

## NOVEMBER 29, 1995 FLOOD ANALYSIS --THE BIG PICTURE



Upper Baker Normal Full Pool 724 feet  
 Upper Baker November 15<sup>th</sup> requirement **707.9** feet  
 Lower Baker (Shannon) Full 438.6 feet  
 Upper Baker powerhouse maximum 4,800 (?)  
 Ross November 20<sup>th</sup> level is **1595.6**  
 Ross minimum winter pool at 1592.1  
 Ross powerhouse maximum 14,000 cfs

Date	Time	ROSS		UPPER BAKER		NHALEM	MARMT	L/B	CON	MT V	SAUK	CORPS FLOOD NOTES
		Elev.	Out	Elev.	Out		SRM	SHAW	CON	MVEV	SAK	
26-Nov	1115											Corps calls PSE and request they go to 10,000 cfs discharge.
26-Nov	1130											Corps calls SCL and requested last 6-hour average inflow. Told it was 6,300 cfs. Corps advises SCL it would take a discharge of 9,000 cfs over inflow averaged over the next 5 days for Ross to get to its Dec 1 <sup>st</sup> flood control pool. Currently Ross is discharging 14,500 cfs. 4 <sup>th</sup> turbine not working. As soon as it comes on line they will go to full powerhouse capacity and close spill gates.
<b>27-Nov</b>	0700			<b>709.42</b>	9,800			11,800				Corps calls PSE to get status report. U/B inflow = 3,370 cfs. Outflow 9,800 L/B inflow (local) 1,180, outflow 11,800. <b>L/B to increase to 13,300 cfs in a couple of hours</b>
27-Nov	0715	1,595.48										SCL advises Corp current status elev. 1595.48. Inflow = 13,560 cfs. Outflow 13,200 cfs. Gorge outflow= 14,400 cfs. Diablo outflow = 15,000 cfs. All 4 turbines now working at Ross.
27-Nov	0800											SCL requested to go to 18,000 cfs outflow at Ross due to very wet weather forecast. Current turbine capacity 13,600. Corps requested 4,400 spill at Ross. SCL advises needed supervisor approval before accommodating Corp request.

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		Elev.	Out	Elev.	Out		SRM	SHAW	CON	MVEW	SAK	
27-Nov	0830											Corps contacts SCL supervisor. Supervisor reluctant to spill but ultimately agrees to do so. Corps expecting major damage on Skagit later tonight. SCL during flood would like to keep 5,000 cfs out of Ross for power generation but would go to zero if requested to do so.
27-Nov	1200	1,595.20	18,000	708.77	10000	19245	18309	11925	42860	50157	9917	
27-Nov	1250											SCL advises it would create no problem for them if Corps gave order to maintain 26,000 cfs at Newhalem. .08 inches of rain in past 4 hrs at Diablo.
27-Nov	1300	1,595.13	18,000	708.66	10000	19200	20303	11950	42970	50621	9917	Corps calls Dave Brookings, Skagit County Public Works and ask him if it is okay to target Newhalem at 26,000 cfs although that would induce minor flooding in Concrete later that day. Release would mean flood stage of 28 feet would be achieved 2-3 hours before it naturally would have occurred. Corps assures Brookings they would cut back discharges 8 hrs. before Concrete forecasted to go to 90,000 cfs. This is one of those ounce of prevention worth a pound of cure questions. Brookings advised Corps, "Go for it."
27-Nov	1310											Corps calls SCL and advised them to go to 26,000 cfs at Newhalem.
27-Nov	1400	1,595.08	23,000	708.59	10000	19200	22156	11925	42805	51130	9880	
27-Nov	1410											Corps calls SCL and explained flood forecast scenario. SCL says they will be targeting 26,000 cfs at Newhalem shortly, first needed to manually open the Diablo spillway gates and sandbag Diablo powerhouse. SCL anticipates Ross discharge at 23,000 cfs.
27-Nov	1500	1,595.02	23,000	708.46	10000	19965	22576	11950	42805	51899	9880	
27-Nov	1600	1,594.92	23,000	708.32	10000	26020	22734	12025	43025	52676	9880	
27-Nov	1700	1,594.81	23,000	708.21	10000	23520	25257	11950	44125	53503	9880	
27-Nov	1750											SCL advises Corps Ross outflow still 23,000 cfs. Newhalem at 25,000 cfs.

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27-Nov	1800	1,594.71	23,000	708.10	10000	25520	28552	11975	45280	54161	9954	
27-Nov	1900	1,594.60	23,000	708.00	10000	25720	27588	11925	46105	54691	9991	
27-Nov	2000	1,594.49	23,000	707.86	10000	25870	28210	11975	46875	55314	10066	
27-Nov	2020											PSE contacts Corps. U/B at elev. 707.86. PSE requested to end spill because powerhouse can pass current inflow. Corps agrees so long as inflow are being passed until further notice. PSE agrees not to raise U/B beyond 707.9 feet. PSE says they are drafting L/B to provide for high flows on Wednesday.
27-Nov	2100	1,594.38	23000	707.86	4900	25870	28609	11900	48635	55986	10140	
27-Nov	2130											SCL wanted to know Corps plans for tonight. Corps advises early afternoon plans were to reduce Ross outflow to 5,000 around midnight OR same reduction if F.C. not required to accommodate SCL. SCL advises they prefer to leave as is at 23,000 cfs because of the problem getting staff to Ross by boat and truck to Diablo to make necessary gate closures. Corps replies they would prefer to continue the present spill until tomorrow. SCL stated they would check and get back to Corps.
27-Nov	2200	1,594.27	23000	707.86	4900	25820	28723	11800	50200	56708	10215	
27-Nov	2245											SCL calls Corps and they both agree to continue present spill rate (23,000 cfs) until tomorrow morning.
27-Nov	2300	1,594.16	23000	707.86	5000	25820	29009	11650	51460	57390	10253	
27-Nov	2400	1,594.06	23000	707.86	5000	25870	28780	8529	49735	58174	10328	
28-Nov	100	1,593.96	23000	707.85	5000	25870	29181	8508	49515	59061	10442	
28-Nov	200	1,593.86	23000	707.85	5000	25770	29124	8487	49680	59767	10632	
28-Nov	300	1,593.77	23000	707.85	5000	25820	29238	8466	50320	60574	10901	
28-Nov	400	1,593.68	23000	707.65	5000	25770	29584	8466	51520	61580	11370	

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		Elev.	Out	Elev.	Out		SRM	SHAW	CON	MVEW	SAK	
28-Nov	0415	1,593.66	23000									SCL advises Ross elev. 1593.66. Inflow 10,000 cfs. Outflow 23,000 cfs. Pool dropping .1 foot per hour, predicted to hit flood control pool of <b>1592.81 by noon today</b> . Since 2200 only ¼ inch of rain at Ross, .4 inches at Diablo. Workers scheduled to be at project at 0800 and expect to begin shutting things down.
28-Nov	500	1,593.60	23000	707.67	5000	25770	29931	8466	51760	62256	11967	
28-Nov	0520											Corps checks with PSE for status. U/B 707.65 5,000 cfs outflow, 4,809 inflow. L/B 8,200 cfs outflow
28-Nov	0555											Corps talks to SCL. Requested cutback to 5,000 cfs outflow. Due to availability of personnel this change might take an hour or two but will be done ASAP. Most current prediction is Concrete to go to 90,000 cfs by 11 am. Concrete flows predicted to go to over 194,000 cfs unregulated and 150,000 cfs regulated.
28-Nov	600	1,593.52	23000	707.67	5000	25770	30279	8466	53320	63348	12826	
28-Nov	700	1,593.44	23000	707.68	5000	25820	30687	8487	54520	64254	13840	
28-Nov	800	1,593.38	23000	707.71	5000	25720	31509	8466	56440	65060	15175	
28-Nov	900	1,593.32	23000	707.75	5000	8045	32219	8594	58240	66036	16767	
28-Nov	1000	1,593.39	5000	707.88	5000	7625	27701	8550	59920	67187	18332	
28-Nov	1030											Corps calls SCL. Ross Elev. 1593.30 Inflow 7,400 cfs. Outflow 5,000 cfs. Corps requested average daily outflow to be kept at 5,000 cfs. Raining hard (.1, .1, .1, .15, .15) last 5 hrs at Ross. SCL advises they will "probably" release a steady 5,000 cfs until night where they may cut back a bit and release more during peak power hours tomorrow.
28-Nov	1100	1,593.48	5000	707.94	5000	7602	18752	8616	<b>62380</b>	68195	19641	

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		Elev.	Out	Elev.	Out		SRM	SHAW	CON	MVEW	SAK	
28-Nov	1115											Corps calls NWS and they hedged severely in forecast. Possibly huge flood event peaking Nov 30 <sup>th</sup> . Corps passes info to Dave Brookings at Skagit County. U/B 707.86 L/B inflow 10,026
28-Nov	1135											Corps calls PSE. Elev U/B at 1100 = 707.86 Flood control pool = 707.9 Corps request PSE hold pool at 707.9 and pass inflow until necessary to prevent major damage at Concrete. Currently Concrete above flood stage of 28 feet at 28.03.
28-Nov	1200	1,593.57	5000	707.94	5000	7671	17484	8594	64120	69295	20937	
28-Nov	1300	1,593.67	5000	707.95	5000	7694	17968	8770	66040	70583	22103	
28-Nov	1400	1,593.77	5000	707.97	5000	7786	18309	12250	68695	71887	22955	
28-Nov	1500	1,593.89	5000	707.93	5000	7855	18554	15620	67720	73206	23763	
28-Nov	1600	1,594.01	5000	707.89	5000	7970	19098	19310	71555	74442	24525	
28-Nov	1700	1,594.09	5000	707.96	5000	8170	20761	23360	75585	76223	25299	
28-Nov	1800	1,594.21	5000	708.05	5000	8195	23369	24740	79420	77188	25962	
28-Nov	1820									78519		Corps calls PSE. Skagit at Concrete is 30.5 (78,000 cfs). Requested PSE close U/B from 18,000 cfs down to 5,000 cfs. L/B is passing inflow.
28-Nov	1900	1,594.30	5000	708.59	5000	8220	26192	29430	83775	80024	26757	
28-Nov	2000	1,594.38	5000	708.46	5000	8245	28438	17360	85075	82039	28887	
28-Nov	2100	1,594.46	5000	708.81	5000	8195	29699	13350	78835	83401	35106	
28-Nov	2200	1,594.60	5000	709.09	5000	14800	30512	13275	80590	85597	38904	
28-Nov	2300	1,594.73	5000	709.59	5000	15800	31391	13150	84165	87572	42196	
28-Nov	2400	1,594.86	5000	710.16	5000	17355	36159	13300	90040	89643	44747	
29-Nov	100	1,594.60	5000	710.35	5000	17310	38913	13450	95080	91811	46887	
29-Nov	200	1,594.75	5000	710.69	5000	17265	40188	13625	98860	93743	48666	
29-Nov	300	1,594.88	5000	711.05	5000	17310	41024	13775	104460	95770	50392	

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		Elev.	Out	Elev.	Out		SRM	SHAW	CON	MVEW	SAK	
29-Nov	0355											SCL calls Corps and advises that they called last night at 2200 hours (NOTE: no entry and increase at Newhalem) and informed Corps they had to open up Gorge to pass local inflows & Ross 5,000 cfs. Newhalem flow jumped to 17,000 cfs from 7,500 within 2 hrs. Still holding Ross to 5,000 cfs or less. Ross inflows still at 21,500+.
29-Nov	400	1,595.07	5000	711.45	5000	17310	41931	14025	108800	97983	51810	
29-Nov	500	1,595.22	5000	711.86	5000	17310	41996	14250	113210	100050	52992	
29-Nov	600	1,595.42	5000	712.27	5000	17400	42583	14475	116430	102920	53844	
29-Nov	700	1,595.63	5000	712.70	5000	17580	43633	14825	121120	104820	54444	
29-Nov	800	1,595.80	5000	713.11	5000	17670	45358	15110	121960	106740	54961	Corps contacts Dave Brookings. Advises NWS forecast of 45 ft at Concrete and 39 ft at Mt. Vernon, dependent on Corps losing control of the river upstream. Corps feels they have better than 50/50 chance of keeping the dams from filling. If they keep dams full Mt. Vernon would be 37 ft and Concrete 40 feet.
29-Nov	900	1,596.00	5000	713.54	5000	18300	45894	15410	126160	108680	55394	
29-Nov	0920											Corps states L/B outflow at 0900 was 9,000 cfs spilled, 3,800 discharged.
29-Nov	1000	1,596.20	5000	713.99	5000	18885	47921	15590	127920	110810	55915	
29-Nov	1100	1,596.41	5000	714.42	5000	21675	49083	15860	128640	113310	56701	
29-Nov	1130											Corps notifies SCL to begin calculating hourly inflows to Ross. Quickly approaching gate regulation schedule. Corps advises SCL to expect Corps to increase discharges by 3 p.m. as inflows increase and pool rises. Corps will call Dave Brookings when they begin to increase flows from Ross.
29-Nov	1200	1,596.68	5000	714.89	5000	27830	51435	16100	130480	115670	57845	

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29-Nov	1210											Corps calls PSE for status report. U/B Time elev Inflow 1000 713.95 29,294 1100 714.37 27,852 1200 714.84 30,638
29-Nov	1230											Corps calls PSE to discuss surcharging U/B to elev. 727 feet. Corps feels will not need to go to gate regulation schedule. However, if they do they are assuming they will have 3 feet of storage. <b>PSE does not commit to 727 ft level.</b>
29-Nov	1300	1,596.95	5000	715.32	5000	30030	55248	16340	131440	117470	59179	
29-Nov	1315											SCL cannot get people to their power house if they are spilling water. They can handle 13,000 through the powerhouse. Corps to begin gate regulation next hour.
29-Nov	1350											Corps notifies SCL to expect to have people camp out at the dams because if NWS forecast pans out we will be releasing 14,000 cfs by 3 a.m. Given uncertainty of inflow to Ross Corps suggest to SCL that they start heading people to the dam before dark.
29-Nov	1400	1,597.33	5000	715.77	5000	30470	59153	19820	136240	119450	60889	
29-Nov	1410											Corps advises PSE they will hold 5,000 cfs for some time to come. Expected to reach "gate regulation" by 6 a.m. tomorrow. By that time Concrete should peak and Corps will probably be increasing flows.
29-Nov	1415											Corps request SCL go to 8,000 cfs as per gate regulation schedule. Corps calls Dave Brookings and notified them that they were increasing discharge from Ross to 8,000 cfs. May go to 15,000 cfs by midnight.
29-Nov	1500	1,597.57	6600	716.16	5000	30305	61658	20210	139280	121370	63914	

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		Elev.	Out	Elev.	Out		SRM	SHAW	CON	MVEV	SAK	
29-Nov	1530											PSE advises no problem with surcharging to 727. Corps now doubts surcharge will be necessary but in case it is they want to be on 727 curve.  SCL advises Corps that due to vortex forming when powerhouse flow was increased the 1500 hour elevation of the reservoir is artificially low and makes the inflow calculation artificially low. Corps waits for 1600 hr. data to recalculate inflow before making an outflow decision.
29-Nov	1600	1,597.80	8000	716.51	5000	29755	61658	20540	142000	123490	72610	
29-Nov	1615											Corps realizes inflow 40,000 cfs at Ross. Elev. 1597.8 Gate regulation schedule says to release at least 6,000 cfs BUT because powerhouse changes create problems in reading forebay elevation, Corps leaves outflow at 8,000 cfs.
29-Nov	1700	1,598.09	8000	716.81	5000	27830	60475	20900	146320	124830	72807	
29-Nov	1715											Corps determines Ross inflow 46,000 cfs. Ross "forebay" elev. 1597.09 Gate regulation schedule suggest outflow of 12,000 cfs. Corps request SCL to go to 12,000 cfs. outflow.
29-Nov	1800	1,598.35	10600	717.05	4805	27775	58350	21530	148560	127260	73597	
29-Nov	1830											PSE advises Corps inflows dropping and it doesn't look like U. Baker will come close to induced surcharge storage.
29-Nov	1900	1,598.59	12000	717.27	4887	27270	55319	22100	152880	128630	73004	
29-Nov	1915											Ross inflow 46,000 cfs. Forebay elev. 1598.59. No change in 12,000 cfs outflow.
29-Nov	2000	1,598.83	12000	717.46	4774	26920	52485	21020	156190	130180	72217	
29-Nov	2045											SCL advises Corps they are switching to a remotely operated gate @ the lowest dam (Gorge). That will cause some minor flow change @ Newhalem.
29-Nov	2050											Corps states, "PSE has been digging a hole in Lower Baker to prepare for when U/B spills, probably 4 a.m. right after Concrete peaks.



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29-Nov	2100	1,599.06	12000	717.63	4764	26170	50739	21200	158980	131390	70654	Corps speaks with SCL re induced surcharge. SCL agrees to up to 2 feet of surcharge storage. Corps Wagner concerned that (1) Corps won't save any flow for induced surcharge (2) won't save any flow off the peak (3) won't be able to save Fir Island anyway; but Corps can relieve flooding sooner. Weather forecast is for 4 days of cooler less rainy weather.
29-Nov	2200	1,599.30	12000	717.81	4759	26470	47853	19010	159070	132220	69396	
29-Nov	2300	1,599.53	12000	717.95	4757	26720	46769	17750	156910	132780	67672	
29-Nov	2330											Corps advises SCL they will do induced surcharge. SCL wants to start when elevation reaches 1602 feet. SCL agrees to plan.
29-Nov	2400	1,599.73	12000	718.06	4757	26820	45894	17150	154000	133340	64844	
30-Nov	100	1,599.95	12000	718.13	4747	26670	44692	16430	151760	132970	58911	
30-Nov	0115											Corps calls PSE. U/B 718.13 Outflow 4,757 cfs. L/B 436.95 Spill gates 2,730 cfs Powerhouse 3,800 cfs. Pool still rising. 2 gates open filling at 0.1 ft per hour. Corps wants to wait till 0230 to open another gate. PSE can hold outflow to current flows for another 5 hours until they need to at least match inflow and get to a stable pool there. Corps doesn't want them to use up their 1 to 1.5 ft of room completely before we begin releasing from U/B later this morning.
30-Nov	200	1,600.14	12000	718.24	4755	25820	44029	15290	149280	132590	54789	
30-Nov	0215									131660		SCL calls Corps and advises Gorge and Diablo are finally starting to draft a little. Newhalem at 25,420. SCL wants to raise Ross powerhouse to 13,500. Corps agrees.
30-Nov	300	1,600.31	13000	718.38	4755	23470	43041	14075	146160	130090	51308	
30-Nov	400	1,600.48	13500	718.50	4757	23170	41153	12875	140880	128530	48015	
30-Nov	500	1,600.67	13500	718.57	4750	22320	38281	11575	136880	126450	45219	
30-Nov	600	1,600.80	13500	718.63	4755	22220	36903	10400	129440	124560	42578	
30-Nov	700	1,601.01	13500	718.70	4752	22120	35974	9386	123760		40087	

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30-Nov	0745									121900		Corps talks to SCL about proposed gate schedule for surcharge. When pool hits 1602 Corps proposes to cut powerhouse to 5,000 cfs and open all gates 1 foot (7,200 cfs spill, 5,000 cfs powerhouse) = 12,200 cfs. When pool hits 1603 cut powerhouse to zero, open all gates to 2 ft. = 15,000 cfs. If pool goes to 1604.3 or .4 then open powerhouse 7,500 cfs. Follow inflows down and reverse order of spill gates to meet target flows whatever they may be at the time.
30-Nov	800	1,601.15	13500	718.77	4735	22070	35420	8616	118600	119540	37811	
30-Nov	0830											SCL manager called to discuss surcharge plan. Latest runs through Corps spreadsheet show Ross reservoir at 1602.0 by 1600 hours today. Plan is to go to phase 1 of surcharge (open gates 1 foot, powerhouse at 5-6000 cfs.) at that time. Model does not show necessity for phase 2 assuming inflow forecast is correct.
30-Nov	900	1,601.32	13500	718.80	4870	21970	34260	8004	112300	116440	35668	
30-Nov	0945									114070		PSE request 1 hr notice from Corps before Corps wants to increase release from U/B. L/B near full and PSE needs to open gates and create some room to take the flow from U/B. U/B not spilling anything. Sending 4,870 cfs through powerhouse. L/B elev 437.32 Powerhouse 3,794 Spilling 2,920
30-Nov	1000	1,601.44	13500	718.84	4870	13600	34018	7500	108100	110980	33789	
30-Nov	1020									108110		SCL advises drop in Newhalem gage due to gate closure at Diablo and Gorge.
30-Nov	1030									105300		PSE request to stop spilling from L/B for 2 hours in order that they could feed fish at facility below dam. Fish had not been fed for two days.
30-Nov	1100	1,601.57	13500	718.88	4880	12700	32338	7220	103340	103000	32362	

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30-Nov	1200	1,601.68	13500	718.92	4880	12840	25531	4341	98440	100430	30963	Corps calls SCL. Concrete flows have receded to 107,000 cfs (34.8 ft). Corps request SCL open all 12 spill gates 1 ft. at 1400 hrs. First Corps wants to know if that request is possible and how long it would take. Corps justified action by stating if inflows send the pool to 1602.0 or 02.6 they would be covered. SCL likes the idea because they can maintain powerhouse capacity while spilling 7,200 cfs. Current pool at <b>1601.57</b> .
30-Nov	1300	1,601.83	13500	718.96	4890	13880	24226	6860	93190	98516	29722	
30-Nov	1400	1,601.92	17000	718.99	4890	19335	23316	6820	89550		28633	
30-Nov	1450											SCL calls Corps and advises on first attempt to open all gates 1 ft. 11 of the 12 were opened in 33 minutes. 1 gate experienced electrical problems but was fixed in 15 minutes.
30-Nov	1500	1,602.02	19525	719.03	4890	22970	24930	6780	86400	96179	27500	
30-Nov	1600	1,602.06	19525	719.06	4900	23120	28894	6900	82475		26450	
30-Nov	1700	1,602.10	19525	719.09	4900	22620	31686	7060	78705	94483	25479	
30-Nov	1800	1,602.15	20000	719.12	4901	22570	32160	<b>7100</b>	75065		24644	Corps request PSE to increase U/B discharge to 5,000 cfs over inflow to begin floodwater evacuation. Inflow = 7,230 cfs plus 5,000 cfs is approx 12,000 cfs U/B level 719.09 L/B 437.74
30-Nov	1900	1,602.19	20000	719.09	4896	22570	31745	<b>15080</b>	76235	93074	23938	Corps calls Skagit County and gives them run-down on operation of Baker and Ross dams.
30-Nov	2000	1,602.23	20700	718.98	11872	22670	31273	15080	80590	91480	23300	Corps talks with newspaper reporter from the Tacoma News Tribune. Gave reporter suggestions for article. Main point was that they took 60,000 cfs off the peak at Concrete and only started increasing flows from Ross (8,000 to 12,000) after the forecasted peak at Concrete. In other words, the Corps did not exacerbate the peak at Concrete by changing their regulation scheme.

**NOVEMBER 29, 1995 FLOOD ANALYSIS --THE BIG PICTURE**

Date	Time	ROSS		UPPER BAKER		NHALEM	MARMT	L/B	CON	MT V	SAUK	CORPS FLOOD NOTES
		Elev.	Out	Elev.	Out		SRM	SHAW	CON	MVEW	SAK	
30-Nov	2045									90362		SCL calls Corps and advises that pool behind Gorge is rising and current gate setting would begin to damage their project. SCL requested to increase outflow at Gorge to maintain pool level. Corps agrees because "it is his right to do so". SCL plan is not to draft Gorge but only pass inflow.
30-Nov	2100	1,602.27	20700	718.87	11872	22770	31391	14930	81305	89252	22783	
30-Nov	2200	1,602.29	20700	718.80	11872	23470	31097	15020	81630	87637	22160	
30-Nov	2230											SCL calls Corps to advise that Newhalem flows are now at approx. 24,000 cfs.
30-Nov	2300	1,602.31	20700	718.70	11872	23470	31273	15020	80330		21600	
30-Nov	2400	1,602.34	20700	718.55	11670	23470	31391	14850	80785	86613	21047	
1-Dec	100	1,602.35	20700	718.45	11667	23420	31332	15020	79940	86040	20555	
1-Dec	200	1,602.38	20700	718.31	11667	23420	30980	14960	79355	85028	20068	
1-Dec	300	1,602.37	20700	718.24	11670	23370	30863	14900	78900	84400	19747	
1-Dec	400	1,602.39	20700	718.16	11665	23320	30687	14900	77795	83463	19428	
1-Dec	500	1,602.38	20700	718.02	11665	23270	30570	14875	76820	82842	18955	
1-Dec	600	1,602.39	20700	717.85	11665	23270	30337	14900	76885	81855	18590	SCL calls Corps with 0500 and 0600 Ross readings. Holding steady at 1602.38. SCL would open Ross up another 2,000 cfs without extra personnel. More than that would have to wait until after 0800 hours when staff is at Diablo and Gorge to handle new water.
1-Dec	0620									81732		Corps calls PSE for current readings. Still drafting U/B. Corps tells PSE that as soon as they hear from Skagit flood engineer (E. Sabo) how levees are doing in Mt. Vernon Corps may want to increase outflow by another 5,000 cfs sometime after 0800 hrs.
1-Dec	0630									81303		Corps request SCL to open Ross up about another 2,000 cfs. SCL concurs by opening up 2 gates up to 3.2 ft. = additional 2,000 cfs
1-Dec	700	1,602.38	20700	717.75	11665	23170	30221	14875	76495	80875	18229	

**NOVEMBER 29, 1995 FLOOD ANALYSIS --THE BIG PICTURE**

Date	Time	ROSS		UPPER BAKER		NHALEM	MARMT	L/B	CON	MT V	SAUK	CORPS FLOOD NOTES
		Elev.	Out	Elev.	Out		SRM	SHAW	CON	MVEW	SAK	
1-Dec	0730									80631		Corps speaks with Sabo. Sabo advises to keep Concrete stage below 31 feet (81,500 cfs) during evacuation of U/B (and Ross).
1-Dec	800	1,602.36	21500	717.64	11665	23070	29989	14900	75650	80388	17820	At 0700 Concrete at 76,500 (30.23). As per message with Sabo Corps request PSE increase 5,000 cfs from U/B. Total U/B release 16,700. 4,800 through powerhouse, 11,900 spillage.
1-Dec	0850									80024		SCL advises Corps that Ross Elev. 1602.36 down .01 ft from 7 a.m. Corps and SCL agree to target Newhalem at 26,000 cfs for the time being. No increase currently planned. After pool drops a tenth or so SCL planned to drop all the manual gates and regulate out of the automatic gates.
1-Dec	900	1,602.34	21500	717.44	16667	22870	29699	19820	77925	79903	17466	
1-Dec	1000	1,602.32	21500	717.24	16667	25470	29469	19760	78575	79722	17265	
1-Dec	1100	1,602.29	21500	717.04	16667	26070	30163	19700	78120	79661	16966	
1-Dec	1200	1,602.26	21500	716.85	16667	26170	31745	19850	77795	79420	16817	
1-Dec	1300	1,602.21	21500	716.66	16667	26170	31982	19730	77080	79179	16570	
1-Dec	1325											Corps request PSE to increase discharge from U/B to 20,000 cfs. 4,800 through powerhouse, 15,200 spill. Corps attempting to get pool down by Sunday (Dec 3 <sup>rd</sup> ). Concrete at 1230 was 77,800. Increase would send gage to 81,000 cfs.
1-Dec	1350									78879		Corps ask SCL if they could investigate whether there is room in the river for more than 26,000 cfs at Newhalem. NWS forecast 2" rain for Sunday 12/3 which would mean pool would be at 1598.20.
1-Dec	1400	1,602.19	23000	716.46	16667	26170	31922	19640	76495	78579	16472	
1-Dec	1500	1,602.12	23900	716.17	20003	26120	31922	23390	78835	78639	16228	SCL returns Corp 1350 phone call. SCL spoke with "3 individuals familiar with situation" on of whom just came up through Marblemount. At 26,000 at Newhalem there is less than 1 foot before river goes over Hwy 20. For now, Corps decides to hold at 26,000 cfs. May reconsider tomorrow.

**NOVEMBER 29, 1995 FLOOD ANALYSIS --THE BIG PICTURE**

Date	Time	ROSS		UPPER BAKER		NHALEM	MARMT	L/B	CON	MT V	SAUK	CORPS FLOOD NOTES
		Elev.	Out	Elev.	Out		SRM	SHAW	CON	MVEW	SAK	
1-Dec	1600	1,602.10	23900	715.94	20001	26170	31922	23390	79420	78280	15841	
1-Dec	1700	1,602.02	23900	715.68	19999	26170	31922	23330	80330	78220	15554	Corps calls Skagit County to advise they were regulating Concrete to 31 feet or less and discharging 23,900 from Ross. Will increase Ross 2,000 cfs every 2 hrs and needed someone from County to monitor conditions at Marblemount. County arranges for Marblemount fire department to observe river during increase. Fire Dept. reports 4 feet of freeboard at 1800. Corps requested SCL to increase flow at 1730 And 1930 by 2,000 cfs at each time. Two increases resulted in a rise from 26,075 to 29,150, a 3,075 rise. SCL calls and requested no further increases because of concern at the project.
1-Dec	1800	1,601.97	24300	715.40	19834	26170	31686	23180	80330		15175	
1-Dec	1900	1,601.96	24300	715.12	19829	27570	31568	23060	79355	77863	14940	
1-Dec	2000	1,601.88	24300	714.69	19229	27620	32338	22940	78965	77684	14712	
1-Dec	2100	1,601.83	24300	714.41	19222	29315	32695	22850	78315	77447	14535	
1-Dec	2200	1,601.75	24300	714.13	19224	29315	33595	22700	78315	77506	14273	
1-Dec	2300	1,601.70	24300	713.84	19219	29425	34018	22520	77665	77033	14099	
1-Dec	2400	1,601.62	24300	713.56	19212	29590	34079	22460	77145	76974	13883	
2-Dec	100	1,601.58	24300	713.28	18917	29590	34139	22370	76755	76326	13798	
2-Dec	200	1,601.52	24300	713.00	18609	29535	34321	22280	77795	75857	13712	
2-Dec	300	1,601.46	24300	712.72	18653	29425	34139	22220	77405	75098	13626	
2-Dec	400	1,601.39	24300	712.46	18612	29370	34079	22040	77925	74461	13584	
2-Dec	500	1,601.31	24300	712.21	18309	29315	33958	21980	76885	73539	13541	
2-Dec	600	1,601.24	24300	711.93	18307	29205	33595	21830	77015	72796	13499	
2-Dec	700	1,601.20	24300	711.68	18300	29150	33415	21680	77145	72114	13414	
2-Dec	0730											Corps to call Skagit County at 0800 to see if Marblemount can take another 4,000 cfs. If yes Corps will increase Ross another 2,000 cfs for two hours.

**NOVEMBER 29, 1995 FLOOD ANALYSIS --THE BIG PICTURE**

Date	Time	ROSS		UPPER BAKER		NHALEM	MARMT	L/B	CON	MT V	SAUK	CORPS FLOOD NOTES
		Elev.	Out	Elev.	Out		SRM	SHAW	CON	MVEW	SAK	
2-Dec	800	1,601.14	24300	711.40	17993	29150	33355	21560	76885	71268	13161	Dave Brookings calls Corps. Advises Corps that Marblemount can take another 4,000 cfs. Corps calls SCL and request another 2,000 cfs per hour for 2 hours for a total outflow of 28,300 cfs and a target Marblemount flow of 38,880 and Concrete stage of 31 ft. 1 ft. freeboard at Marblemount highway at 24,300 out from Ross (34,900 cfs @ Marblemount). 38,900 cfs will raise stage 0.7 ft. SCL will call back when these two changes are stabilized.
2-Dec	900	1,601.05	24700	711.08	18295	29535	33294	21470	76235	70150	12993	Corps calls SCL and is informed that SCL had not done the 0800 change at Ross because it takes 2 hours to do gate change. Corps request increase in Ross discharge to 28,300 cfs to be accomplished by 1000-1100. Current 24,700 outflow. SCL having to use manual gates to increase outflows because of flow control.
2-Dec	1000	1,600.97	25500	710.83	18288	30910	33535	21410	76170	69319	12910	Corps calls Marblemount FD and alerted them that river levels would rise just over 0.5 ft. by mid-afternoon due to increase flow at Ross.
2-Dec	1100	1,600.85	28000	710.51	18286	30910	34321	21200	74415	68658	12826	Corps request PSE to decrease U/B outflow to 13,500 cfs. U/B elev. 710.51. Corps wanted to be below 710.  Corps contacts SCL to advise them about how to make changes. If Corps provides them with a target flow at Newhalem, along with desired release @ Ross, then they can make changes "in the middle" at Gorge and Diablo to meet the target constraint at Newhalem.
2-Dec	1200	1,600.76	28300	710.30	15786	31405	34625	21080	74415		12619	
2-Dec	1230									67675		Corps request PSE to decrease discharge from U/B to 8,200 cfs (by 5,000 cfs) at 1300 and down to 5,000 cfs at 1400.

**NOVEMBER 29, 1995 FLOOD ANALYSIS --THE BIG PICTURE**

Date	Time	ROSS		UPPER BAKER		NHALEM	MARMT	L/B	CON	MT V	SAUK	CORPS FLOOD NOTES
		Elev.	Out	Elev.	Out		SRM	SHAW	CON	MVEW	SAK	
2-Dec	1300	1,600.66	28300	710.16	13502	32340	34747	15530	70515	66594	12291	Corps request PSE to reduce discharge from U/B to 8,200 and hold it there so that bottom of flood pool (Elev 707.9) can be reached before the time precip begins tomorrow.
2-Dec	1400	1,600.57	28300	710.06	8300	32175	35236	10025	66280		12129	
2-Dec	1500	1,600.46	28300	709.95	8300	30800	35789	9950	64120	65524	11927	Corps calls SCL to inform them of latest plan. Corps request SCL reduce discharge out of Ross to target of <b>21,000 cfs by 1800 tonight.</b>
2-Dec	1600	1,600.36	28300	709.85	8300	30690	35175	9950	63040	64202	11687	
2-Dec	1700	1,600.25	28300	709.74	8300	30690	34382	9950	62800	63209	11528	
2-Dec	1800	1,600.14	<b>28300</b>	709.64	8300	25970	34321	9950	63040	61969	11488	
2-Dec	1900	1,600.03	28300	709.53	8300	23020	33958	9950	62920	60795	11409	
2-Dec	2000	1,599.92	28300	709.42	8300	22620	29469	9950	62680		11370	
2-Dec	2100	1,599.80	28300	709.32	8300	21770	26971	9950	62560		11252	
2-Dec	2200	1,599.68	28300	709.21	8300	21720	26303	9925	61060		11134	
2-Dec	2300	1,599.57	28300	709.10	8300	20955	25806	9925	60400		11057	
2-Dec	2400	1,599.44	28300	709.00	8300	21000	25367	9925	58480		10979	
3-Dec	100	1,599.32	<b>28300</b>	708.89	8300	21090	24930	9900	56200		10979	
3-Dec	0145											SCL called Corps and advised that discharge from Ross was <b>20,200</b> not 21,000. 21,000 was discharge at Newhalem. Corps instructs SCL to increase Ross discharge to 21,000.
3-Dec	200	1,599.20	28300	708.78	8300	21090	24930	9900	54280		10940	
3-Dec	300	1,599.08	28300	708.68	8300	21135	24930	9900	53200		10901	
3-Dec	400	1,598.95	28300	708.57	8300	21090	24930	9875	52960		10901	
3-Dec	500	<b>1,598.82</b>	28300	708.47	8300	21135	24876	9875	51880		10786	
3-Dec	0540											Corps request SCL to "ramp up" to 26,000 cfs at Newhalem. SCL makes change from 21,000 to <b>22,500</b> and will make another to 24,500 after crews arrive at 0800. Corps will cut back U/B before noon. Ross pool <b>1599.5.</b>
3-Dec	600	1,598.70	28300	708.37	8300	21135	24604	9900	51280		10786	



**NOVEMBER 29, 1995 FLOOD ANALYSIS --THE BIG PICTURE**

Date	Time	ROSS		UPPER BAKER		NHALEM	MARMT	L/B	CON	MT V	SAUK	CORPS FLOOD NOTES
		Elev.	Out	Elev.	Out		SRM	SHAW	CON	MVEV	SAK	
3-Dec	700	1,598.57	28300	708.28	8300	22220	24767	9850	50680		10747	Corps wants to keep Concrete at or below zero damage level of 62,000 cfs, currently at <b>52,000</b> cfs.
3-Dec	0730											Corps request PSE to stop spilling U/B. Current elev. 708.3. Inflow 2,500 cfs., outflow 4,600 powerhouse. Flood control pool (707.9) should be reached by 2100 today.
3-Dec	800	1,598.44	28300	708.19	8300	<b>22370</b>	24984	9850	50500		10747	Corps calls SCL and confirmed the <b>26,000 cfs</b> target at Newhalem. SCL informs Corps that at 28,000 cfs (done yesterday) there were problems with a sewage tank in Diablo overtopping causing raw sewage to get into river, also some water in Diablo powerhouse where some electrical switches are. Corps thinks problems were minor but also recognized some problems with hwy east of Marblemount.
3-Dec	900	1,598.31	28300	708.11	8300	25620	25751	6462	48635		10671	
3-Dec	1000	1,598.18	28300	708.03	8300	25970	27307	4188	45775		10594	
3-Dec	1100	1,598.05	28300	707.96	8300	26320	28952	4171	44895		10480	
3-Dec	1200	1,597.92	28300	707.89	8300	26670	29238	4171	44840		10366	
3-Dec	1300	1,597.79	28300	707.83	8300							
3-Dec	1400	1,597.66	28300	707.79	8300							
3-Dec	1500	1,597.53	28300	707.74	8300							
3-Dec	1600	1,597.40	28300	707.71	8300							
3-Dec	1700	1,597.27	28300	707.68	8300							
3-Dec	1800	<b>1,597.14</b>	<b>28300</b>	707.64	8300	26,525						SCL reports that Ross Elev. <b>1598.21</b> . Newhalem = 26,525 Ross discharge <b>24,800 cfs</b>
3-Dec	1900	1,597.02	28300									
3-Dec	2000	1,596.89	28300									
3-Dec	2100	1,596.77	28300									
3-Dec	2200	1,596.69	23000									
3-Dec	2300											Corps notifies PSE that the flood control status is officially terminated this hour.
3-Dec	2400											

