

MEMORANDUM

Date: August 12, 2009
To: Water Right File 37-8169
From: medl
Re: license review

While reviewing this file for licensing, I found that the permit had lapsed and needed to be reinstated before further action could be taken.

Applicant

Big Wood Canal Company is the permit holder. Mutual Energy Company constructed the power house and until 2001 operated the facility through a lease agreement with the canal company. The termination for the lease is December 13, 2013 or sooner. Big Wood Canal has submitted ownership change documents to FERC and in 2001 the FERC license was assigned to the canal company.

Source and POD

The point of diversion is the headgate of the South Gooding Main Canal at the Little Wood River. I created the point-of-diversion shape based on 2004 aerial photography and the field exam. I made some data point correlations and corrections but more work is needed to clarify the shared points-of-diversion in this section.

The powerhouse intake consists of three penstocks which divert water from the South Gooding Main Canal approximately 1/2 mile down-canal from the headgate. A rectangular overflow weir in the canal creates a forebay pond to stabilize the water level at the intake. Water in excess of the hydro plants capacity remains in the canal. Water used for power generation is returned to the South Gooding Main Canal through a tailrace channel downstream from the powerhouse.

The largest water right conveyed through the South Gooding Main Canal is WR #1-6 held by the American Falls Reservoir District #2. Although the database does not show it, many other rights share the diversion and are administered by the watermaster but those rights are in various stages of confirmation with the department and are one or two orders of magnitude smaller than the American Falls right. I could not justify taking additional time to confirm them and list them in a condition to this right when that listing would not add meaning or clarity. This right is junior to all other rights including the downstream hydropower license 37-8166 which has the same source and POD.

Place of Use

I created the powerhouse place-of-use shape based on 2004 aerial photography and the field exam. Current taxlot information from Lincoln County indicates that the permit holder owns the land at the point of diversion but the US Government owns the land at the place-of-use.

I contacted the BLM and requested confirmation that an easement was in effect. Debbie Kovar from BLMs Shoshone field office provided copies of their right-of-way records for both the South Gooding Main Canal and the Sagebrush Hydroelectric plant. The active right-of-way agreement for the hydroelectric facility was assigned from Mutual Energy to the Big Wood Canal Co in 2001 and expires 8/29/2014.

Water Use

I was able to locate the turbine manufacturer and requested turbine curves for the Sagebrush plant. They provided me with the maximum hydraulic capacity flow for the two turbine models that were installed at the Sagebrush plant. The two larger turbines, model EL 7570, were built to handle 89 cfs each. The smaller turbine, model EL 7555 was built to handle 52 cfs. The Sagebrush plant design capacity is approximately 230 cfs (2 x 89 cfs + 52 cfs).

I also located a letter dated July 31, 1986 from Charles S. Greenwood of Greenwood Engineering to IDWR Southern Region personnel. The letter was in the water right file for a sibling hydroelectric plant (WR# 37-8166) but contained information pertinent to both plants. In his letter, Mr. Greenwood describes the turbines and the flow measurement system that was built into each plant. A graph attachment shows the flow and stage relation for each plant. The as-built capacity for the Sagebrush plant is shown as 232 cfs. Any canal flow above or below that capacity should be considered spill and not credited toward beneficial use.

Copies of documents from the Public Utilities Commission indicate that the Sagebrush plant was online and began generating in August of 1985. Proof of Beneficial Use was submitted on March 5, 1986. To determine a volume, I chose to analyze data from calendar year 1986 and requested archive water data from the Big Wood Canal Company.

In response to my request, Lynn Harmon (general manager Big Wood Canal Company) and other canal company personnel provided daily spot readings of stage and discharge from the nearest streamgaging station which they call Station 15. Station 15 is on the South Gooding Main Canal approximately ½ mile above the power plant and is maintained by the canal company. Daily (except Sunday) stage readings are taken and recorded. This is a "rated" section and the companion daily flow values are derived from the stage-discharge relationship that is effect at the time of the stage reading. Periodic check measurements of flow are made and if necessary, shifts are applied to the stage-discharge relationship to account for aquatic growth and other changes to the channel. I could not confirm the quality of the data provided to me but it is the best flow information available for this water right.

According to Mr. Harmon, the control works for the South Gooding Main Canal self-correct to dampen large fluctuations in the diversion rate to within 15 cfs +/- of a target value. Therefore, for my volume calculation, I used the daily spot values provided as if they were daily average values. Mr. Harmon stated that the canal capacity is approximately 370 cfs and when all customers are accessing water through the B-1 lateral, it takes approximately 20 cfs from the canal upstream of the hydro plant intake. I have subtracted a constant 20 cfs from the daily values to account for that diversion in my volume calculation. Even with that 20 cfs decrease in flow, water was available and the canal carrying capacity would have been sufficient to meet the hydraulic capacity of hydro plant for nearly the entire irrigation season in 1986. During calendar year 1986, the plant generated electricity from March through December and therefore beneficially used available Big Wood Canal water in that timeframe.

The hydro power plant s lessee requested the use of incidental water outside the irrigation season be allowed for this power generation permit. Generation records obtained from the Big Wood Canal Company and confirmed by records from the Public Utilities Commission shows that the plant generated outside of the irrigation season for several years. However, the season allowed by the permit is April 1 – November 1 (inclusive) and only flow during that season of use were considered in the volume calculation. Please refer to the attached spreadsheet for the volume calculation: (39825 cfs converted to AF = 78992.8 AF. Rounded to 3 significant figures = 79000 AF).

This project is authorized by FERC as a conduit exempt project. Conduit projects use the potential of a conduit that was constructed for a non-hydropower use. The project is known as Sagebrush Hydroelectric Project FERC #8046 and in this case the conduit is the South Gooding Main Canal. The order granting the exemption was issued June 28, 1984 and is issued in perpetuity. A downstream sibling hydroelectric plant is known as Jim Knight Power Plant FERC # 7686 reuses the same canal water through licensed water right #37-8166.

The power plant operator, Mutual Energy Company had a 35-year, firm energy, sales agreement with Idaho Power Company beginning April 1, 1985 which would expire in 2020.

The date for the Directors review is typically set to coincide with the expiration of a license or other agreement. In this case, a condition of the permit sets the director s review for thirty (30) years after permit approval, which would be 2015. However, the directors review date for the downstream sibling plant Jim Knight Power Plant is set for 2013 and for consistency I am assigning that review date to this license.

DATE	station 15 flow	-20 cfs for B1			
		available Sagebrush inflow	Permitted flow		
4/1/1986					estimate
4/2/1986					
4/3/1986					
4/4/1986					
4/5/1986					
4/6/1986					
4/7/1986					
4/8/1986					
4/9/1986					
4/10/1986					
4/11/1986					
4/12/1986					
4/13/1986					
4/14/1986	253	233	232		
4/15/1986	258	238	232		
4/16/1986	262	242	232		
4/17/1986	257	237	232		
4/18/1986	248	228	228		
4/19/1986	257	237	232		
4/20/1986	257	237	232		
4/21/1986	264	244	232		
4/22/1986	260	240	232		
4/23/1986	262	242	232		
4/24/1986	276	256	232		
4/25/1986	304	284	232		
4/26/1986	317	297	232		
4/27/1986	317	297	232		
4/28/1986	322	302	232		
4/29/1986	321	301	232		
4/30/1986	313	293	232		
5/1/1986	312	292	232		
5/2/1986	317	297	232		
5/3/1986	322	302	232		
5/4/1986	322	302	232		
5/5/1986	344	324	232		
5/6/1986	337	317	232		
5/7/1986	317	297	232		
5/8/1986	292	272	232		
5/9/1986	294	274	232		
5/10/1986	292	272	232		
5/11/1986	292	272	232		
5/12/1986	288	268	232		
5/13/1986	285	265	232		
5/14/1986	295	275	232		
5/15/1986	290	270	232		
5/16/1986	299	279	232		
5/17/1986	306	286	232		
5/18/1986	306	286	232		
5/19/1986	290	270	232		
5/20/1986	295	275	232		
5/21/1986	301	281	232		

Flow data from Station 15
created by Michele Edl
for use in WR# 37-8169

DATE	station 15 flow	-20 cfs for B1			
		available Sagebrush inflow	Permitted flow		
5/22/1986	299	279	232		
5/23/1986	324	304	232		
5/24/1986	299	279	232		
5/25/1986	299	279	232		
5/26/1986	290	270	232		
5/27/1986	294	274	232		
5/28/1986	304	284	232		
5/29/1986	313	293	232		
5/30/1986	324	304	232		
5/31/1986	333	313	232		
6/1/1986	333	313	232		
6/2/1986	326	306	232		
6/3/1986	327	307	232		
6/4/1986	326	306	232		
6/5/1986	326	306	232		
6/6/1986	328	308	232		
6/7/1986	326	306	232		
6/8/1986	326	306	232		
6/9/1986	328	308	232		
6/10/1986	326	306	232		
6/11/1986	328	308	232		
6/12/1986	357	337	232		
6/13/1986	355	335	232		
6/14/1986	355	335	232		
6/15/1986	355	335	232		
6/16/1986	355	335	232		
6/17/1986	357	337	232		
6/18/1986	357	337	232		
6/19/1986	355	335	232		
6/20/1986	353	333	232		
6/21/1986	351	331	232		
6/22/1986	351	331	232		
6/23/1986	349	329	232		
6/24/1986	355	335	232		
6/25/1986	371	351	232		
6/26/1986	364	344	232		
6/27/1986	373	353	232		
6/28/1986	369	349	232		
6/29/1986	369	349	232		
6/30/1986	369	349	232		
7/1/1986	367	347	232		
7/2/1986	378	358	232		
7/3/1986	367	347	232		
7/4/1986	367	347	232		
7/5/1986	371	351	232		
7/6/1986	371	351	232		
7/7/1986	364	344	232		
7/8/1986	349	329	232		
7/9/1986	346	326	232		
7/10/1986	348	328	232		
7/11/1986	342	322	232		

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		-20 cfs for B1			
DATE	station 15 flow	available Sagebrush inflow	Permitted flow		
7/12/1986	340	320	232		
7/13/1986	340	320	232		
7/14/1986	349	329	232		
7/15/1986	351	331	232		
7/16/1986	349	329	232		
7/17/1986	349	329	232		
7/18/1986	351	331	232		
7/19/1986	349	329	232		
7/20/1986	349	329	232		
7/21/1986	351	331	232		
7/22/1986	335	315	232		
7/23/1986	335	315	232		
7/24/1986	346	326	232		
7/25/1986	355	335	232		
7/26/1986	342	322	232		
7/27/1986	342	322	232		
7/28/1986	342	322	232		
7/29/1986	335	315	232		
7/30/1986	325	305	232		
7/31/1986	323	303	232		
8/1/1986	351	331	232		
8/2/1986	351	331	232		
8/3/1986	351	331	232		
8/4/1986	331	311	232		
8/5/1986	329	309	232		
8/6/1986	325	305	232		
8/7/1986	340	320	232		
8/8/1986	338	318	232		
8/9/1986	340	320	232		
8/10/1986	340	320	232		
8/11/1986	340	320	232		
8/12/1986	340	320	232		
8/13/1986	340	320	232		
8/14/1986	351	331	232		
8/15/1986	351	331	232		
8/16/1986	351	331	232		
8/17/1986	351	331	232		
8/18/1986	354	334	232		
8/19/1986	354	334	232		
8/20/1986	307	287	232		
8/21/1986	309	289	232		
8/22/1986	309	289	232		
8/23/1986	320	300	232		
8/24/1986	320	300	232		
8/25/1986	314	294	232		
8/26/1986	314	294	232		
8/27/1986	314	294	232		
8/28/1986	309	289	232		
8/29/1986	309	289	232		
8/30/1986	309	289	232		
8/31/1986	309	289	232		

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-20 cfs for B1				
DATE	station 15 flow	available Sagebrush inflow	Permitted flow	
9/1/1986	309	289	232	
9/2/1986	312	292	232	
9/3/1986	312	292	232	
9/4/1986	307	287	232	
9/5/1986	299	279	232	
9/6/1986	289	269	232	
9/7/1986	289	269	232	
9/8/1986	287	267	232	
9/9/1986	289	269	232	
9/10/1986	249	229	229	
9/11/1986	249	229	229	
9/12/1986	232	212	212	
9/13/1986	232	212	212	
9/14/1986	232	212	212	
9/15/1986	232	212	212	
9/16/1986	212	192	192	
9/17/1986	205	185	185	
9/18/1986	198	178	178	
9/19/1986	195	175	175	
9/20/1986	164	144	144	
9/21/1986	164	144	144	
9/22/1986	164	144	144	
9/23/1986	151	131	131	
9/24/1986	150	130	130	
9/25/1986	148	128	128	
9/26/1986	133	113	113	
9/27/1986	128	108	108	
9/28/1986	128	108	108	
9/29/1986	132	112	112	
9/30/1986	118	98	98	
10/1/1986	118	98	98	
10/2/1986	117	97	97	
10/3/1986	113	93	93	
10/4/1986	113	93	93	
10/5/1986	113	93	93	
10/6/1986	112	92	92	
10/7/1986	245	225	225	
10/8/1986	245	225	225	
10/9/1986	240	220	220	
10/10/1986	227	207	207	
10/11/1986	210	190	190	
10/12/1986	56	36	0	below smallest unit
10/13/1986		-20	0	
10/14/1986		-20	0	
10/15/1986		-20	0	
10/16/1986		-20	0	
10/17/1986		-20	0	
10/18/1986		-20	0	
10/19/1986		-20	0	
10/20/1986		-20	0	
10/21/1986		-20	0	

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		-20 cfs for B1			
DATE	station 15 flow	available Sagebrush inflow	Permitted flow		
10/22/1986		-20	0		
10/23/1986		-20	0		
10/24/1986		-20	0		
10/25/1986		-20	0		
10/26/1986		-20	0		
10/27/1986		-20	0		
10/28/1986		-20	0		
10/29/1986		-20	0		
10/30/1986		-20	0		
10/31/1986		-20	0		
11/1/1986	280	260	232		
11/2/1986	280	260		outside season of use	
11/3/1986	280	260			
11/4/1986	280	260			
11/5/1986	280	260			
11/6/1986	280	260			
11/7/1986	280	260			
11/8/1986	280	260			
11/9/1986	280	260			
11/10/1986	303	283			
11/11/1986	312	292			
11/12/1986	249	229			
11/13/1986	297	277			
11/14/1986	329	309			
11/15/1986	329	309			
11/16/1986	329	309			
11/17/1986	329	309			
11/18/1986	329	309			
11/19/1986	327	307			
11/20/1986	325	305			
11/21/1986	327	307			
11/22/1986	327	307			
11/23/1986	327	307			
11/24/1986	327	307			
11/25/1986	327	307			
11/26/1986	325	305			
11/27/1986	325	305			
11/28/1986	325	305			
11/29/1986		-20			
11/30/1986		-20			
sum cfs			39825		
convert	1.9835	cfs to AF conversion factor			
sum AF			78992.888		
round to 3 sig fig			79000		

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