
  
Clerk of the Board

(SEAL)

PLACER COUNTY WATER AGENCY

  
Chair

ATTEST:

  
Clerk of the Board

(SEAL)

**ATTACHMENT 4-3**

**Resolution 08-16 of the Board of Directors of the Placer County Water Agency  
Establishing a Policy for the Distribution and Use of Net Power Sale Revenues  
from the Middle Fork American River Hydroelectric Project.**

**RESOLUTION 08-16 OF THE BOARD OF DIRECTORS OF THE PLACER COUNTY WATER AGENCY ESTABLISHING A POLICY FOR THE DISTRIBUTION AND USE OF NET POWER SALE REVENUES FROM THE MIDDLE FORK AMERICAN RIVER HYDROELECTRIC PROJECT**

WHEREAS, the citizens of Placer County approved a bond measure in 1962 to fund the construction of the Middle Fork Project with assurances that the Project would provide benefits to the residents of Placer County; and,

WHEREAS, the existing Middle Fork Project power sale contract, which funded the repayment of the bonds which funded the construction of the Middle Fork Project and its annual operating and maintenance costs, will expire in March 2013; and,

WHEREAS, under the terms of a new power sale contract after March 2013 PCWA anticipates that there will frequently be net power sale revenues in excess of the operating costs of the Middle Fork Project, available to provide public benefits; and,

WHEREAS, PCWA intends to invest net revenues into projects and programs which benefit of the people of Placer County consistent with its authorities under the PCWA Act.

NOW THEREFORE the Board of Directors of the Placer County Water Agency does hereby adopt the attached Policy as a guide for the use of Middle Fork Project Net Revenues.


The foregoing resolution was duly passed at a regular meeting of the Board of Directors of the Placer County Water Agency held on June 5, 2008, by the following roll call vote:

AYES DIRECTORS: Gray Allen, Alex Ferreira, Lowell Jarvis, Otis Wollan,  
Chairman Mike Lee

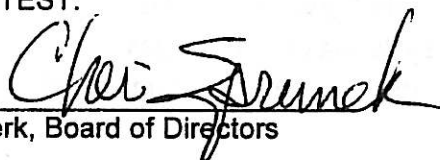
NOES DIRECTORS: None

ABSENT DIRECTORS: None

Signed and approved by me after its passage this 5th day of June, 2008.

  
\_\_\_\_\_  
Mike Lee, Chairman of the Board  
Placer County Water Agency

ATTEST:

  
\_\_\_\_\_  
Clerk, Board of Directors

## **PCWA POLICY FOR THE USE OF MIDDLE FORK PROJECT NET REVENUES**

This policy is intended to guide future PCWA Boards of Directors in the distribution of the Agency's share of net revenues from the sale of power from the Middle Fork Project.

The Board of Directors should allocate net revenues from the sale of power from the Middle Fork Project for disbursement to public agencies within Placer County, including PCWA's own water systems, in the form of loans or grants for projects and programs which are consistent with PCWA's authorities under the PCWA Act.

PCWA may establish by separate action such rules and procedures as it deems appropriate for the distribution of these funds.

The following is a list of the types of projects that will be eligible for funding:

### **Water Supply:**

#### **Water Rights protection**

Water supply development; including needs assessment studies, supply feasibility studies, infrastructure design, and environmental studies – but not including construction of water supply infrastructure intended to supply new land development projects.

Water conservation and water recycling programs; including program development studies, meter installation or replacement, installation of devices for water use efficiency, leak detection, conservation education programs, conservation rebate and incentive programs, and infrastructure construction

Groundwater management; including planning and implementation, aquifer recharge management and facilities, and agriculture groundwater supply protection programs

Renewal and replacement of ageing infrastructure, including planning and assessment programs

Development of new or extension of existing water systems to serve existing homes, neighborhoods and communities that do not have adequate domestic water supplies

### **Water Supply Reliability:**

Projects; including installation of supply facilities for use during water outages, installation of backup power generation facilities for use during power outages, increased storage capacity, control system improvements, and mapping for improved planning and emergency response

**Water Quality:**

Treatment process improvements; including compliance with mandated water quality requirements and projects to improve water treatment process reliability

Source water quality protection programs; including watershed management to reduce or prevent contaminants from entering the water system, watershed management to sustain or enhance flow and timing, or watershed management to reduce the risk of fire to infrastructure or the sustainability of watershed function.

**Ecosystem protection:**

Habitat conservation plan support; including the management of Agency lands for protection of water supplies

Aquatic system management; including removal and replacement of fish migration obstacles, installation of fish screens on intakes, stream/river bed management, listed species protection and riparian habitat management of Placer County water systems

Carbon footprint and greenhouse gas emission reduction programs, including renewable energy projects and energy efficiency programs.

**Recreation:**

Creation or enhancement of recreation opportunities associated with Placer County water or power facilities

**Public Education:**

Projects and programs designed to educate and inform the public on important water, energy, and resource issues

**Financial:**

Emergency financial aid to Placer County public water systems

**Energy System Supply and Reliability:**

Enhancements and betterments to the energy generation system, expansion of the energy portfolio consistent with the PCWA act