

RECLAMATION

Managing Water in the West

Bureau of Reclamation Renewable Energy Update

Fiscal Year (FY) 2017, Q4



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Executive Summary

The Bureau of Reclamation Renewable Energy Update identifies Federal and non-Federal renewable energy projects currently online or in development on Reclamation land, facilities, and water bodies and highlights current Reclamation renewable activities. The update provides Reclamation-wide and regional summaries, renewable energy portfolios, and project updates as well as updates on WaterSMART Grant projects that feature a renewable energy component.

The quarterly update is a compilation of monthly updates submitted by regional offices with area office input. Reclamation personnel, including Daniel Vallejo, Nicholas Williams, Robert Ross, Gary Grassel, and James Stauffer provided essential support in the development of this document.

Renewable Activities

Reclamation Power Resources Office Request for Proposals for Sustainable Energy Initiatives

The Reclamation Power Resources Office (PRO) request for proposals (RFP) for sustainable energy initiatives was announced on June 6, 2017. The RFP solicits internal, sustainable energy project proposals from Reclamation regional, area, and facility offices (collectively, “the regions”); and the Denver Technical Service Center.

The RFP aims to leverage Reclamation expertise and increase regional participation in advancing the Department’s Memorandum of Understanding for Hydropower¹ and Reclamation’s Sustainable Energy Strategy.² To that end, all proposals are required to accomplish one – or both – of the following:

1. Analyze or demonstrate innovative and cost effective solutions that can strengthen hydropower generation or energy efficiency at Reclamation projects where outcomes or lessons learned can be used to deliver a greater, Reclamation-wide benefit.
2. Assist Tribes in the development of sustainable energy resources to enhance the management of water resources.

¹ <https://www.usbr.gov/power/hydropower-mou/Memorandum-of-Understanding-for-Hydropower-Five-Year-Extension.pdf>

² <https://www.usbr.gov/power/Reclamation%20Sustainable%20Energy%20Strategy%20.pdf>

Per the RFP, proposals that fail to accomplish stated requirements are ineligible for funding. Proposals were due to PRO on August 1, 2017. Awards were announced on September 29, 2017 – with two projects receiving funding, totaling \$365,500. Awarded projects are summarized below:

Recipient: Great Plains Regional Office
Project Title: Blackfoot Nation Sustainable Development of Renewable Energy Resources

The Reclamation Great Plains Regional Office in partnership with the Blackfoot Nation and the National Renewable Energy Laboratory will evaluate hydropower potential on the St. Mary Canal – a participating work of the Milk River Project, St. Mary Unit located within the Blackfoot Reservation, Montana. Project partners will concurrently evaluate non-hydropower renewable energy (N-HRE) potential on the St. Mary Unit (e.g. wind and solar) – and assess the viability of integrating hydropower and N-HRE generation within the St. Mary Unit footprint – for the betterment of the Tribe and Reclamation.

The project will deliver a report to the Tribe, outlining findings and recommendations for renewable energy development – to be pursued by the Tribe - on the St. Mary Canal and St. Mary Unit footprint. Project findings will also inform rehabilitation work to be conducted on the St. Mary Unit within the context of the Blackfoot Nation water rights settlement – see: *Water Infrastructure Improvements for the Nation Act (WIIN Act)* (Pub. L. No. 114-322, Title III, Subtitle G).

Project is jointly funded by PRO and the Reclamation Native American Affairs Program.

Recipient: Technical Service Center – Hydraulic Investigations and Laboratory Services
Project Title: Hydraulic Investigation of Hydrokinetic Performance and Impacts to Canal Systems

The Technical Service Center will continue ongoing analyses of hydrokinetic impacts to canal systems. Project will evaluate two unique hydrokinetic designs and configurations in two distinct canal systems – Reclamation's Roza Main Canal and Denver Water's South Boulder Canal.

Data collected from field tests will refine modeling tools to predict hydraulic impacts caused by hydrokinetic devices – e.g. impacts to free-board limitations, turbulence and sediment transport, canal turnouts, flow measurement structures, and existing hydropower or pumping facilities. Modeling tools will allow Reclamation to better understand the impacts of these devices - deployed in Reclamation canals - on project operations.

FY17 Renewable Summary

Non-Federal Hydropower Development

Whereas no new non-Federal hydroelectric facilities developed on Reclamation projects were brought online in FY17 – 12 new projects were initiated on the North Unit Canal and one on the Silver Jack Dam. The 13 projects comprise 6 MW and over 20,300 MWh of estimated annual generation – the equivalent demand of over 1,800 US homes. In addition, the Clark Canyon Dam project received a FERC License and the Pueblo Dam project received a LOPP Contract during the fiscal year. These two projects comprise 11.7 MW and over 34,000 MWh of estimated annual generation – the equivalent demand of over 3,100 US homes.

Solar and Wind Development

No new solar or wind facilities sited on Reclamation projects came online in FY17. However, development work is ongoing at a number of projects – and Reclamation anticipates awarding a contract for the installation of two carport-mounted photovoltaic (solar) systems at the Lower Colorado Yuma Area Office in early FY18.

Capital Improvement Projects at Reclamation Facilities

Replacing an antiquated turbine runner with a more modern design, featuring improved materials can increase operating efficiencies - on average, by three percent. Likewise, rewinding a generator with modern windings and insulating materials can increase operating efficiencies and provide the opportunity to uprate generator capacity. The effect is more MWh per acre-foot of water that passes through the unit.

In FY17, turbines were replaced at Hoover (N5 and A0) and a generator rewind was completed at Trinity (G1) – and work was conducted at a number of ongoing rewinds and turbine replacement projects detailed in the following Reclamation Renewable Energy Summary.

Reclamation Renewable Energy Summary

Online Hydropower Facilities

	Great Plains		Lower Colorado		Mid-Pacific		Pacific Northwest		Upper Colorado		Bureau of Reclamation	
	#	MW ³	#	MW	#	MW	#	MW	#	MW	#	MW
Reserved	21	1013	3	2454	10	1910	10	7537	9	1816	53	14730
Transferred	-	-	10	297	3	452	-	-	10	41	23	790
Other	-	-	7	85	-	-	-	-	-	-	7	85
FERC Facilities ⁴	6	29	-	-	13	60	27	326	5	50	51	466
LOPP Facilities ⁵	2	4	-	-	1	1	-	-	10	41	13	46
Total	29	1046	20	2836	27	2423	37	7863	34	1948	147	16117

In Development – Conventional Hydropower (FERC)

	Great Plains		Lower Colorado		Mid-Pacific		Pacific Northwest		Upper Colorado		Bureau of Reclamation	
	#	MW	#	MW	#	MW	#	MW	#	MW	#	MW
License	2	20	-	-	1	7	1	3	-	-	4	30
Exemption	1	1	-	-	-	-	4	2	-	-	5	3
Preliminary Permit	2	2	-	-	2	5	8	21	-	-	12	28
Total	5	23	-	-	3	12	13	26	-	-	21	61

In Development – Conventional Hydropower (LOPP)

	Great Plains		Lower Colorado		Mid-Pacific		Pacific Northwest		Upper Colorado		Bureau of Reclamation	
	#	MW	#	MW	#	MW	#	MW	#	MW	#	MW
Contract	1	7	-	-	-	-	-	-	1	1	2	8
Preliminary Lease	2	14	-	-	-	-	-	-	-	-	2	14
Posted Solicitation	-	-	-	-	-	-	-	-	1	0.1	1	0.1
Request for Development	3	3	1	2	2	0.4	12	6	3	1	21	12
Total	6	24	1	2	2	0.4	12	6	5	2	26	34

³ Megawatts (MW).

⁴ Non-Federal hydropower developed on Reclamation infrastructure, licensed by the Federal Energy Regulatory Commission (FERC).

⁵ Non-Federal hydropower developed on Reclamation infrastructure, authorized through a Reclamation LOPP Contract. Reclamation holds title to the Upper Colorado Grand Valley power facility LOPP.

In Development – Pump Storage (PS) (FERC and LOPP)

Unlike conventional hydropower facilities that utilize a single waterbody (e.g. a reservoir or conduit), pump storage facilities utilize two waterbodies (e.g. an upper and lower reservoir). Typical pump storage operation consists of pumping water from the lower reservoir to the upper reservoir when electricity demand (and therefore price) is low and releasing water from the upper reservoir to the lower reservoir through a powerhouse to generate electricity when electricity demand (and therefore price) is high. Beyond engaging in arbitrage to maximize facility economic value, pump storage facilities are also fitted to support variable renewable integration through the provision of ancillary (i.e. grid) support services (e.g. energy storage, demand response, contingency reserves, frequency response, etc.).

Non-Federal pump storage development at Reclamation projects may require both a FERC License and Reclamation LOPP if the proposed project utilizes a Reclamation reservoir within Reclamation’s permitting jurisdiction and any second reservoir outside Reclamation’s permitting jurisdiction (i.e. FERC’s jurisdiction). Projects subject to dual FERC/LOPP jurisdiction are identified as “Dual LOPP/FERC PS” projects in the table below and the Appendix – Regional Renewable Energy Portfolios. Additional information regarding non-Federal pumped storage permitting is available on the Reclamation LOPP website, see: <https://www.usbr.gov/power/LOPP>.

	Great Plains		Lower Colorado		Mid-Pacific		Pacific Northwest		Upper Colorado		Bureau of Reclamation	
	#	MW	#	MW	#	MW	#	MW	#	MW	#	MW
FERC PS												
License	-	-	-	-	-	-	-	-	-	-	-	-
Preliminary Permit	2	1732	4	3645	1	1250	2	1200	1	300	10	8127
LOPP PS												
Contract	-	-	-	-	-	-	-	-	-	-	-	-
Preliminary Lease	-	-	-	-	-	-	-	-	-	-	-	-
Dual LOPP/FERC PS⁶												
Preliminary Permit	1	133	-	-	-	-	1	400	1	750	3	1283
Preliminary Lease	-	-	-	-	-	-	-	-	-	-	-	-
Preliminary Lease and Permit	-	-	-	-	-	-	-	-	-	-	-	-
Total	3	1865	4	3645	1	1250	3	1600	2	1050	13	9410

⁶ The proposed Seminole Pumped Storage Project (GP), Anderson Ranch Pumped Storage Project (PN), and Ute Pumped Storage Project (UC) have each received a FERC Preliminary Permit for upper reservoir development, however no project has received a Reclamation Preliminary Lease or LOPP Contract for lower reservoir development.

Capital Improvement Projects at Reclamation Facilities

Turbine Replacements

Replacing an antiquated runner with a more modern design, featuring improved materials can increase unit operating efficiencies - on average, by three percent. At this time, turbine replacements are in progress at Palisades (G2) and Minidoka (G9).

Generator Rewinds

Rewinding a generator with modern windings and insulating materials can increase unit operating efficiencies and provide the opportunity to uprate generator capacity. At this time, rewinds are in progress at Yellowtail (G1) and Glen Canyon (G1 and G3).

Online Solar and Wind Projects

	Great Plains		Lower Colorado		Mid-Pacific		Pacific Northwest		Upper Colorado		Bureau of Reclamation	
	#	MW	#	MW	#	MW	#	MW	#	MW	#	MW
Solar	-	-	4	14.3	-	-	1	.005	2	.035	7	14.4
Wind	-	-	-	-	-	-	-	-	-	-	-	-
Total	-	-	4	14.3	-	-	1	.005	2	.035	7	14.4

In Development Solar and Wind Projects

	Great Plains		Lower Colorado		Mid-Pacific		Pacific Northwest		Upper Colorado		Bureau of Reclamation	
	#	MW	#	MW	#	MW	#	MW	#	MW	#	MW
Solar	-	-	2	50.02	1	26	-	-	-	-	3	76.02
Wind	-	-	1	500	-	-	-	-	-	-	-	500
Total	-	-	3	550.02	1	26	-	-	-	-	3	576.02

WaterSMART

Through WaterSMART Grants (formerly Challenge Grants), Reclamation provides 50/50 cost share funding to irrigation and water districts, tribes, states, and other entities with water or power delivery authority. Projects should seek to carry out water and energy efficiency improvements, including projects that save water; support environmental benefits; facilitate and support water markets; mitigate the risk of future water conflict in areas of high risk; and accomplish other benefits that contribute to water supply sustainability in the western US.

Projects are selected through a competitive process and the focus is on projects that can be completed within 24 to 36 months that will help sustainable water supplies in the western US. For additional information visit the WaterSMART program website, available at: <https://www.usbr.gov/watersmart>.

WaterSMART Updates

On August 29, 2017 Reclamation announced \$20.9 million in total awards to 43 WaterSMART Water and Energy Efficiency Grant (WEEG) projects. Six of the 43 FY2017 projects feature a renewable energy component, detailed below:

Recipient: City of Big Bear Lake Department of Water and Power
Project Title: Division Well Field Solar Project

The City of Big Bear Lake Department of Water and Power will install 700 solar panels at the city's five division well pumping plants, which provide a significant portion of the city's water supply. In total, the solar panels will have a capacity of 220 kilowatts (kW) and are expected to generate over 400,000 kilowatt-hours (kWh) of energy annually, which is expected to reduce the city's electrical power costs by 25%.

Recipient: Browns Valley Irrigation District
Project Title: Tennessee Ditch Canal Modernization and Hydroelectric Project

The Browns Valley Irrigation District in Yuba County, California will install an 8,300-foot penstock adjacent to the earthen Tennessee Ditch Canal to recover 270 acre-feet of water annually, which is currently lost to seepage. Conserved water will help alleviate water supply shortages and allow for improved water management across the District's service area. The project also includes the installation of a 427 kW hydroelectric facility, which is expected to produce over 1.94 million kWh of energy annually.

Recipient: Three Sisters Irrigation District
Project Title: Canal Piping and McKenzie Hydroelectric Facility Project

The Three Sisters Irrigation District located near Bend, Oregon will pipe 7.5 miles of existing open canals with high density polyethylene pipe, complete restoration work along six miles of Whychus Creek, and install a 300 kW hydroelectric turbine.

The conversion of open canals to pipe is expected to result in annual water savings of 1,400 acre-feet that is currently lost to seepage. The District will work with the Deschutes River Conservancy to dedicate approximately 210 acre-feet per year of the conserved water to a new instream water right held by the State of Oregon. In addition, the District will complete stream restoration work along six miles of Whychus Creek, including planting native vegetation, eliminating an unscreened diversion, and installing a fish passage. The increased instream flows and restoration will improve riparian habitat and benefit various species, including Bull and Steelhead Trout, Chinook and Sockeye Salmon, the Oregon Spotted Frog, the willow flycatcher, and the yellow breasted chat. The pressurized pipeline resulting from this project will allow farmers who receive deliveries from the District to implement further improvements. Lastly, the project will also include the installation a 300 kW hydro turbine at McKenzie Reservoir, which is expected to generate over 1 million kWh of energy annually.

Recipient: Greybull Valley Irrigation District
Project Title: Roach Gulch Outlet Hydroelectric Power Plant

The Greybull Valley Irrigation District located near Emblem, Wyoming will install a 3.9 MW hydropower facility on the Roach Gulch Dam outlet works. The project also includes the installation of a 200-foot penstock pipe to convey water to the new powerhouse as well as a 16-mile 12 kilovolt (kV) powerline to connect the hydropower facility to the Emblem Substation. The project is expected to generate over 7.5 million kWh of energy annually.

Recipient: Greybull Valley Irrigation District
Project Title: Roach Gulch Inlet Hydroelectric Power Plant

The Greybull Valley Irrigation District will also install a 1.1 MW hydropower facility on the Roach Gulch Inlet Canal. The project will include a new intake/bypass structure and a 2.5-mile, 12 kV powerline. The project is expected to generate over 2.7 million kWh of energy annually.

Recipient: Orchard Mesa Irrigation District
Project Title: Grand Valley Power Plant Turbines and Generators Upgrade

The Orchard Mesa Irrigation District located in Palisade, Colorado in partnership with the Grand Valley Water Users Association, will upgrade the Grand Valley Hydroelectric Power Plant. The upgrade will provide operational efficiencies and will add an additional 1.35 MW of capacity, bringing the total capacity of the system to 4.1 MW. The increased capacity and operational efficiencies will allow

for an additional 6,000 MWh of generation annually. In addition, continued and consistent power generation at the power plant will ensure that critical flows are maintained in the 15-Mile Reach that is a designated habitat for the recovery of endangered fish species, including the Razor Back Sucker and Humpback Chub.

WaterSMART Summary

Project summaries for all FY11-17 WaterSMART WEEG projects are available on the WaterSMART website: <http://www.usbr.gov/watersmart/weeg/prev.html>.

Regional Renewable Energy Updates

Great Plains Renewable Energy Updates

FERC Projects

Project: Fresno Dam
Developer: Alpine Pacific Utilities Hydro, LLC
Status: Preliminary Permit (P-14751)

Alpine Pacific Utilities Hydro, LLC filed a FERC License application on February 1, 2017. On March 22, 2017 FERC issued a “Deficiency of Application and Request for Additional Information,” requesting Alpine Pacific Utilities Hydro, LLC resolve application deficiencies (noted within the correspondence) within 90 days (June 20, 2017).

Alpine Pacific Utilities Hydro, LLC responded to FERC’s request on June 9, 2017, requesting an additional 90 days to resolve all deficiencies. The extension was granted on July 17, 2017. On September 19, 2017 Alpine Pacific Utilities Hydro, LLC submitted additional application information to FERC. FERC did not post a response to the Fresno Dam docket by the close of FY17 Q4.

LOPP Projects

Project: Pueblo Dam
Developer: Southeastern Colorado Water Conservancy District
Status: LOPP Contract

The Pueblo Dam LOPP Contract was executed on August 10, 2017. A Notice to Proceed was issued on September 25, 2017 authorizing preconstruction and drilling activities. Pre-construction blast baseline data collection began September 25, 2017. Blasting is scheduled to begin October 4, 2017 and resume through the end of the month.

The Pueblo Dam LOPP facility is scheduled to begin commercial operation in spring 2018.

Project: Helena Valley Pumping Plant
Developer: Helena Valley Irrigation District
Status: Preliminary Lease

At the request of the Helena Valley Irrigation District, Reclamation extended the Helena Valley Pumping Plant Preliminary Lease for an additional 12 months (May 2018). Communications between the Western Area Power Administration, Reclamation, and the District are ongoing regarding project design and a potential

interconnection with the Western Area Power Administration transmission system.

Project: Yellowtail Afterbay
Developer: Crow Tribe
Status: Preliminary Lease

A revised, 60% design package was submitted to Reclamation the week of May 15, 2017. Reclamation comments were formally transmitted to the Tribe on August 7, 2017. Project Management Team meetings were held in July, August, and September. Reclamation is currently coordinating with the Tribe to complete computational fluid dynamics modeling.

As agreed to in a July 27, 2017 meeting, the Western Area Power Administration will assist in the Tribe's evaluation of power marketing opportunities.

National Environmental Policy Act (NEPA) compliance activities are ongoing – however, the compliance schedule has slipped to accommodate Cooperating Agency MoU development⁷ and recovery of cultural surveys. If the revised schedule holds, the draft Environmental Assessment (EA) will be available in October with public scoping meetings occurring in November. The Final EA and Finding of No Significant Impact documents are scheduled to be completed in February 2018.

Lower Colorado Renewable Energy Updates

No updates for this quarter.

Mid-Pacific Renewable Energy Updates

No updates for this quarter.

Pacific Northwest Renewable Energy Updates

LOPP Projects

Project: North Unit Canal (Mile 2 South, Mile 2 North, Mile 3, Mile 18, Mile 19, Mile 20, Mile 43, Mile 48, 50 East, 50 West, 52 North, 52 South)
Developer: To Be Determined
Status: Request for Development

⁷ The Cooperating Agency MoU establishes intergovernmental NEPA compliance roles and responsibilities.

On June 8, 2017 Reclamation received a Formal Request from developer Kinet to initiate the LOPP process at six sites on the Reclamation North Unit Canal. The North Unit Canal is a transferred work conduit, operated and maintained by the North Unit Irrigation District in Madras, Oregon.

Two additional Formal Requests were transmitted by Kinet on July 7 and July 28, 2017 for six additional North Unit Canal sites. In total, Kinet requested Reclamation initiate the LOPP process at 12 unique sites. On August 7, 2017, Kinet withdrew the June 8, July 7, and July 28 requests and submitted one comprehensive request for the 12 sites. Per the August 7 Formal Request, the 12 sites comprise 5.75 MW of capacity and over 20,300 MWh of annual generation.

As noted in the FY17 Q2 Renewable Update - per the Reclamation Manual Directive and Standard, *Lease of Power Privilege (LOPP) Processes, Responsibilities, Timelines, and Charges*, (FAC 04-08)⁸ upon receiving a Formal Request to develop a transferred work conduit from a party other than the operating entity, Reclamation will first offer the LOPP opportunity to the operating entity. Following the offer, Reclamation will allow up to 60 calendar days for the operating entity to either accept or reject, in writing, the opportunity to develop hydropower through a LOPP.

Reclamation offered the LOPP opportunity to the North Unit Irrigation District and the District declined. Reclamation is currently coordinating with the Bonneville Power Administration and preparing a public solicitation for LOPP project proposals, in accordance with FAC 04-08.

Upper Colorado Renewable Energy Updates

LOPP Projects

Project: Silver Jack Dam Project
Developer: TBD
Status: Request for Development

On July 12, 2017 Reclamation received a Formal Request from the Bostwick Park Water Conservancy District to initiate the LOPP process at the Silver Jack Dam. Silver Jack Dam is a feature of the Reclamation Bostwick Park Project located in Gunnison County, Colorado.

In accordance with a 1992 MoU between FERC and FAC 04-08 – on September 7, 2017, Reclamation transmitted a letter to FERC, asserting jurisdiction at the Bostwick Park Project and Silver Jack Dam.

⁸ See: <https://www.usbr.gov/recman/fac/fac04-08.pdf>.

The Bostwick Park Project was authorized as a participating work of the Colorado River Storage Project (CRSP). The *CRSP Act of 1956* (Pub. L. No. 84-485), Section 1, authorizes CRSP for the "... reclamation of arid and semiarid land, for the control of floods, and for the generation of hydroelectric power." The Act further authorizes the Secretary of the Interior "[t]o construct, operate, and maintain the following additional reclamation projects (including power-generating and transmission facilities related thereto), hereinafter referred to as participating projects...."

Under Presumption Four of the 1992 MoU, Reclamation is presumed to have leasing jurisdiction at sites authorized for Federal hydropower power development. Applied here, Reclamation maintains leasing jurisdiction at Silver Jack Dam as the Bostwick Park Project is specifically authorized for, among other purposes, generation of hydroelectric power.

Per the 1992 MoU, FERC has 60 days to respond to Reclamation's letter (November 6, 2017). If FERC concurs with Reclamation's determination (or fails to respond within the 60 day deadline), Reclamation will initiate the lease process – specifically, preparing a public solicitation for LOPP project proposals, in accordance with FAC 04-08. If FERC dissents, the Silver Jack Dam project will proceed through the FERC Licensing process.

Project: Mancos Project Outlet Canal
Developer: Mancos Water Conservancy District
Status: Request for Development

The Preliminary Lease and cost-recovery agreement was submitted to the District on November 8, 2016 for signature. Documents have not been signed as the District has suspended LOPP activities while exploring title transfer for the underlying Federal, Mancos Project infrastructure.

Appendix – Regional Renewable Energy Portfolios

Great Plains Renewable Portfolio

State	Project Status	Project Name	FERC ID	Area Office	Operating Entity	Hydropower Type	Capacity (kW)	Project Initiation Date	Preliminary Permit or Lease Date	Exemption or CE Date	License or Lease Date	Online Date
RECLAMATION OWNED AND OPERATED (RESERVED WORKS)												
WY	Online	Alcova		Wyoming	Reclamation	Conventional	41,400.00					1955
CO	Online	Big Thompson		Eastern Colorado	Reclamation	Conventional	4,500.00					1959
WY	Online	Boysen		Wyoming	Reclamation	Conventional	15,000.00					1952
WY	Online	Buffalo Bill		Wyoming	Reclamation	Conventional	18,000.00					1992
MT	Online	Canyon Ferry		Montana	Reclamation	Conventional	50,001.00					1953
CO	Online	Estes		Eastern Colorado	Reclamation	Conventional	45,000.00					1950
CO	Online	Flatiron (Unit 1, 2, 3)		Eastern Colorado	Reclamation	Conventional/Pump Storage	94,500.00					1954
WY	Online	Fremont Canyon		Wyoming	Reclamation	Conventional	66,800.00					1960
WY	Online	Glendo		Wyoming	Reclamation	Conventional	38,000.00					1959
CO	Online	Green Mountain		Eastern Colorado	Reclamation	Conventional	26,000.00					1943
WY	Online	Guernsey		Wyoming	Reclamation	Conventional	6,400.00					1928
WY	Online	Heart Mountain		Wyoming	Reclamation	Conventional	5,000.00					1948
WY	Online	Kortes		Wyoming	Reclamation	Conventional	36,000.00					1950
CO	Online	Marys Lake		Eastern Colorado	Reclamation	Conventional	8,100.00					1951
CO	Online	Mt. Elbert PS		Eastern Colorado	Reclamation	Pump Storage	200,000.00					1981
WY	Online	Pilot Butte		Wyoming	Reclamation	Conventional	1,600.00					1929

Great Plains Renewable Portfolio

State	Project Status	Project Name	FERC ID	Area Office	Operating Entity	Hydropower Type	Capacity (kW)	Project Initiation Date	Preliminary Permit or Lease Date	Exemption or CE Date	License or Lease Date	Online Date
CO	Online	Pole Hill		Eastern Colorado	Reclamation	Conventional	38,238.00					1954
WY	Online	Seminole		Wyoming	Reclamation	Conventional	51,750.00					1939
WY	Online	Shoshone		Wyoming	Reclamation	Conventional	3,000.00					1992
WY	Online	Spirit Mountain		Wyoming	Reclamation	Conventional	4,500.00					1994
MT	Online	Yellowtail		Montana	Reclamation	Conventional	259,374.00					1966
FEDERAL ENERGY REGULATORY COMMISSION PROJECTS												
WY	Online	Garland Canal	3031	Wyoming	Shoshone Irrigation District	Conventional	2,610.00				10/9/1981	~ 1988
MT	Online	Lower Turnbull Drop	12597	Montana	Turnbull Hydro, LLC	Conventional	7,700.00	6/21/2005			7/28/2006	6/22/2011
CO	Online	Ruedi Dam	3603	Western Colorado	City of Aspen	Conventional	3,200.00				9/8/1983	~ 1990
CO	Online	Sugarloaf Dam	3819	Eastern Colorado	STS Hydropower Limited	Conventional	2,800.00				11/18/1982	~ 1987
MO	Online	Tiber Dam	3574	Montana	Tiber Montana, LLC	Conventional	7,500.00		11/20/1990		6/2/1997	6/14/2004
MT	Online	Upper Turnbull Drop	12598	Montana	Turnbull Hydro, LLC	Conventional	5,300.00	6/24/2005			7/28/2006	6/24/2011
MT	License	Clark Canyon Dam	14677	Montana	Clark Canyon Hydro, LLC	Conventional	4,700.00	4/20/2015	9/18/2015		3/31/2017	
MT	License	Gibson Dam	12478	Montana	Gibson Dam Hydroelectric Company, LLC	Conventional	15,000.00	10/28/2003	4/20/2004		1/12/2012	
MT	Exemption	Mary Taylor Drop	14294	Montana	Turnbull Hydro, LLC	Conventional	890.00	9/23/2011		6/28/2012		
NE	Preliminary	Medicine Creek Dam	13648	Nebraska-Kansas	Twin Valleys Public Power District	Conventional	800.00	12/30/2009	6/15/2010			

Great Plains Renewable Portfolio

State	Project Status	Project Name	FERC ID	Area Office	Operating Entity	Hydropower Type	Capacity (kW)	Project Initiation Date	Preliminary Permit or Lease Date	Exemption or CE Date	License or Lease Date	Online Date
MT	Preliminary	Fresno Dam	14751	Montana	Alpine Pacific Utilities Hydro, LLC	Conventional	1,348.00	1/21/2016	4/29/2016			
WY	Preliminary	Black Canyon Pumped Storage Project	14087	Wyoming	Black Canyon Hydro, LLC	Pump Storage	700,000.00	1/25/2011	7/15/2011			
MT	Preliminary	Square Butte Pumped Storage	13349	Montana	Square Butte Hydro LLC	Pump Storage	1,032,000.00	12/23/2008	7/23/2012			
LEASE OF POWER PRIVILEGE PROJECTS												
CO	Online	Carter Lake Outlet		Eastern Colorado	Northern Water Conservancy District	Conventional	2,600.00	5/7/2009	11/24/2009		4/22/2011	5/18/2012
CO	Online	Granby Dam	LP11-3	Eastern Colorado	Northern Water Conservancy District	Conventional	1,200.00	4/20/2011	6/26/2012		3/31/2015	5/19/2016
CO	Contract	Pueblo Dam	LP11-4	Eastern Colorado	Southeastern Colorado Water Conservancy District	Conventional	7,010.00	4/20/2011	2/27/2012		8/10/2017	
MT	Preliminary	Yellowtail Afterbay		Montana	Crow Tribe	Conventional	9,000.00	1/11/2012	3/6/2015			
MT	Preliminary	Helena Valley Pumping Plant		Montana	Helena Valley Irrigation District	Conventional	4,800.00	9/13/2013	8/20/2015			
MT	Request for Development	A Drop		Montana	Turnbull Hydro, LLC	Conventional	1,000.00	6/1/2014				
MT	Request for Development	Johnson Drop		Montana	Turnbull Hydro, LLC	Conventional	700.00	6/1/2014				
MT	Request for Development	Woods Drop		Montana	Turnbull Hydro, LLC	Conventional	900.00	6/1/2014				
FEDERAL ENERGY REGULATORY COMMISSION / LEASE OF POWER PRIVILEGE PUMP STORAGE PROJECTS												
CO	Preliminary	Seminole Pumped Storage Project	14787	Wyoming	Black Canyon Hydro, LLC	Pump Storage	133,300.00	6/13/2016	9/23/2016			

Lower Colorado Renewable Portfolio

State	Project Status	Project Name	FERC ID	Area Office	Operating Entity	Hydropower Type	Capacity (kW)	Project Initiation Date	Preliminary Permit or Lease Date	Exemption or CE Date	License or Lease Date	Online Date
RECLAMATION OWNED AND OPERATED (RESERVED WORKS)												
AZ	Online	Davis		Yuma	Reclamation	Conventional	255,000.00					1951
AZ/NV	Online	Hoover		Lower Colorado	Reclamation	Conventional	2,078,800.00					1936
AZ	Online	Parker		Yuma	Reclamation	Conventional	120,000.00					1943
RECLAMATION OWNED AND OPERATED BY OTHERS (TRANSFERRED WORKS)												
AZ	Online	Arizona Falls Powerplant		Phoenix	Salt River Valley Water Users Association	Conventional	750.00					1902
AZ	Online	Cross Cut Powerplant		Phoenix	Salt River Valley Water Users Association	Conventional	3,000.00					1914
AZ	Online	Horse Mesa Powerplant		Phoenix	Salt River Valley Water Users Association	Conventional/Pump Storage	129,000.00					1927
AZ	Online	Mormon Flat Powerplant		Phoenix	Salt River Valley Water Users Association	Conventional/Pump Storage	60,000.00					1926
AZ	Online	New Waddell Pump/Generating Plant		Phoenix	Central Arizona Water Conservation District	Pump Storage	45,000.00					1993
CA	Online	Senator Wash Pump/Generating Plant		Yuma	Imperial Irrigation District	Pump Storage	7,200.00					1966
AZ	Online	Siphon Drop Powerplant		Yuma	Yuma County Water Users Association	Conventional	4,600.00					1926
AZ	Online	South Consolidated Powerplant		Phoenix	Salt River Valley Water Users Association	Conventional	1,400.00					1912
AZ	Online	Stewart Mountain Powerplant		Phoenix	Salt River Valley Water Users Association	Conventional	10,400.00					1930
AZ	Online	Theodore Roosevelt Powerplant		Phoenix	Salt River Valley Water Users Association	Conventional	36,020.00					1973
OTHER PLANTS ON RECLAMATION FACILITIES												
AZ	Online	C.C. Craigin Dam and Powerplant	2304	Phoenix	Salt River Project	Conventional	3,000.00					1965

Lower Colorado Renewable Portfolio

State	Project Status	Project Name	FERC ID	Area Office	Operating Entity	Hydropower Type	Capacity (kW)	Project Initiation Date	Preliminary Permit or Lease Date	Exemption or CE Date	License or Lease Date	Online Date
AZ	Online	Drop Five Powerplant		Yuma	Imperial Irrigation District	Conventional	4,000.00					1982
AZ	Online	Drop Four Powerplant		Yuma	Imperial Irrigation District	Conventional	19,600.00					1941
AZ	Online	Drop One Powerplant		Yuma	Imperial Irrigation District	Conventional	6,000.00					1984
AZ	Online	Drop Three Powerplant		Yuma	Imperial Irrigation District	Conventional	9,800.00					1941
AZ	Online	Drop Two Powerplant		Yuma	Imperial Irrigation District	Conventional	10,000.00					1953
AZ	Online	Pilot Knob Powerplant		Yuma	Imperial Irrigation District	Conventional	33,000.00					1961
FEDERAL ENERGY REGULATORY COMMISSION PROJECTS												
NV	Preliminary	Blue Diamond Pumped Storage Project	14344	Regional Office	The International Consortium of Energy Managers	Pump Storage	450,000.00	1/6/2012	7/11/2012			
NV	Preliminary	Eldorado Pumped Storage Project	13861	Regional Office	Eldorado Pumped Storage, LLC	Pump Storage	400,000.00	10/13/2010	2/3/2012			
AZ	Preliminary	Longview Pumped Storage Project	14341	Regional Office	Longview Energy Exchange, LLC	Pump Storage	2,000,000.00	1/3/2012	5/4/2012			
AZ	Preliminary	Verde Pumped Storage Project	14061	Phoenix	Arizona Independent Power	Pump Storage	795,000.00	1/12/2011	8/15/2011			
LEASE OF POWER PRIVILEGE PROJECTS												
AZ	Request for Development	Laguna Dam		Yuma		Conventional	2,200.00	1/28/2013				
SOLAR PROJECTS												
NV	Online	Boulder City Regional Office Building		Regional Office	Reclamation		276.36					
NV	Online	Boulder City Regional Office Building (parking)		Regional Office	Reclamation		5.97					

Lower Colorado Renewable Portfolio

State	Project Status	Project Name	FERC ID	Area Office	Operating Entity	Hydropower Type	Capacity (kW)	Project Initiation Date	Preliminary Permit or Lease Date	Exemption or CE Date	License or Lease Date	Online Date
NV	Online	Hoover Spillway House Renovation		Regional Office	Reclamation		48.00					Aug-13
NV	Online	River Mountains		Regional Office	Southern Nevada Water Authority and SunEdison		14,000.00					Jan-16
NV	In Development	First Solar		Regional Office	First Solar Development, LLC		50,000.00	Jun-14				
CA	In Development	Blythe Office Solar Installation		Regional Office	Reclamation		19.00					
WIND PROJECTS												
AZ	In Development	Mohave County Wind Farm		Regional Office	BP Wind Energy North America		500,000.00					

Mid-Pacific Renewable Portfolio

State	Project Status	Project Name	FERC ID	Area Office	Operating Entity	Hydropower Type	Capacity (kW)	Project Initiation Date	Preliminary Permit or Lease Date	Exemption or CE Date	License or Lease Date	Online Date
RECLAMATION OWNED AND OPERATED (RESERVED WORKS)												
CA	Online	Folsom		Central California	Reclamation	Conventional	207,000.00					1955
CA	Online	Judge Francis Carr		Northern California	Reclamation	Conventional	154,400.00					1963
CA	Online	Keswick		Northern California	Reclamation	Conventional	117,000.00					1950
CA	Online	Lewiston		Northern California	Reclamation	Conventional	350.00					1964
CA	Online	New Melones		Central California	Reclamation	Conventional	380,000.00					1979
CA	Online	Nimbus		Central California	Reclamation	Conventional	13,500.00					1955
CA	Online	Shasta		Northern California	Reclamation	Conventional	714,000.00					1944
CA	Online	Spring Creek		Northern California	Reclamation	Conventional	180,000.00					1964
CA	Online	Stampede		Lahontan Basin	Reclamation	Conventional	3,650.00					1988
CA	Online	Trinity		Northern California	Reclamation	Conventional	140,000.00					1964
RECLAMATION OWNED AND OPERATED BY OTHERS (TRANSFERRED WORKS)												
CA	Online	San Luis/Gianelli Pumping-Generating Plant		South Central California	California Department of Water Resources	Pump Storage	424,000.00					1968
NV	Online	Lahontan Powerplant		Lahontan Basin	Truckee-Carson Irrigation District	Conventional	2,400.00					1911
CA	Online	O'Neill Pumping-Generating Plant		South Central California	San Luis Delta-Mendota Water Authority	Pump Storage	25,200.00					1967
FEDERAL ENERGY REGULATORY COMMISSION PROJECTS												
OR	Online	East Side	2082	Klamath Basin	Scottish Power (PacifiCorp)	Conventional	3,200.00					

Mid-Pacific Renewable Portfolio

State	Project Status	Project Name	FERC ID	Area Office	Operating Entity	Hydropower Type	Capacity (kW)	Project Initiation Date	Preliminary Permit or Lease Date	Exemption or CE Date	License or Lease Date	Online Date
CA	Online	Friant Fishwater Release	11068	South Central California	Orange County Irrigation District	Conventional	510.00				5/16/1991	
CA	Online	Friant Power	2892	South Central California	Friant Power Authority	Conventional	27,360.00				9/30/1982	1991
CA	Online	High Line Canal	7252	Northern California	Santa Clara	Conventional	530.00				7/17/1984	
CA	Online	Madera Canal	5765	South Central California	Madera-Chowchilla Water and Power Authority	Conventional	440.00	11/16/1981	4/27/1982		9/8/1983	
CA	Online	Madera Canal Water Power STA 1174+84	2958	South Central California	Madera-Chowchilla Water and Power Authority	Conventional	563.00	11/23/1981			6/8/1982	
CA	Online	Madera Canal Water Power STA 1923+10	2958	South Central California	Madera-Chowchilla Water and Power Authority	Conventional	916.00	11/23/1981			6/8/1982	
CA	Online	Madera Canal Water Power STA 980+65	2958	South Central California	Madera-Chowchilla Water and Power Authority	Conventional	2,125.00	11/23/1981			6/8/1982	
CA	Online	Monticello	2780	Central California	Solano Irrigation District	Conventional	11,500.00				1/29/1981	Jun-83
NV	Online	New Lahontan	7828	Lahontan Basin	Truckee-Carson Irrigation District	Conventional	4,000.00				12/26/1985	6/12/1989
CA	Online	Stony Gorge Hydroelectric	3193	Northern California	Santa Clara, City of	Conventional	4,900.00				8/31/1982	Apr-86
OR	Online	West Side	2082	Klamath Basin	Scottish Power (PacifiCorp)	Conventional	600.00					
CA	Online	Whiskey Dam Power Project	2888	Northern California	City of Redding	Conventional	3,530.00	2/17/1982			3/10/1983	1986
CA	License	Friant Fishwater Release	11068	South Central California	Orange County Irrigation District	Conventional	7,000.00				5/16/1991	
CA	Preliminary	Boca	14728	Lahontan Basin	Pyramid Lake Paiute Tribe	Conventional	1,400.00	11/2/2015	6/8/2016			
CA	Preliminary	Prosser Creek	14726	Lahontan Basin	Pyramid Lake Paiute Tribe	Conventional	3,450.00	11/2/2015	6/8/2016			
OR	Preliminary	Bryant Mountain (Pumped Storage)	13680	Klamath Basin	Bryant Mountain LLC	Pump Storage	1,250,000.00	3/1/2010	9/24/2010			
LEASE OF POWER PRIVILEGE PROJECTS												
OR	Online	Klamath Canal Drop C		Klamath Basin	Klamath Irrigation District	Conventional	900.00	2/8/2011			11/8/2011	5/3/2012

Mid-Pacific Renewable Portfolio

State	Project Status	Project Name	FERC ID	Area Office	Operating Entity	Hydropower Type	Capacity (kW)	Project Initiation Date	Preliminary Permit or Lease Date	Exemption or CE Date	License or Lease Date	Online Date
CA	Request for Development	A-C3 (Panicker Drop)		Lahontan Basin	Truckee-Carson Irrigation District	Conventional	125.00	2014				
CA	Request for Development	V-C2 (Lewis Wasteway)		Lahontan Basin	Truckee-Carson Irrigation District	Conventional	250.00	2014				
SOLAR PROJECTS												
CA	In Development	San Luis Facility		South Central California	San Luis Renewables, LLC		26,000.00	8/5/2011				

Pacific Northwest Renewable Portfolio

State	Project Status	Project Name	FERC ID	Area Office	Operating Entity	Hydropower Type	Capacity (kW)	Project Initiation Date	Preliminary Permit or Lease Date	Exemption or CE Date	License or Lease Date	Online Date
RECLAMATION OWNED AND OPERATED (RESERVED WORKS)												
ID	Online	Anderson Ranch		Snake River	Reclamation	Conventional	40,000.00					1950
ID	Online	Black Canyon		Snake River	Reclamation	Conventional	10,200.00					1925
ID	Online	Boise River Diversion		Snake River	Reclamation	Conventional	3,450.00					1912
WA	Online	Chandler		Columbia Cascades	Reclamation	Conventional	12,000.00					1956
WA	Online	Grand Coulee		Columbia Cascades	Reclamation	Conventional/Pump Storage	6,809,000.00					1941
OR	Online	Green Springs		Columbia Cascades	Reclamation	Conventional	17,290.00					1960
MT	Online	Hungry Horse		Columbia Cascades	Reclamation	Conventional	428,000.00					1952
ID	Online	Minidoka		Snake River	Reclamation	Conventional	27,700.00					1942
ID	Online	Palisades		Snake River	Reclamation	Conventional	176,564.00					1957
WA	Online	Roza		Columbia Cascades	Reclamation	Conventional	12,937.00					1958
FEDERAL ENERGY REGULATORY COMMISSION PROJECTS												
ID	Online	American Falls	2736	Snake River	Idaho Power Co	Conventional	92,400.00				3/31/1975	1975
ID	Online	ARROWROCK DAM	4656	Snake River	Big Bend Irrigation District, et al.	Conventional	15,000.00		8/15/1983		3/27/1989	Mar-10
ID	Online	CASCADE	2848	Snake River	Idaho Power Company	Conventional	12,420.00				2/17/1981	3/4/1985
WA	Online	COWICHE	7337	Columbia Cascades	Yakima-Tieton Irrigation District	Conventional	1,470.00				7/6/1984	1986
ID	Online	Dietrich Drop	8909	Snake River	Big Wood Canal Company	Conventional	4,770.00	3/7/1985			5/22/1987	1989

Pacific Northwest Renewable Portfolio

State	Project Status	Project Name	FERC ID	Area Office	Operating Entity	Hydropower Type	Capacity (kW)	Project Initiation Date	Preliminary Permit or Lease Date	Exemption or CE Date	License or Lease Date	Online Date
WA	Online	ELTOPIA BRANCH CANAL	3842	Columbia Cascades	Columbia Basin Hydropower	Conventional	2,200.00				12/9/1981	1982
WA	Online	ESQUATZEL POWER	12638	Columbia Cascades	Green Energy Today, LLC	Conventional	900.00	1/4/2006		6/6/2008		Apr-12
ID	Online	FARGO DROP NO. 1	5042	Snake River	Boise Project Board of Control	Conventional	1,100.00			10/23/1981		Jun-13
ID	Online	FELT HYDRO	5089	Snake River	Fall River Rural Cooperative	Conventional	7,450.00				9/9/1983	1985
ID	Online	ISLAND PARK	2973	Snake River	Fall River Rural Electric	Conventional	4,800.00		7/8/1983		10/19/1988	1982
ID	Online	Little Wood Reservoir	7427	Snake River	Little Wood Irrigation District	Conventional	3,000.00			4/13/1984		1989
ID	Online	LOW LINE NO. 8 ARENA DROP	5056	Snake River	Boise Project Board of Control	Conventional	385.00	6/10/1981		10/23/1981		Apr-12
WA	Online	MAIN CANAL HEADWORKS	2849	Columbia Cascades	Columbia Basin Hydropower	Conventional	26,000.00				11/16/1981	1987
ID	Online	Mile 28	10552	Snake River	Contractor's Power Group	Conventional	1,500.00	12/2/1987	9/15/1988		8/12/1992	1996
OR	Online	MITCHELL BUTTE LATERAL	5357	Snake River	Owyhee Irrigation District, et al.	Conventional	1,880.00		2/26/1982		12/14/1984	1990
ID	Online	Mora Drop Hydro	3403	Snake River	Boise Kuna Irrigation District, et al.	Conventional	1,900.00			12/18/1980		9/15/2006
WA	Online	ORCHARD AVENUE	7338	Columbia Cascades	Yakima-Tieton Irrigation District	Conventional	1,441.00				7/6/1984	1986
OR	Online	OWYHEE DAM	4354	Snake River	Gem, Owyhee, and Ridgeview Irrigation Districts	Conventional	4,340.00				5/9/1984	1985
OR	Online	OWYHEE TUNNEL NO. 1	4359	Snake River	Gem, Owyhee, and Ridgeview Irrigation Districts	Conventional	8,120.00				2/28/1986	6/1/1983
WA	Online	POTHOLES EAST CANAL	3843	Snake River	Columbia Basin Hydropower	Conventional	2,400.00				12/9/1981	1982
WA	Online	POTHOLES EAST CANAL HEADWORKS	2840	Columbia Cascades	Columbia Basin Hydropower	Conventional	6,500.00				9/21/1982	1991
WA	Online	QUINCY CHUTE	2937	Columbia Cascades	Columbia Basin Hydropower	Conventional	9,367.00				8/20/1982	1983

Pacific Northwest Renewable Portfolio

State	Project Status	Project Name	FERC ID	Area Office	Operating Entity	Hydropower Type	Capacity (kW)	Project Initiation Date	Preliminary Permit or Lease Date	Exemption or CE Date	License or Lease Date	Online Date
WA	Online	RUSSEL D SMITH PEC 22.7	2926	Columbia Cascades	Columbia Basin Hydropower	Conventional	6,100.00				3/27/1980	1982
WA	Online	SUMMER FALLS	3295	Columbia Cascades	Columbia Basin Hydropower	Conventional	92,000.00				8/14/1981	1983
WA	Online	TIETON DAM	3701	Columbia Cascades	Yakima-Tieton Irrigation District	Conventional	13,600.00				6/27/1991	2007
OR	Online	45-Mile	13817	Columbia Cascades	Apple, Inc.	Conventional	5,000.00	7/16/2010		12/17/2010		5/13/2015
OR	Online	Monroe Drop	14430	Columbia Cascades	Apple, Inc.	Conventional	300.00	7/2/2012	3/28/2013	2/18/2015		10/29/2015
ID	License	Mason Dam Hydro	12686	Snake River	Baker County	Conventional	3,400.00	4/25/2006	5/26/2010		9/6/2016	
ID	Exemption	FARGO DROP NO. 2	5040	Snake River	Boise Project Board of Control	Conventional	175.00			10/23/1981		
ID	Exemption	MAIN CANAL NO. 10	5041	Snake River	Columbia Basin Hydropower	Conventional	500.00			10/23/1981		
ID	Exemption	MAIN CANAL NO. 6	5038	Snake River	Columbia Basin Hydropower	Conventional	1,055.00			10/23/1981		
ID	Exemption	WALDVOGEL BLUFF	5043	Snake River	Boise Project Board of Control	Conventional	300.00	6/30/1981		12/23/1981		
WA	Preliminary	16.4 Wasteway	14349	Columbia Cascades	Columbia Basin Hydropower	Conventional	1,750.00	7/29/2011	3/26/2013			
WA	Preliminary	46A Wasteway	14351	Columbia Cascades	Columbia Basin Hydropower	Conventional	1,600.00	7/29/2011	3/26/2013			
WA	Preliminary	McKay Dam	14546	Columbia Cascades	Houtama Hydropower, LLC	Conventional	2,300.00	8/13/2013	2/6/2014			
WA	Preliminary	PEC 1973 Drop	14316	Columbia Cascades	Columbia Basin Hydropower	Conventional	2,200.00	11/8/2011	3/26/2013			
WA	Preliminary	Pinto Dam	14380	Columbia Cascades	Columbia Basin Hydropower	Conventional	3,400.00	4/4/2012	10/10/2012			
WA	Preliminary	Scooteney Inlet Drop	14318	Columbia Cascades	Columbia Basin Hydropower	Conventional	1,700.00	5/31/2011	3/26/2013			
OR	Preliminary	Unity Dam by Warm Springs Hydro	14576	Snake River	Warm Springs Hydro, LLC	Conventional	800.00	1/13/2014	6/16/2014			

Pacific Northwest Renewable Portfolio

State	Project Status	Project Name	FERC ID	Area Office	Operating Entity	Hydropower Type	Capacity (kW)	Project Initiation Date	Preliminary Permit or Lease Date	Exemption or CE Date	License or Lease Date	Online Date
WA	Preliminary	Wickiup Dam Hydro	12965	Columbia Cascades	Symbiotics	Conventional	7,150.00	8/17/2007	5/15/2008			
WA	Preliminary	Banks Lake Pumped Storage Project	14329	Columbia Cascades	Columbia Basin Hydropower	Pump Storage	1,000,000.00	11/30/2011	8/22/2013			
OR	Preliminary	Prineville Pumped Storage Project	14553	Columbia Cascades	Prineville Energy Storage, LLC	Pump Storage	200,000.00	8/31/2012	7/19/2013			
LEASE OF POWER PRIVILEGE PROJECTS												
OR	Request for Development	North Unit Canal (Mile 2 South)		Columbia Cascades	TBD	Conventional	723.00	8/7/2017				
OR	Request for Development	North Unit Canal (Mile 2 North)		Columbia Cascades	TBD	Conventional	723.00	8/7/2017				
OR	Request for Development	North Unit Canal (Mile 3)		Columbia Cascades	TBD	Conventional	785.00	8/7/2017				
OR	Request for Development	North Unit Canal (Mile 18)		Columbia Cascades	TBD	Conventional	797.00	8/7/2017				
OR	Request for Development	North Unit Canal (Mile 19)		Columbia Cascades	TBD	Conventional	492.00	8/7/2017				
OR	Request for Development	North Unit Canal (Mile 20)		Columbia Cascades	TBD	Conventional	661.00	8/7/2017				
OR	Request for Development	North Unit Canal (Mile 43)		Columbia Cascades	TBD	Conventional	912.00	8/7/2017				
OR	Request for Development	North Unit Canal (Mile 48)		Columbia Cascades	TBD	Conventional	132.00	8/7/2017				
OR	Request for Development	North Unit Canal (Mile 50 East)		Columbia Cascades	TBD	Conventional	128.00	8/7/2017				
OR	Request for Development	North Unit Canal (Mile 50 West)		Columbia Cascades	TBD	Conventional	139.00	8/7/2017				
OR	Request for Development	North Unit Canal (Mile 52 North)		Columbia Cascades	TBD	Conventional	128.00	8/7/2017				
OR	Request for Development	North Unit Canal (Mile 52 South)		Columbia Cascades	TBD	Conventional	128.00	8/7/2017				
FEDERAL ENERGY REGULATORY COMMISSION / LEASE OF POWER PRIVILEGE PUMP STORAGE PROJECTS												
ID	Preliminary	Anderson Ranch Pump Storage	14655	Snake River	Cat Creek Energy, LLC	Pump Storage	400,000.00	11/5/2014	11/27/2015			

Pacific Northwest Renewable Portfolio

State	Project Status	Project Name	FERC ID	Area Office	Operating Entity	Hydropower Type	Capacity (kW)	Project Initiation Date	Preliminary Permit or Lease Date	Exemption or CE Date	License or Lease Date	Online Date
SOLAR PROJECTS												
WA	Online	Grand Coulee Solar		Columbia Cascades	Reclamation		4.70					Oct-12

Upper Colorado Renewable Portfolio

State	Project Status	Project Name	FERC ID	Area Office	Operating Entity	Hydropower Type	Capacity (kW)	Project Initiation Date	Preliminary Permit or Lease Date	Exemption or CE Date	License or Lease Date	Online Date
RECLAMATION OWNED AND OPERATED (RESERVED WORKS)												
CO	Online	Blue Mesa		Western Colorado	Reclamation	Conventional	86,400.00					1967
CO	Online	Crystal		Western Colorado	Reclamation	Conventional	31,500.00					1978
NM	Online	Elephant Butte		Albuquerque	Reclamation	Conventional	27,945.00					1940
UT	Online	Flaming Gorge		Provo	Reclamation	Conventional	151,500.00					1963
WY	Online	Fontenelle		Provo	Reclamation	Conventional	10,000.00					1968
AZ	Online	Glen Canyon		Western Colorado	Reclamation	Conventional	1,320,000.00					1965
CO	Online	Lower Molina		Western Colorado	Reclamation	Conventional	5,589.00					1962
CO	Online	Morrow Point		Western Colorado	Reclamation	Conventional	173,334.00					1971
CO	Online	Upper Molina		Western Colorado	Reclamation	Conventional	9,936.00					1962
RECLAMATION OWNED AND OPERATED BY OTHERS (TRANSFERRED WORKS)												
UT	Online	Causey Powerplant		Provo	Weber Basin Water Conservancy District	Conventional	1,900.00					1999
UT	Online	Deer Creek Powerplant		Provo	Provo River Water Users Association	Conventional	4,950.00					1958
UT	Online	Gateway Powerplant		Provo	Weber Basin Water Conservancy District	Conventional	4,275.00					1958
UT	Online	Lower Spanish Fork Powerplant		Provo	Strawberry Water Users Association	Conventional	250.00					1937
CO	Online	McPhee Powerplant		Western Colorado	Dolores Water Conservancy District	Conventional	1,283.00					1992
UT	Online	Olmsted Powerplant		Provo	Central Utah Water Conservancy District	Conventional	10,300.00					1904

Upper Colorado Renewable Portfolio

State	Project Status	Project Name	FERC ID	Area Office	Operating Entity	Hydropower Type	Capacity (kW)	Project Initiation Date	Preliminary Permit or Lease Date	Exemption or CE Date	License or Lease Date	Online Date
UT	Online	Payson Powerplant		Provo	Strawberry Water Users Association	Conventional	400.00					1941
CO	Online	Towaoc Powerplant		Western Colorado	Dolores Water Conservancy District	Conventional	11,495.00					1994
UT	Online	Upper Spanish Fork		Provo	Strawberry Water Users Association	Conventional	3,900.00					1909
UT	Online	Wanship Powerplant		Provo	Weber Basin Water Conservancy District	Conventional	1,900.00					1958
FEDERAL ENERGY REGULATORY COMMISSION PROJECTS												
UT	Online	Echo Dam	3755	Provo	City of Bountiful	Conventional	4,500.00		11/30/1981		12/7/1984	1987
NM	Online	El Vado Dam	5226	Albuquerque	County of Los Alamos	Conventional	8,000.00		1/4/1982		10/31/1985	7/1/1988
CO	Online	Navajo Dam	4720	Western Colorado	City of Farmington	Conventional	30,000.00				10/15/1985	2/1/1988
UT	Online	Pineview Dam	4597	Provo	Weber-Box Elder Conservancy District	Conventional	1,800.00				3/16/1984	1991
CO	Online	Vallecito Dam	3174	Western Colorado	Ptarmigan Resources and Energy, Inc.	Conventional	5,880.00				10/5/1983	5/1/1989
UT	Preliminary	Lake Powel Hurricane Cliffs Pumping Plant	12966	Regional Office	State of Utah	Pump Storage	300,000.00	8/21/2007	5/20/2011			
LEASE OF POWER PRIVILEGE PROJECTS												
CO	Online	Grand Valley Project		Western Colorado	Grand Valley Water Users Association and the Orchard Mesa Irrigation District	Conventional	3,000.00				1933	1938
CO	Online	Jackson Gulch Dam		Western Colorado	Mancos Water Conservancy District	Conventional	260.00				1995	1995
UT	Online	Jordanelle Dam		Provo	Central Utah Water Conservancy District, Heber Light and Power	Conventional	13,000.00	7/2/1999			2008	7/1/2008
CO	Online	Lemon Dam		Western Colorado	Florida Water Conservancy District	Conventional	120.00				1988	9/1/1988

Upper Colorado Renewable Portfolio

State	Project Status	Project Name	FERC ID	Area Office	Operating Entity	Hydropower Type	Capacity (kW)	Project Initiation Date	Preliminary Permit or Lease Date	Exemption or CE Date	License or Lease Date	Online Date
CO	Online	South Canal (Drop 1)		Western Colorado	Uncompahgre Valley Water Users and the Delta-Montrose Electric Association	Conventional	4,000.00	8/26/2009			3/16/2012	6/3/2013
CO	Online	South Canal (Drop 3)		Western Colorado	Uncompahgre Valley Water Users and the Delta-Montrose Electric Association	Conventional	3,500.00	8/26/2009			3/16/2012	8/1/2013
CO	Online	Ridgway Dam		Western Colorado	Tri-County Water Conservancy District	Conventional	7,000.00	6/2/2010			2/6/2012	4/3/2014
CO	Online	Shavano Falls		Western Colorado	Uncompahgre Valley Water Users Association	Conventional	2,800.00	8/21/2013	1/27/2014		6/18/2014	6/24/2015
CO	Online	South Canal (Drop 4)		Western Colorado	Uncompahgre Valley Water Users Association	Conventional	4,800.00	8/21/2013	5/14/2014		9/8/2014	6/24/2015
CO	Online	South Canal (Drop 5)		Western Colorado	Uncompahgre Valley Water Users Association	Conventional	2,400.00	3/3/2015	6/18/2015		11/5/2015	8/12/2016
CO	Contract	South Canal (Drop 2)		Western Colorado	Percheron Power, LLC, Uncompahgre Valley Water Users Association	Hydrodynamic Screw	987.00	5/27/2014	7/29/2014	9/17/2014	12/17/2014	
NM	Posted Solicitation	San Juan Chama Project	LP12-1-000	Albuquerque	Albuquerque Bernalillo County Water Utility Authority	Conventional	100.00	7/6/2012				
CO	Request for Development	Rifle Gap Dam		Western Colorado		Conventional	341.00	4/1/2013				
UT	Request for Development	Mancos Project Outlet Canal		Western Colorado	Mancos Water Conservancy District	Conventional	415.00	3/22/2016				
CO	Request for Development	Silver Jack Dam Project		Western Colorado	TBD	Conventional	25.00	7/12/2017				
FEDERAL ENERGY REGULATORY COMMISSION / LEASE OF POWER PRIVILEGE PUMP STORAGE PROJECTS												
UT	Preliminary	Ute Pumped Storage Project	14742	Provo	Ute Tribe	Pump Storage	750,000.00	12/4/2015	9/8/2016			
SOLAR PROJECTS												
UC	Online	Provo Area Office Solar		Provo	Reclamation		24.80					May-16
UC	Online	Alamosa Solar Project		Albuquerque	Reclamation		9.84					Jul-10