

Appendix D Pertinent Data

Location of dam

On Smith River at latitude 36 46'50", longitude 80 01'40", about 44.3 river miles above the mouth, about 7 miles upstream from Bassett, Virginia, and 34 air miles south from Roanoke, Virginia.

Drainage areas, square miles

Smith River at Philpott Dam site	212
Smith River at Bassett, Virginia (gage).	253
Smith River at Martinsville, Virginia	374
Smith River at mouth near Eden, N. C	550

Flows at damsite in period Sep 1929 - Dec 1981. c.f.s.

Average	285
Maximum (19 Oct 1937)	32,000
Minimum (weekly mean, Sept 1932)	40
Maximum monthly (Oct 1937)	1,205
Minimum monthly (Aug 1981)	29

Elevations, feet, mean sea level

Top of dam	1,016
Flood plain (general elevation).	815
Base of dam (approx.)	797
Crest of spillway.	985
Maximum surcharge elevation (spillway design flood). . .	1,014

Top of power intakes 902

Minimum elevation to which land has been purchased or
 flowage easement acquired 998

Reservoir clearing limits:

 Upper. 977

 Lower. 940

Max. (22June72) 983.06

Min. (26Sep56). 927.59

Tailwater elevations. feet, mean sea level.

Maximum level for spillway design flood outflow
 (70,000 c.f.s.) 836

Maximum design level for protection of powerhouse
 (20,000 c.f.s.) 822

Normal operating level 811

Minimum level, regulated flow (20 c.f.s.). 808

Reservoir

State affected Virginia

Counties affected. Franklin, Henry, Patrick

Length along Smith River at elev. 985. 16 miles

Length of shoreline at elev. 985 110 miles

Maximum width at elev. 985 0.75 miles

Storage:

	Acre-feet	Inches
Total volume at elev. 1014.	318,300	28.2
Uncontrolled flood storage (elev. 1014 to elev. 985).	117,900	10.4

Controlled flood storage (elev. 985 to
 elev. 974) 34,200 3.0

Power drawdown (elev. 974 to elev. 920). . . 111,200 9.8

Volume at design minimum power pool
 (below elev. 920). 55,000 4.9

Surface area:

Total area at elev. 998 4,060 ac.

Maximum power pool (elev. 974). 2,880 ac.

Design minimum power pool (elev. 920) 1,350 ac.

Original river area (below elev. 998) 310 ac.

Dam

Type. . . . Concrete gravity with 120 ft. long ungated spillway

Foundation. Quartz mica schist

Length. 920 ft.

Maximum height of dam 220 ft.

Maximum width at base 166 ft.

Sluices:

Number. Three, 5 ft. 8 in. by 10 ft. 0 in.

Sluice gates. . . . Six (1 service and 1 emergency per outlet)
 slide gates, hydraulically operated.

Total capacity at elev. 985 13,350 c.f.s.

Low flow outlets:

Number. Two, circular, 12 in. I.D.

Gates Four (1 service and 1 emergency per outlet)
 iron body gate valves; 3 manually operated,
 1 electrically operated.

Total capacity at elev. 985 80 c.f.s.

Spillway energy dissipator:

Type Stilling basin

Length 189 ft.

Elevation of end sill 806 ft. msl.

Elevation of bottom 790 ft. msl.

Power Plant:

Rated generating capacity:

2 units at 6700 kw each 13,400 kw

1 unit at 600 kw 600 kw

Total 14,000 kw

Principal dimensions:

Power house 86 ft. x 76 ft.

Generator room. 82 ft. x 32 ft.

Intakes:

Number 3

Gates Slide type, fixed cable hoists

Penstocks:

Number 3

Type Welded steel

Dimensions:

For 6700 kw units. 9'-0" Dia.

For 600 kw unit. 3'-0" Dia.

Hydraulic turbines:

Number 3

Type Francis, vertical shaft

Rated capacity

2 units at 9400 hp each at 152 ft. net head.18,800 hp.

1 unit at 860 hp at 152 ft. net head 860 hp.

Total.19,660 hp.

Discharge at rated turbine capacity (152 ft. net head):

9400 hp units - 605 c.f.s. x 2 units 1210 c.f.s.

860 hp unit - 55 c.f.s. x 1 unit 55 c.f.s.

Total discharge. 1265 c.f.s.

Normal speed:

9400 hp units. 277 RPM

860 hp units 720 RPM

Draft tubes:

Type:

Main unitsConcrete below

Secondary unit.Conical plate steel

Approximate throat diameter:

Main units 5'-5"

Secondary unit1'-11"

Horizontal length (center line of main unit turbines
to downstream face)24'-0"

Net area at outlet opening (9400 hp. units). . . . 142 sq. ft.

Transformer:

Type.3 phase, 60 cycle, oil immersed, inert gas filled, air cooled.

13.2 - 138 kv (series connection)

13.2 - 69 kv (multiple connection)

Rating: 14,000 kva, self cooled

17,500 kva force cooled

Switchyard:

Size 55' x 54'

Outgoing lines 1-132 kv, 3 phase, 60 cycle

