Swift No. 1 Hydroelectric Project
FERC Project No. 2111

FINAL LICENSE APPLICATION

Exhibit B – Project Operation and Resource Utilization

PacifiCorp
Portland, Oregon

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B.1.0 INTRODUCTION

In compliance with the Code of Federal Regulations (18 CFR, Parts 4 and 16), PacifiCorp is applying to the Federal Energy Regulatory Commission (FERC) to relicense the Swift No. 1 Hydroelectric Project (FERC Project No. 2111) on the North Fork Lewis River, in the State of Washington. The current license for the Swift No. 1 Project, which PacifiCorp currently owns and operates, was issued on October 29, 1956 and expires on May 1, 2006.

PacifiCorp is applying for a new license to continue operation of the project. This Exhibit B presents the response to information required by the FERC as described in 18 Code of Federal Regulations (CFR) Section 4**.**51(c). It is a description of project operations and resource utilization. The information contained in this exhibit is organized into several sections and generally follows the list of information required in 18 CFR, Section 4.51(c).

B.2.0 PROJECT OPERATION

The Swift No. 1 Project is 1 of 4 hydroelectric projects located on the North Fork of the Lewis River in southwest Washington. It is the last in a string of 4 facilities. The other 3 projects are Yale (FERC Project No. 2071), Merwin (FERC Project No. 935), and Swift No. 2 (FERC Project No. 2213). Merwin, Yale and Swift No. 1 are owned and operated by PacifiCorp. Swift No. 2 is owned by the Cowlitz County Public Utility District No. 1 (Cowlitz PUD) and maintained and operated by PacifiCorp under contract. The Swift No. 1 Project is operated as a flexible and load following facility and to meet reservoir storage requirements, flood management, system load and recreational needs. Storage from Swift Reservoir is also released downstream as necessary to meet the minimum flow requirements of Article 49 of the current Merwin license.

PacifiCorp's 3 Lewis River Hydroelectric Projects are operated as integral component of its system control area. Scheduling of power resources from these facilities is coordinated daily based on factors such as reservoir storage, fishery requirements, recreation requirements, flood control requirements, snow pack conditions, current and forecasted inflow conditions, system load requirements, availability of other resources, and in-streamflow requirements. Real-time adjustments to this schedule occur as load and resource conditions dictate. Water releases for generation are based on the need for the dispatch of a flexible resource, real-time load demands, river and reservoir management objectives.

The Swift No. 1 units can be remotely operated and monitored from the Lewis River Hydro Control Center (HCC) located at the Merwin headquarters building. These units can also be manually or automatically operated from the plant. The Swift No. 1 plant is visited daily as 3 Operators are on duty for the entire Lewis River Hydroelectric Project during normal work hours. At all other times, there are 2 operators on duty. Operators live in housing near the Merwin and Yale projects and are available for local control on short notice.

Water releases for generation are based on energy production, flexible real-time load following, and river and reservoir management. HCC is staffed 24 hours a day with at least one System Control Operator per shift. Hourly generation for each plant is prescheduled by the C&T Operations Planning Group in Portland. The prescheduled generation is dispatched in real-time by the HCC Control Operator, with any required adjustments coordinated between HCC and the C&T Real Time Generation Control Desk, located in Portland. Swift units are operated in one of three control modes, as follows:

Local Manual Operation: To start a unit on local manual, the operator verifies that the lube oil pump for the turbine guide bearing is operating and the bearing oil level is normal. An Operator pushes the start button, and the unit begins to roll, coming up to speed no-load. Once up to speed no-load, the operator turns on the synchroscope, manually synchronizes the unit to the line, and closes the breaker to connect the unit to the system. The output and voltage can then be adjusted manually as required by the operator.

Local Auto Operation: To start a unit on local auto, the Operator verifies that the lube oil pump for the turbine guide bearing is operating and the bearing oil level is normal. The Operator then pushes the start button. The automated control system begins to roll the unit up to speed no-load, synchronize, and close the breaker automatically. The output and voltage can then be adjusted by the Operator.

Remote Auto Operation: To start in remote auto, a selector switch located within the powerhouse must be in the "remote auto" position, and the unit auxiliaries must be functioning normally. The HCC Control Operator can then send a start signal via the System Control and Data Acquisition (SCADA) system, and the unit will roll, come up to speed, synchronize, and close the breaker automatically. The HCC Operator can then adjust the load as required or put the unit on load control.

Normal plant operation involves receipt of the prescheduled generation requirements from the Portland Real Time Generation Control Desk. Swift No. 1 units are then operated from HCC to meet Portland's request. The Swift No. 1 units can also be operated in an automatic mode to provide load control. In this mode, the units are started automatically by the HCC Control Operator as describe above. The control of the units is then transferred to respond automatically to a signal received from the C&T Real Time Generation Control Desk computer in Portland.

Swift Reservoir is the largest and uppermost impoundment on the Lewis River. There is no flow regulation above Swift Dam; therefore, reservoir elevations and project operations can be significantly affected by natural inflows. During the summer, PacifiCorp typically maintains reservoir levels within 5 feet of full pool to meet recreational needs. Reservoir elevations also are influenced by factors such as minimum streamflow releases below Merwin Dam, inflows, system load, and flood control.

When natural inflows to Swift Reservoir are in excess of power production capacity and vacant reservoir storage space nears the prescribed minimum, spilling is initiated. During

high run-off conditions, the projects operate under special guidelines established to manage peak storm runoff in accordance with the respective FERC licenses.

B.3.0 DEPENDABLE CAPACITY AND ENERGY PRODUCTION

Total plant capacity of the Swift No. 1 Project is 240 MW. The long-term (30 year) average annual generation at Swift is approximately 631,988 MWh. Based on the estimated generation and the plant capacity of 240 MW, the plant factor is 30 percent, and the dependable capacity is 65 MW[1].

B.3.1 HYDROLOGY

The Swift Project is located on the North Fork Lewis River in the Cascade Mountain Range in southwestern Washington. The majority of the drainage basin lies within the Gifford Pinchot National Forest. The drainage area upstream of Swift No. 1 is approximately 477 square miles. Because the Swift No. 1 Project is the most upstream project on the North Fork Lewis River, inflow to Swift Reservoir is unregulated.

The annual and monthly inflows to Swift Reservoir are based on average monthly flow data for the 1928 through 1989 period of record, obtained from the development of adjusted streamflow and storage records for the Columbia River and coastal basins by the Bonneville Power Administration (BPA). These data were published in July 1993. The adjusted streamflows were derived from project outflow and reservoir elevation and storage records from PacifiCorp for the Lewis River projects. The nearest USGS Gage Station (No. 14220500) on the Lewis River is located at Ariel, at RM 19, immediately downstream of the Merwin powerhouse.

Mean monthly inflows for the project generally peak during December and reach their lowest levels in August and September. Mean monthly inflows for each month of the period of record are shown in Table B.3.1-1. A summary of the mean monthly inflows for the period of record is shown on Figure B.3.1-1.

Table B.3.1-1. Mean monthly flows (cfs) at Swift No. 1.

Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Avg
1927-28										1360	905	714	
1928-29	1180	2160	2440	1670	998	2320	3489	4810	3420	1310	846	673	2115
1929-30	581	523	2120	1460	5750	2690	3450	2480	1550	873	705	608	1872
1930-31	650	856	1100	2700	2940	4330	5020	3000	1480	1050	715	657	2035
1931-32	1140	2490	2690	3270	2730	6180	5500	5640	4630	2240	1130	857	3209
1932-33	1010	5830	3620	3750	1630	3390	3930	5580	7580	3570	1510	1460	3575
1933-34	2761	3243	13390	8541	3431	4632	3217	1885	1161	931	761	693	3741
1934-35	2257	6793	4840	3813	3689	2866	3173	5128	3852	1631	949	809	3310
1935-36	739	944	1826	5256	1933	3092	3814	5521	3770	1585	984	827	2530
1936-37	671	596	2603	1259	1275	3180	5536	5019	5245	1970	1023	820	2436
1937-38	859	5636	5655	4643	2153	3007	5037	4868	2962	1319	876	709	3147

[1] This value was determined using BPA data from 1928-1970 and 878 ft. as a minimum elevation for Swift reservoir and 604 ft. as the tailwater elevation.

Table B.3.1-1. Mean monthly flows (cfs) (continued).

Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Avg
1938-39	860	1630	3104	3704	2389	2779	3720	3570	2135	1179	853	766	2224
1939-40	765	809	5073	3058	5389	5291	3495	2955	1253	872	731	679	2526
1940-41	842	1795	3276	3169	2315	2042	1993	2378	1367	911	794	1236	1839
1941-42	1713	2520	6099	1898	2688	2026	2817	2545	2550	1272	861	706	2307
1942-43	706	5042	4357	2629	2808	3456	6612	4150	3731	1899	1050	826	3098
1943-44	1205	1731	2388	2284	2563	1970	2791	2919	1743	869	681	654	1813
1944-45	637	1824	1955	4086	4441	3004	2940	5581	2589	1180	791	898	2483
1945-46	784	2985	4882	3935	2653	3488	3938	5729	4828	2993	1200	886	3197
1946-47	1336	4343	8258	2936	4688	3466	3789	2636	1774	1133	875	989	3008
1947-48	4290	4346	3427	4487	3119	2766	3590	5512	4396	1685	1093	991	3309
1948-49	1364	2940	2979	1183	2825	3764	4722	7093	4004	1990	1079	954	2906
1949-50	1156	4257	3442	3317	4637	5889	4970	5569	6287	3166	1427	1053	3753
1950-51	3122	6077	7710	4056	6515	2323	4560	5115	2898	1459	996	923	3793
1951-52	3658	3420	4059	1611	4079	2216	4742	5141	3097	1579	960	779	2938
1952-53	648	648	1323	10460	5392	2535	3179	4934	3805	2300	1172	882	3096
1953-54	1154	3404	6477	3774	5029	3623	4718	5166	4742	2958	1364	1048	3611
1954-55	1310	3451	2951	2500	2971	1593	3062	4335	6106	2945	1315	1092	2794
1955-56	3753	7078	7115	5106	2236	3847	5457	7205	5887	3202	1576	1038	4466
1956-57	1843	2836	4935	1805	2715	4715	4213	4687	2077	1122	905	733	2718
1957-58	885	1740	3948	4478	6820	2610	4934	4104	2287	1222	906	777	2865
1958-59	944	5943	5009	6584	2446	2775	4252	3882	3260	1377	855	1498	3236
1959-60	3269	3736	3414	2010	4804	3377	4912	4701	3358	1315	958	798	3043
1960-61	1076	6067	3191	5298	8945	5103	3824	4606	3068	1253	885	777	3634
1961-62	1185	2172	5108	3781	2872	2125	4679	3701	2521	1175	890	814	2583
1962-63	2115	5952	4167	2619	4748	2285	4277	3562	1558	980	746	672	2787
1963-64	1018	4790	3349	4780	2994	2402	2970	4106	4719	2254	1367	986	2972
1964-65	1105	2839	7862	4582	4122	2885	4680	3946	2555	1156	889	671	3104
1965-66	723	1689	2257	3074	1910	3909	4986	5359	3172	1834	926	741	2552
1966-67	939	2428	6617	5570	3592	2907	2356	4413	4010	1448	843	699	2987
1967-68	2321	2832	3190	4244	8857	4446	2791	2921	3304	1175	1264	431	3208
1968-69	2866	5363	4130	3983	1621	2203	4857	6871	3531	1343	873	1078	3234
1969-70	1727	2416	3717	7782	4604	3608	2912	3235	2245	960	708	699	2879
1970-71	1053	3427	4121	5829	4593	3047	4051	8917	5402	3649	1507	1208	3729
1971-72	1426	2990	3155	5469	6978	9748	4186	6664	4582	2234	1187	1413	4163
1972-73	1013	2382	6795	4282	1878	2597	2332	2547	1591	1002	710	823	2339
1973-74	1250	5589	7013	8815	3942	4118	4906	5319	7230	3627	1593	987	4536
1974-75	827	2393	5415	6271	3588	3500	2244	4826	3751	1840	1067	877	3054
1975-76	1781	4808	9252	5433	3193	2362	3465	5657	3146	1987	1229	900	3609
1976-77	811	905	1001	1128	1338	2491	3216	2837	2357	831	740	1134	1564
1977-78	1244	172	10410	3987	3507	2933	3274	3881	2102	1123	740	1105	3309
1978-79	794	1248	2209	1113	4202	4624	3022	4148	1593	987	714	780	2112
1979-80	1199	1396	6127	3632	4298	3140	5149	2836	1539	981	711	678	2636
1980-81	613	3175	11197	2303	5962	1984	3346	2257	2797	1269	798	721	2701
1981-82	1837	3400	5539	3605	9248	4319	3072	4745	3273	1413	898	844	3544
1982-83	1469	2916	5674	6364	5628	6371	3700	3679	2507	2199	1196	1089	3560
1983-84	825	7071	3034	5104	3547	4479	3242	4296	3218	1495	890	1251	3197
1984-85	1012	4486	1997	1237	1369	2220	4987	4389	3714	1092	815	801	2339

Table B.3.1-1. Mean monthly flows (cfs) (continued).

Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Avg
1985-86	1614	2971	1618	4326	5760	4661	2531	2673	1445	838	621	681	2458
1986-87	728	4188	2394	2675	4560	5730	3380	2797	1404	821	648	547	2474
1987-88	456	653	4135	2465	2957	3880	5199	3494	2192	1077	686	622	2316
1988-89	597	4585	2780	3282	1835	4531	5218	3550	2138	1054	805	636	2584
Mean	1372	3327	4442	3909	3815	3506	3954	4326	3221	1606	966	882	2939
Median	1105	2985	3948	3774	3507	3140	3824	4335	3097	1317	890	822	2972
Max	4290	7078	13390	10460	9248	9748	6612	8917	7580	3649	1593	1498	4536

Maximum mean monthly flows for the Lewis River at the Swift powerhouse for the period 1928-1989 are as follows:

	Flow (cfs)			Flow (cfs)	
Month	**Max**	**Min**	**Month**	**Max**	**Min**
January	10,460	1,113	***July***	3,649	821
February	9,248	998	***August***	1,593	621
March	9,748	1,593	***September***	1,498	431
April	6,612	1,993	***October***	4,290	456
May	8,917	1,885	***November***	7,078	172
June	7,580	1,161	***December***	13,390	1,001

Project annual and monthly flow duration curves are included in Appendix A. Releases from Swift Reservoir are a function of inflow, available storage, and generation demands.

B.3.2 AREA CAPACITY CURVE AND TYPICAL OPERATIONAL CURVE

The reservoir formed by Swift Dam is approximately 11.5 miles long and has a surface area of 4,680 acres at the operating level of 1,000 feet msl (full pool). The reservoir's gross and usable storage capacities at this elevation are 755,500 acre-feet and 447,000 acre-feet, respectively. Figure 3.2-1 shows the Swift Reservoir area capacity curve, and a typical operational rule curve is presented in Figure 3.2-2.[2]

[2] The numbers in this paragraph are the same as those in the IIP and are as per the production manager (B. Fields, email to J. Kelly 4/30/03.)

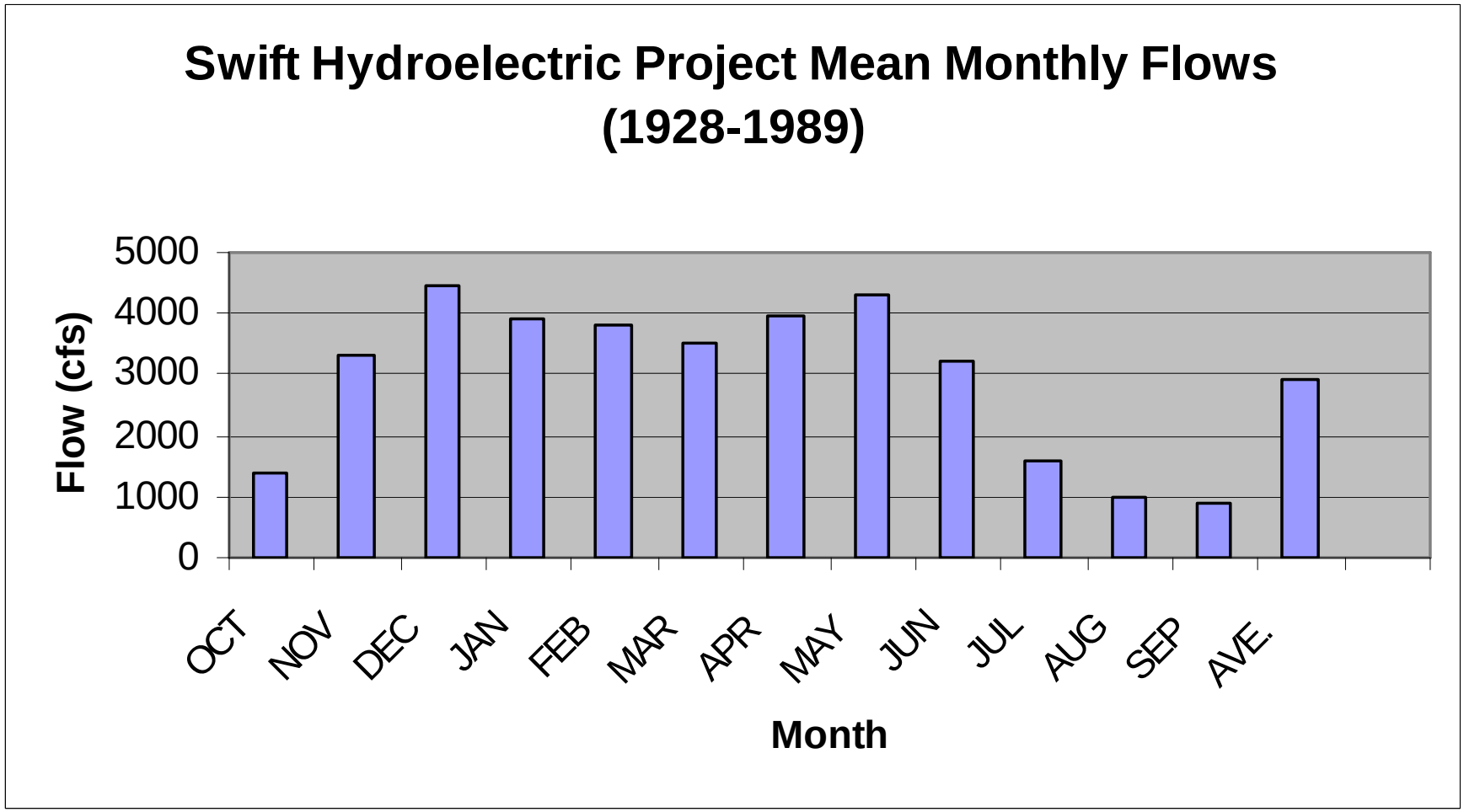

Figure B.3.1-1. Mean monthly flows for the Lewis River at Swift No. 1 powerhouse.

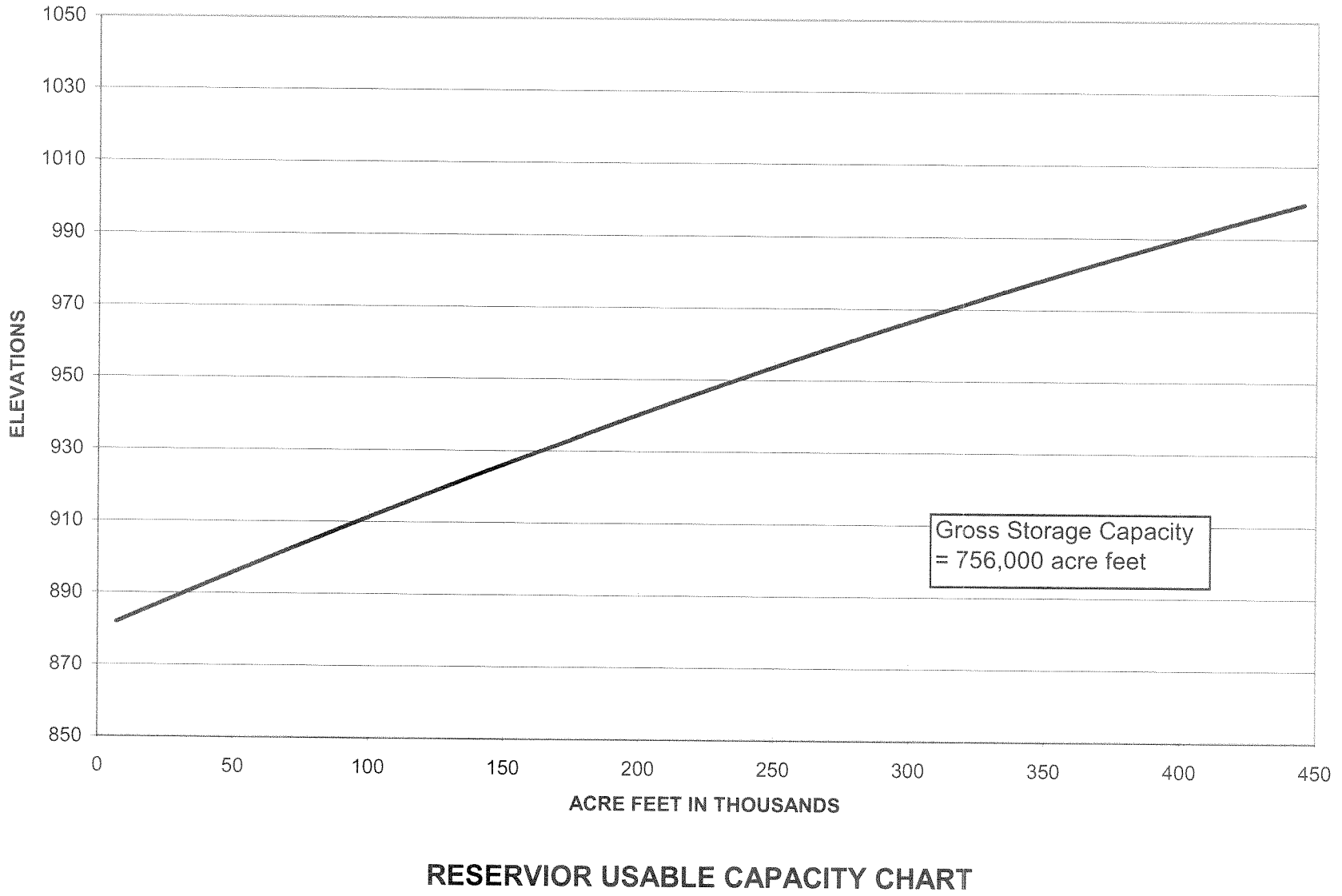

Figure B.3.2-1. Swift Reservoir area capacity chart.

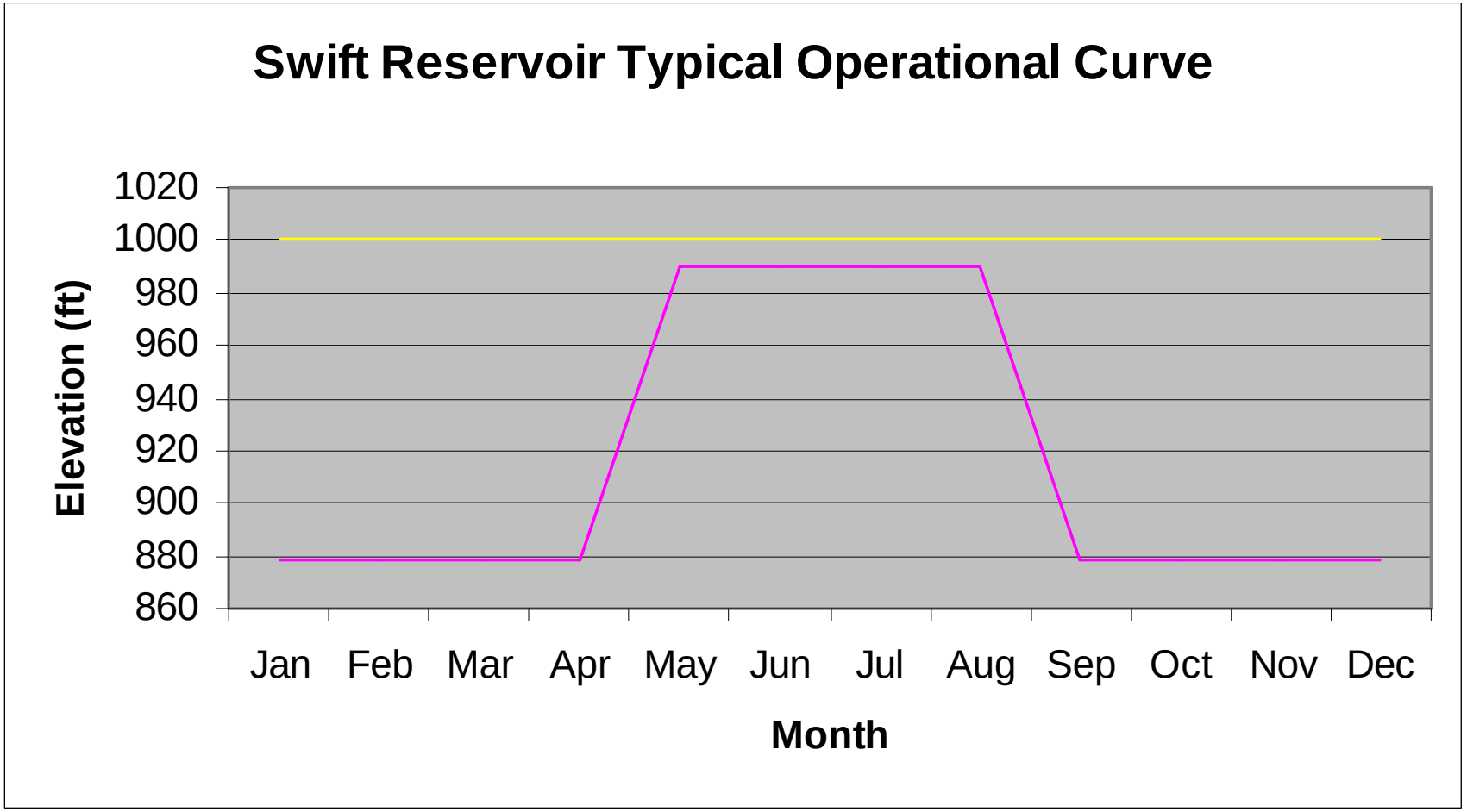

Figure B.3.2-2. Swift Creek Reservoir typical operational curve.

B.3.3 HYDRAULIC CAPACITY

The Swift Project has a total estimated hydraulic capacity of 9,145 cfs composed of 3,065 cfs at a rated head of 378.0 ft from the Unit No. 11 vertical Francis turbine and 3,040 cfs at a rated head of 378.0 ft from the Unit Nos. 12 and 13 Francis turbines.

B.3.4 TAILWATER RATING CURVE

The Swift No. 1 powerhouse discharges into a canal which extends 3.5 miles and delivers water to the Swift No. 2 intake and powerhouse. The canal includes an ungated overflow spillway, wasteway, and discharge channel which provides for flows that exceed the Swift No. 2 hydraulic capacity, and maintains a relatively constant level in the canal. Therefore, the water surface elevation at the Swift No. 1 tailrace depends largely on Swift No. 2 powerhouse discharge as well as the Swift No. 1 powerhouse discharge.

B.3.5 PLANT CAPACITY

The plant capacity for the Swift No. 1 Project is shown in Figure 3.5-1.

B.4.0 PROJECT POWER UTILIZATION

The estimated average (30-year) annual net generation at the Swift Project is approximately 631,988,000 kWh. Approximately 9,084,000 kWh[3] are used annually for station service. The Swift No. 1 Project does not have a specific service territory. Electricity generated at the project goes into the regional transmission grid and serves PacifiCorp's customers throughout the Northwest. Approximately half of the company's sales are to industrial customers, about one-fourth to commercial, and one-fourth to residential customers.

B.5.0 FUTURE PROJECT DEVELOPMENT

As part of this license application, PacifiCorp is not proposing any major modifications or upgrades. However, the Company will continue to evaluate the potential for project upgrades and modifications as future market and other conditions change, to ensure the most cost-effective, efficient and environmentally balanced use of the water resources available.

[3] This number is a five year average (1998-2002) as per C. Wright and T. Mitchell.

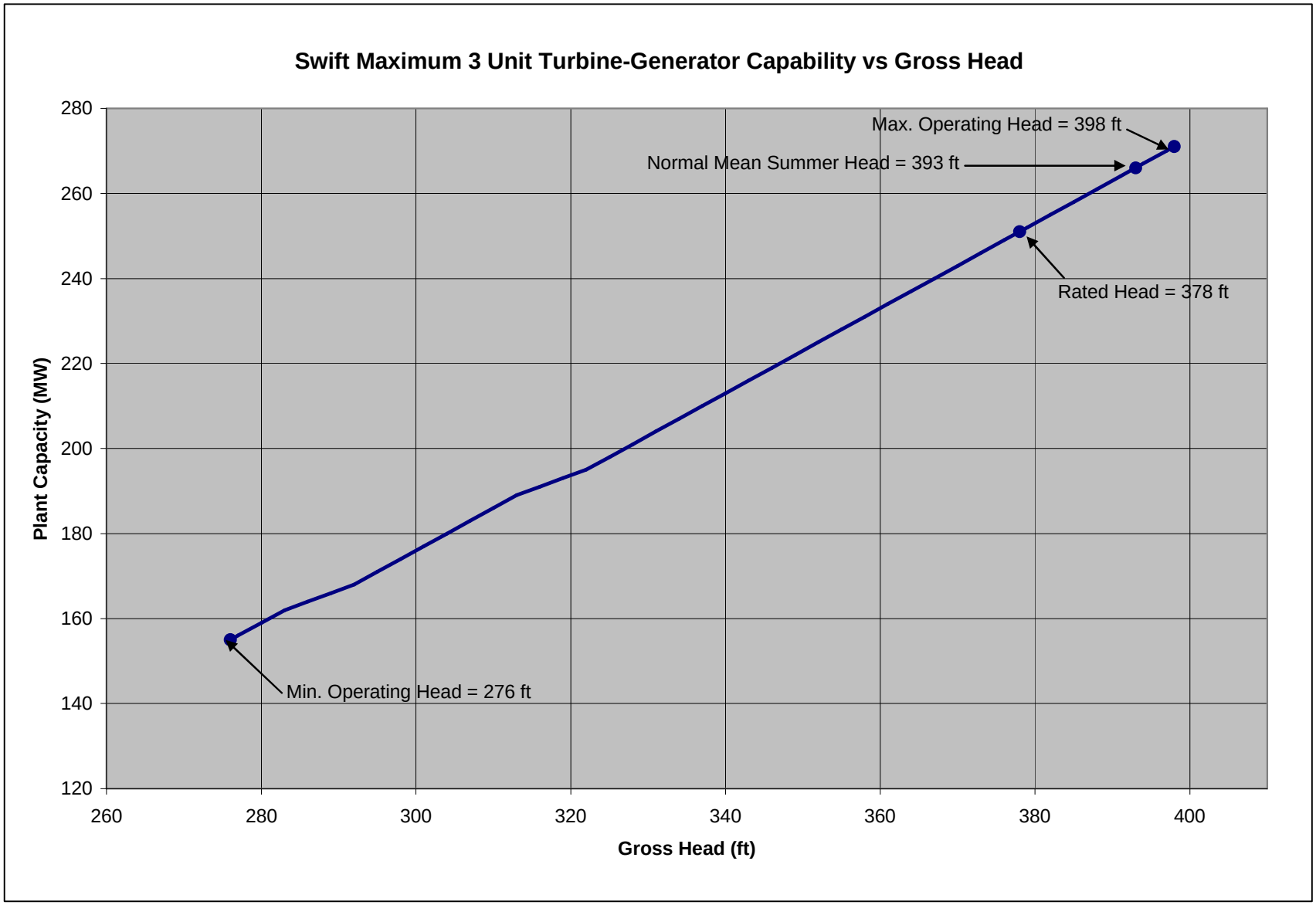

Figure B.3.5-1. Swift No. 1 plant capacity curv