

RECLAMATION

Managing Water in the West

Bureau of Reclamation Renewable Energy Update

Fiscal Year 2016, Q4



Contents

	Page
Executive Summary	1
Renewable Activities.....	1
Reclamation Renewable Energy Summary	4
WaterSMART.....	7
Great Plains (GP) Region Project Updates.....	9
Lower Colorado (LC) Region Project Updates	11
Mid-Pacific (MP) Region Project Updates	11
Pacific Northwest (PN) Region Project Updates	12
Upper Colorado (UC) Region Project Updates	13
Appendix – Regional Renewable Energy Portfolios.....	15

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 a listing of 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, Rick Clayton, Nicholas Williams, Robert Ross, Dale Lentz, and James Stauffer provided essential support in the development of this document.

Renewable Activities

Non-Hydro Renewable Energy (N-HRE) Projects on Bureau of Reclamation Lands, Facilities, and Waterbodies

Reclamation Manual Directive and Standard (D&S), *Non-Hydro Renewable Energy (N-HRE) Projects on Bureau of Reclamation Lands, Facilities, and Waterbodies* (FAC 04-16) was published on September 12, 2016. The D&S defines standard procedures for land use authorization documents permitting the use of Reclamation lands for N-HRE projects. In defining these procedures, the D&S supports the Department's Secretarial Order 3285, Renewable Energy Development by the Department of the Interior, and strategic objectives identified in the Department's Strategic Plan for Fiscal Years 2014– 2018, and The Bureau of Reclamation's Sustainable Energy Strategy, Fiscal Years 2013-2017.

FAC 04-16 replaces Temporary Reclamation Manual Release (TRMR), *Non-Hydro Renewable Energy (N-HRE) Projects on Bureau of Reclamation Lands, Facilities, and Waterbodies* (TRMR-70). In May 2016, TRMR-70 underwent a concurrent internal and external comment period. The D&S was revised in response to collected comments and finalized as FAC 04-16.

To support FAC 04-16, Reclamation has developed the *Use Authorizations for Non-Hydro Renewable Energy on Reclamation Lands* guidebook. The guidebook assists Reclamation personnel in screening, processing, and administering use authorizations for N-HRE projects on Reclamation lands consistent with FAC 04-

16. Reclamation has designed the guidebook to avoid “reinventing” authorization methodology and help promote consistency among Department of Interior agencies handling N-HRE projects on Federal lands. Both the D&S and guidebook are available on the Reclamation Hydropower Program website: <http://www.usbr.gov/power/>.

All Reclamation Manual releases and related information are available on the Reclamation Manual website: <http://www.usbr.gov/recman/>.

FY16 Renewable Summary

Non-Federal Hydropower Development

In FY16, three non-federal hydroelectric facilities were brought online on Reclamation infrastructure. The three projects, totaling 3.4 megawatts (MW) will generate over 15,000 megawatt hours (MWh), annually – the equivalent demand of over 1,400 US homes. Project profiles are provided below.

Monroe Drop

Located on the North Unit Main Canal in Oregon, the Monroe Drop hydroelectric facility was developed through the Federal Energy Regulatory Commission (FERC) Licensing process. The project received a FERC conduit licensing exemption on August 1, 2014 and began commercial operation on October 29, 2015. The facility is rated at 0.3 MW and is estimated to generate approximately 1,700 MWh, annually.

The project received 2011 Advanced Hydropower Technology Development Funding Opportunity Announcement (FOA) financial support. The FOA, funded by Reclamation and the Department of Energy under the 2010 Hydropower Memorandum of Understanding, was offered to support new hydropower technologies. The Monroe Drop facility, currently operated by Apple, Inc., features a modular Schneider Linear hydroEngine developed by Natel Energy.

Granby Dam

Located on the Granby Dam in Colorado, the Granby Dam hydroelectric facility was developed by the Northern Water Conservancy District through a Reclamation Lease of Power Privilege (LOPP). The project received a LOPP Contract on March 31, 2015 and began commercial operation on May 19, 2016. The facility is rated at 1.2 MW and is estimated to generate approximately 5,000 MWh, annually.

South Canal (Drop 5)

Located on the South Canal in Colorado, the South Canal (Drop 5) hydroelectric facility was developed by the Uncompahgre Valley Water Users Association through a Reclamation LOPP. The project received a LOPP Contract on November 5, 2015 and began commercial operation on August 12, 2016. The

facility is rated at 2.4 MW and is estimated to generate approximately 8,600 MWh, annually. In addition, the project received a FY16 WaterSMART Grant. Additional information regarding the grant is provided in the WaterSMART Updates section.

New Development

Also in FY16, two new projects were initiated (Fresno Dam and Mancos Project Outlet Canal), one project received a FERC License (Mason Dam Hydro), and one project received a LOPP Contract (South Canal, Drop 5)¹.

N-HRE Development

Two solar facilities sited on Reclamation projects came online in FY16. The two solar facilities, totaling 14.004 MW will generate over 38,041 MWh, annually – the equivalent demand of over 3,500 US homes. Project profiles are provided below.

Provo Area Office

A second solar panel array, totaling 4 kilowatts (kW) (0.004 MW) was brought online at the Provo Area Office in May 2016. In total, 25 kW of solar operates on Reclamation's Provo Area Office, generating approximately 41 MWh, annually.

River Mountains

The 14 MW River Mountains solar array was brought online at the Southern Nevada Water Authority's River Mountains Water Treatment Facility in January 2016. The Treatment Facility is located on Reclamation's Robert B. Griffin Water Project, approximately ten miles west of Hoover Dam. The array is expected to generate approximately 38,000 MWh, annually.

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 FY16, Reclamation completed rewinds at Yellowtail (G3), Spring Creek (G2), Folsom (G3), and Glen Canyon (G5) and turbine replacements at Glen Canyon (G2) and Trinity (G1).

Additional information, including updates on ongoing capital improvement projects, is provided in the following Reclamation Renewable Energy Summary section.

¹ As noted, the South Canal, Drop 5 facility was brought online later in the FY.

Reclamation Renewable Energy Summary

Online Hydropower Facilities

	Great Plains		Lower Colorado		Mid-Pacific		Pacific Northwest		Upper Colorado		Bureau of Reclamation	
	#	MW	#	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 ²	7	29	-	-	13	60	27	326	5	50	52	466
LOPP Facilities ³	2	4	-	-	1	1	-	-	10	41	13	46
Total	30	1046	20	2836	27	2423	37	7863	34	1948	148	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	1	15	-	-	1	7	1	3	-	-	3	25
Exemption	1	1	-	-	-	-	4	2	-	-	5	3
Preliminary Permit	5	10	-	-	-	-	8	21	-	-	13	31
Total	7	26	-	-	1	7	13	26	-	-	21	59

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	1	1	1
Preliminary Lease	3	21	-	-	-	-	-	-	1	8	4	29
Posted Solicitation	-	-	-	-	-	-	-	-	1	0.1	1	0.1
Request for Development	3	3	2	3	2	0.4	0	0	3	13	10	19
Total	6	24	2	3	2	0.4	-	-	6	22	16	48

² Non-Federal hydropower developed on Reclamation infrastructure, licensed by FERC.

³ Non-Federal hydropower developed on Reclamation infrastructure, authorized through a 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 authorized for Federal power development and any second reservoir, *not* authorized for Federal power development. 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.

	Great Plains		Lower Colorado		Mid-Pacific		Pacific Northwest		Upper Colorado		Bureau of Reclamation	
	#	MW	#	MW	#	MW	#	MW	#	MW	#	MW
FERC PS												
License	-	-	-	-	-	-	-	-	-	-	-	-
Preliminary Permit	3	2132	4	3645	1	1250	2	1200	2	800	12	9027
LOPP PS												
Contract	-	-	-	-	-	-	-	-	-	-	-	-
Preliminary Lease	-	-	-	-	-	-	-	-	-	-	-	-
Dual LOPP/FERC PS												
Preliminary Permit ⁴	1	133	-	-	-	-	1	400	-	-	2	533
Total	4	2265	4	3645	1	1250	3	1600	2	800	14	9650

Capital Improvement Projects at Reclamation Facilities

Turbine Replacements

Replacing an antiquated runner with a more modern design, featuring improved materials can increase operating efficiencies - on average, by three percent. At

⁴ At this time, the proposed Anderson Ranch Pumped Storage Project (PN) and the Seminole Pumped Storage Project (GP) have received a FERC Preliminary Permit for upper reservoir development – but have not received a Reclamation Preliminary Lease or LOPP Contract for lower reservoir development.

this time, turbine replacements are in progress at Palisades (G2) and Minidoka (G9). In FY16, Reclamation completed turbine replacements at Glen Canyon (G2) and Trinity (G1).

Generator Rewinds

Rewinding a generator with modern windings and insulating materials can increase operating efficiencies and provide the opportunity to uprate generator capacity. At this time, rewinds are in progress at Yellowtail (G1) and Trinity (G1). In FY16, Reclamation completed rewinds at Yellowtail (G3), Spring Creek (G2), Folsom (G3), and Glen Canyon (G5).

As noted in the FY2016 Q2 Renewable Update, all four Yellowtail generators are scheduled to be rewound and uprated by FY2019. The G3 uprate was completed in February 2016 and the G1 uprate is in progress. Once completed, the uprates will add an additional 37.6 MW to the existing, 250 MW facility.

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 conserve and use water more efficiently, increase the use of renewable energy, protect endangered species, or facilitate water markets. 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 United States. For additional information see the WaterSMART Web site at: <http://www.usbr.gov/watersmart/>.

WaterSMART Updates

The Uncompahgre Valley Water Users Association was awarded a WaterSMART grant in FY16 to develop the South Canal Hydropower Development Project: Drop 5. The project installed a 2.4 MW hydroelectric facility on the South Canal “Drop 5” irrigation canal drop structure in Montrose, Colorado. The hydroelectric facility is expected to generate approximately 8,600 MWh annually. The project implements 2012 WaterSMART Colorado River Basin Water Supply and Demand Study adaptation strategies. The Association received a LOPP Contract in November 2015 and brought the Drop 5 project online on August 12, 2016.

WaterSMART Summary

All active, FY 2011-2016 WaterSMART WEEG projects that feature a renewable energy component are listed in the table below. Full project summaries are available on the WaterSMART Web site at: <http://www.usbr.gov/watersmart/weeg/prev.html>

	Fiscal Year	Recipient and Project Title	Renewable Component Status
1	2011	Three Sisters Irrigation District <i>Main Canal Pipeline Penstock Hydro Project</i>	Online (8/2014)
2	2011	Pershing County Water Conservation District <i>Humboldt River Automation Metering and Hydropower Project</i>	In development, FERC License
3	2011	Boise Project Board of Control <i>Hydroelectric Project</i>	Online (4/2013)
4	2012	Consolidated Irrigation Company <i>Improve Irrigation Efficiencies and Provide Sustainability</i>	Online (9/2015)
5	2013	Cub River Irrigation Company <i>Middle Ditch Water Conservation & Renewable Energy Piping Project</i>	In development

Reclamation Renewable Energy Update FY16 Q4

	Fiscal Year	Recipient and Project Title	Renewable Component Status
6	2014	Nevada Irrigation District <i>Hydroelectric Project</i>	In development
7	2014	Rosedale-Rio Bravo Water Storage District <i>Water Conservation, Energy Efficiency, and Solar Power Project</i>	Online (6/2016)
8	2014	Uncompahgre Valley Water Users Association <i>Shavano Falls Hydropower Development</i>	Online (5/2015)
9	2014	Oxford Reservoir and Irrigation Company <i>Innovative Energy Production and Irrigation Efficiencies</i>	Terminated, project will be removed from future updates
10	2014	Elephant Butte Irrigation District <i>Water-Habitat-Energy-Nexus</i>	In development
11	2014	Davis and Weber Counties Canal Company <i>Main Piping and Small Hydro Project</i>	In development
12	2014	Fremont Irrigation Company <i>Extension to Improve Irrigation Efficiency and Provide Sustainability</i>	In development
13	2014	Richmond Irrigation District <i>Upper High Creek Canal Enclosure and Hydropower Development Project</i>	In development
14	2015	Bella Vista Water District <i>Renewable Energy, Advanced Metering Infrastructure, and Water Conservation Improvements</i>	In development
15	2015	Uncompahgre Valley Water Users Association <i>South Canal Drop 4 Hydropower Development</i>	Online (6/2015)
16	2015	Navajo Agricultural Product Industry <i>Create and Implement a Comprehensive Water Management Web-Based Tool for Ordering and Delivering Irrigation Water</i>	In development
17	2015	Three Sisters Irrigation District <i>Main Canal Pipeline and Micro Hydro Generation Project</i>	In development
18	2015	Cameron County Irrigation District No. 6 <i>Conversion of the Saldana Canal into Pipeline, Elimination of the Saldana Pump by Construction of Aerial Crossing and Solar Powered Second Lift Pump</i>	In development
19	2015	Santa Cruz Irrigation District No. 15 <i>Shotcrete Lining of the N-Canal, Installation of a VFD at Pump-15, and Wind Powered Alternative at Pump 15</i>	In development
20	2015	Davis and Weber Counties Canal Company <i>Canal Piping and Hydro Project</i>	In development
21	2015	Davis and Weber Counties Canal Company <i>Secondary Water Irrigation Metering and Hydro Project</i>	In development
22	2015	Marion Upper Ditch Company <i>Main Canal Pipeline and Micro Hydro Generation Project</i>	In development
23	2016	Uncompahgre Valley Water Users Association <i>South Canal Hydropower Development Project: Drop 5</i>	Online (8/2016)
24	2016	Davis and Weber Counties Canal Company <i>Piping and Hydro Project</i>	In development
25	2016	Hights Creek Irrigation Company <i>Green Road Piping, Metering, and Small Hydro Project</i>	In development
26	2016	Weber Basin Water Conservancy District <i>Uintah Bench Secondary Water Metering & Small Hydro Project</i>	In development
27	2016	Woodruff Irrigation Company <i>Woodruff Hydroelectric Project</i>	In development

Great Plains Renewable Energy Updates

FERC Projects

Project: Clark Canyon Dam
Developer: Clark Canyon Hydro, LLC
Status: Preliminary Permit (P-14677)

On June 29, 2016, FERC published the Clark Canyon Dam Hydroelectric Project Environmental Assessment to the Federal Register. The Assessment finds, “with appropriate environmental protective measures, (Clark Canyon Dam) would not constitute a major federal action that would significantly affect the quality of the human environment.” The Reclamation Montana Area Office submitted Assessment comments on August 10, 2016.

On September 1, 2016, the Upper Missouri Waterkeeper filed an appeal and request for rehearing in response to the Montana Department of Environmental Quality’s issuance of a final Section 401 Water Quality Certification, arguing the certification is, “arbitrary and capricious, and not in accordance with law.” At this time, the Certification has been denied, pending a Montana Department of Environment Quality Board of Environmental Review decision.

The Environmental Assessment and comments provided by Reclamation, the Upper Missouri Waterkeeper, and the Montana Department of Environmental Quality are available on FERC’s eLibrary website: <http://www.ferc.gov/docs-filing/elibrary.asp>. Enter the docket number “P-14677” to access documents.

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

FERC issued Alpine Pacific Utilities, LLC a Preliminary Permit on April 29, 2016. The Preliminary Permit entitles Alpine Pacific Utilities, LLC to investigate project feasibility and prepare a license application. On June 30, 2016, the developer published a draft license application to the Fresno Dam FERC docket and solicited stakeholder comments. The Reclamation Great Plains Region submitted comments on September 28, 2016.

FERC/LOPP Pump Storage Projects

Project: Seminole Pumped Storage Project
Developer: Black Canyon Hydro, LLC

Status: Preliminary Permit (P-14787)

FERC issued Black Canyon Hydro, LLC a Preliminary Permit on September 23, 2016. The Preliminary Permit entitles Black Canyon Hydro, LLC to investigate project feasibility and prepare a license application for proposed project works outside of Reclamation's Seminole and Dam and Reservoir. Per the order issuing the Preliminary Permit, FERC notes that proposed project works utilizing Reclamation's Seminole Dam and Reservoir would require a Reclamation LOPP, as Seminole has been reserved for Federal power development. Black Canyon Hydro, LLC has not received a Preliminary Lease or LOPP Contract at this time.

LOPP Projects

Project: Pueblo Dam
Developer: Southeastern Colorado Water Conservancy District, Colorado Springs Utilities, and Board of Water Works of Pueblo, Colorado
Status: Preliminary Lease

The Southeastern Colorado Water Conservancy District has requested a 12-month Preliminary Lease extension. Reclamation has granted the extension and the signatory process has been initiated.

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

Reclamation has drafted a position paper documenting Yellowtail Afterbay Dam operations and constraints. This paper will help Reclamation, the Western Area Power Administration, and the Tribe develop Yellowtail Afterbay operating criteria.

A Project Management Team meeting was held in Billings in August to discuss National Environmental Policy Act (NEPA) compliance, project schedule, and Yellowtail Afterbay Dam operations and constraints. Also in August, the Reclamation Montana Area Office conducted a coordination meeting to brief resource agencies on the proposed project and solicit input. The meeting was attended by representatives from the Montana Department of Natural Resources and Conservation; Montana Fish, Wildlife, and Parks; the local United States Army Corps of Engineers Regulatory Office; the Western Area Power Administration; the United States Fish and Wildlife Service; and the Department of Agriculture.

A 60% design package is expected to be complete in late October 2016, with a final Environmental Assessment delivered in March 2017. Developer representatives anticipate a 100% design package in late spring/summer 2017.

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

The District has voluntarily terminated their Power Purchase Agreement with NorthWestern Energy. On May 2, 2016 the District requested all remaining cost recovery agreement funds be returned. Funds were returned by Reclamation to the District on May 19, 2016. Reclamation has been contacted to discuss a potential Preliminary Lease extension; however, no formal extension request has been made at this time.

Lower Colorado Renewable Energy Updates

LOPP Projects

Project: Santa Rosa Canal
Developer: Maricopa-Stanfield Irrigation and Drainage District
Status: Request for Development

The developer has postponed the project indefinitely due to depressed power rates. No Preliminary Lease has been awarded at this time.

Mid-Pacific Renewable Energy Updates

Solar Projects

Project: San Luis Facility
Developer: San Luis Renewables, LLC
Status: In Development

The developer is in the process of obtaining an interconnection agreement with the Western Area Power Administration and local balancing authority, California Independent System Operator (“CAISO”).

Pacific Northwest Renewable Energy Updates

FERC Projects

Project: Mason Dam Hydro
Developer: Baker County
Status: FERC License (P-12686)

On April 30, 2013, Baker County filed a License application to develop the Mason Dam Hydroelectric project. On September 6, 2016, FERC published an order issuing Baker County a License to develop the 3.4 MW facility, sited on Reclamation's Mason Dam, a participating work of the Baker Project in east-central Oregon. Per the order, Baker County is to "commence construction within two years from the issuance date of the license, for which the deadline may be extended once for two additional years."

FERC/LOPP Pumped Storage Projects

Project: Anderson Ranch Pump Storage
Developer: Cat Creek Energy, LLC
Status: Preliminary Permit (P-14655)

On November 27, 2015, FERC published an order issuing Cat Creek Energy, LLC a Preliminary Permit to investigate project feasibility and prepare a license application for proposed project works outside of Reclamation's Anderson Ranch Dam and Reservoir. Per the order, FERC notes that Reclamation retains jurisdiction over development at the Anderson Ranch Dam and Reservoir, as the project was reserved for Federal power development. Accordingly, proposed project works utilizing Anderson Ranch Dam and Reservoir would require a Reclamation LOPP.

On November 5, 2014, Cat Creek Energy, LLC sent Reclamation a formal request to develop non-Federal hydropower at Anderson Ranch Dam and Reservoir. In accordance with Reclamation Manual D&S, *Lease of Power Privilege (LOPP) Processes, Responsibilities, Timelines, and Charges* (FAC 04-08), Reclamation published a Federal Register Notice, soliciting proposals to develop pumped-storage at Anderson Ranch Reservoir. The Notice was published on April 11, 2016 with proposals due on September 8, 2016. A Reclamation selection team was assembled to review proposals and provide a recommendation to the regional director for award of the Preliminary Lease. In response to the Notice, one proposal was received (Cat Creek Energy, LLC). The selection team has reviewed

the proposal and has made a recommendation to the Pacific Northwest Regional Director.

Upper Colorado Renewable Energy Updates

LOPP Projects

Project: South Canal (Drop 5)
Developer: Uncompahgre Valley Water Users Association
Status: Online

The Uncompahgre Valley Water Users Association South Canal (Drop 5) facility began commercial operation on August 12, 2016. The project is expected to generate approximately 8,600 MWh, annually. The Association currently operates five LOPP facilities on the South Canal, Drops 1, 3, 4, 5, and Shavano Falls (Drop 6).

Project: South Canal (Drop 2)
Developer: Uncompahgre Valley Water Users Association and Percheron Power, LLC
Status: LOPP Contract

On September 13, 2016, Percheron Power, LLC requested an 18-month extension to the LOPP Contract. The extension will afford the development team time to secure a power purchase agreement and additional project funding, as necessary.

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

The District submitted to Reclamation a Formal Request for Development and project proposal on March 22, 2016. The Reclamation selection team has reviewed the District's proposal and at the recommendation of the team, the Upper Colorado Regional Director has accepted the District's proposal. Reclamation is currently coordinating with the District to execute a Preliminary Lease and funding agreement.

Project: San Juan Chama Project
Developer: Albuquerque Bernalillo County Water Utility Authority
Status: Request for Development

Reclamation Renewable Energy Update FY16 Q4

Reclamation has selected the Albuquerque Bernalillo County Water Utility Authority for Preliminary Lease award. At this time, the Preliminary Lease has not been executed, as the Authority is working internally to determine if it plans to proceed with the project and execute a Preliminary Lease and funding agreement. Reclamation has notified the Authority that any extension of timeframes would require the Upper Colorado Regional Director's approval.

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
OK	Online	McGee Creek Dam	8492	Oklahoma Texas	McGee Creek Authority	Conventional	175.00	7/26/1984	3/14/1985		6/23/1986	~ 1991
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	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		
WY	Preliminary	Deer Creek Drop	14370	Wyoming	Willwood Irrigation District	Conventional	780.00	3/6/2012	9/19/2012			
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
WY	Preliminary	Willwood Diversion Dam	13423	Wyoming	Willwood Irrigation District	Conventional	2,000.00	4/6/2009	7/7/2009			
MT	Preliminary	Clark Canyon Dam	14677	Montana	Clark Canyon Hydro, LLC	Conventional	4,700.00	4/20/2015	9/18/2015			
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			
WY	Preliminary	Medicine Bow Pumped Storage	13836	Wyoming	Medicine Bow Hydro, LLC	Pump Storage	400,000.00	8/30/2010	12/3/2010			
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	Preliminary	Pueblo Dam	LP11-4	Eastern Colorado	Southeastern Colorado Water Conservancy District, Colorado Springs Utilities, and Board of Water Works of Pueblo, Colorado	Conventional	7,010.00	4/20/2011	2/27/2012			
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				
AZ	Request for Development	Santa Rosa Canal		Phoenix	Maricopa-Stanfield Irrigation and Drainage District	Conventional	375.00	9/4/2012				
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	
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			
FEDERAL ENERGY REGULATORY COMMISSION / LEASE OF POWER PRIVILEGE PUMP STORAGE PROJECTS												
ID	Posted Solicitation	Anderson Ranch Pump Storage		Snake River	Cat Creek Energy, LLC	Pump Storage	400,000.00	11/5/2014	11/27/2015			
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			
CO	Preliminary	Plateau Creek Pumped Storage	14426	Western Colorado	Dolores Water Conservancy District	Pump Storage	500,000.00	5/10/2012	10/1/2012			
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	
UT	Preliminary	Spanish Fork Flow Control Structure	LP11-2	Provo	Central Utah Water Conservancy District, Strawberry Water users Association, and South Utah Valley Electric Service District	Conventional	8,000.00	5/11/2011	3/9/2012			
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	Diamond Fork		Central Utah Project Completion Act	Central Utah Water Conservancy District	Conventional	12,214.00	Nov-14				
UT	Request for Development	Mancos Project Outlet Canal		Western Colorado	Mancos Water Conservancy District	Conventional	415.00	3/22/2016				
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