Little Springs Creek Seepage Study
July 22-23, 2008

Two seepage studies were conducted, the first study August 20-21, 2007 and the second July 22-23, 2008 by IDWR staff. These studies consisted of measuring surface water flows (stream flows, diversion rates, return flows and tributary inputs) in Little Springs Creek in order to quantify gaining and losing reaches.

During the two day 2008 study twenty measurements or observations were taken, including measurements of L52 injection and extraction, L50 diversion, LS2, LS3, and LS4 diversions. There were also inputs from a pond channel upstream of the L52 extraction and Mill Creek that were measured (Figure 1; Table 1). During the study LS2 and LS4 diverted the entire flow. Below LS2 the channel was dry to the mouth and at the Idaho Power Company maintained gage near the mouth. Below the LS4 diversion there was some seepage around the diversion. Due to the saturated nature of the valley bottom, largely associated with irrigation, Little Springs gained flow rapidly above LS3, 9.4 cfs. Overall Little Springs Creek gained flow downstream, but currently this stream is disconnected from the Lemhi River during irrigation season (Table 2). Light rains the morning of July 22 did not seem to affect the flows in Little Springs Creek; the IDWR stream gage stage (LS Gage in Figure 1) was consistent between the two days of measurements.

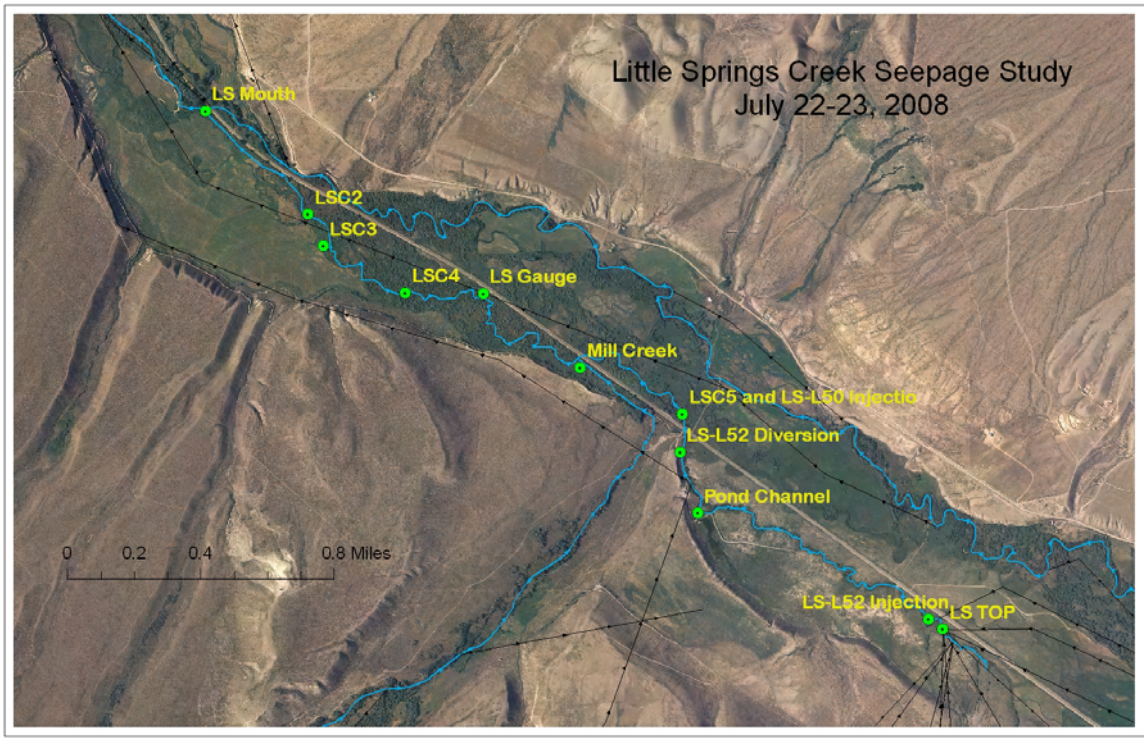

Figure 1. Map of Little Springs Creek with important surface water features labeled.

Main stream location	Trib/diversion location	Discharge	diverted out	Trib/diversion Q in	Little Springs Qs	Seepage	Point_X	Point_Y	Date and time	Notes
		(cfs)	**(cfs)**	(cfs)	(cfs)	(cfs)		(cfs)		
Above L-52 injection		4.36			4.36		2539532	1506434	7/22/2008 9:27am	Rained the previous evening, grass was damp. Sprinkled during measurement.
	L-52 injection	12.64		12.64			2539515	1506468	7/22/08 10:12 AM	350ft upstream of highway
Below L-52 Injection		**17.00**			17.00					
Above LS-Pond channel		21.85			21.85		none	none	7/22/2008 11:02am	
	Pond Channel	3.34		3.34			2538352	1506981	7/22/2008 12:07pm	This flow was taken near the mouth of the pond channel, The culvert coming out of the pond is 22in in diameter and the height of flow was 0.8ft.
Above L-52 extraction		**18.20**			18.20		2538283	1507165	7/22/2008 11:15am	Poor measurement, tried to clear ditch channel of weeds but the 0.8ft depth measurements of the 0.2/0.8 had many errors.
	L-52 extraction	4.36	4.36							
Below L-52 extraction		13.85			13.85		2538296	1507336	7/22/2008 1:35pm	
L-52 injection to L-52 extraction						-2.13				
Above L-50 injection and LSC-5		13.85			13.85					
	L-50 injection	0.00		0.00						
	LSC5	0.50	0.50						7/22/2008 2:20pm	This flow is an estimate, no measurement device and no suitable location (too small) to measure.
Little Springs Blw LSC5		**14.65**			14.65					
L-52 extraction to LSC-5						1.30				
Above Mill Ck		**14.65**			14.65					
	Mill Ck	0.51		0.51			2537169	1507724	7/22/2008 1:18pm	Thunder storm rolled in during measurement.
Below Mill Ck		15.16			15.16		25377739	1507708	7/22/2008 3:35pm	Thunder storms forced postponement of this measurment for 40minutes. Had to start this measurement over. No measureable precipitation, flows were uneffected.
Above L-50 extraction		16.19			16.19					The measurement was taken at the Little Springs Gauge, the seepage run was continued here the next day 7/23/2008 and the stage was the same 0.97-0.98 at 10:31am so flow measurements from each day are comparable.
	L-50 extraction	5.28	5.28							
Below L-50 extraction		**10.91**			10.91		2537100	1507989	7/22/2008 5:10pm	
Above LSC-4		6.24			6.24		2536947	1508054	7/23/2008 11:18am	Little flow passes LS4, 0.25 to 0.5cfs.
	LSC-4	7.15	7.15							
Below LSC-4		**0.50**			0.50					This flow is an estimate, very little passes this diversion.
LSC-5 to LSC-4						-2.23				
Above LSC-3		9.42			9.42		2536585	1508234	7/23/2008 12:32pm	
	LSC-3	2.72	2.72				2536468	1508240	7/23/2008 12:25pm	
Below LSC-3		**6.70**			6.70					
LSC-4 to LSC3						8.92				
Above LSC-2		**6.70**			6.70					
	LSC-2	6.73	*6.73*				2536319	1508391	7/23/2008 1:15pm	
Below LSC-2		0.00			0.00					
LSC-3 to LSC-2						0.03				
Little Springs MOUTH		0.00			0.00					
LSC-2 to MOUTH						0.00				

Table 1. Summary of the 2008 seepage study for Little Springs Creek, including reach gains and losses calculated from the measured flows. Coordinates are in the IDTM 83 projection.

Little Springs Creek Summary	cfs
Initial flow/input	**4.355**
Diverted rate out of Little Springs Creek	**26.742**
Tributary/injection Input	**16.488**
Cumulative reach losses	**-4.355**
Cumulative reach gains	**10.254**
Calculated output	**0.000**
Measured output	**0.000**

Table 2. Summary of the 2008 Little Springs Creek seepage study.

Main stream location	Trib/diversion location	Discharge	Q diverted out	Trib/diversion Q in	Little Springs Qs	Seepage	Point_X	Point_Y	X-Section Substrate	Date and time	Notes	File name
		(cfs)	**(cfs)**	(cfs)	(cfs)	(cfs)		(cfs)				
L-52 injection to L-52 extraction						7.4200						
Above L-52 injection		3.06			3.06		2539521	1506453.458	Gravel	8/20/07 17:03	FT as BSTOP while it should have been LSTOP. It was	**BSTOP.WAD**
	L-52 injection	1.76		1.76			2539588	1506522.194	Silt and some Cobbles	8/20/2007 5:15-5:45	Flowtracker: Planning. Cutbanks on both sides…very hard to find a good location.	**L52Q.WAD**
Below L-52 Injection		**4.82**			**4.82**							
Above L-52 extraction		**12.2**			**12.2**							
	L-52 extraction	6.44	6.44				2538192	1507403.281	Coarse Gravel-Sma	8/20/2007 5:15-5:45pm	Flowtracker: Planning. Pt of measurment is at the best location found, however, it has a wide cross section where the right bank has high velocity angles. The Spring below this point is extreamly vegetated.	**LSBLL52.WAD**
Below L-52 extraction		5.80			5.80		2538315	1507134.472	Gravel	8/20/07 18:21	Flowtracker: OLD/Corbin	**LSL52DIV.WAD**
L-52 extraction to LSC-5						-0.3500						
Above L-50 injection and LSC-5		5.45					2538276	1507458.602	Coarse Gravel	8/21/07 10:10	Flowtracker: Planning; Nick cleared the water! Raked the vegetation up to 5 ft upstream of the cross-section. Diverted amount ~ 0.5 cfs	**LS5ABV.WAD**
	L-50 injection	0		0.00			none	none			The L-50 injection is just above LSC5 and there is no place to measure in between the two points.	
	LSC5	**0.4**	0.4000				none	none			Visual estimation, ditch is too narrow to measure.	
Little Springs Blw LSC5		**5.05**			**5.05**							
LSC-5 to LSC-4						4.2200						
Above Mill Ck							none	none				
	Mill Ck	0.0000		0.00			none	none				
Below Mill Ck							none	none				
Above L-50 extraction		**8.12**			**8.12**							
	L-50 extraction	**0.500**	0.50				2537131	1508011.144			Not measured…this is just a visual estimate of flow	
Below L-50 extraction		7.62			7.62		2537106	1508019.411	Fine Gravel	8/21/07 11:55	Flowtracker: Planning.	**LSAL50.WAD**
Above LSC-4		8.77			8.77		2536938	1508044.456	Gravel + small cobb	8/21/2007 1:20-2:00	Flowtracker: OLD/Corbin, very silty banks.	**LS4ABV.WAD**
	LSC-4	0.00	0.0000				2536910	1508037.966				
Below LSC-4		**8.77**										
LSC-4 to LSC3						-1.0500						
Above LSC-3		7.72			7.72		2536541	1508271.788	Fine Gravel+ Silt	8/21/07 0:00	Flowtracker: Planning; very silty banks	**LS3ABV.WAD**
	LSC-3	0.00					2536529	1508270.548				
Below LSC-3		**7.72**										
LSC-3 to LSC-2						-0.7300						
Above LSC-2		6.99			6.99		2536468	1508425.396	Fine Gravel	8/21/07 13:21	Flowtracker: OLD/Corbin. File name was mislabeled. It said LSC3ABV when it should have been LSC2ABV. It is correct in the GPS	**LS3ABV.WAD**
	LSC-2	0.00					2536450	1508409.139				
Below LSC-2		**6.99**										
LSC-2 to MOUTH						-0.9500						
Little Springs MOUTH		6.04			6.04		2535985	1508947.607	Gravel + small cobb	8/21/2007 2:45-3:10pm	Flowtracker: Planning; We had to clear some of the branches…stupid stinging nedle!	**LSMOUTH.WAD**

Table 3. Summary of the 2007 seepage study for Little Springs Creek, including reach gains and losses calculated from the measured flows. Coordinates are in the IDTM 83 projection.

Little Springs Creek Summary	**cfs**
Initial flow/input	**3.060**
Diverted rate out of Little Springs Creek	**7.340**
Tributary/injection Input	**1.760**
Cumulative reach losses	**-3.080**
Cumulative reach gains	**11.640**
Calculated output	**6.040**
Measured output	**6.040**

Table 4. Summary of the 2007 Little Springs Creek seepage study.