

## Appendix A. Return Flow Assignments and Monthly Lag Factors

Group	Irr. Entity	Assigned Return flows	Water Supply: Historic Diversions	Results: Ann. Return and Lags							
1	IESW032	13152450	Irr. Ditch nr Bliss	13087000	T. F. Northside	<b>WY 1928-1987</b>					
		13152895	W. Dr. Nr Tuttle (to Malad)	13086510	'A' Lateral in Gooding	Total Annual Returned (%) => 11					
		13133785	Drain Nr Bickel Srings	13086520	N. Side Cross-cut	Month => 1 2 3 4 5					
		13094050	J8 at Rivers Edge			Lag. Ret. (%) => 3 2 2 2 2					
		13095490	Irr. Drain to Blind Canyon			<b>WY 1988-2001</b>					
		13095360	S. Coulee (Ceder Draw)			Total Annual Returned (%) => 4.6					
		13093150	Sonnicksn drain			Month => 1 2 3 4 5					
		13091733	Jerome Golf drain			Lag. Ret. (%) => 3.1 1.5					
						<b>WY 2002:</b>					
						Total Annual Returned (%) => 3.7					
						Month => 1 2 3 4 5					
						Lag. Ret. (%) => 3.1 0.7 0.05 0 0					
						<b>WY 2003:</b>					
						Total Annual Returned (%) => 3.5					
						Month => 1 2 3 4 5					
						Lag. Ret. (%) => 2.5 1.11 0 0 0					
						<b>WY 2004:</b>					
						Total Annual Returned (%) => 3.0					
						Month => 1 2 3 4 5					
						Lag. Ret. (%) => 2.5 0.6 0.04 0 0					
						<b>WY 2005:</b>					
						Total Annual Returned (%) => 2.446					
						Month => 1 2 3 4 5					
						Lag. Ret. (%) => 2 0.4 0.1 0.07 0					
						<b>WY 2006:</b>					
						Total Annual Returned (%) => 4.32					
						Month => 1 2 3 4 5					
						Lag. Ret. (%) => 4 0.3 0.13 0.04 0					
						<b>WY 2007:</b>					
						Total Annual Returned (%) => 3.23					
						Month => 1 2 3 4 5					
						Lag. Ret. (%) => 2.85 0.25 0.05 0 0					
						<b>WY 2008:</b>					
						Total Annual Returned (%) => 3.269					
						Month => 1 2 3 4 5					
						Lag. Ret. (%) => 2.9 0.2 0.05 0 0					
						<b>WY 2009:</b>					
						Total Annual Returned (%) => 4.157					
						Month => 1 2 3 4 5					
						Lag. Ret. (%) => 3.65 0.25 0.15 0.1 0					
						<b>WY 2010:</b>					
						Total Annual Returned (%) => 3.683					
						Month => 1 2 3 4 5					
						Lag. Ret. (%) => 3.5 0.1 0.05 0 0					

Group 1 returns to Milner to Kimberly, Kimberly to Buhl, & Buhl to Lower Salmon Falls reaches.

2	IESW028	13085060 D-17 drain nr Heyburn	13080000 Minidoka Northside
		13085065 Main drain North nr Heyburn	
		13084707 B drain nr Heyburn	
		13084705 D-16 drain nr Heyburn	
		13082064 D-4 drain nr Rupert	
		13082062 D-5 drain nr Rupert	
		13082032 D-3 drain	

<p>Group 2 returns to Minidoka to Milner reach. Reach is not connected to ESPAM and reach gain is not used in ESPAM. Return flow data are used for calibration of return flow from IESW028.</p>
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<b>WY 2002:</b>					
Total Annual Returned (%)	0	6.797	0	0	0
Month =>	1	2	3	4	5
Lag. Ret. (%) =>	2.1	1.7	1.2	1.8	0
<b>WY 2003:</b>					
Total Annual Returned (%)	0	4.9	0	0	0
Month =>	1	2	3	4	5
Lag. Ret. (%) =>	2.7	1	1	0.2	0
<b>WY 2004:</b>					
Total Annual Returned (%)	0	6.2	0	0	0
Month =>	1	2	3	4	5
Lag. Ret. (%) =>	3.7	1	1	0.5	0
<b>WY 2005:</b>					
Total Annual Returned (%)	0	7.475	0	0	0
Month =>	1	2	3	4	5
Lag. Ret. (%) =>	5.15	1.3	1	0.06	0
<b>WY 2006:</b>					
Total Annual Returned (%)	0	7.1	0	0	0
Month =>	1	2	3	4	5
Lag. Ret. (%) =>	5.5	1	0.1	0.5	0
<b>WY 2007:</b>					
Total Annual Returned (%)	0	7.3	0	0	0
Month =>	1	2	3	4	5
Lag. Ret. (%) =>	5.6	1	0.4	0.3	0
<b>WY 2008:</b>					
Total Annual Returned (%)	0	7.537	0	0	0
Month =>	1	2	3	4	5
Lag. Ret. (%) =>	5.7	1.1	0.4	0.3	0
<b>WY 2009:</b>					
Total Annual Returned (%)	0	6.808	0	0	0
Month =>	1	2	3	4	5
Lag. Ret. (%) =>	4.6	1.3	0.8	0.1	0
<b>WY 2010:</b>					
Total Annual Returned (%)	0	7.434	0	0	0
Month =>	1	2	3	4	5
Lag. Ret. (%) =>	4.95	1.35	0.88	0.19	0

3 IESW010 13082060 F drain nr Declo Minidoka South (13080500)  
 13082320 Marsh Creek nr Declo  
 13082330 Spring Creek nr Declo  
 13085070 G drain nr Burley  
 13085080 J drain nr Burley

Group 3 returns to Minidoka to Milner reach. Reach is not connected to ESPAM and reach gain is not used in ESPAM. Return flow data are used for calibration of return flow from IESW010.

<b>WY 1996:</b>					
Total Annual Returned (%)	0	19.56	0	0	0
Month =>	1	2	3	4	5
Lag. Ret. (%) =>	19	0.47	0	0	0
<b>WY 1997:</b>					
Total Annual Returned (%)	0	16.61	0	0	0
Month =>	1	2	3	4	5
Lag. Ret. (%) =>	16	0.6	0	0	0
<b>WY 1998:</b>					
Total Annual Returned (%)	0	17.89	0	0	0
Month =>	1	2	3	4	5
Lag. Ret. (%) =>	17	0.8	0.05	0	0
<b>WY 1999:</b>					
Total Annual Returned (%)	0	14.52	0	0	0
Month =>	1	2	3	4	5
Lag. Ret. (%) =>	14	0.4	0.05	0	0
<b>WY 2000:</b>					
Total Annual Returned (%)	0	12.27	0	0	0
Month =>	1	2	3	4	5
Lag. Ret. (%) =>	11	1.2	0.1	0	0
<b>WY 2001:</b>					
Total Annual Returned (%)	0	8.785	0	0	0
Month =>	1	2	3	4	5
Lag. Ret. (%) =>	7.5	0.9	0.4	0	0
<b>WY 2002:</b>					
Total Annual Returned (%)	0	12.13	0	0	0
Month =>	1	2	3	4	5
Lag. Ret. (%) =>	9	3	0.1	0	0
<b>WY 2003:</b>					
Total Annual Returned (%)	0	10.99	0	0	0
Month =>	1	2	3	4	5
Lag. Ret. (%) =>	9	1.2	0.8	0	0
<b>WY 2004:</b>					
Total Annual Returned (%)	0	13.33	0	0	0
Month =>	1	2	3	4	5
Lag. Ret. (%) =>	9	4	0.3	0	0
<b>WY 2005:</b>					
Total Annual Returned (%)	0	17.92	0	0	0
Month =>	1	2	3	4	5
Lag. Ret. (%) =>	14	2	1.9	0	0
<b>WY 2006:</b>					
Total Annual Returned (%)	0	17.87	0	0	0
Month =>	1	2	3	4	5
Lag. Ret. (%) =>	17	0.9	0	0	0
<b>WY 2007:</b>					
Total Annual Returned (%)	0	14.66	0	0	0
Month =>	1	2	3	4	5
Lag. Ret. (%) =>	14.3	0.4	0	0	0
<b>WY 2008:</b>					
Total Annual Returned (%)	0	12.25	0	0	0
Month =>	1	2	3	4	5
Lag. Ret. (%) =>	12	0.21	0	0	0
<b>WY 2009:</b>					
Total Annual Returned (%)	0	14.09	0	0	0
Month =>	1	2	3	4	5
Lag. Ret. (%) =>	12	2	0.05	0	0
<b>WY 2010:</b>					
Total Annual Returned (%)	0	8.532	0	0	0
Month =>	1	2	3	4	5
Lag. Ret. (%) =>	8.3	0.2	0.03	0	0

4 IESW041 13089690 Irr drain nr Hansen 13087500 Twin Falls Southside Ca.  
 13089695 Twin Falls Coulee  
 13090370 Fish Hatchery Waste 0  
 13090460 Perrine Coulee nr Twin Falls  
 13093190 Sucker Flat drain nr Filer (LSLQ)  
 13093550 Cedar Draw nr Filer  
 13093900 Waste I nr Buhl  
 13094700 Mud Creek nr Buhl  
 13095061 Fish Hatchery drain lower  
 13095060 Fish Hatchery drain upper

**Additional Group 4 sites:**

13093000 Rock Creek at Poleline Rd.  
 13094725 Deep Creek  
 13108011 S2 Coulee  
 13108022 L10 power plant into Salmon Falls Creek  
 N coulee into Salmon Falls Creek

Group 4 returns to Milner to Kimberly, Kimberly to Buhl, & Buhl to Lower Salmon Falls reaches. IESW041 is south of Snake River and outside of ESPAM boundary. Return flow data used in calculation of reach gains.

<b>WY 2002:</b>					
Total Annual Returned (%) =>	21.7				
Month =>	1	2	3	4	5
Lag. Ret. (%) =>	19	1.7	1	0	0
<b>WY 2003:</b>					
Total Annual Returned (%) =>	21.0				
Month =>	1	2	3	4	5
Lag. Ret. (%) =>	19	1.8	0.14	0.02	0
<b>WY 2004:</b>					
Total Annual Returned (%) =>	21.84				
Month =>	1	2	3	4	5
Lag. Ret. (%) =>	19	1.9	0.94	0	0
<b>WY 2005:</b>					
Total Annual Returned (%) =>	19				
Month =>	1	2	3	4	5
Lag. Ret. (%) =>	15.6	3	0.4	0	0
<b>WY 2006:</b>					
Total Annual Returned (%) =>	22.17				
Month =>	1	2	3	4	5
Lag. Ret. (%) =>	17	3	1	1.2	0
<b>WY 2007:</b>					
Total Annual Returned (%) =>	16.7				
Month =>	1	2	3	4	5
Lag. Ret. (%) =>	13	1.7	1.1	0.9	0.03
<b>WY 2008:</b>					
Total Annual Returned (%) =>	18.5				
Month =>	1	2	3	4	5
Lag. Ret. (%) =>	15	2	1	0.5	0
<b>WY 2009:</b>					
Total Annual Returned (%) =>	24.05				
Month =>	1	2	3	4	5
Lag. Ret. (%) =>	18	4.5	0.8	0.7	0
<b>WY 2010:</b>					
Total Annual Returned (%) =>	25.57				
Month =>	1	2	3	4	5
Lag. Ret. (%) =>	19	5	0.9	0.7	0
Average	21.17				
Month =>	1	2	3	4	5
Lag. Ret. (%) =>	16.95	2.45	0.8	0.42	0.00375

5 IESW002 13069548 Sterling Waste 13061610 Aberdeen Springfield Ca.  
 13069565 Aberdeen Waste Drain  
 13076210 Tartar Waste

Group 5 returns to Near Blackfoot to Neeley reach.

<b>WY 2002:</b>					
Total Annual Returned (%) =>	6.0				
Month =>	1	2	3	4	5
Lag. Ret. (%) =>	3.5	2.0	0.6	0.0	0.0
<b>WY 2003:</b>					
Total Annual Returned (%) =>	5.1				
Month =>	1	2	3	4	5
Lag. Ret. (%) =>	4.1	1.0	0.0	0.0	0.0
<b>WY 2004:</b>					
Total Annual Returned (%) =>	6.1				
Month =>	1	2	3	4	5
Lag. Ret. (%) =>	5.0	0.7	0.4	0.0	0.0
<b>WY 2005:</b>					
Total Annual Returned (%) =>	6.3				
Month =>	1	2	3	4	5
Lag. Ret. (%) =>	4.4	1.5	0.3	0.1	0.0
<b>WY 2006:</b>					
Total Annual Returned (%) =>	8.8				
Month =>	1	2	3	4	5
Lag. Ret. (%) =>	6.8	1.5	0.5	0.0	0.0
<b>WY 2007:</b>					
Total Annual Returned (%) =>	7.6				
Month =>	1	2	3	4	5
Lag. Ret. (%) =>	6.1	1.0	0.5	0.0	0.0
<b>WY 2008:</b>					
Total Annual Returned (%) =>	6.5				
Month =>	1.0	2.0	3.0	4.0	5.0
Lag. Ret. (%) =>	5.1	0.9	0.5	0.0	0.0
<b>WY 2009:</b>					
Total Annual Returned (%) =>	8.7				
Month =>	1	2	3	4	5
Lag. Ret. (%) =>	7.0	0.9	0.7	0.1	0.0
<b>WY 2010:</b>					
Total Annual Returned (%) =>	10.7				
Month =>	1.0	2.0	3.0	4.0	5.0
Lag. Ret. (%) =>	9.0	0.9	0.7	0.1	0.0

7 IESW016 13050543 Independent Canal drain  
 (Ave. of 1989-90 USGS Data)  
 13049725 St Anthony canal  
 13049550 Last Chance  
 13050525 Egin Canal  
 13050530 St Anthony Union Fdr  
 13050535 Independant Canal

Group 7 returns to Ashton to Rexburg reach.

**WY 1989:**

Total Annual Returned (%) =>	1.644				
Month =>	1	2	3	4	5
Lag. Ret. (%) =>	1	0.6	0	0	0

8 IESW011 13057045 Butte Market Lake Canal 13057025 Butte Market Lake

Group 8 returns to Heise to Shelley reach.

**WY 2002:**

Total Annual Returned (%) =>	1.8				
Month =>	1	2	3	4	5
Lag. Ret. (%) =>	1.8	0	0	0	0

**WY 2003:**

Total Annual Returned (%) =>	2.8				
Month =>	1	2	3	4	5
Lag. Ret. (%) =>	3	0	0	0	0

Year	Code	Asset Name	Asset ID	Asset Name	Asset ID	Year	Total Annual Return	Month =>	Lag. Ret. (%) =>	Year	Total Annual Return	Month =>	Lag. Ret. (%) =>
9	IESW036	13056550	Texas Slough Canal nr Thornton	13038392	Sunnydell Ca	36	0	0	32.3	0	0	0	0
		13056650	Liberty Park Canal	13038426	Lenroot Ca	36	0	1	2	3	4	5	0
		13056850	Bannock Jim Spring Slough	13038431	Reid Canal	36	0	15.3	9	7	1	0	0
		**13055337	Rexburg Canal drain nr Thornton	13038435	Bannock Jim	36	0	0	50.5	0	0	0	0
		13056600	Texas Slough nr Rexburg	13038436	Hill Pitinger	36	0	1	2	3	4	5	0
		**	Rexburg District Removed (no data from IPCO)	13038437	Nelson Cory	36	0	31	12	4.5	2	1	0
				13038434	Texas Feeder	36	0	0	39.8	0	0	0	0
							0	1	2	3	4	5	0
							0	38	1.2	0.5	0	0	0
							0	0	33.4	0	0	0	0
							0	1	2	3	4	5	0
							0	31.4	1	0.5	0.5	0	0
							0	0	24.3	0	0	0	0
							0	1	2	3	4	5	0
					0	23.5	0.4	0.3	0.1	0	0		
					0	0	25.8	0	0	0	0		
					0	1	2	3	4	5	0		
					0	25	0.4	0.3	0.1	0	0		
					0	0	26.12	0	0	0	0		
					0	1	2	3	4	5	0		
					0	25.3	0.4	0.3	0.1	0	0		
					0	0	28.4	0	0	0	0		
					0	1	2	3	4	5	0		
					0	27	0.9	0.4	0.1	0	0		
					0	0	29.89	0	0	0	0		
					0	1	2	3	4	5	0		
					0	28	0.9	0.9	0.1	0	0		

Group 9 returns to Heise to Shelley reach.

Group	IESW	Location	Year	WY	Total Annual Returned (%) =>	Month =>	Lag. Ret. (%) =>	1	2	3	4	5
10	IESW009	13056900 Scott's Slough	9	<b>WY 2002:</b>	28.0							
	IESW020	13057020 Dry Bed	9	Total Annual Returned (%) =>		1	2	3	4	5		
	IESW055	13057030 South Parks	9	Month =>		14	8	3	3	0		
		13057100 Burgess drain nr Idaho Falls	20	<b>WY 2003:</b>	32.3							
			20	Total Annual Returned (%) =>		1	2	3	4	5		
			20	Month =>		17.7	8.5	6	0	0		
			20	Lag. Ret. (%) =>								
			20	<b>WY 2004:</b>	26.3							
			20	Total Annual Returned (%) =>		1	2	3	4	5		
			20	Month =>		19	4.5	2.2	0.6	0		
			20	Lag. Ret. (%) =>								
			20	<b>WY 2005:</b>	27.0							
			20	Total Annual Returned (%) =>		1	2	3	4	5		
			20	Month =>		16.5	5	4	1.0	0.5		
			20	Lag. Ret. (%) =>								
			20	<b>WY 2006:</b>	25.0							
			23	Total Annual Returned (%) =>		1	2	3	4	5		
			23	Month =>		11	7	6	1.0	0		
			23	Lag. Ret. (%) =>								
			23	<b>WY 2007:</b>	26.6							
			23	Total Annual Returned (%) =>		1	2	3	4	5		
			23	Month =>		13	6	6	1.0	0.5		
			23	Lag. Ret. (%) =>								
			24	<b>WY 2008:</b>	30.9							
			Total Annual Returned (%) =>		1	2	3	4	5			
			Month =>		20.0	5.2	3.6	1.5	0.5			
			Lag. Ret. (%) =>									

Group 10 returns to Heise to Shelley reach.