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Task 3: Update NHD in IDWR Critical Areas – Great Feeder Canal Area

COOPERATIVE AGREEMENT NO. G13AC00195

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Introduction:

In Idaho, water resources management is critical to the State's agriculturally-based economy. Idaho is the second largest water user in the U.S., only behind California, with the majority of water used in agriculture.ⁱ Idahoans are also heavily dependent on its water for power. Nearly 90% of Idaho's power is hydroelectric with 136 hydroelectric plants generating an annual average of 11 billion kilowatt hours.ⁱⁱ Planners and engineers have a difficult task implementing water-related projects without accurate data and need adequate tools for planning and design. In areas like southern Idaho, where agriculture is dominant, the current National Hydrography Dataset (NHD) often does not match the existing hydrography because of changes on the ground since the digital information was created. The expansion of agricultural land led to the construction of canals and the altering of waterways, sometimes with major changes to the original hydrography.

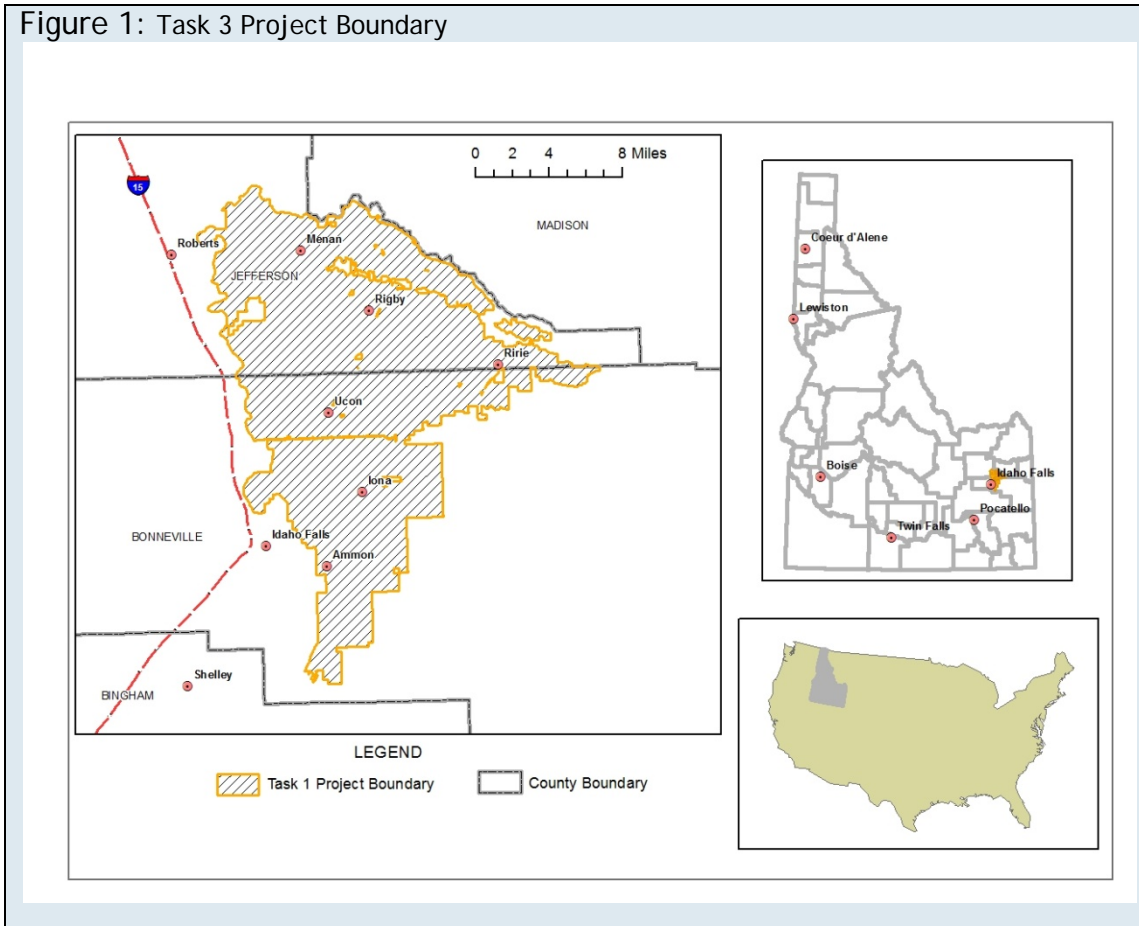
Accurate maps and digital data are the basic tools for planning and designing water projects, such as managed aquifer recharge, and are essential components of hydrologic modeling. Although groundwater comprises only 22 percent of Idaho's total water use, it accounts for nearly 95 percent of Idaho's drinking water.ⁱⁱⁱ One of Idaho's important aquifers is the Eastern Snake Plain Aquifer (ESPA). The ESPA covers approximately 10,800 square miles in Southeastern Idaho. The ESPA is a vital source of water for a region that produces approximately 21 percent of all goods and services within Idaho.^{iv} ESPA Aquifer recharge occurs primarily via irrigation percolation, canal and stream losses, and subsurface flow from surrounding areas.^v

The Great Feeder Canal system, located five miles east of the town of Ririe, Idaho, was dedicated in June, 1895. This canal system is the largest irrigating system in the Upper Snake River Valley and one of the largest systems in the West. It supplies water for twenty major canal systems, diverts up to one million acre-feet of water and has irrigated one hundred thousand or more acres of farmland. At one time, the head gate (116 feet from end to end) was said to be the largest in the US.

Area of Interest - The Great Feeder Canal System:

The Task 3 Project Area consists of the combined water right boundaries of the water delivery organizations that use water from the Great Feeder Canal system (Figure 1). The water delivery organizations that use the Great Feeder Canal system are located in Jefferson and Bonneville Counties in Eastern Idaho. A list of Water Delivery Organizations in the Great Feeder System is listed in Table 1. The project area intersects 4 SubBasins (HUC - 8); 17040201, 17040205, 14040207, and small portion of 17040206. In addition, the project area is within two Water Districts; Water District 01 and Water District 120. A Water District is created by order of the Director of IDWR for purposes of water right administration, specifically distribution of water from public or natural water sources in accordance with water right priority dates.^{vi}

Figure 1: Task 3 Project Boundary



Most of the population in the project area is within the town of Ammon. The city of Idaho Falls is nearby, and part of the incorporated area falls within the project area. Based on the 2010 Census data, population within the project area is over 25,000. ^{vii} The Great Feeder canal diverts water from the Snake River, in an area locally known as the South Fork of the Snake River. ^{viii} The South Fork of the Snake River is technically not a fork, but the main stem of the Snake River. ^{ix} This portion of the Snake River is a nationally renowned trout fishery and recreation destination.

Agriculture dominates the project area and the majority of the land is privately owned. (Figure 3)

Burgess Canal & Irrigating Co.	Butler Island Canal Co.	Clark & Edwards Canal Co.	Dilts Irrigation Co. LTD	Enterprize Canal Co. LTD
Farmers Friend Irrigation Co LTD	Harrison Canal & Irrigation Co	Island Irrigation Co.	Labelle Irrigating Co.	Long Island Irrigation Co.
Lowder Slough Canal Co.	Osgood Canal Co.	Parks & Lewisville Irrigation Co. Inc.	Progressive Irrigation Dist.	Rigby Canal & Irrigating Co. Inc.
Rudy Irrigation Canal Co. LTD	North Rigby Irrigation & Canal Co. Inc.	West Labelle Irrigation Co. LTD		

Figure 2: Task 3 Hydrography

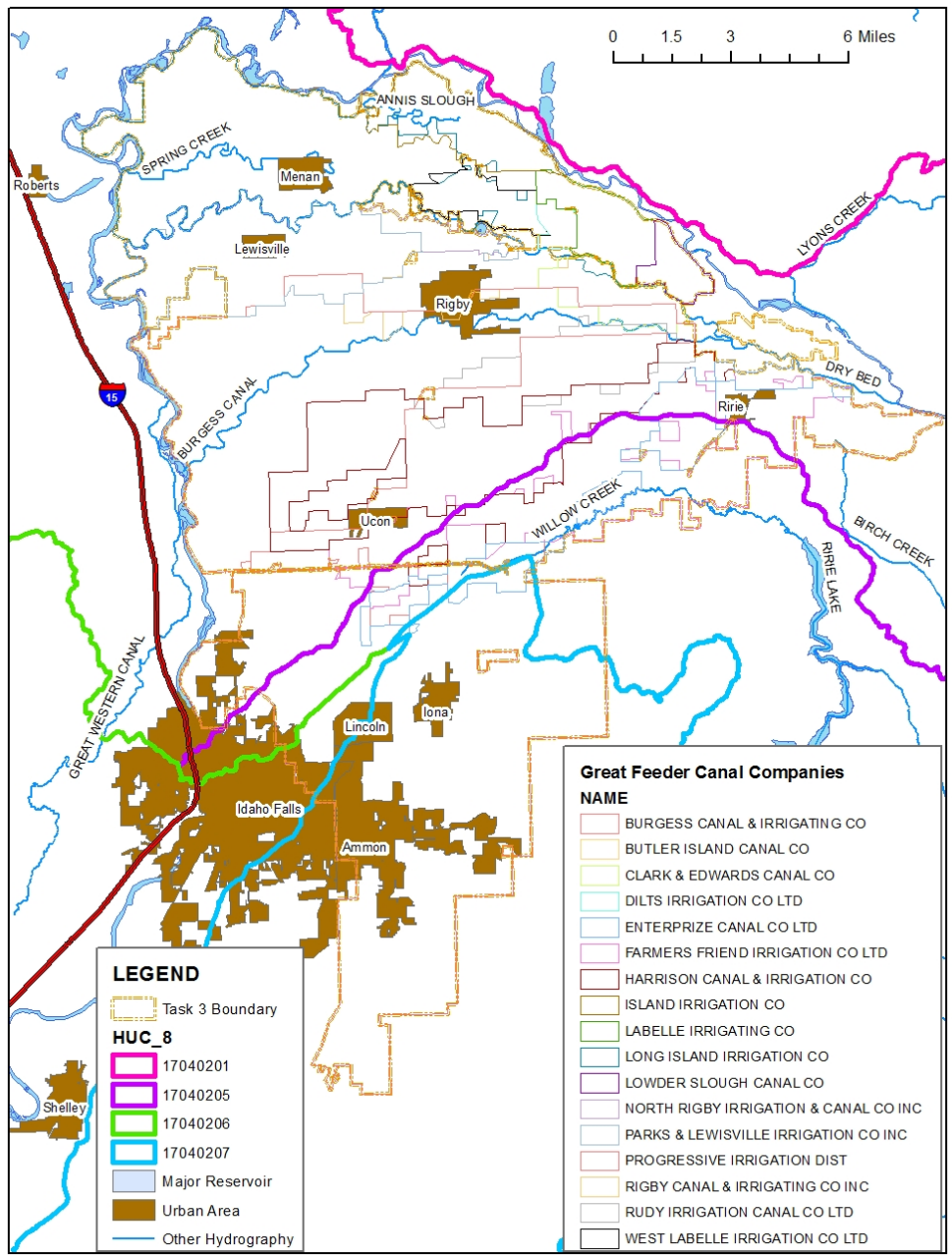
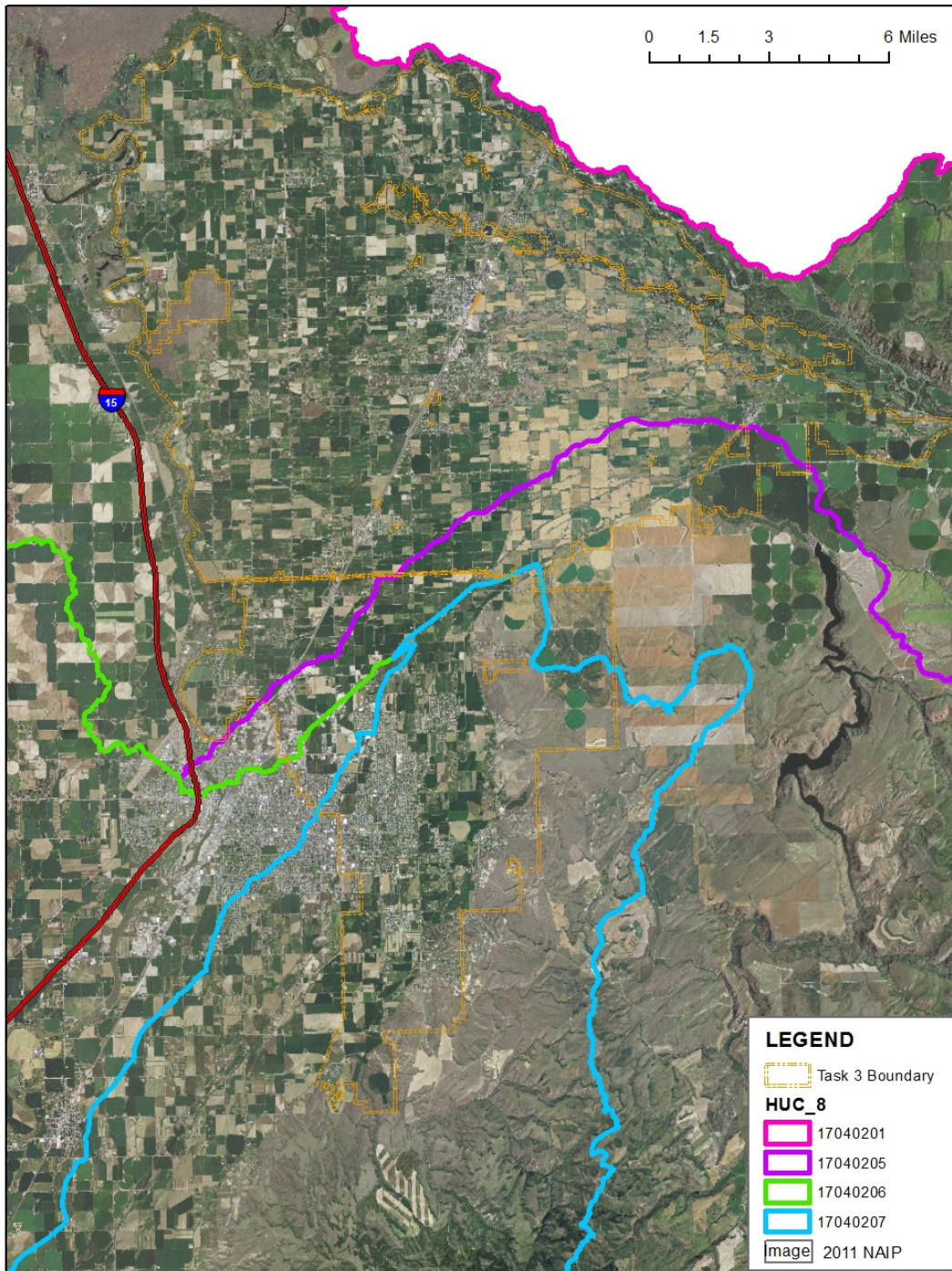


Figure 3: Task 3 General Land Use



Methods:

The Idaho NHD Technical Point of Contact downloaded the appropriate SubBasins from the NHD website (<http://nhd.usgs.gov/data.html>). The existing NHDFlowlines and other NHD features in SubBasins 17040201 were photo-rectified using 2011 and 2013 NAIP imagery. Areas where there

were questions regarding flow direction, new features, or interactions of features were recorded in order to be sent to local water managers for input.

The next step was to collect locally available data from cooperators within the project area. Maps of hydrography over NAIP imagery of the project area were supplied to the cooperators. The cooperators were encouraged to write on the maps indicating areas where the geometry need to be adjusted and names added or corrected. The updated maps were used to verify correct placement of hydrography, flow direction, and connectivity. Also, the data provided by the local cooperators were used for submittal to GNIS in order to update names for unnamed NHDflowlines.

Table 2: Water Delivery Organizations Solicited for Input

Burgess Canal & Irrigating Co.	Butler Island Canal Co.	Clark & Edwards Canal Co.	Dilts Irrigation Co. LTD	Enterprize Canal Co. LTD
Farmers Friend Irrigation Co LTD	Harrison Canal & Irrigation Co	Island Irrigation Co.	Labelle Irrigating Co.	Long Island Irrigation Co.
Lowder Slough Canal Co.	Osgood Canal Co. Inc.	Parks & Lewisville Irrigation Co. Inc.	Rigby Canal & Irrigating Co. Inc.	Rudy Irrigation Canal Co. LTD
North Rigby Irrigation & Canal Co. Inc.	West Labelle Irrigation Co. LTD			

Table 3: Water Delivery Organizations Who Returned Corrected Maps to IDWR

West Labelle Irrigation Co. LTD				

Table 4: Water Delivery Organizations Who Indicated to IDWR That They Will Return Corrected Maps After the Project Period

Burgess Canal & Irrigating Co.	Harrison Canal & Irrigation Co	Rudy Irrigation Canal Co. LTD	Farmers Friend Irrigation Co LTD	

Maps were sent to 17 water delivery organizations (Table 2). The staff at one water delivery organizations reviewed the updated maps and returned the edited information to IDWR for incorporation into the NHD (Table 3). IDWR has heard from 4 additional companies. These additional companies indicated that they received the maps, and will return edits to IDWR but not within the timeline of this project (Table 4). North Rigby Irrigation & Canal Co. Inc. contacted IDWR to indicate that no additional edits were needed at this time. The USGS NHD GeoEdit Tools were used to incorporate changes received for submittal to the USGS for inclusion into the NHD. Additional edits will be incorporated as received and time allows.

Results:

Updates Provided to USGS for Incorporation into the NHD

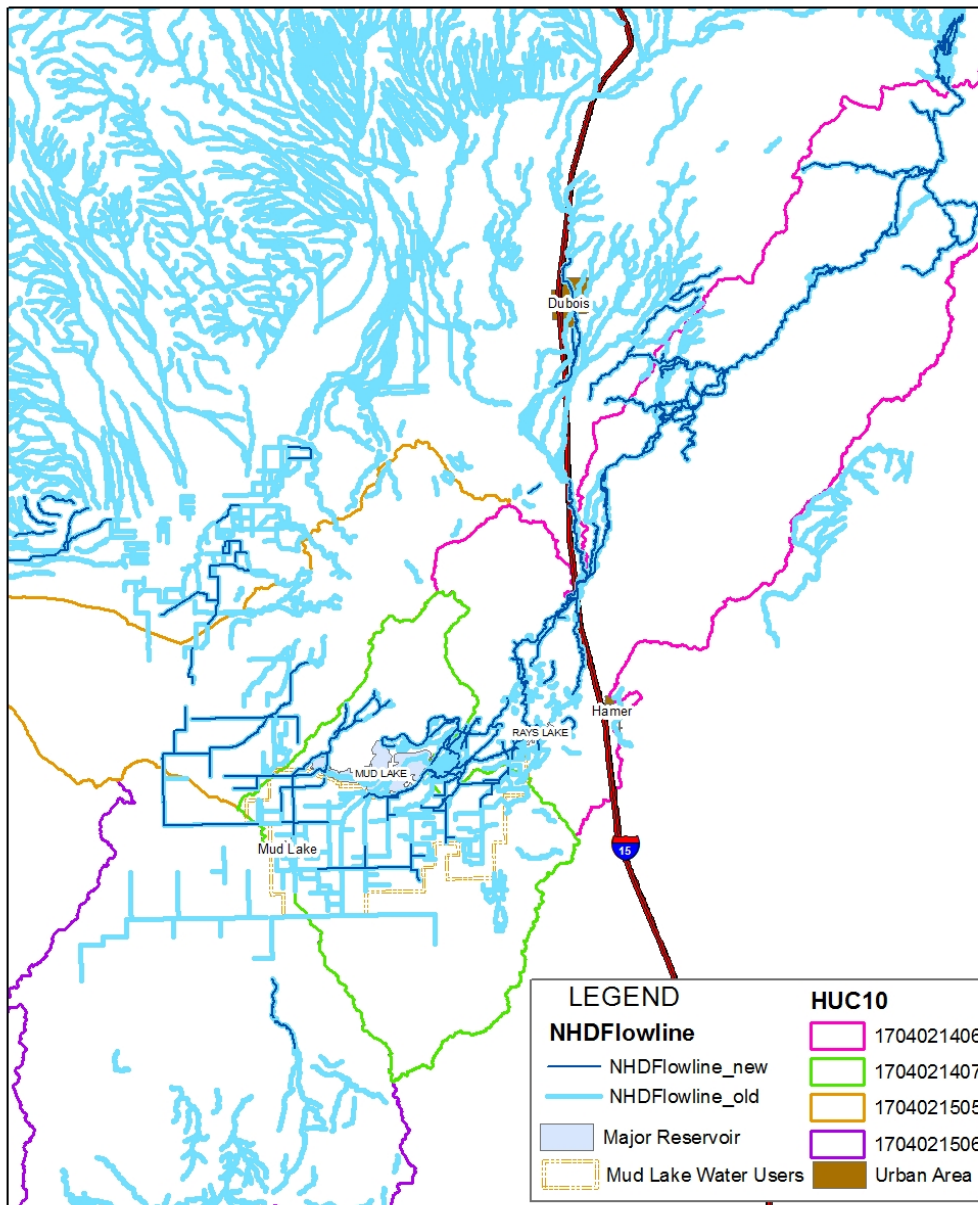
During this process, 1543 NHDFlowlines, 71 Waterbody, and 60 NHD Area edits were inserted, updated, or deleted (Table 4). In addition, one name was identified for submittal to GNIS. Updates were submitted to USGS for incorporation into the NHD. See Figure 4 for representations of all the updated linework as a result of this project.

Table 4: Number of Edits per Subbasin			
NHDFlowline Edits	Delete	Insert	Update
17040201	200	495	791
17040205	5	28	10
17040206	1	6	3
17040207	0	4	0
TOTAL	206	533	804
NHDWaterbody Edits	Delete	Insert	Update
17040201	48	9	13
17040205	0	1	0
17040206	0	0	0
17040207	0	0	0
TOTAL	48	10	13
NHDArea Edits	Delete	Insert	Update
17040201	7	22	10
17040205	0	9	1
17040206	0	4	2
17040207	0	4	1
TOTAL	7	39	14
GRAND TOTAL	261	582	831

Maps provided to Cooperators

IDWR provided maps of the updated NHD to cooperators illustrating the submitted updates in their service area.

Figure 4: Task 3 Updates



Discussion and Conclusions:

Issues and Challenges

- 1) *Extensive photorevision was necessary.* Because of the large amount of agricultural activity in the project area, the existing NHDFlowlines did not reflect current ground conditions.
- 2) *Obtaining input from the local managers in a timely manner.* Providing corrections to IDWR provided maps was one of many priorities. Not all water delivery organizations have full-time staff and therefore may not have been available to review maps within the timeline of this project.

Conclusion

Although photorevision is an effective way to update hydrography, input from local sources is critical in accurately depicting connectivity, vertical relationships, and flow direction. Cooperation from local managers was achieved by providing maps and data products that they found useful in their business processes.

IDWR was able to provide better data for development and monitoring of managed recharge projects and other water management projects. In working together, all the cooperators have a product that is better than what any one organization could have produced.

Acknowledgements:

Thank you to the staff at West Labelle Irr. Co. LTD

End Notes:

ⁱ <http://www.uiweb.uidaho.edu/wq/wqpubs/cis887.html>

ⁱⁱ http://www.legislature.idaho.gov/sessioninfo/2006/interim/energy0810s_INL.pdf

ⁱⁱⁱ Mahler, R.L. & Van Steeter, M. M., *Idaho's Water Resource, Current Information Series No. 887*. University of Idaho. Retrieved January 15, 2013 from <http://www.uiweb.uidaho.edu/wq/wqpubs/cis887.html>

^{iv} <http://www.idwr.idaho.gov/waterboard/WaterPlanning/CAMP/ESPA/>

^v http://www.idwr.idaho.gov/waterboard/WaterPlanning/PDFs/2010_Resource-Inventory.pdf p. 34

vi <http://www.idwr.idaho.gov/WaterManagement/WaterRelatedDistricts/default.htm>

vii <http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml>

viii

<https://www.google.com/url?q=https://www.idwr.idaho.gov/waterboard/WaterPlanning/CompBasinPlanning/SF%2520Snake/PDF/SF%2520Snake%2520Basin%2520Description.pdf&sa=U&ei=ewb9Uq-QG8y8oQT97ILwDw&ved=OCACQFjAB&client=internal-uds-cse&usg=AFQjCNGw4Z-bY258QBcMcsSmsXBhDg5zzA> p.

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<https://www.google.com/url?q=https://www.idwr.idaho.gov/waterboard/WaterPlanning/CompBasinPlanning/SF%2520Snake/PDF/SF%2520Snake%2520Basin%2520Description.pdf&sa=U&ei=ewb9Uq-QG8y8oQT97ILwDw&ved=OCACQFjAB&client=internal-uds-cse&usg=AFQjCNGw4Z-bY258QBcMcsSmsXBhDg5zzA> p. 1