5. DISSOLVED OXYGEN UPTAKE RESULTS

Uptake values are calculated with following equation and values from CRIQ report "Table 7: Mean Values for each condition".

Dissolved Oxygen Uptake $= \frac{DO_1 + 2 \times DO_2 + DO_3}{4} - DO_{Upstream}$

Power: 30 MW $= \frac{4.971 + 2 \times 5.116 + 4.591}{4} - 0 = 4.9$ mg/L

Power 35 MW $= \frac{4.766 + 2 \times 5.070 + 4.47}{4} - 0.217 = 4.6$ mg/L

Power: 41 MW $= \frac{2.804 + 2 \times 3.358 + 2.808}{4} - 0.008 = 3.1$ mg/L

Table 5-1 Dissolved Oxygen Uptake Results

Power (MW)	Servomotor Stroke (%)	Guide Vane Opening (°)	Water (CFS)	Air (CFS)	Water/Air	Uptake (mg/L)	Relative Uptake
30	52.7	19.3	4723.0	231.5	20.4	4.9	101
35	59.5	22.0	5302.4	228.8	23.2	4.6	107
41 Disp	84.9	32.4	6692.5	135.5	49.4	3.1	152

Test 41 A from CRIQ report is rejected because the dissolved oxygen sensors were outside of the main flow stream. Test 41 Disp (displaced probes) is the test after repositioning of the sensor in the high load main flow stream.

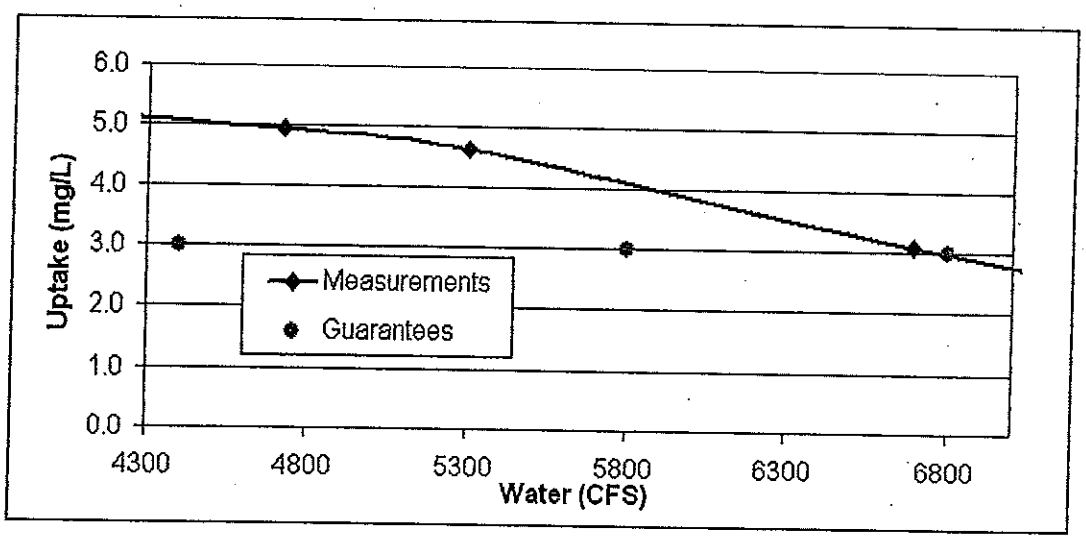

Figure 5-1 Dissolved Oxygen Uptake (mg/L) vs Water Discharge (CFS)

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
SOUTH ATLANTIC DIVISION

SUMMARY OF PROJECT OPERATIONS

DISTRICT: WILMINGTON

PERIOD HOURS	PERIOD	CY2005	HYDROPLANT	(RCS SADVS-139)
8760	1-JAN-05/31-DEC-05		JOHN H. KERR	

A. RIVER & RESERVOIR OPERATIONS

POOL EL. BEG. OF PERIOD	1470433	(RULE CURVE)	295.50	299.63 FT
POOL EL. END OF PERIOD	1366070	(RULE CURVE)	295.50	297.45 FT
GAIN OR LOSS IN POOL ELEVATION				-2.18 FT
MAX ELEVATION		15:00	04/03	305.08 FT
MININUM ELEVATION		21:00	10/06	296.41 FT
AVERAGE GROSS HEAD	(DESIGH HEAD 90.0 FT.)			96.48 FT
ENDING USABLE POWER STORAGE				194370 ACFT
CHANGE IN STORAGE				-104363 ACFT
AVERAGE INFLOW				6474 DSF
AVERAGE TURBINE DISCHARGE				6618 DSF
OTHER DISCHARGE	(LOCK & SPILL)			0 DSF
TOTAL DISCHARGE	(AVG. BELOW DAM)			6618 DSF
MAX. DAILY DISCHARGE			04/05	24410 DSF
MIN DAY DISCHARGE			11/08	0 DSF
DISCHARGE USED FOR POWER				100.0%
POT. POWER USED IN TURBINE DISCHARGE				473566.1 MWH
PLANT EFFICIENCY				80.1%

B. POWER PLANT OPERATIONS

UNIT NO.	RATED CAPACITY KW	MAXIMUM HOUR KWH	MWH GEN THIS PERIOD
1	12000	15000	16670.0
2	32000	38000	63577.0
3	32000	38000	64333.0
4	32000	38000	64373.0
5	32000	38000	40026.0
6	32000	38000	61534.0
7	32000	38000	63831.0
SSA	1000	1000	2453.0
SSB	1000	900	2338.4

TOTAL GROSS GENERATION		379135.4
NET STATION USE	1.3%	4791.4
NET GENERATION W/O CONDENSING		374344.0
CONDENSING USE		0.0
NET GENERATION W/CONDENSING		374344.0
ENERGY FOR PUMPING		–
GROSS GENERATION(PUMP STORAGE)		–
SALES FOR RESALE		369542.0
INTERDEPARTMENTAL SALES		504.8
TOTAL SALES		370046.8
LOSSES		4802.0

C: STATION DEMAND

MAX HOUR DEMAND	19:00	11/28	246.3 MWH
MAX DAY DEMAND		04/05	4173.3 MWH

D: STATION FACTORS

LOAD FACTOR	17.57%
PLANT FACTOR	21.01%
PUMP FACTOR	–

E: UNIT OPERATIONS - TIME IN HOURS

UNIT NO	IN SERVICE TIME GEN	IN SERVICE TIME COND	IN SERVICE TIME PUMP	STAND BY TIME	TOTAL AVAIL TIME	OUTAGES GEN	OUTAGES NON GEN	OUTAGES PUMP	TOTAL UNAVAIL TIME	NO OF OUTAGES	% AVAIL
1	1299.9	0.0		5868.7	7168.6	0.0	1591.4		1591.4	2	81.8%
2	1958.4	0.0		6650.8	8609.2	150.8	0.0		150.8	2	98.3%
3	1942.8	0.0		6388.0	8330.8	0.0	429.2		429.2	1	95.1%
4	1954.3	0.0		6256.4	8210.7	19.2	530.1		549.3	3	93.7%
5	1250.7	0.0		4701.6	5952.3	1960.2	847.5		2807.7	3	67.9%
6	1895.0	0.0		6284.4	8179.4	0.0	580.6		580.6	1	93.4%
7	1988.0	0.0		6759.7	8747.7	0.0	12.3		12.3	2	99.9%
SSA	5321.4	0.0		1433.0	6754.4	0.0	2005.6		2005.6	4	77.1%
SSB	6254.8	0.0		1263.3	7518.1	384.3	857.6		1241.9	3	85.8%

REMARKS:

VILLAGE FEEDER END.	1187.8
VILLAGE FEEDER BEG.	683.0
DIFF	504.8

SEE ATTACHED OUTAGE REPORT