Placer County Water Agency
Middle Fork American River Project
(FERC No. 2079)

FINAL

LAND 4 – FERC PROJECT BOUNDARY AND AUTHORIZATION TECHNICAL STUDY REPORT – 2008

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1.0 INTRODUCTION

This report documents the results of studies conducted by the Placer County Water Agency (PCWA) in accordance with the LAND 4 – FERC Project Boundary and Authorization Study Plan (LAND 4 – TSP) for the Middle Fork American River Project (MFP or Project). The LAND 4 – TSP was included in Supporting Document (SD) H of the Pre-Application Document (PAD) for Project (PCWA 2007). Specifically, this report provides a description of the methods and results related to identifying and mapping the location of existing Project facilities and features, Project recreation facilities and proposed Project betterment facilities (including new inundation areas) with respect to the FERC Project boundary, land ownership, legal easements, right-of-ways (ROWs), and other authorizations or agreements. The study also identifies and maps any additional lands necessary for operations or maintenance of the MFP.

2.0 STUDY OBJECTIVES

The objectives of the studies described in the LAND 4 – TSP are:

- Identify lands that are necessary for operation and maintenance of the MFP in relation to the existing FERC Project boundary, legal easements, ROWs, or current authorizations.
- Identify lands that are necessary for operation and maintenance of potential Project betterments in relation to the existing FERC Project boundary, legal easements, right-of-ways (ROWs), or current authorizations.

Figure LAND 4-1 shows the LAND 4 – TSP objectives and the study elements associated with each objective. It also shows where the information developed in this study is documented.

3.0 STUDY IMPLEMENTATION

The study elements described in the LAND 4 – TSP were initiated in 2008 and completed in 2009. A summary of the study elements that have been completed, outstanding study elements, and any deviations or proposed modifications to the LAND 4 – TSP are discussed in the following subsections.

3.1 STUDY ELEMENTS COMPLETED

All study elements described in the LAND 4 – TSP were completed in 2008-2009 as described below.

Existing Project Facilities

- Identified and mapped the locations of all existing Project facilities, roads, trails, Project-related recreation facilities, and additional lands necessary for operation and maintenance of the MFP in relation to the FERC Project boundary and current land ownership.

- Identified Project-related facilities that are currently situated outside the FERC Project boundary.

- Identified and mapped existing legal easements and ROWs associated with access for, and operation and maintenance of the MFP.

- Compiled and summarized current authorizations (including termination dates) and other Project-related agreements with the U.S. Department of Agriculture - Forest Service (USDA-FS), other public entities, and private landholders regarding operation and maintenance of the MFP.

Potential Project Betterments

- Identified and mapped proposed facilities (including roads and trails) and new inundation areas associated with potential Project betterments in relation to the current FERC Project boundary, current land ownership, existing legal easement and ROWs, and current authorizations.
- Identified and mapped the location of potential Project betterment construction, staging and disposal areas in relation to the current FERC Project boundary, existing land ownership, and current authorizations.

3.2 VARIANCES FROM LAND 4 TSP

The study was completed as described in the LAND 4 – TSP with the following two exceptions. First, the study schedule included in the LAND 4 – TSP identified that a draft study report would be distributed to the LAND Management Technical Working Group (TWG) in September 2008. Additional time was required to investigate and acquire legal descriptions of existing easements, ROWs, and authorizations associated with the MFP. This work was completed and the results are included in this report.

Second, the maps depicting locations of special use permits, easements, and authorizations are not included because they cannot be accurately depicted at the scale included in this report. Copies of the special use permits, easements, and authorizations including maps are available upon request.

3.3 OUTSTANDING STUDY ELEMENTS

There are no outstanding study elements.

3.4 PROPOSED MODIFICATIONS TO THE LAND 4 – TSP

There are no proposed modifications to the LAND 4 – TSP.

4.0 EXTENT OF STUDY AREA

The study area includes those areas encompassing the existing Project facilities, roads, trails, developed Project recreation facilities, and additional areas necessary for

operation and maintenance of the MFP, as identified in Tables LAND 4-1 and LAND 4-2**.**

The study area also included areas associated with potential Project betterments, including new inundation areas, the areas enveloping new facility footprints, and areas and/or roads needed for construction, staging, and disposal, as identified in Table LAND 4-3**.**

5.0 STUDY APPROACH

This section describes the study approach used to complete the LAND 4 – TSP.

5.1 EXISTING PROJECT FACILITIES AND PROJECT LANDS

During preparation of the PAD for the MFP in 2007, PCWA completed a comprehensive assessment of identifying lands necessary for the continued operations and maintenance of the Project, including all Project facilities and features and Project-related recreational facilities. The findings of this assessment were summarized in SD B of the PAD (PCWA 2007). A list of Project facilities and lands necessary for the operations and maintenance of the MFP were included in Table SD B-1 and Table SD B-2. As part of the current LAND 4 study, PCWA reviewed and updated, as appropriate, the information included in the PAD.

The PAD also included Geographic Information System (GIS) maps illustrating the locations of all Project facilities and lands in relation to the current FERC Project boundary. The location of the FERC Project boundary was established using information and exhibits contained in PCWA and FERC Project files. PCWA also retained a survey firm, Andregg Geomatics, to ground-truth the location of the FERC Project boundary. Detailed maps illustrating the location of all existing Project facilities and lands in relationship to the FERC Project boundary were provided in SD B of the PAD (Maps SD B-2a through B-2f).

As part of the current LAND 4 study, PCWA reviewed and updated, as appropriate, the information included in the maps provided in the PAD. These updated maps were used to identify whether existing Project facilities and lands are within the current FERC Project boundary.

In addition, PCWA also augmented information contained in the SD B of the PAD including: (1) incorporation of land ownership information into GIS maps of the Project; (2) development of a list of Project-related legal easements and ROWs; and (3) summarization of current authorizations and other Project-related agreements related to operation and maintenance of the MFP. Information on land ownership in the study area was obtained from the Placer County and Eldorado County Assessors offices and incorporated in the Project GIS maps. PCWA's files were reviewed to identify any legal easements, ROWs, or agreements associated with the MFP between PCWA and any party including the USDA-FS, another public entity, or private landowner. In addition, files maintained at the Tahoe National Forest (TNF) - Foresthill Ranger District office and the Eldorado National Forest (ENF) - Georgetown Ranger District office were

reviewed to identify and characterize any authorizations or agreements between PCWA and USDA-FS including, if available, permit number or name, authorization date, expiration data, and current status.

5.2 POTENTIAL PROJECT BETTERMENTS

In SD C of the PAD (PCWA 2007), PCWA provided a detailed description of three proposed Project betterments/enhancements for the MFP, including the identification of all proposed facilities and features and new inundation areas associated with the proposed betterments (PCWA 2007). A brief description of each potential Project betterment is provided in Appendix A.

The three proposed Project betterments include:

- Hell Hole Reservoir Seasonal Storage Increase.
- French Meadows Powerhouse Capacity Upgrade.
- Ralston Powerhouse Capacity Upgrade.

A list of proposed Project facilities associated with the betterments was provided in Table SD C-1 of the PAD. Table SD C-1 also provided a list of potential construction, staging, and disposal areas necessary for construction of each of the betterments. The PAD included GIS maps illustrating the locations of all proposed betterment facilities and lands necessary for construction of the betterments in relation to the current FERC Project boundary. Detailed maps illustrating the location of all proposed betterment facilities in relationship to the FERC Project boundary and existing Project facilities were provided in SD C of the PAD (Maps SD C-1a, SD C-1b, SD C-2, and SD C-3).

As part of the current LAND 4 study, PCWA reviewed and updated, as appropriate, the information included in the PAD. In addition, PCWA augmented information contained in the SD C of the PAD including: (1) incorporation of land ownership information into GIS maps of the potential Project betterments; and (2) identification of existing legal easements, ROWs, or authorizations on lands where the proposed betterment facilities will be located or lands used during construction of betterment facilities.

6.0 STUDY RESULTS

6.1 EXISTING PROJECT FACILITIES AND PROJECT LANDS

An updated list of Project facilities and features, including all land necessary for operation and maintenance of the MFP and Project-related recreation facilities is provided in Table LAND 4-1 and Table LAND 4-2. Updated GIS maps illustrating the location of all existing Project facilities and features and Project-related recreation facilities in relationship to the current FERC Project boundary and land ownership are provided in Maps LAND 4-1 through LAND 4-6. Table LAND 4-1 identified for each Project facility and features: (1) whether the occupied lands are within the current FERC Project boundary, (2) the associated ownership of the occupied lands, and (3) any associated easements, ROWs, authorizations or agreements that pertain to the Project facility or feature. Similarly, Table LAND 4-2 provided the same information for each

Project-related recreation facility and feature. Of the 165 Project facilities and features listed in Table LAND 4-1, 32 are located on lands either partially or completely outside the current FERC Project boundary. In regard to Project-related recreation facilities and features, 13 of the 25 are located on lands either partially or completely outside the current FERC Project boundary.

Table LAND 4-4 presents the Project facilities and features located partially or completely outside the FERC Project boundary. Table LAND 4-4 organizes the Project facility and features by geographic area rather than facility type. The table also includes a description of Project boundary issues and Project use of the facilities. The location of these facilities and features relative to the current FERC Project boundary is provided in Maps LAND 4-7a through 4-7j.

Similarly, Table LAND 4-5 presents the Project recreation facilities and features located partially or completely outside the FERC Project boundary. Table LAND 4-5 also organizes the Project recreation facility and features by geographic area rather than facility type. The table also includes a description of Project boundary issues and Project-related use of the facilities. The location of these facilities and features relative to the current FERC Project boundary is provided in Maps LAND 4-8a through 4-8e.

6.2 POTENTIAL PROJECT BETTERMENTS

An updated list of proposed betterment facilities and features (including potential construction, staging and disposal areas) is provided in Table LAND 4-3. The most substantial change in proposed betterment facilities and features since issuance of the PAD is associated with the Hell Hole Reservoir Seasonal Storage Increase Betterment. The original design of the betterment included installation of up to 10 foot-high crest gates on the existing dam spillway. Installation of 10 foot-high crest gates required that several parapet walls were needed around Hell Hole Reservoir to protect existing Project facilities. Installation of 3 foot-high crest gates or check value at South Fork Long Canyon Diversion Dam was also needed to prevent water from freely flowing from Hell Hole Reservoir into the diversion through the water conveyance system.

The current design of the betterment includes installation of only a 6 foot-high crest gate at Hell Hole Dam to ensure the new inundation areas does not extend beyond the current FERC Project Boundary. As such, the parapet walls at Hell Hole Reservoir and crest gates at South Fork Long Canyon Diversion Dam have been removed from the list of potential betterment facilities and features. Updated GIS maps illustrating the location of proposed betterment facilities and features in relationship to the current FERC Project boundary and land ownership for each of the betterments are provided in Map LAND 4-9. The new inundation area associated with the Hell Hole Reservoir Seasonal Storage Betterment has not been mapped because the inundation area continues to be within the existing reservoir maximum flood pool and the change in areal extent of the inundation area is so small that it cannot be clearly illustrated at the map scale used in this report.

Table LAND 4-3 identified for each proposed betterment facility and features: (1) whether the occupied lands are within the current FERC Project boundary; and (2) the associated ownership of the occupied lands. A summary of this information for each proposed betterment is described below.

6.2.1 Hell Hole Reservoir Seasonal Storage Increase Betterment

All proposed betterment facilities and features including construction and staging areas occur within the existing FERC Project boundary on lands owned by either the ENF or PCWA. The "new" inundation area of Hell Hole Reservoir resulting from the proposed Hell Hole Seasonal Storage Increase Betterment (6 foot-high crest gates) is within the existing maximum flood pool of the reservoir and the existing FERC Project boundary (PCWA 2007). No legal easements, ROWs, or other authorizations, other than the existing FERC Project Boundary currently exist on lands to be occupied by the proposed betterment.

6.2.2 French Meadows Powerhouse Capacity Upgrade Betterment

Only one proposed betterment facility, the French Meadows - Hell Hole Surge Shaft or Pipeline Road is located outside the existing FERC Project boundary (ENF land). In addition, a portion of one non-Project road (Forest Road 14N09A) located outside the existing FERC Project boundary (ENF land) would be improved to provide better access to the proposed French Meadows - Hell Hole Surge Shaft or Pipeline Road. These facilities are shown on Map LAND 4-10. No legal easements, ROWs, or other authorizations, other than the existing FERC Project Boundary currently exist on the lands to be occupied by the proposed betterment.

Five temporary construction and staging areas related to the French Meadows Powerhouse Capacity Upgrade Betterment occur outside the FERC Project boundary on lands owned by either the ENF or PCWA (Map LAND 4-10). These facilities would be temporary and not required for ongoing operation and maintenance of the MFP.

6.2.3 Ralston Powerhouse Capacity Upgrade Betterment

All proposed facility modifications and construction and staging areas occur within the existing FERC Project boundary on PCWA owned lands. No legal easements, ROWs, or other authorizations, other than the existing FERC Project Boundary currently exist on the lands occupied by the proposed betterment.

7.0 LITERATURE CITED

PCWA. 2007. Pre-Application Document for the Middle Fork American River Project, Placer County Water Agency and supplemental documents, 2007.

TABLES

Table LAND 4-1. Existing Project Facilities and Features in Relation to Current FERC Project Boundary, Land Ownership, Associated Legal Easements, ROWs, and Authorizations.

Existing Project Facilities and Features	In FERC Boundary	Land Ownership						Legal Easements	ROWs	Authorization/Agreement			
		TNF	ENF	PCWA	LST	SPI	OP			Name or Number	Date of Issue	Agreement Date Expiration	Current Status
Dams Reservoirs, and Diversion Pools													
Large Dams													
French Meadows Dam and Outlet Works	Yes	X											
Hell Hole Dam and Outlet Works	Yes		X										
Medium Dams													
Middle Fork Interbay Dam	Yes			X									
Ralston Afterbay Dam	Yes	X		X									
Small Dams													
Duncan Creek Diversion Dam	Yes	X											
North Fork Long Canyon Diversion Dam	Yes			X									
South Fork Long Canyon Diversion Dam	Yes			X									
Large Reservoirs													
French Meadows Reservoir	Yes	X		X									
Hell Hole Reservoir	Yes		X	X									
Medium Reservoirs													
Middle Fork Interbay	Yes			X									
Ralston Afterbay	Yes	X	X	X									
Small Diversion Pools													
Duncan Creek Diversion Pool	Yes	X											
North Fork Long Canyon Diversion Pool	Yes			X									
South Fork Long Canyon Diversion Pool	Yes			X									
Water Conveyance Systems													
Tunnels													
Duncan Creek - Middle Fork Tunnel	Yes	X											
French Meadows - Hell Hole Tunnel	Yes	X	X	X				SPI - Underground /1991					
Hell Hole - Middle Fork Tunnel	Yes		X	X	X			SBC Underground/1964 SPI Undergound/1991					
Middle Fork-Ralston Tunnel	Yes		X	X	X	X		SBC Underground/1964 SPI Undergound/1991					
Ralston-Oxbow Tunnel	Yes	X											
Diversion Pipes and Drop Inlets													
North Fork Long Canyon Diversion Pipe and Drop Inlet	Yes			X									
South Fork Long Canyon Diversion Pipe and Drop Inlet	Yes			X									
Surge Shafts and Adits													
Brushy Canyon Adit	Yes		X										
Hell Hole - Middle Fork Tunnel Surge Shaft and Tank	Yes			X									
Middle Fork-Ralston Tunnel Surge Shaft and Tank	Yes		X										

Table LAND 4-1. Existing Project Facilities and Features in Relation to Current FERC Project Boundary, Land Ownership, Associated Legal Easements, ROWs, and Authorizations (continued).

Existing Project Facilities and Features	In FERC Boundary	Land Ownership						Legal Easements	ROWs	Authorization/Agreement			
		TNF	ENF	PCWA	LST	SPI	OP			Name or Number	Date of Issue	Agreement Date Expiration	Current Status
Water Conveyance Systems (continued)													
Removable Sections and Portals													
Duncan Creek - Middle Fork Tunnel Portal	Yes	X											
French Meadows - Hell Hole Tunnel Removable Section	Yes			X									
Hell Hole - Middle Fork Tunnel Removable Section	Yes			X									
Middle Fork-Ralston Tunnel Removable Section	Yes		X										
North Fork Long Canyon Crossing Removable Section	Yes			X									
Intakes and Gatehouses													
Duncan Creek - Middle Fork Tunnel Intake	Yes	X											
French Meadows - Hell Hole Tunnel Gatehouse	Yes	X											
French Meadows - Hell Hole Tunnel Intake	Yes			X									
Hell Hole - Middle Fork Tunnel Gatehouse	Yes		X										
Hell Hole - Middle Fork Tunnel Intake	Yes		X										
Middle Fork-Ralston Tunnel Intake and Gatehouse	Yes			X									
Ralston-Oxbow Tunnel Intake	Yes	X											
Penstocks and Valve Houses													
French Meadows Powerhouse Penstock and Butterfly Valve House	Yes			X									
Middle Fork Powerhouse Penstock and Butterfly Valve House	Yes			X									
Ralston Powerhouse Penstock and Butterfly Valve House	Yes		X										
Powerhouses, Switchyards, and Substations													
French Meadows Powerhouse and Switchyard	Yes			X									
Hell Hole Powerhouse	Yes		X	X									
Middle Fork Powerhouse and Upper and Lower Switchyards	Yes			X									
Ralston Powerhouse and Switchyard	Yes		X										
Oxbow Powerhouse and Switchyard	Yes	X											
Hell Hole Substation	Yes			X									
Gaging Stations and Weirs													
Stream Gages and Weirs													
Duncan Creek Gage and Weir above Diversion Dam (USGS Gage and Weir No. 11427700)	Yes	X											
Duncan Creek Gage and Weir below Diversion Dam (USGS Gage and Weir No. 11427750)	No	X											
Middle Fork American River Gage and Weir below French Meadows Dam (USGS Gage and Weir No. 11427500)	No				X			Pending					
Middle Fork American River Gage at Interbay Dam (USGS Gage No. 11427770)	Yes			X									
Middle Fork American River Gage above Middle Fork Powerhouse (USGS Gage No. 11427760)	Yes			X									
Middle Fork American River Gage below Oxbow Powerhouse (USGS Gage No. 11433300)	No						X	Yes					
North Fork Long Canyon Gage and Weir at Diversion Dam (USGS Gage and Weir No. 11433085)	Yes			X									
South Fork Long Canyon Gage and Weir at Diversion Dam (USGS Gage and Weir No. 11433065)	Yes			X									

Table LAND 4-1. Existing Project Facilities and Features in Relation to Current FERC Project Boundary, Land Ownership, Associated Legal Easements, ROWs, and Authorizations (continued).

Existing Project Facilities and Features	In FERC Boundary	Land Ownership						Legal Easements	ROWs	Authorization/Agreement			
		TNF	ENF	PCWA	LST	SPI	OP			Name or Number	Date of Issue	Agreement Date Expiration	Current Status
Gaging Stations and Weirs (continued)													
Stream Gages and Weirs (continued)													
Rubicon River Gage and Weir below Hell Hole Dam (USGS Gage and Weir No. 11428800)	Yes			X									
Diversion Gages													
North Fork Long Canyon Gage at Diversion Dam (USGS Gage No. 11433080)	Yes			X									
South Fork Long Canyon Gage at Diversion Dam (USGS Gage No. 11433060)	Yes			X									
Reservoir Gages													
French Meadows Reservoir Gage (USGS Gage No. 11427400)	Yes			X									
French Meadows Reservoir Staff Gage	Yes	X											
Hell Hole Reservoir Gage (USGS Gage No. 11428700)	Yes		X										
Hell Hole Reservoir Staff Gage	Yes		X										
Middle Fork Interbay Reservoir Gage	Yes			X									
Ralston Afterbay Reservoir Gage	Yes	X											
Powerhouse Gages													
French Meadows Powerhouse Gage (USGS Gage No. 11427200)	Yes			X									
Middle Fork Powerhouse Gage (USGS Gage No. 11428600)	Yes			X									
Oxbow Powerhouse Gage (USGS Gage No. 11433212)	Yes	X											
Ralston Powerhouse Gage (USGS Gage No. 11427765)	Yes		X										
Leakage Weirs													
French Meadows Dam Leakage Weirs Nos. 1-6	Yes	X											
Hell Hole Dam Leakage Weir	Yes		X										
Project Communication Lines and Powerlines													
French Meadows Area													
French Meadows Dam Generator Building to French Meadows Dam Outlet Works Powerline	Yes	X											
French Meadows Dam Generator Building to French Meadows Dam Spillway Gates Powerline	Yes	X											
Hell Hole Area													
French Meadows Powerhouse to French Meadows Powerhouse Penstock and Butterfly Valve House Communication Line/Powerline	Yes			X									
French Meadows Powerhouse and Switchyard to Hell Hole - Middle Fork Tunnel Gatehouse, Dormitory Facility, Operator's Cottages, and Hell Hole Powerhouse Communication Line/Powerline	Portion		X	X									
Dormitory and Cottages Water Supply Tank Powerline	Yes		X										
Hell Hole Powerhouse to Rubicon River Gage and Weir below Hell Hole Dam Communication Line/Powerline	Yes		X	X									
Middle Fork Interbay Area													
Middle Fork Powerhouse to Middle Fork Powerhouse Butterfly Valve House Communication Line/Powerline	Yes			X									
Middle Fork Powerhouse Butterfly Valve House to Radio Repeater near Hell Hole - Middle Fork Tunnel Surge Tank (underground) Communication Line/Powerline	Yes		X	X									

Table LAND 4-1. Existing Project Facilities and Features in Relation to Current FERC Project Boundary, Land Ownership, Associated Legal Easements, ROWs, and Authorizations (continued).

Existing Project Facilities and Features	In FERC Boundary	Land Ownership						Legal Easements	ROWs	Authorization/Agreement			
		TNF	ENF	PCWA	LST	SPI	OP			Name or Number	Date of Issue	Agreement Date Expiration	Current Status
Project Communication Lines and Powerlines (continued)													
Middle Fork Interbay Area (continued)													
Middle Fork Powerhouse to Middle Fork-Ralston Tunnel Intake and Gatehouse Communication Line/Powerline	Yes			X									
Middle Fork Powerhouse to Middle Fork American River Gage above Middle Fork Powerhouse Communication Line/Powerline	Yes			X									
Ralston-Oxbow Area													
Ralston-Oxbow Tunnel Intake to Ralston Powerhouse Communication Line	Portion	X	X										
Ralston Powerhouse to Ralston Powerhouse Butterfly Valve House Communication Line/Powerline	Yes		X										
Ralston Afterbay Dam Generator Building to Ralston-Oxbow Tunnel Intake Communication Line/Powerline	Yes	X											
Oxbow Powerhouse to Ralston Afterbay Dam Generator Building Communication Line/Powerline	Yes	X											
Photovoltaic Poles and Powerlines													
Photovoltaic Poles and Powerline to Duncan Creek Gage above Diversion Dam	Yes	X											
Photovoltaic Pole and Powerline at Duncan Creek Gage below Diversion Dam	No	X											
Photovoltaic Pole and Powerline at Middle Fork American River Gage below French Meadows Dam	No				X								
Photovoltaic Pole and Powerline at Middle Fork American River Gage above Middle Fork Powerhouse	Yes			X									
Photovoltaic Pole and Powerline at North Fork Long Canyon Gage at Diversion Dam	Yes			X									
Photovoltaic Pole and Powerline at South Fork Long Canyon Gage at Diversion Dam	Yes			X						Special Use Permit GTN 1004-01	7/25/1990	3/1/2005	Application/ New Permit 6/29/2008
Photovoltaic Pole at Middle Fork American River Gage below Oxbow Powerhouse	No						X						
Microwave Reflectors and Radio Towers													
Passive Microwave Reflector Station above Middle Fork Interbay	No	X								Special Use Permit FHD 100301 (expired)			
Radio Communications Tower near French Meadows - Hell Hole Tunnel Gatehouse	Yes	X											
Radio Communications Tower and Repeater near Hell Hole - Middle Fork Tunnel Surge Shaft and Tank	Yes		X										
Passive Microwave Reflector Station above Ralston Afterbay	No		X							Special Use Permit GTN 1004-03	Not Available	12/31/2005	Application/ New Permit 6/31/2008
Disposal Sites													
Duncan Diversion Dam Sediment Disposal Area	Yes	X								FS Decision Memo 1950(2770) 8-20-2998			

Table LAND 4-1. Existing Project Facilities and Features in Relation to Current FERC Project Boundary, Land Ownership, Associated Legal Easements, ROWs, and Authorizations (continued).

Existing Project Facilities and Features	In FERC Boundary	Land Ownership						Legal Easements	ROWs	Authorization/Agreement			
		TNF	ENF	PCWA	LST	SPI	OP			Name or Number	Date of Issue	Agreement Date Expiration	Current Status
Disposal Sites (continued)													
North Fork Long Canyon Crossing Sediment Disposal Area	No		X							Special Use Permits GTN 99 (522) GTN 146/9907 (522) (522)	 11/12/2004 8/16/2006	 12/31/2005 12/31/2007	
Middle Fork Interbay Sediment Disposal Area	No	X								Special Use Permit None Assigned (522)	8/18/2000	6/30/2001	
Ralston Ridge Sediment Disposal Area	Portion		X							Special Use Permits GTN 1004-02 (522) GTN 1004-04 (522)	 11/20/1991 Not Available	 12/31/1996 12/31/2008	Application/ Renewal 7/31/2008
Indian Bar Sediment Disposal Area	Yes	X		X									
Ancillary Facilities													
French Meadows Dam Generator Building	Yes	X											
French Meadows Dam Staging Area	Yes	X											
Dormitory Facility	Yes		X										
Dormitory and Cottages Water Supply Tank	Yes		X										
Hell Hole Staging Areas	Yes		X										
Operator Cottages and Shop	Yes		X										
Ralston Afterbay Dam Generator Building	Yes	X											
Storage Building at Middle Fork-Ralston Tunnel Surge Shaft and Tank	Yes		X										
Wabena Meadows Snow Course	No	X											
Miranda Cabin Snow Course	No				X			Pending					
Diamond Crossing Snow Course	No	X											
Talbot Camp Snow Course	No	X											
Project Fences													
Slope Fences													
French Meadows Powerhouse Penstock Rock Fence	Yes			X									
French Meadows Powerhouse Slope Fence	Yes			X									
Long Canyon Crossing Slope Fence	Yes			X									
Middle Fork Powerhouse Upper Switchyard Slope Fence	Yes			X									
Middle Fork Interbay Dam Slope Fence	Yes			X									
Oxbow Powerhouse Slope Fence	Yes	X											
Ralston Powerhouse Penstock and Butterfly Valve House Slope Fences	Yes		X										
Ralston Powerhouse Slope Fence	Yes		X										
Public Safety Fences													
Dormitory Facility Barrier Fence	Yes		X										
Hell Hole Dam General Parking Area Barrier Fence	Yes		X										
North Fork Long Canyon Crossing Removable Section Barrier Fence	Yes			X									
Project Roads and Access Points													
Duncan Creek Area													
Duncan Creek Diversion Intake Road and Diversion Pool Access Point	Yes	X											
Duncan Creek Diversion Dam Road	Portion	X											
Duncan Creek Diversion Pool Road and Access Point	Yes	X											

Table LAND 4-1. Existing Project Facilities and Features in Relation to Current FERC Project Boundary, Land Ownership, Associated Legal Easements, ROWs, and Authorizations (continued).

Existing Project Facilities and Features	In FERC Boundary	Land Ownership						Legal Easements	ROWs	Authorization/Agreement			
		TNF	ENF	PCWA	LST	SPI	OP			Name or Number	Date of Issue	Agreement Date Expiration	Current Status
Project Roads and Access Points (continued)													
French Meadows Area													
Duncan Creek - Middle Fork Tunnel Portal Road and Spillway Access Point	Yes	X											
French Meadows - Hell Hole Tunnel Gatehouse Road	Yes	X											
French Meadows Dam Outlet Works and Leakage Weirs Road	Yes	X											
French Meadows Dam Staging Area Road	Yes	X											
Middle Fork American River Gage and Weir below French Meadows Dam Road	No*				X								
Hell Hole Area													
Hell Hole Dam and Powerhouse Road and Spillway Southern Access Point	Yes		X	X									
Rubicon River Gage and Weir below Hell Hole Dam Road	Yes			X									
Hell Hole Dam Leakage Weir Road	Yes		X	X									
Hell Hole Dam Spillway Northern Access Point	Yes		X										
French Meadows - Hell Hole Tunnel Portal Road	Portion		X							1962 FS-PCWA MOU (K)	1962	NA	
French Meadows Powerhouse Road	Portion		X	X						1962 FS-PCWA MOU (J)	1962	NA	
Hell Hole - Middle Fork Tunnel Gatehouse Road	Yes		X										
Dormitory Facility Road	Yes		X										
Hell Hole Dam Spillway Discharge Channel Road	Portion		X	X									
Long Canyon Area													
North Fork Long Canyon Diversion North Road	Portion			X	X			Road Easement		SBC (portion)	1964		
North Fork Long Canyon Diversion South Road	Yes			X						1962 FS-PCWA MOU (K)	1962		
North Fork Long Canyon Diversion Drop Inlet Road	Yes			X									
South Fork Long Canyon Diversion and Drop Inlet Road	Yes		X	X				Road Easement		1962 FS-PCWA MOU (K)	1962		
North Fork Long Canyon Crossing Removable Section North Road and Parking Area	Portion			X	X			Road Easement					
North Fork Long Canyon Crossing Removable Section South Road	Yes**		X	X						1962 FS-PCWA MOU (K)	1962		Application/ New SUP
Middle Fork Interbay Area													
Middle Fork Powerhouse Butterfly Valve House Road	No***		X	X	X			Road Easement		1962 FS-PCWA MOU (K)	1962		
Middle Fork Powerhouse Penstock and Butterfly Valve House Road	Portion		X	X						1962 FS-PCWA MOU (K) SBC (portion)	1962 1964		Application/ New SUP 3/12/2008
Middle Fork Interbay Dam and Powerhouse Road and Interbay Access Points	Portion	X		X						1962 FS-PCWA MOU (H)	1962		
Middle Fork Powerhouse Upper Switchyard Road	Yes			X									
Ralston-Oxbow Area													
Brushy Canyon Adit Road	No****		X					Road Easement		1962 FS-PCWA MOU (K) SBC (portion)	1962 1964		Application/ New SUP 3/12/2008
Oxbow Powerhouse Road	Yes	X											

Table LAND 4-1. Existing Project Facilities and Features in Relation to Current FERC Project Boundary, Land Ownership, Associated Legal Easements, ROWs, and Authorizations (continued).

Existing Project Facilities and Features	In FERC Boundary	Land Ownership						Legal Easements	ROWs	Authorization/Agreement			
		TNF	ENF	PCWA	LST	SPI	OP			Name or Number	Date of Issue	Agreement Date Expiration	Current Status
Project Roads and Access Points (continued)													
Ralston-Oxbow Area (continued)													
Ralston Powerhouse Butterfly Valve Road	Yes		X							1962 FS-PCWA MOU (K): 1963 SUP	1962		
Ralston-Oxbow Tunnel Intake Road	Yes	X											
Ralston Afterbay Road and Boat Ramp	Yes	X											
Ralston Afterbay Dam Road and Afterbay Access Point	Yes	X		X									
Ralston Afterbay Sediment Removal Access Point	Yes		X										
Project Trails													
Duncan Creek Area													
Duncan Creek Diversion Dam North Trail	Yes	X											
Duncan Creek Diversion Dam South Trail	Yes	X											
Photovoltaic Poles and Powerline to Duncan Creek Gage above Diversion Dam Trail	Yes	X											
Duncan Creek Gage and Weir above Diversion Trail	Yes	X											
Duncan Creek Gage and Weir below Diversion Trail	No	X											
French Meadows Area													
Middle Fork American River Gage and Weir below French Meadows Dam Trail	No				X								
Middle Fork Interbay Area													
Middle Fork American River Gage above Middle Fork Powerhouse Trail	Yes			X									
Passive Microwave Reflector Station above Middle Fork Interbay Trail	No	X											
Ralston Afterbay Area													
Passive Microwave Reflector Station above Ralston Afterbay Trail	No		X										
Middle Fork American River Gage below Oxbow Powerhouse Trail	No						X						

Notes:

[1]USDA-FS lands

[2]PCWA lands

[3]Within 200 feet of a wilderness boundary per GIS mapping

[a]Recreation Access Road between facility and FR 68 includes segment(s) outside of FERC boundary

[b]Recreation Access Road between facility and FR 96 includes segment(s) outside of FERC boundary

Recreation Access Road between facility and FR 2 includes segment(s) outside of FERC boundary

[f]Permit application filed with Forest Service

[w]Located within Wilderness Area

ENF - Eldorado National Forest, LST - Lone Star Timber, OP - Other Private, PCWA - Placer County Water Agency

SBC - Stockton Box Company, SPI - Sierra Pacific Industries, TNF - Tahoe National Forest, U - underground

*This road was originally designated as a Project road in the PAD. The road is currently designated as a multi-use road on private property based on additional data gathering.

**This road was originally designated as a Project Road in the PAD. The road is currently divided into two segments with the first segment being designated as a multi-use road on ENF property outside the FERC Project boundary and the second segment designated as a Project road within the FERC Project boundary on PCWA land.

***This road was originally designated as a Project Road in the PAD. The road is currently divided into two segments with the first segment being designated as a multi-use road on private property outside the FERC Project boundary and the second segment designated as a Project road with the majority of the road located on ENF property outside the FERC Project boundary.

****This road was originally designated as a Project Road in the PAD. The road is currently divided into two segments with the first segment being designated as a multi-use road on private and ENF property outside the FERC Project boundary **(NOTE: also a portion within FERC boundary)** and the second segment designated as a Project road within ENF property outside the FERC Project boundary.

Table LAND 4-2. Project-Related Recreation Facilities in Relation to FERC Project Boundary, Land Ownership, Associated Legal Easements, ROWs, and Authorizations.

Project-related Recreation Facilities	In FERC Boundary	Land Ownership						Legal Easements	ROWs	Authorization/Agreement			
		TNF	ENF	PCWA	LST	SPI	OP			Name or Number	Date of Issue	Agreement Date Expiration	Current Status
Project Recreation Facilities													
French Meadows Area													
Ahart Campground	No	X								1989 FS-PCWA Revised Rec Plan	4/27/1992		
Coyote Group Campground	Yes	X								1989 FS-PCWA Revised Rec Plan	4/27/1992		
Poppy Campground	Yes	X								1989 FS-PCWA Revised Rec Plan	4/27/1992		
French Meadows Campground	Yes	X								1989 FS-PCWA Revised Rec Plan	4/27/1992		
Gates Group Campground	Portion	X								1989 FS-PCWA Revised Rec Plan	4/27/1992		
Lewis Campground	Portion	X								1989 FS-PCWA Revised Rec Plan	4/27/1992		
French Meadows Picnic Area	Yes	X								1989 FS-PCWA Revised Rec Plan	4/27/1992		
McGuire Picnic Area	Portion	X								1989 FS-PCWA Revised Rec Plan	4/27/1992		
French Meadows Boat Ramp	Yes	X		X						1989 FS-PCWA Revised Rec Plan	4/27/1992		
McGuire Boat Ramp	Yes	X								1989 FS-PCWA Revised Rec Plan	4/27/1992		
Hell Hole Area													
Big Meadows Campground	No		X		X			Road Easement		1989 FS-PCWA Revised Rec Plan	4/27/1992		
Hell Hole Campground	No		X							1989 FS-PCWA Revised Rec Plan	4/27/1992		
Upper Hell Hole Campground	Portion		X							1989 FS-PCWA Revised Rec Plan	4/27/1992		
Hell Hole Vista	No		X							1989 FS-PCWA Revised Rec Plan	4/27/1992		
Hell Hole General Parking Area	Yes		X							1989 FS-PCWA Revised Rec Plan	4/27/1992		
Hell Hole Boat Ramp Parking Area	Yes		X							1989 FS-PCWA Revised Rec Plan	4/27/1992		
Hell Hole Boat Ramp	Yes		X							1989 FS-PCWA Revised Rec Plan	4/27/1992		
Ralston Afterbay Area													
Ralston Picnic Area	Yes	X								1989 FS-PCWA Revised Rec Plan	4/27/1992		
Ralston Picnic Area Cartop Boat Ramp	Yes	X											
Indian Bar Rafting Access and General Parking	Yes	X											
Long Canyon Area													
Middle Meadows Group Campground	Portion		X	X						SBC (Portion)	1963		

Table LAND 4-2. Project-Related Recreation Facilities in Relation to FERC Project Boundary, Land Ownership, Associated Legal Easements, ROW, and Authorizations (continued).

Project-related Recreation Facilities	In FERC Boundary	Land Ownership						Legal Easements	ROWs	Authorization/Agreement			
		TNF	ENF	PCWA	LST	SPI	OP			Name or Number	Date of Issue	Agreement Date Expiration	Current Status
Project Recreation Facility Features													
Project Recreation Facility Water Supplies and Associated Maintenance Trails													
Dolly Creek Water Supply	No	X								1989 FS-PCWA Revised Rec Plan PCWA-DWR Contract # D-GGR-12	4/27/1992		
French Meadows Campground Water Supply and Trail	No	X								1989 FS-PCWA Revised Rec Plan PCWA-DWR Contract # D-GGR-12	4/27/1992		
Big Meadows Campground Water Supply and Trail	No		X							1989 FS-PCWA Revised Rec Plan	4/27/1992		Relocated
Middle Meadows Group Campground Water Supply and Trail	Portion		X	X						1989 FS-PCWA Revised Rec Plan	4/27/1992		

TNF - Tahoe National Forest
ENF - Eldorado National Forest
PCWA - Placer County Water Agency
LST - Line Star Timber
SPI - Sierra Pacific Industries
OP - Other Private

Table Land 4-3. Proposed Project Betterment Facilities in Relation to FERC Project Boundary and Land Ownership.

Project Facility	In FERC Boundary	Land Ownership
Hell Hole Reservoir Seasonal Storage Increase Betterment		
Hell Hole Dam		
Modified Facilities		
Hell Hole Dam Spillway Crest Gates	Yes	ENF
New Facilities		
Hell Hole Dam Spillway Crest Gates Control Building	Yes	ENF
Hell Hole Dam Spillway Crest Gates Control Building Powerline	Yes	ENF/PCWA
Temporary Construction and Staging Areas		
Hell Hole Dam Spillway Crest Gates Construction Road	Yes	ENF
Hell Hole Dam Spillway Crest Gates Construction Work Area	Yes	ENF
Hell Hole Dam Spillway Crest Gates and Control Building Construction Staging Area	Yes	ENF
Hell Hole Dam Spillway Crest Gates Control Building Construction Work Area	Yes	ENF
Hell Hole Dam Spillway Crest Gates Control Building Powerline Construction Work Area	Yes	ENF/PCWA
Hell Hole Dam Spillway Crest Gates Control Building Powerline Construction Staging Area	Yes	ENF
French Meadows Powerhouse Capacity Upgrade Betterment		
French Meadows Reservoir		
Modified Facilities		
French Meadows - Hell Hole Tunnel Intake Trash Rack	Yes	PCWA
Temporary Construction and Staging Areas		
French Meadows - Hell Hole Tunnel Intake Trash Rack Construction Staging Area	Yes	TNF
French Meadows - Hell Hole Tunnel Intake Trash Rack Construction Work Area	Yes	TNF/PCWA
French Meadows - Hell Hole Tunnel Intake Trash Rack Construction Road	Yes	TNF/PCWA
French Meadows Powerhouse		
Modified Facilities		
French Meadows Powerhouse Switchyard	Yes	PCWA
New Facilities		
French Meadows Powerhouse	Yes	PCWA
French Meadows Powerhouse Penstock	Yes	PCWA
French Meadows - Hell Hole Tunnel Surge Shaft/Tank	Yes	ENF
French Meadows - Hell Hole Tunnel Surge Pipeline	Yes	ENF/PCWA
French Meadows - Hell Hole Tunnel Surge Shaft or Pipeline Road	No	ENF
Temporary Construction and Staging Areas		
French Meadows Powerhouse/Switchyard Construction Work Area	Yes	PCWA
French Meadows Powerhouse/Switchyard Construction Staging Area	Yes	ENF/PCWA
French Meadows Powerhouse Penstock Construction Work Area	Partial	ENF/PCWA
French Meadows Powerhouse Penstock Construction Staging Areas	Partial	ENF/PCWA
French Meadows - Hell Hole Tunnel Surge Shaft/Tank or Pipeline Construction Staging Areas	No	ENF
French Meadows - Hell Hole Tunnel Surge Shaft/Tank Construction Work Area	Yes	ENF

Table Land 4-3. Proposed Project Betterment Facilities in Relation to FERC Project Boundary and Land Ownership (continued).

Project Facility	In FERC Boundary	Land Ownership
French Meadows Powerhouse Capacity Upgrade Betterment (continued)		
French Meadows Powerhouse (continued)		
Temporary Construction and Staging Areas (continued)		
French Meadows - Hell Hole Tunnel Surge Pipeline Construction Work Area	Yes	ENF/PCWA
French Meadows - Hell Hole Tunnel Surge Shaft or Pipeline Road Construction Staging and Work Area	No	ENF
Non-Project Facilities Modified During Construction		
Forest Road 14N09A	Partial	ENF
Forest Road 14N09A Construction Staging and Work Area	Partial	ENF
Middle Fork Powerhouse		
Modified Facilities		
Middle Fork Powerhouse Upper Switchyard	Yes	PCWA
Ralston Powerhouse Capacity Upgrade Betterment		
Ralston Powerhouse		
Modified Facilities		
Ralston Powerhouse	Yes	ENF
Temporary Construction and Staging Areas		
Ralston Powerhouse Construction Staging Areas	Yes	ENF

Table LAND 4-4. Project-Related Facilities Outside or Partially Outside Existing FERC Project Boundary.

Facility	Map No.	Description	Project Use
Duncan Creek Area			
Duncan Creek Gage and Weir below Diversion Dam	LAND 4-7a	The gage and weir located on TNF land outside the Project boundary.	Stream flow monitoring FERC license compliance.
Photovoltaic Pole and Powerline at Duncan Creek Gage and Weir below Diversion Dam	LAND 4-7a	A photovoltaic tower and powerline adjacent to the Duncan Creek Gage and Weir below the Diversion Dam located outside the Project boundary on TNF land.	Power supply to support a remote Project facility.
Duncan Creek Gage and Weir below the Diversion Dam Trail	LAND 4-7a	The approximately 0.17 mile long trail to the gage and weir is located on TNF land outside the Project boundary.	Single use access trail to a Project facility.
Duncan Creek Diversion Dam Road	LAND 4-7a	Approximately 75 ft. at the midpoint of the 0.5 mile long road is located outside the Project boundary on TNF land.	Single use access road to a Project facility.
French Meadows Area			
Middle Fork American River Gage and Weir below French Meadows Dam	LAND 4-7b	The gage and weir are located outside the Project boundary on land owned by Lone Star Timber.	Stream flow monitoring FERC license compliance.
Photovoltaic Pole and Powerline at Middle Fork American River Gage and Weir below French Meadows Dam	LAND 4-7b	A photovoltaic tower and powerline adjacent to the Middle Fork American River gage located outside the Project boundary on land owned by Lone Star Timber.	Power supply to support a remote Project facility.
Middle Fork American River Gage and Weir below French Meadows Dam Trail	LAND 4-7b	An approximately 0.02 mile long trail to the gage, weir, and photovoltaic tower are located outside the Project boundary on land owned by Lone Star Timber.	Single use access rail to a Project facility.
Hell Hole Area			
French Meadows Powerhouse and Switchyard to Hell Hole - Middle Fork Tunnel Gatehouse, Dormitory Facility, Operator's Cottages, and Hell Hole Powerhouse Communication Line/Powerline	LAND 4-7c	Approximately 0.7 mile of this 2.3 mile long power and communication line is located on the western shore of Hell Hole Reservoir outside the Project boundary on ENF land.	Power and communications line for Project operations.
French Meadows Powerhouse Road	LAND 4-7c	Approximately 1 mile of a 1.28 mile long road from FR 2 to the French Meadows Powerhouse is located outside the Project boundary on ENF land.	Single use access road to a Project facility.
French Meadows - Hell Hole Tunnel Portal Road	LAND 4-7c	Approximately 0.61 mile long road from FR 2 to the tunnel portal is located outside the Project boundary on ENF land.	Single use access road to a Project facility.
Hell Hole Dam Spillway Discharge Channel Road	LAND 4-7c	Two portions located near the midpoint of this road, one approximately 600 ft. long and the other approximately 250 ft. long of this 0.60 mile long road are outside of the Project boundary on ENF land.	Single use access road to a Project facility.
Long Canyon Area			
North Fork Long Canyon Diversion North Road	LAND 4-7d	Approximately 300 ft. of 0.14 mile long portion of road originating at Forest Road 14N42.1.	Single use access road to a Project facility.
North Fork Long Canyon Crossing Sediment Disposal Site	LAND 4-7e	Approximately 8 acre sediment disposal site adjacent to road 14N16 south of the North Fork Long Canyon Crossing is outside the Project boundary on ENF land.	Sediment disposal area to support Project maintenance activities.
North Fork Long Canyon Crossing Removable Section North Road and Parking Area	LAND 4-7e	Approximately 400 ft. of 0.15 mile long access road from FR 2 to the North Fork Long Canyon Crossing Removable Section is located outside the Project boundary on ENF land.	Single use access road to a Project facility.
Middle Fork Interbay Area			
Passive Microwave Reflector Station above Middle Fork Interbay	LAND 4-7f	Microwave reflector located approximately 1.25 miles NW of Middle Fork Interbay is outside the Project boundary on TNF land.	Microwave communications facility to support Project operations.
Passive Microwave Reflector Station above Middle Fork Interbay Trail	LAND 4-7f	Approximately 0.1 mile long trail interconnecting with Forest Road 16.26 is outside the Project boundary on TNF land.	Access trail to Microwave communications facility.

Table LAND 4-4. Project-Related Facilities Outside or Partially Outside Existing FERC Project Boundary (continued).

Facility	Map No.	Description	Project Use
Middle Fork Interbay Area (continued)			
Middle Fork Interbay Sediment Disposal Area	LAND 4-7f	Approximately 1.9 acre sediment disposal area midway along the Middle Fork Interbay Dam and Powerhouse Road is outside the Project boundary on TNF land.	Sediment disposal area to support Project maintenance activities.
Middle Fork Interbay Dam and Powerhouse Road and Interbay Access Point	LAND 4-7f	Approximately 4.42 miles of a 4.85 mile long road from Mosquito Ridge Road (FR 96) to the Middle Fork Powerhouse is located outside the Project boundary on TNF land.	Single use access road and access point to a Project facility.
Middle Fork Powerhouse Butterfly Valve House Road	LAND 4-7f	Approximately 0.6 mile length of FR 14N55 to the Middle Fork Powerhouse Butterfly Valve House is located outside the Project boundary on ENF land.	Single use access road to a Project facility.
Middle Fork Powerhouse Penstock and Butterfly Valve House Road	LAND 4-7f	Approximately 1.4 miles of a 1.8 mile long road adjacent to the Middle Fork Powerhouse Penstock is outside the Project boundary on ENF land.	Single use access road to a Project facility.
Ralston-Oxbow Area			
Middle Fork American River gage below Oxbow Powerhouse	LAND 4-7h	The gage is located outside the Project boundary on privately held land.	Stream flow monitoring FERC license compliance.
Ralston - Oxbow Tunnel Intake to Ralston Powerhouse Communication Line	LAND 4-7h	Portion of communication line from Ralston - Oxbow Tunnel Intake to the confluence with the Middle Fork American River that is adjacent to FR 23.	Communications line for Project operations.
Photovoltaic Pole and Powerline at Middle Fork American River gage below Oxbow Powerhouse	LAND 4-7h	Gage and photovoltaic pole adjacent to the Middle Fork American River gage below Oxbow Powerhouse located outside the Project boundary on privately held land.	Power supply to support a remote Project facility.
Passive Microwave Station above Ralston Afterbay	LAND 4-7h	Microwave reflector located approximately 0.5 mile SE of Ralston Powerhouse is outside the Project boundary on ENF land.	Microwave communications facility to support Project operations.
Passive Microwave Reflector Station above Ralston Afterbay Trail	LAND 4-7h	Approximately 0.1 mile long trail interconnecting with Ralston Ridge Road (FR 23) is outside the Project boundary on ENF land.	Access trail to Microwave communications facility.
Ralston Ridge Sediment Disposal Area	LAND 4-7h	Approximately 1.8 acre of the is 2.3 acre sediment disposal area located at the intersection of FR 23 and the Ralston Powerhouse Butterfly Valve House Road are outside the Project area on ENF land.	Sediment disposal area to support Project maintenance activities.
Brushy Canyon Adit Road	LAND 4-7g	Approximately 0.48 mile long road segment that provides access to Brushy Canyon Adit is on ENF lands outside the Project boundary.	Single use access road to a Project facility.
Middle Fork American River Gage below Oxbow Powerhouse Access Trail	LAND 4-7h	Approximately 50 foot long access trail is located outside the Project boundary on privately held land.	Single use access trail to a Project facility.
Snow Course Area			
Wabena Meadows Snow Course	LAND 4-7i	Snow course for annual snow surveys located outside the Project boundary on TNF land.	Snow course to support annual hydrologic forecast for Project operations.
Diamond Crossing Snow Course	LAND 4-7j	Snow course for annual snow surveys located outside the Project boundary on TNF land within the Granite Chief Wilderness Area.	Snow course to support annual hydrologic forecast for Project operations.
Talbot Camp Snow Course	LAND 4-7i	Snow course for annual snow surveys located outside the Project boundary on TNF land.	Snow course to support annual hydrologic forecast for Project operations.
Miranda Cabin Snow Course	LAND 4-7j	Snow course for annual snow surveys located outside the Project boundary on private land.	Snow course to support annual hydrologic forecast for Project operations.

Table LAND 4-5. Project-Related Recreation Facilities Outside or Partially Outside Existing FERC Project Boundary.

Project Recreation Facility

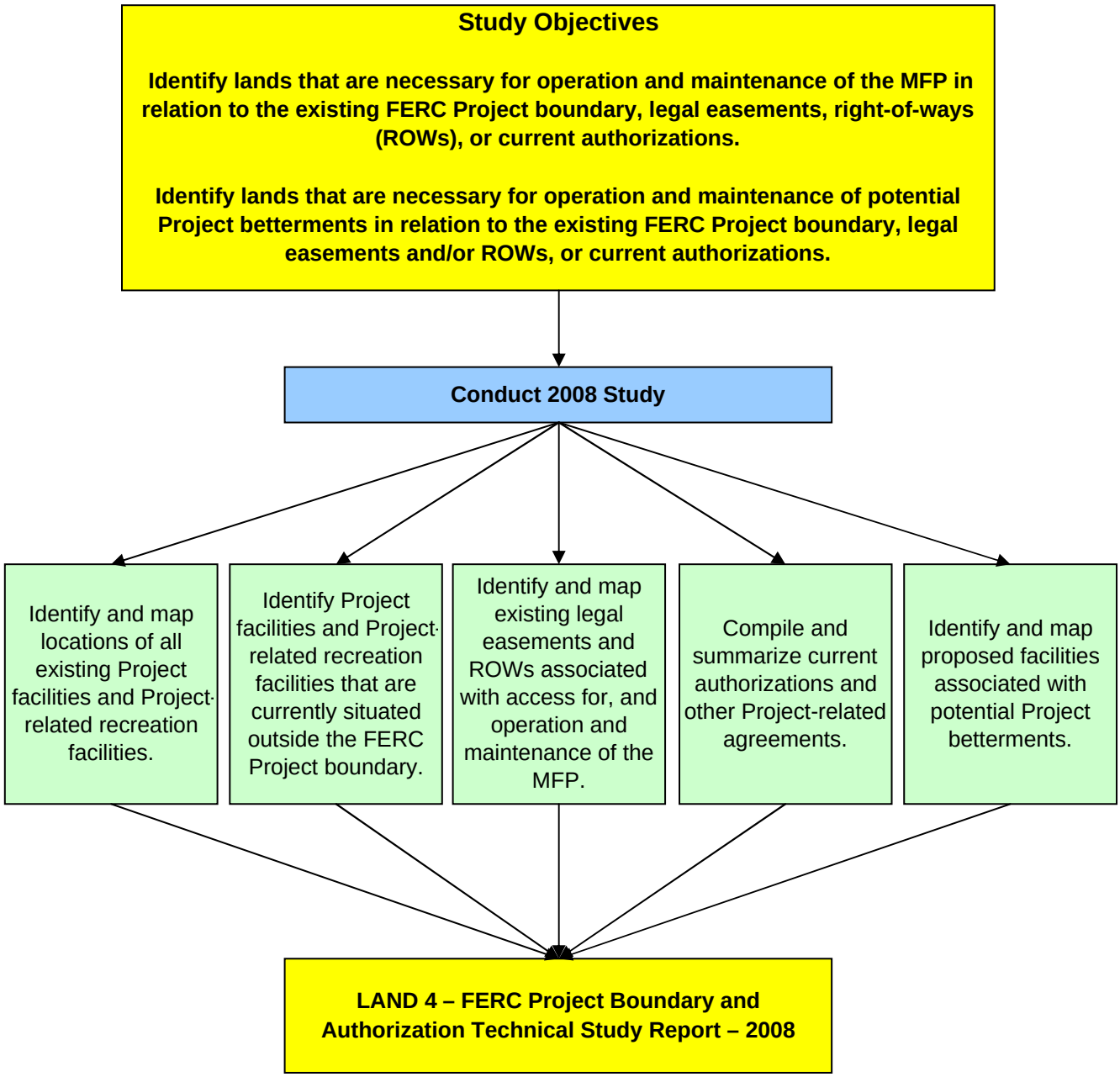
Facility	Map No.	Description	Use
French Meadows Area			
Ahart Campground	LAND 4-8a	The Ahart Campground and access road are outside the Project boundary on TNF land.	Public Recreation
Gates Group Campground	LAND 4-8a	A portion of the Gates Group Campground on the southwest side and a portion of the access road to the campground are outside the Project boundary on TNF land.	Public Recreation
Lewis Campground	LAND 4-8a LAND 4-8b	A portion of the access road to the Lewis campground is outside the Project boundary on TNF land.	Access to public recreation site
McGuire Picnic Area	LAND 4-8b	A portion of the access road to the McGuire Picnic Area is outside the Project boundary on TNF land.	Access to public recreation sites (McGuire Picnic Area and Boat Ramp)
Hell Hole Area			
Hell Hole Campground	LAND 4-8d	Campground facility adjacent to FR2 at Hell Hole Reservoir and access road are located outside the Project boundary on ENF land.	Public Recreation
Hell Hole Vista	LAND 4-8d	Vista point adjacent to FR2 at Hell Hole Reservoir is located outside the Project boundary on ENF land.	Public Recreation
Upper Hell Hole Campground	LAND 4-8d	Campground facility located at the upper end of Hell Hole Reservoir partly outside the Project boundary on ENF land.	Public Recreation
Big Meadows Campground	LAND 4-8d	Campground facility adjacent to FR2 at Hell Hole Reservoir and access road are located outside the Project boundary on ENF land. Note: The first segment of the access road is a multi-use road located on LST land outside the FERC Project boundary. The second segment of the access road is a Project recreation access road located on ENF land outside the FERC Project boundary.	Public Recreation
Long Canyon Area			
Middle Meadows Group Campground	LAND 4-8e	A portion of Middle Meadows Campground and a portion of the access road to the campground adjacent to the South Fork Long Canyon Diversion are outside the Project boundary on ENF land.	Public Recreation

Project Recreation Facility Features

Facility	Map No.	Description	Use
French Meadows Area			
Dolly Creek Campground Water Supply	LAND 4-8a LAND 4-8b	Approximately 2.3 miles of a 3.6 mile long water supply pipeline along FR 68, storage tanks, and well facilities that serve campgrounds at the east end of French Meadows Reservoir are located outside the Project boundary on TNF land.	Potable water supply to public recreation site
French Meadows Campground Water Supply and Trail	LAND 4-8c	Approximately .73 miles of a .86 mile long water supply pipeline crossing FR 96, an approximately .24 mile long trail, and storage and well facilities that serve French Meadows Campground are located outside the Project boundary on TNF land.	Potable water supply to public recreation site
Hell Hole Area			
Big Meadows Campground Water Supply and Trail	LAND 4-8d	Approximately 0.95 mile long water supply pipeline, 0.2 mile long trail, water storage tank, and spring that serve Big Meadows and Hell Hole Campgrounds are located outside the Project boundary on ENF land.	Potable water supply to public recreation site
Long Canyon Area			
Middle Meadows Group Campground Water Supply and Trail	LAND 4-8e	Approximately .49 miles of a 0.56 mile long underground waterline, trail, water storage tank, and spring sites that serve Middle Meadows Campground are located outside the Project boundary on ENF land.	Potable water supply to public recreation site

FIGURES

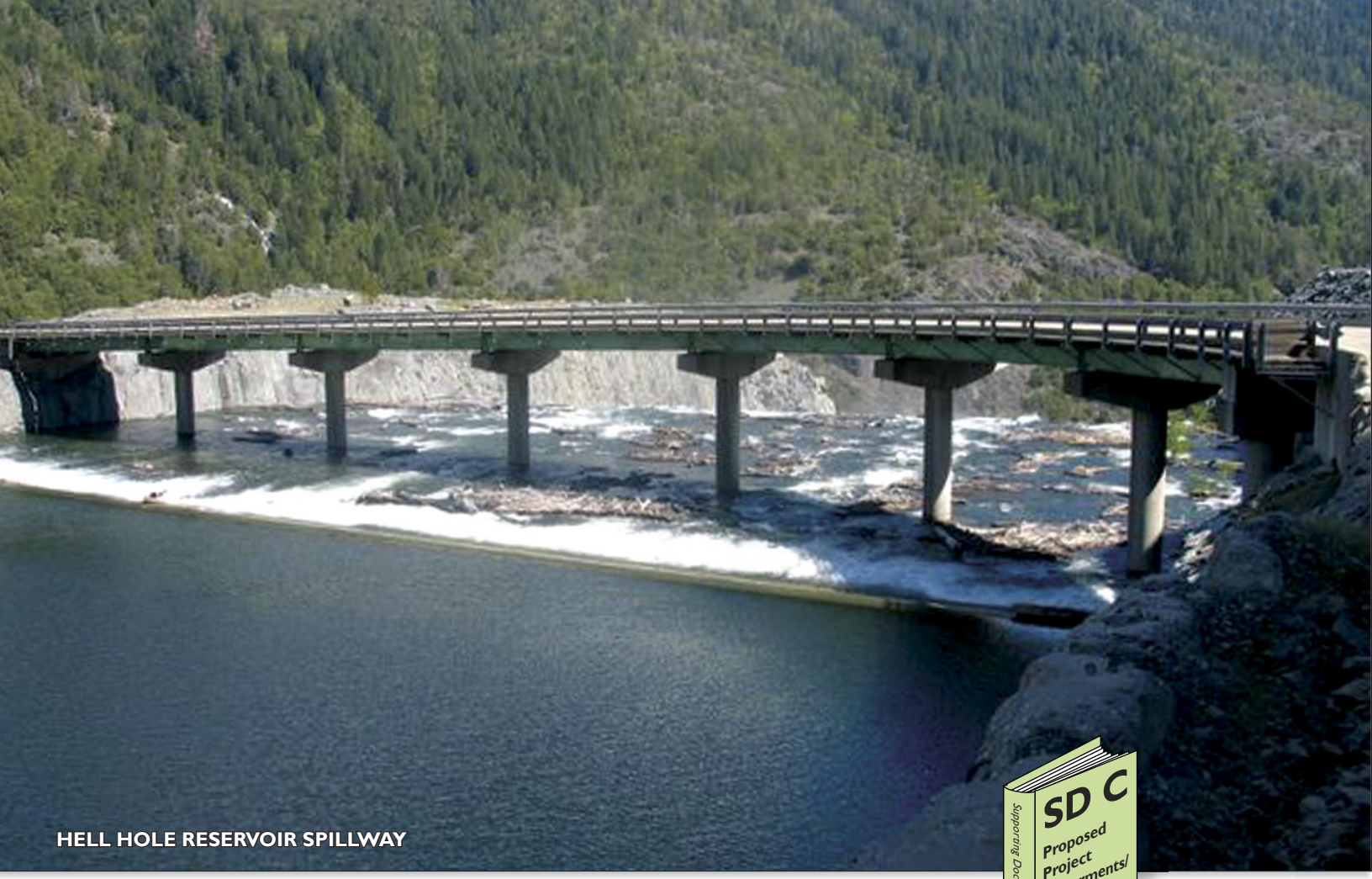
Figure LAND 4-1. FERC Project Boundary and Authorization Objectives and Related Study Elements and Reports.



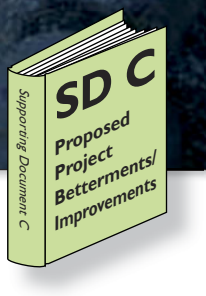
MAPS

APPENDIX A

Brief Summary of Project Betterments



HELL HOLE RESERVOIR SPILLWAY



Project Betterments/ Improvements

IN PREPARATION FOR THE RELICENSING OF THE MFP, PCWA conducted an assessment to identify potential modifications or additions (betterments) to existing Project facilities that would improve operations or maintenance of the Project, and result in an increase in net or peaking generation. As a result of this assessment, PCWA is including the following three potential Project betterments in the PAD:

- Hell Hole Reservoir Seasonal Storage Increase
- French Meadows Powerhouse Capacity Upgrade
- Ralston Powerhouse Capacity Upgrade

PCWA intends to further evaluate these potential betterments during relicensing with respect to their engineering and economic feasibility and the potential protection, mitigation, or enhancement measures that may be necessary to address potential effects on environmental and cultural resources. The specific Project betterments to be included in the License Application will be determined after reviewing the results of on-going engineering, economic, cultural, and environmental studies in relation to potential future license conditions.

HELL HOLE RESERVOIR SEASONAL STORAGE INCREASE

The purpose of this betterment would be to seasonally increase the storage capacity of Hell Hole Reservoir. The betterment would 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 9,750 ac-ft to 12,000 ac-ft increase in seasonal storage in the reservoir would be achieved by installing 8-10 foot high crest gates on the existing dam spillway. The crest gates would be raised when needed to increase reservoir storage. Operation of the crest gates would also seasonally increase the reservoir's inundation area within the existing flood pool by approximately 37 acres.

Installation of spillway gates on Hell Hole Reservoir will increase seasonal storage and power generation.

In years when either French Meadows or Hell Hole reservoirs would have spilled, this betterment would allow 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, the betterment would also allow the MFP to shift the timing of some generation from the spring run-off period to the summer peak energy demand period. While the shift in the timing of the generation will not increase total annual MFP generation, it will increase the benefit of the Project by increasing generation during the peak energy demand period. This betterment would require a new water right to allow for additional storage at Hell Hole Reservoir.

This betterment would require the following modifications to existing Project facilities:

- Hell Hole Dam Spillway - install 8-10 foot-high crest gates on the existing concrete spillway
- Hell Hole Dam - install 2 foot-high parapet walls on each end of the existing dam to maintain minimum freeboard requirements, if 10 foot-high crest gates are installed
- French Meadow Powerhouse - install 4 foot-high parapet wall at the powerhouse to avoid inundation from wave action when the reservoir is at its maximum water surface elevation
- Hell Hole - Middle Fork Tunnel Gatehouse - install 4 foot-high parapet wall around the gatehouse to avoid inundation from wave action
- South Fork Long Canyon Diversion Dam - install 3 foot-high crest gates on the diversion dam or a check valve at the drop inlet to avoid the backflow of water from the Hell Hole - Middle Fork Tunnel into South Fork Long Canyon Creek when Middle Fork Powerhouse is not operating

The betterment would also require construction of three new Project facilities including:

- Hell Hole Dam Spillway Crest Gates Control Building - construct a small control building adjacent to the spillway to provide power to operate the spillway crest gates
- Hell Hole Dam Spillway Crest Gates Control Building Powerline - construct a short spur line (approximately 525 feet) from the control building to an existing powerline to provide power for spillway crest gate operations
- South Fork Long Canyon Diversion Dam Generator Building - construct a control building with a generator to provide power to operate the crest gate

FRENCH MEADOWS POWERHOUSE CAPACITY UPGRADE

The purpose of this betterment would be to increase the generating capacity of the existing French Meadows Powerhouse from 15.3 MW to approximately 30 MW. Generating capacity would be increased by adding a second powerhouse immediately adjacent to the existing powerhouse. The existing French Meadows Powerhouse is only able to utilize approximately one-half of the maximum hydraulic capacity of the French Meadows - Hell Hole Tunnel. The addition

The addition of a second French Meadows Powerhouse will allow PCWA to increase peaking generation.

of a second unit would allow the maximum hydraulic capacity of the tunnel to be used to transport more water over a shorter period of time from French Meadows Reservoir to Hell Hole Reservoir, thereby increasing the MFP's peaking generation capabilities. This betterment would require a new water right to allow for an increase in the permitted direct diversion rate from French Meadows Reservoir to Hell Hole Reservoir.

The new powerhouse would also increase the capability of the MFP to supply electrical grid support services. The new generating unit could be operated simultaneously or independently of the existing generating unit. The existing PG&E 60-kV French Meadows - Middle Fork Transmission Line will be used to interconnect the new powerhouse with the PG&E transmission system.

This betterment would require the following modifications to existing Project facilities:

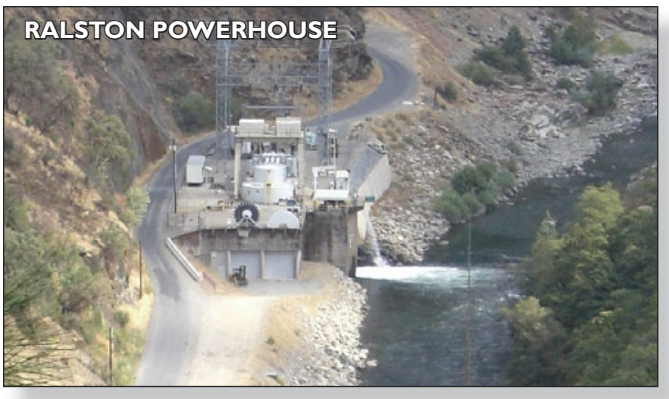
- French Meadows - Hell Hole Tunnel Intake Trash Rack - possible replacement of the existing cylindrical trash rack with a larger trash rack to reduce head losses and allow greater volume of water to flow into the tunnel
- French Meadows Powerhouse Switchyard - expand the existing switchyard to include additional buswork, transformers, and electrical switching equipment necessary to convey the additional power generated at the new powerhouse
- Middle Fork Powerhouse Upper Switchyard - upgrade the transformers and switchgear at the existing 60kV substation at Middle Fork Interbay to handle the additional power transfer

This betterment would also require construction of the following new Project facilities:

- French Meadows Powerhouse - construct a second powerhouse with installed generating capacity of approximately 15 MW immediately adjacent to existing powerhouse
- French Meadows Powerhouse Penstock - construct a second penstock, parallel to the existing penstock, to provide water to the new powerhouse
- Additional Surge Capacity Facility - develop additional surge capacity through construction of a surge shaft, surge shaft and tank, or surge pipeline located above the French Meadows - Hell Hole Tunnel Portal, or installation of a bypass valve in the new powerhouse
- French Meadows - Hell Hole Tunnel Surge Shaft or Pipeline Access Road - construct a new Project road from an existing Forest Service road to the surge shaft or pipeline and temporarily improve the existing Forest Service road

RALSTON POWERHOUSE CAPACITY UPGRADE

The purpose of this betterment is to improve the operating efficiency of the Middle Fork - Ralston system by increasing the hydraulic capacity of Ralston Powerhouse to match Middle Fork Powerhouse throughput, plus accretions at Middle Fork Interbay. This betterment would allow the MFP to maximize peaking generation during periods of high energy demand, thereby increasing the overall benefit of the MFP. This betterment would only require upgrades to electrical and mechanical equipment within the Ralston Powerhouse. This betterment may result in the ability of Ralston Powerhouse to utilize more than 1,000 cfs, in which case a new water right will be needed.



The Ralston Powerhouse upgrade will increase peaking generation opportunities.