

MEMORANDUM

Date: June 25, 2014
To: Water Right File 47-7702
From: medl
Re: license review

This project was the first project to come 'on-line' for the Cogeneration-Small Power Production program with Idaho Power Company in the 1980's. As a pioneer, the Mud Creek/S&S project suffered from a lack of understanding of the unpredictable water source and of an effective water-to-wires engineering plan. Over the years the two power plants have been refitted more than once to improve operational efficiency.

Foreclosure proceedings in 1986, which involved the permit holder, complicated the processing of this right. A few months before the Proof of Beneficial Use date, the 5th District Court awarded permits 47-7700 and 47-7702 to Glaser Land and Livestock. That action was inconsistent with assignments that the Department received. Ownership questions necessitated additional assignments and an extension of the proof due date.

To assist with me in licensing this permit, I created a timeline of all the documentation available to me. It is available in the water right file.

Applicant

The most recent assignment document conveys this permit and permit 47-7700 (also for hydropower use in the Mud Creek/S&S project) from Zions Leasing Co to HK Hydro LLC. Steve Harmsen is the representative for and a member of HK Hydro LLC which has its address in Salt Lake City, UT. HK Hydro LLC is registered as a business in Idaho under ISOS identifier W92164. Scott Kaster is the local (Buhl area) operator of the power plants in this project.

The Federal Energy Regulatory Commission (FERC) approved licensing exempt authorization #4769 for the Mud Creek project on November 20, 1981 to S & S Limited Partnership.

A 35-year Power Sales agreement with Idaho Power Company (IPCo) was available from the IPUC archive. The agreement expires January 1, 2017 and that is the date I used for the term review condition. I found evidence that the agreement was assigned to Zions Credit Corp in September 1987. IPUC records show that an agreement is still in effect. I assume that it was assigned to HK Hydro LLC.

Source and POD - Accomplished transfer

The source listed on permit 47-7702 is Sewer Creek (Unnamed stream). Sewer Creek enters Mud Creek between the upper and the lower powerhouses. (See the attached schematic.) At the convergence with Mud Creek, the water is no longer Unnamed stream but is instead Mud Creek and diversions from Mud Creek for hydropower use are authorized through right 47-7700.

However, I know that originally the upper powerhouse had two penstocks. This knowledge is based on conversations with Don Campbell, the location of the concrete remnants of intake structures on the Campbell property and the information that I collected in order to successfully process licenses for the hydropower rights 47-7700 and 47-7702. (In particular, see the Times-News newspaper article dated 2-21-1982). One penstock delivered Mud Creek water from the canal running along the west side of Mud Creek. The second penstock delivered water from the east side of Mud Creek. The water for the later was cascaded from fish propagation and heating uses which were developed by the former owners, the Skeem family. The sources would have included Sewer Creek and some of the flowing low-temperature geothermal wells.

When proof of beneficial use for this permit was submitted on April 30, 1987, the upper power plant benefited from water diverted from both the east and the west sides of the Mud Creek ravine. By November 19, 1987, the deadline for SRBA submittals, the flow of water from the east side (by then Don and Dianne Campbell's property) had been discontinued and the siphon diversion for water right 47-8056 had been developed.

(Permit 47-8056 was signed on June 18, 1987 and authorized the Campbell's to divert from Mud Creek. I believe that the penstock change occurred when both powerhouses were under construction and offline in the summer of 1987. Mr. Campbell confirmed that adapting existing piping to meet his needs for cool water in fish propagation was one of the first actions he accomplished.)

The configuration that currently exists still provides water from a source other than Mud Creek for hydropower use. Similar to the pre-1987 configuration, the source water would be best described as wastewater. The path that the water takes begins and ends with Mud Creek. Mud Creek water is diverted from the power channel at the upper powerhouse on the west side of the ravine, and used on the First Ascent Fish Farm property on the east side of the ravine. On the First Ascent Fish Farm property, Mud Creek water is comingled with water from 1) unnamed stream, a.k.a. Sewer Creek, 2) unnamed stream a.k.a. Silver Creek and 3) several flowing, artesian, low-temperature geothermal wells. The comingled water eventually returns to Mud Creek. It is discharged from the final pond on First Ascent Fish Farm property and into the power channel above the lower powerhouse. From there, water either overflows from the lower power channel into Mud Creek or is discharged through the lower powerhouse turbines into Mud Creek.

Water Use

Power Generation

Based on the information I was able to collect from the Idaho Public Utilities Commission (IPUC), the best generation year within the development period was 1983 and the best month of generation within that year was October. The available generation data does not separate the upper plant generation from the lower plant generation. According to a 1988 FERC inspection report, only the upper plant was completed by 1983. That same report stated that the lower plant was not completed until 1984. Both plants would have been constructed by the time the proof-of-beneficial use statements for permits 47-7700 and 47-7702 were submitted in 1987, but I was not able to confirm that the lower plant contributed any power generation during 1983, the best year for generation within the development period.

The generation capacity stated in a power sales agreement with Idaho Power Company (IPCo) and the FERC authorized capacity for the same time period were not consistent with each other. I found evidence that the installed generator capacity in 1982 exceeded what had been authorized by FERC in 1981. However, that same generation configuration underperformed to the IPCo power sales agreement significantly enough that that contract was amended. The lack of consistency between those two commitments made beneficial use more difficult to resolve. In the end, I used summaries of actual composite generation to determine the beneficial use and to set the combined rate for the licenses.

The FERC issued an order to amend the exemption #4769, revising the capacity of both the upper and lower plants in July 1988. The amendment was justified by a FERC inspection report from February 23, 1988. The report stated that significant changes had been made to both facilities since the previous inspection on June 2, 1987. At that time, S & S Limited Partnership was still named as the exemptee but the FERC correspondence of the period was directed to both Zions Credit Corp and HK Hydro.

No vetted water data was available and the number of turbines and their hydraulic capacities at the time that proof was submitted was also unavailable. The contemporary hydraulic capacity of the units in the upper powerhouse is approximately 58 cfs. For the units in the lower powerhouse, the contemporary hydraulic capacity is approximately 48 cfs.

Fish Flows

The FERC authorization required the Mud Creek power plants provide for fish passage and a minimum flow in the Mud Creek channel. The fish passage requirement was eliminated in 1987 probably because

irrigation return flow water is not suitable fish habitat. The fish ladder at the upper plant has been abandoned. However, both plants have requirements for maintaining a minimum 5 cfs flow in Mud Creek.

Beneficial use field exams for both 47-7700 and 47-7702 were conducted by Southern Region personnel in 2005. The Southern Region field examiners found beneficial use at the two powerhouses, and confirmed that the required bypass flow was supplied. I do not concur with all of the field examiner's recommendations for this license.

Additional field work, including a wading measurement of the discharge from First Ascent Fish Farm was accomplished by Dan Nelson and me on May 9, 2014. The flow rate I recommend for this license is 3.0 cfs, and is based on that measurement. See the attached FlowTracker discharge measurement summary.

Place of Use

The powerhouse place-of-use shape was created by Southern Region staff based on their 2005 field exam. The powerhouse location conforms to maps created in 1981. The lower powerhouse appears to straddle the section line between section 11 and 14. The authorized place-of-use for 47-7702 was the upper powerhouse. But as a result of the accomplished transfer described in the water use section above, the lower powerhouse is the only possible place-of-use now. An amendment will be required before licensing.

Twin Falls County taxlot information indicates that HK Hydro Inc owns the land at the place-of-use.

The power canals do not provide significant storage and both power plants are operated as 'run-of-river' plants.

Combined Use

This water right confirms that another source of water is available for use in the lower hydropower plant. The majority of the water used in the lower hydropower plant is diverted from Mud Creek. License 47-7700 has been issued for 50 cfs to be used in either powerhouse. I believe that the power generation capability of the lower plant has always been less than that of the upper plant. Therefore the additional source can't provide additional flowrate for hydropower generation at the lower plant. Combined use limits which recognize those constraints have been applied to the license.

Conditions

Although this permit was not subordinated, I am adding a subordination condition to the license.

The term condition is based on the expiration date of an available power sales agreement that HK Hydro may have with Idaho Power Company. The IPUC does not have a case number for this agreement. It was the first project to come online and as such may have preceded the case number record keeping. The IPUC record for this project Mud Creek(S&S Limited Partnership) shows October 30, 2016 as the expiration date for the sales agreement. I have not been able to locate documents to support that date. To be consistent with companion license 47-7700, I am conditioning this license with the same term review date.

Discharge Measurement Summary

Date Generated: Thu Jun 26 2014

File Information

File Name OUTFLOX.WAD
Start Date and Time 2014/05/09 17:04:29

Site Details

Site Name
Operator(s) DAN

System Information

Sensor Type FlowTracker
Serial # P4554
CPU Firmware Version 3.7
Software Ver 2.11

Units (English Units)

Distance ft
Velocity ft/s
Area ft^2
Discharge cfs

Discharge Uncertainty

Category	ISO	Stats
Accuracy	1.0%	1.0%
Depth	0.2%	1.1%
Velocity	0.6%	4.4%
Width	0.2%	0.2%
Method	2.4%	-
# Stations	4.6%	-
Overall	5.4%	4.6%

Summary

Averaging Int.	40	# Stations	11
Start Edge	LEW	Total Width	5.050
Mean SNR	37.8 dB	Total Area	9.019
Mean Temp	77.93 °F	Mean Depth	1.786
Disch. Equation	Mid-Section	Mean Velocity	0.3365
		Total Discharge	3.0349

Measurement Results

St	Clock	Loc	Method	Depth	%Dep	MeasD	Vel	CorrFact	MeanV	Area	Flow	%Q
0	17:04	4.75	None	1.800	0.0	0.0	0.0000	1.00	0.3793	0.675	0.2560	8.4
<i>1</i>	<i>17:05</i>	<i>5.50</i>	<i>0.6</i>	<i>1.800</i>	<i>0.6</i>	<i>0.720</i>	<i>0.3793</i>	<i>1.00</i>	<i>0.3793</i>	<i>1.125</i>	<i>0.4266</i>	<i>14.1</i>
2	17:08	6.00	0.6	1.800	0.6	0.720	0.5561	1.00	0.5561	0.900	0.5005	16.5
3	17:09	6.50	0.6	1.800	0.6	0.720	0.4449	1.00	0.4449	0.900	0.4004	13.2
4	17:12	7.00	0.6	2.000	0.6	0.800	0.3514	1.00	0.3514	1.000	0.3514	11.6
5	17:13	7.50	0.6	2.000	0.6	0.800	0.3038	1.00	0.3038	1.000	0.3038	10.0
6	17:14	8.00	0.6	1.800	0.6	0.720	0.2539	1.00	0.2539	0.900	0.2285	7.5
7	17:15	8.50	0.6	1.800	0.6	0.720	0.2474	1.00	0.2474	0.900	0.2226	7.3
8	17:16	9.00	0.6	1.800	0.6	0.720	0.2024	1.00	0.2024	0.900	0.1822	6.0
9	17:17	9.50	0.6	1.800	0.6	0.720	0.2264	1.00	0.2264	0.720	0.1630	5.4
10	17:17	9.80	None	0.000	0.0	0.0	0.0000	1.00	0.0000	0.000	0.0000	0.0

Rows in italics indicate a QC warning. See the Quality Control page of this report for more information.

Discharge Measurement Summary

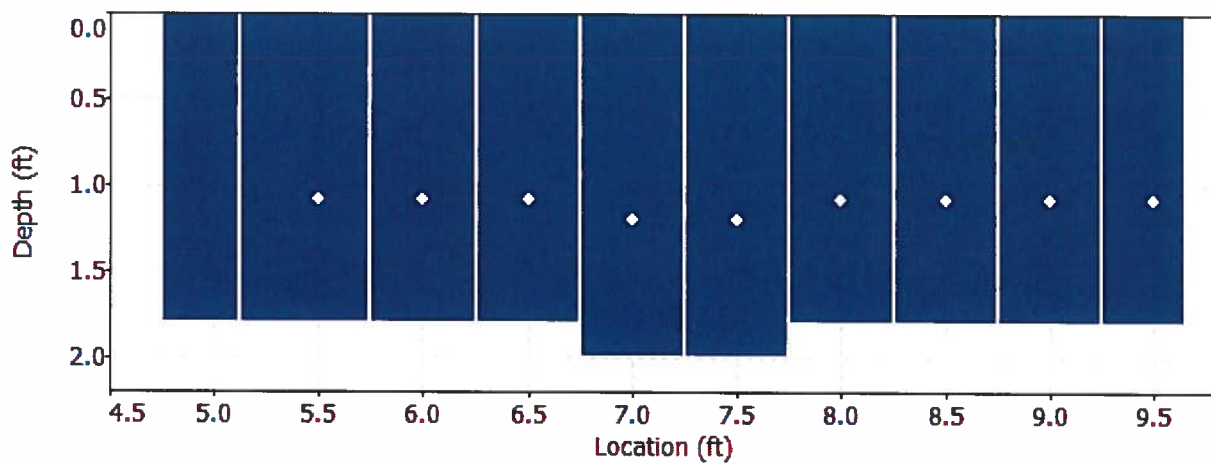
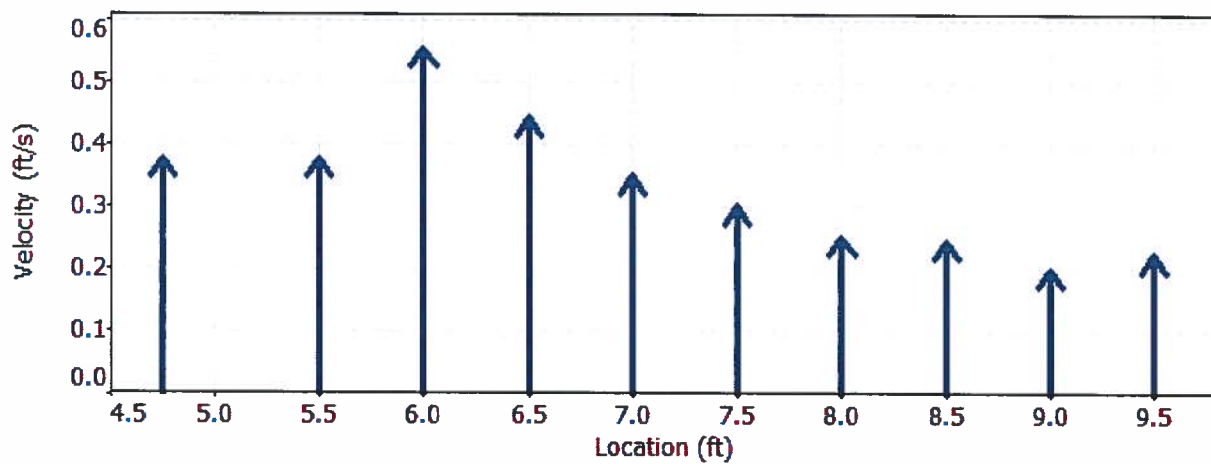
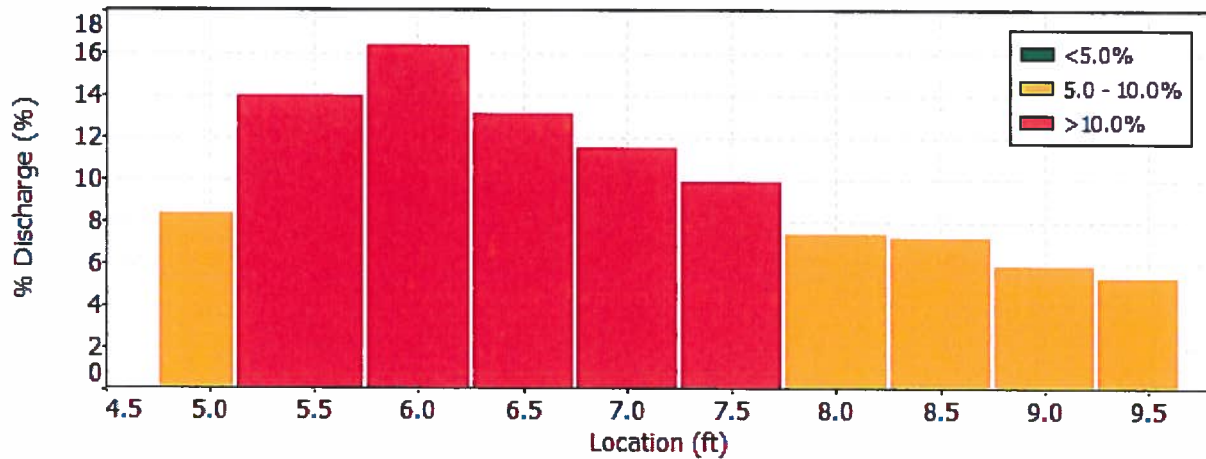
Date Generated: Thu Jun 26 2014

File Information

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Start Date and Time 2014/05/09 17:04:29

Site Details

Site Name
Operator(s) DAN



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Start Date and Time 2014/05/09 17:04:29

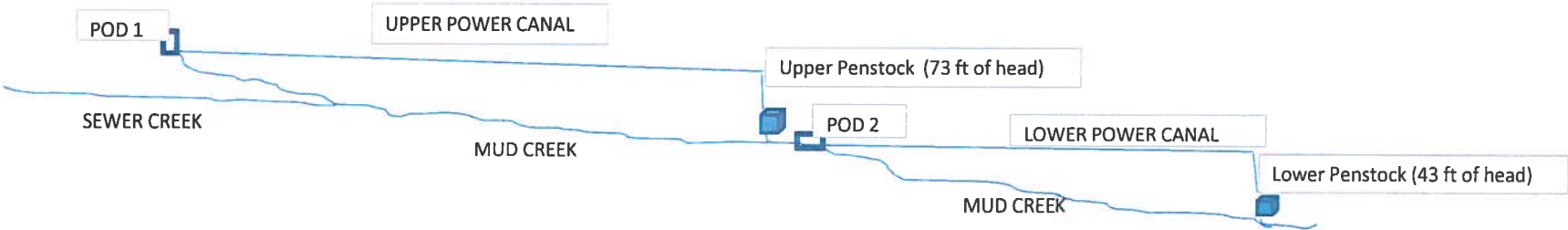
Site Details

Site Name
Operator(s) DAN

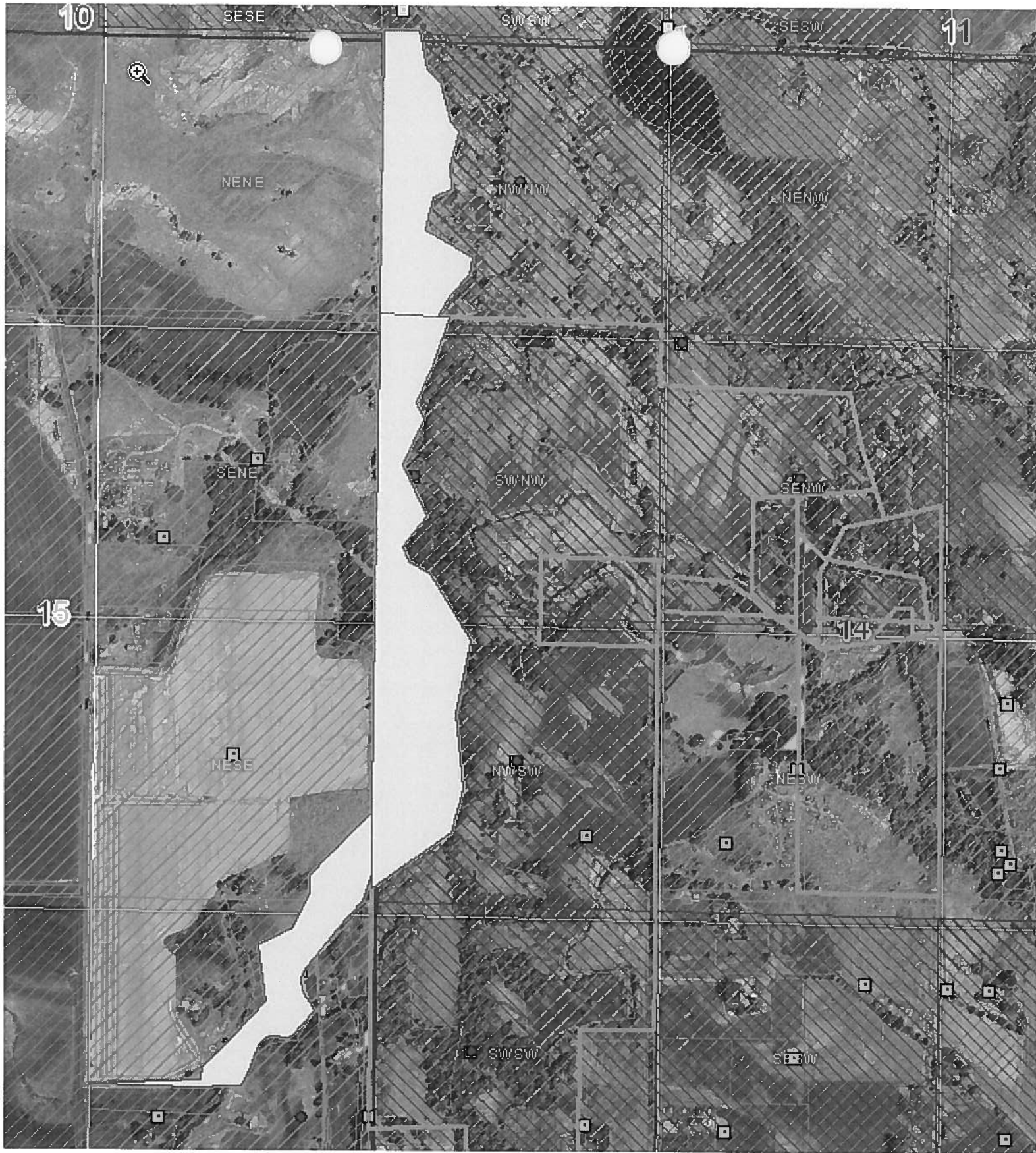
Quality Control

St	Loc	%Dep	Message
1	5.50	0.6	High angle: -48

ELEVATION SCHEMATIC OF MUD CREEK HYDROS



created by Michele Edl
for 47-7700 and 47-7702



HK Hydro

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Commerce

Business Entity Search

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Name	Type	City	Status
HK HYDRO LLC	Limited Liability Company	Salt Lake City	Active

Business Name:	HK HYDRO LLC
Entity Number:	5348213-0160
Registration Date:	07/02/2003
State of Origin:	

Address

26 N STATE ST
Salt Lake City, UT 84103

Status

Status:	Active
Status Description:	Good Standing
This Status Date:	07/02/2003
Last Renewed:	07/07/2009
License Type:	LLC - Domestic
Delinquent Date:	07/02/2010

Registered Agent

Registered Agent:	STEVE HARMSSEN [Search BES] [Search RPS]
Address Line 1:	26 N STATE ST
Address Line 2:	
City:	Salt Lake City
State:	UT
Zip:	84103

Additional Information

NAICS Code:	5313
NAICS Title:	5313-Activities Related to Real Estate
Qualified Alien - I-94 or:	
Qualified Alien - Registration No:	
U.S. Citizen - SSN or:	

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No. W 92164	Due no later than Apr 30, 2014 Annual Report Form		2. Registered Agent and Address (NO PO BOX)			
Return to: SECRETARY OF STATE 700 WEST JEFFERSON PO BOX 83720 BOISE, ID 83720-0080 NO FILING FEE IF RECEIVED BY DUE DATE	1. Mailing Address: Correct in this box if needed. H K HYDRO LLC STEVE HARMSSEN 26 N STATE ST SALT LAKE CITY UT 84103		STEVE WUTHRICH 1011 WASHINGTON ST MONTPELIER ID 83254			
			3. <u>New</u> Registered Agent Signature:*			
4. Limited Liability Companies: Enter Names and Addresses of at least one Member or Manager.						
Office Held	Name	Street or PO Address	City	State	Country	Postal Code
MANAGER	STEVE HARMSSEN	26 N STATE ST	SALT LAKE CITY	UT	USA	84103
5. Organized Under the Laws of: UT W 92164		6. Annual Report must be signed.* Signature: Steve Harmsen Name (type or print): Steve Harmsen Date: 02/12/2014 Title: President				
Processed 02/12/2014		* Electronically provided signatures are accepted as original signatures.				