

IMPACT OF THE SPARTANBURG WATER SYSTEM ON THE
HYDROPOWER GENERATION OF BLUESTONE ENERGY DESIGN, INC.,
AND CLIFTON POWER CORPORATION FACILITIES

Pacolet River System
Spartanburg County, South Carolina

by
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South Carolina Water Resources Commission
1201 Main Street, Suite 1100
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State of South Carolina

The Honorable Carroll A. Campbell, Jr., Governor



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CONTENTS

	Page
Introduction.....	1
Purpose.....	1
Description of study area.....	1
Data collection sites.....	3
Method of study.....	4
Method 1.....	4
Method 2.....	9
Findings.....	11
References.....	16
Appendices	
A. Input data and source of data.....	17
B. Daily difference in regulated flow and unregulated flow in Pacolet River at the hydropower facilities for the period from July 1981 to September 1991.....	19

FIGURES

	Page
1. Map showing study area of the Pacolet River system in Spartanburg County.....	2
2. Schematic diagram of the study area in the Pacolet River system.....	5
3. Daily changes in the Pacolet River flow, reservoir storage, water withdrawal, and net rainfall minus evaporation.....	13

TABLES

	Page
1. Annual losses or gains in Pacolet River flow that could be used for hydropower generation using the unregulated flow from the model (method 1).....	12
2. Annual losses or gains in Pacolet River flow that could be used for hydropower generation using the unregulated flow from method 2.....	14
3. Average monthly runoff from upper and lower drainage areas of the Pacolet River basin in the study area.....	15

INTRODUCTION

Under authority of the South Carolina Water Resources Planning and Coordination Act (§40-3-10, et seq.), the South Carolina Water Resources Commission (Commission) is authorized and required to study and make recommendations concerning State water policy and to develop and establish policies and proposals designed to meet and resolve special problems of water resource use and control within or affecting the State. As part of the development process of a comprehensive State water policy, the Commission seeks to focus on actual controversies and conflicts regarding water demand and use. The controversy that is the subject of this report represents a classic example of competing interests and demands for the same water resource, involving a conflict between municipal interests and those of private riparian landowners. The various questions at issue in this dispute raise broader questions relating to the State's public policy on riparian rights and water availability, distribution, and use.

This study may or may not assist the parties involved in resolving their dispute; however, the parties' participation in this study has enabled the Commission to gain valuable experience. This experience will be combined with other studies and analyses undertaken by the Commission in the formulation of a proposed State water policy. To that extent, all parties involved in this study are placed on notice that the study has been undertaken by the Commission only for the purpose of gathering information for use in developing prospective policy. The Commission cannot guarantee the accuracy of the data reviewed in the study and does not warrant that any information contained in the study is useful for any particular purpose other than that described in this paragraph.

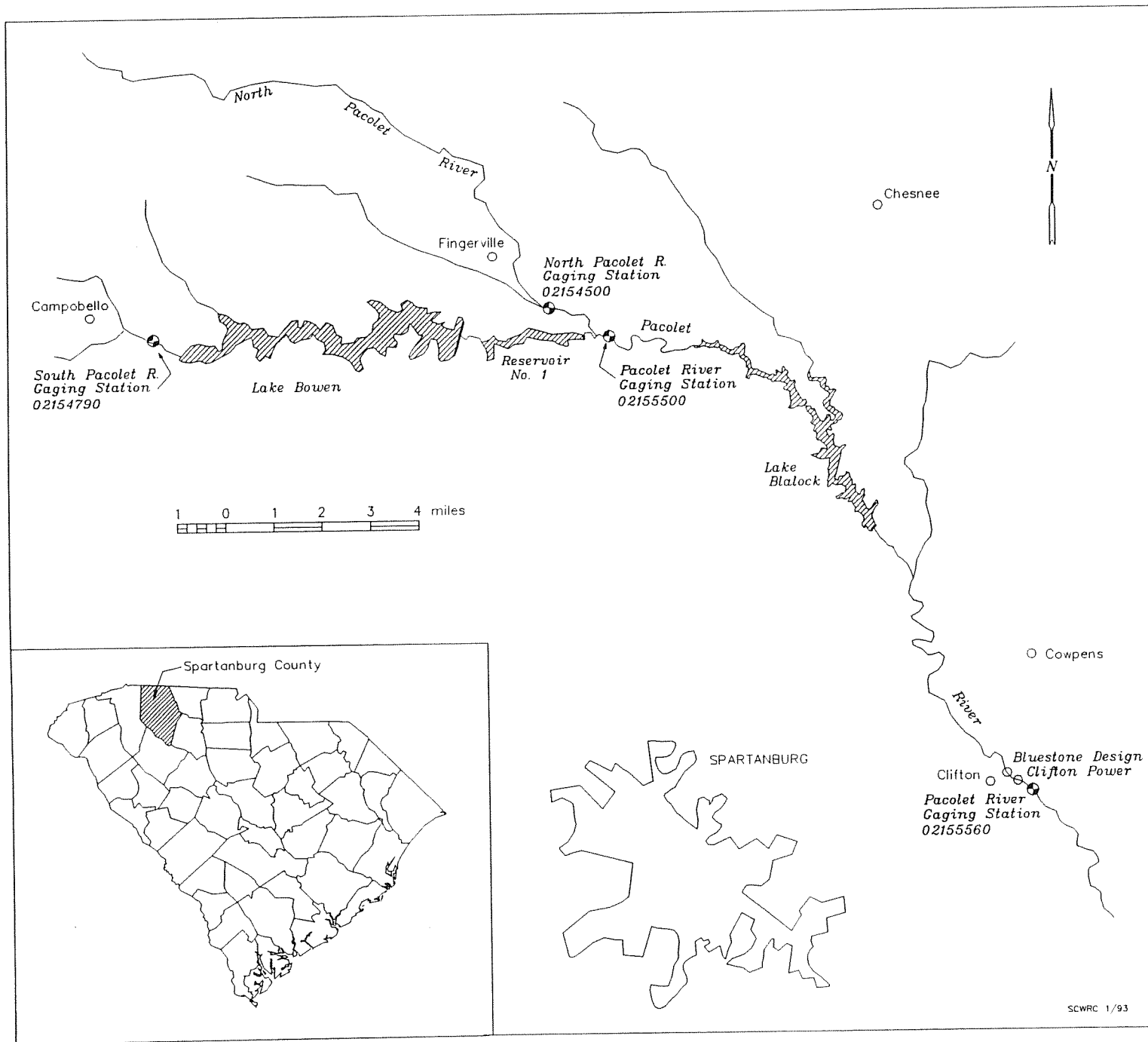
Purpose

The purpose of this study was to determine the gain or loss in flow of the Pacolet River at the Bluestone Energy Design, Inc., and Clifton Power Corporation facilities due to withdrawal of water and regulation of flow in the Pacolet River by Spartanburg Water System (SWS).

Description Of Study Area

The study area (Fig. 1) includes the drainage areas of the North and South Pacolet Rivers and Pacolet River from their headwaters to Bluestone Energy Design, Inc., and Clifton Power Corporation.

The Pacolet River starts at the confluence of the North and South Pacolet Rivers. Flow in the South Pacolet is impacted by



2

Figure 1. Study area of the Pacolet River system in Spartanburg County.

water withdrawals from Municipal Reservoir 1 and by flow regulation in Lake Bowen and Reservoir 1. The flow of the Pacolet River is further effected by regulation at Lake Blalock. All the reservoirs in the system are owned and operated by SWS.

Lake Bowen was constructed on the South Pacolet River in 1959. The lake has a surface area of 1,795 acres at the normal pool stage of 815 ft msl. The drainage area of the lake is 81 square miles.

Municipal Reservoir 1 was constructed on the South Pacolet River in 1926. The lake has a surface area of 320 acres at the normal pool stage of 772 ft msl and the lake's drainage area is 90 square miles.

Lake Blalock was constructed on the Pacolet River in 1980. The lake has a surface area of 1,475 acres at the normal pool stage of 700 ft msl. The drainage area of the lake is 256 square miles.

The R.B. Simms Water Treatment Plant is located near the South Pacolet River and is supplied by water withdrawn from Reservoir 1. The plant has a maximum capacity of 64 million gallons per day.

Bluestone Energy Design, Inc., and Clifton Power Corporation facilities are located about 6 miles downstream of Blalock Dam on the Pacolet River. The drainage area of the Pacolet River is about 321 square miles at the hydropower facilities.

Data-Collection Sites

Data were collected in the study area at:

1. The gaging station on the North Pacolet River at Fingerville (02154500): The basin drainage area at this station is 116 square miles. The station has been operated since April 1930 by the U.S. Geological Survey (USGS).
2. The gaging station on the Pacolet River near Fingerville (02155500): The basin drainage area at this station is 212 square miles. The station has been operated since December 1929 by USGS.
3. The gaging station on the Pacolet River at Clifton (02155560): The basin drainage area at this station is 321 square miles. The station was operated from October 1939 to September 1971 by USGS.
4. The gaging station on the Pacolet River near Campobello (02154790): The basin drainage area at this station is 55.4 square miles. The station has been operated since February 1989 by USGS.

5. Blalock Dam:
The daily reading of the lake's gaging staff is used to calculate the daily flow from the dam weir and the 6-inch valve.
6. R.B. Simms Plant:
Rainfall and pan evaporation rates (inches) are measured at the R.B. Simms Plant by SWS. An analysis of the areal distributions, by the Thiessen Polygon method and using stations at Tryon and the R.B. Simms plant and Gaffney, indicate that rainfall and pan evaporation as measured at the R.B. Simms plant would be representative of 86 percent of the area.

Water withdrawals for the Spartanburg Water System were measured at the R.B. Simms plant.

METHOD OF STUDY

The gain or loss in flow is the difference between unregulated and regulated flow in the 100 - 600 cfs (cubic feet per second) range of the Pacolet River at the hydropower facilities.

Flows less than 100 cfs or greater than 600 cfs cannot be utilized by the turbines to generate power at the hydropower facilities.

Unregulated flow is the flow at the hydropower facilities had withdrawals and regulation of impoundments not occurred.

Regulated flow is the flow downstream of withdrawals and regulation of the impoundments.

The flow of the North Pacolet River at Fingerville, South Pacolet River near Campobello, and the inflow to the Pacolet River between the Pacolet River near Fingerville station and Blalock Dam are considered as unregulated flow.

The flow of the Pacolet River near Fingerville and at Blalock Dam is considered to be regulated flow.

Two independent methods were used to calculate the unregulated and regulated flow in the Pacolet River at the hydropower facilities and to determine the daily losses or gains in the river flow that could be used to generate hydropower.

METHOD 1

A computer model was used to calculate flow of the Pacolet River at the hydropower facilities (Fig. 2). The relationship of surface area to stage and the relationship of volume to stage for all impoundments are included in the model. The computational units are in cubic feet per second.

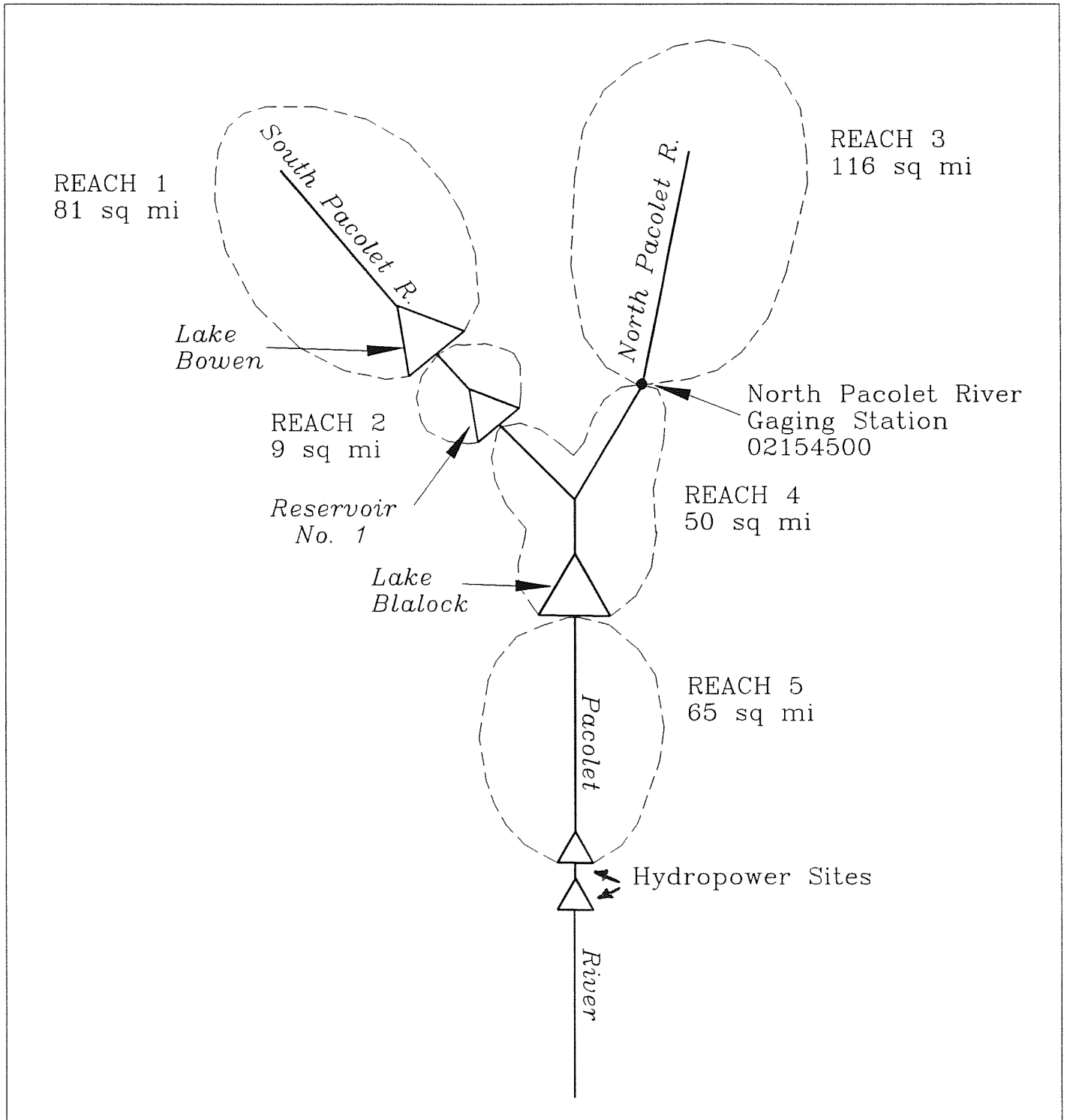


Figure 2. Schematic diagram of the study area in the Pacolet River system.

Model inputs are daily rainfall, withdrawals from Reservoir 1, lake stages, flow from Lake Blalock dam, and the observed daily flows at the North Pacolet River at Fingerville and the Pacolet River near Fingerville from July 1981 to December 1983. A listing of the model inputs is given in Appendix A.

Model outputs are the daily surface area of the impoundments and daily regulated and unregulated flow at the power facilities.

Unregulated flow at the hydropower facilities for the period July 1981 to December 1983 is:

$$UPQ_{PF} = Q_{1545} + LQ_{55-PF} + SPQ$$

Where:

UPQ_{PF} = unregulated flow at the hydropower facilities,

Q_{1545} = observed flow of the North Pacolet River at Fingerville (02154500),

LQ_{55-PF} = inflow to the Pacolet River between the Pacolet River near Fingerville (02155500) and the hydropower facilities, and

SPQ = unregulated flow from reaches 1 and 2.

Regulated flow at the hydropower facilities for the period July 1981 to December 1983 was computed as follows:

$$PQ_{PF} = Q_{1555} + LQ_{55-PF}$$

Where:

PQ_{PF} = regulated flow at the hydropower facilities, and

Q_{1555} = the observed flow of the Pacolet River at Fingerville (02155500).

Unregulated flow at the hydropower facilities for the period December 1983 to September 1991 is:

$$UPQ_{PF} = Q_{1545} + LQ_{45-PF} + SPQ$$

Where:

UPQ_{PF} = unregulated flow at the hydropower facilities,

Q_{1545} = observed flow of the North Pacolet River at Fingerville (02154500),

LQ_{45-PF} = inflow to the Pacolet River between North Pacolet River at Fingerville (02155500) and the hydropower facilities, and

SPQ = unregulated flow from reaches 1 and 2.

Regulated flow at the hydropower facilities for the period December 1983 to September 1991 was computed as follows:

$$PQ_{PF} = PQ_{BL} + LQ_{BL-PF}$$

Where:

PQ_{PF} = regulated flow at the hydropower facilities,

PQ_{BL} = the observed flow at Lake Blalock Dam, and

LQ_{BL-PF} = inflow to the Pacolet River between Blalock Dam and the hydropower facilities.

The difference in the regulated and unregulated flow at the hydropower facilities is;

$$D = \text{regulated flow } (PQ_{PF}) - \text{unregulated flow } (UPQ_{PF})$$

A series of equations was developed to calculate flows in various reaches in the study area. The development of the equations is simplified by using observed flows at the Blalock Dam as follows:

$$D = \text{Regulated flow } (PQ_{BL}) - \text{unregulated flow } (UPQ_{BL}) \dots\dots(1)$$

Where:

PQ_{BL} = Observed flow at Lake Blalock, in cfs, and

UPQ_{BL} = unregulated flow of Pacolet River at Lake Blalock Dam.

The flow of the Pacolet River at Blalock Dam (UPQ_{BL}) can be calculated from the following equation:

$$UPQ_{BL} = Q_{1545} + LQ_{45-BL} + SPQ \dots\dots(2)$$

Where:

Q_{1545} = Flow of North Pacolet River (02154500) at Fingerville,

LQ_{45-BL} = Inflow into Pacolet River between North Pacolet River at Fingerville and Blalock Dam, and

SPQ = Unregulated flow of South Pacolet River in reach 1 and reach 2.

Substituting equation 2 into equation 1,

$$D = PQ_{BL} - Q_{1545} - LQ_{45-BL} - SPQ \dots\dots(3)$$

A mass balance (of water) was used to calculate the unregulated flow of the South Pacolet River (SPQ):

$$SPQ = SPQ_B + SPQ_R \quad \dots\dots(4)$$

Where:

SPQ_B = Unregulated flow in reach 1, and

SPQ_R = Unregulated flow in reach 2.

The mass balance for Lake Bowen is:

$$SPQ_B = \Delta S_B - R_B + E_B + Q_B \quad \dots\dots(5)$$

Where:

ΔS_B = Daily change in storage of Lake Bowen,

R_B = Daily net rainfall on Lake Bowen (rainfall - runoff),
Runoff in inches from the flooded area of the lake is calculated from established relationship between the runoff of North and South Pacolet Rivers.

E_B = Evaporation from Lake Bowen surface area, (0.75 x Pan Evaporation) and,

Q_B = Flow from Lake Bowen dam.

The water mass balance equation for Reservoir 1 is:

$$SPQ_R = \Delta S_R - R_R + E_R - Q_B + Q_R + W_R \quad \dots\dots(6)$$

Where:

ΔS_R = Daily change in storage of Reservoir 1,

R_R = Daily net rainfall on Reservoir 1 (rainfall - runoff),

E_R = Evaporation from Reservoir 1 surface area,

Q_R = Flow from Reservoir 1, and

W_R = Water withdrawal by SWS.

Substitute equations 5 and 6 into equation 4:

$$SPQ = \Delta S_B - R_B + E_B + \Delta S_R - R_R + E_R + Q_R + W_R \quad \dots\dots(7)$$

The water mass balance equation for Lake Blalock is:

$$\Delta S_{BL} = Q_{1545} + LQ_{45-BL} + Q_R + R_{BL} - E_{BL} - Q_{BL} \quad \dots\dots(8)$$

Therefore:

$$LQ_{45-BL} = \Delta S_{BL} - Q_{1545} - Q_R - R_{BL} + E_{BL} + Q_{BL} \quad \dots\dots(9)$$

Where:

ΔS_{BL} = Daily change in storage of Lake Blalock,

R_{BL} = Daily net rainfall (rainfall - runoff),

E_{BL} = Evaporation from surface area of Lake Blalock,

Q_{BL} = Flow from Blalock Dam, and

LQ_{45-BL} = Inflow into the Pacolet River in reach 4.

Substituting equations 9 and 10 into equation 3:

$$D = R_B - E_B - \Delta S_B + R_R - E_R - \Delta S_R + R_{BL} - E_{BL} - \Delta S_{BL} - W_R \quad \dots\dots(10)$$

Assuming that the daily rainfall and evaporation rates are the same in all lakes, equation 10 can be rearranged as follows:

$$D = (R-E) - \Delta S - W_R \quad \dots\dots(11)$$

Where:

$$R = R_B + R_R + R_{BL},$$

$$E = E_B + E_R + E_{BL}, \text{ and}$$

$$\Delta S = \Delta S_B + \Delta S_R + \Delta S_{BL}$$

METHOD 2

The unregulated flow of the Pacolet River at the hydropower facilities for the period 1984 to 1991 was determined by the following equation:

$$UQ_{PF} = (Q_{1545}/116)*212 + ((Q_{BL} + \Delta S - Q_{1555})/44)*109 \quad \dots\dots(12)$$

Where:

UQ_{PF} = unregulated flow at the hydropower facilities,

Q_{BL} = flow from Blalock Dam,

ΔS = change in storage in Blalock Lake, and

Q_{1555} = flow of Pacolet River near Fingerville.

The regulated flow of the Pacolet River at the hydropower facilities was calculated by the following equation:

$$RQ_{PF} = Q_{BL} + ((Q_{BL} + \Delta S - Q_{1555})/44) * 65$$

where:

RQ_{PF} = regulated flow at the hydropower facilities,

Q_{BL} = discharge from Blalock Dam in cfs,

ΔS = change in storage in Lake Blalock, and

Q_{1555} = flow of Pacolet River near Fingerville.

FINDINGS

The daily difference in unregulated flow and regulated flow in the Pacolet River at the hydropower facilities for the period July 1981 to September 1991 are given in Appendix B.

The unregulated flow of the Pacolet River at the hydropower facilities calculated by the model excludes the effects of withdrawals, flow regulation by SWS, and land conversion of the drainage area. The regulated flow (observed) includes the combined effects of regulation, withdrawals, and land conversion. The difference between unregulated and observed flow to generate energy (100 - 600 cfs) equaled the loss or gain at the hydropower facilities. Annual summaries of most variables are given in Table 1. The loss was 7.59 percent of the flow that could be used to generate hydropower at the facilities for the study period.

An analysis of the model output indicates that the flow losses of the Pacolet River caused by water withdrawals are mitigated by rainfall volume and frequency on the lake surfaces and by regulation of the lakes. For example (Fig. 3), on July 12, 1981, SWS withdrew 48 cfs and the difference between net rainfall and evaporation resulted in a loss of 19 cfs, while storage in Lake Bowen increased by 0.04 ft (32 cfs); consequently, the loss in flow amounted to 99 cfs instead of the 48 cfs withdrawn and the 15 cfs loss to evaporation. The following day the water withdrawal and evaporation were the same, but storage in Lake Bowen decreased by 0.01 ft (17 cfs). Consequently, the loss was 50 cfs ($48 + 19 - 17$) instead of the loss of 63 cfs due to only withdrawal and evaporation.

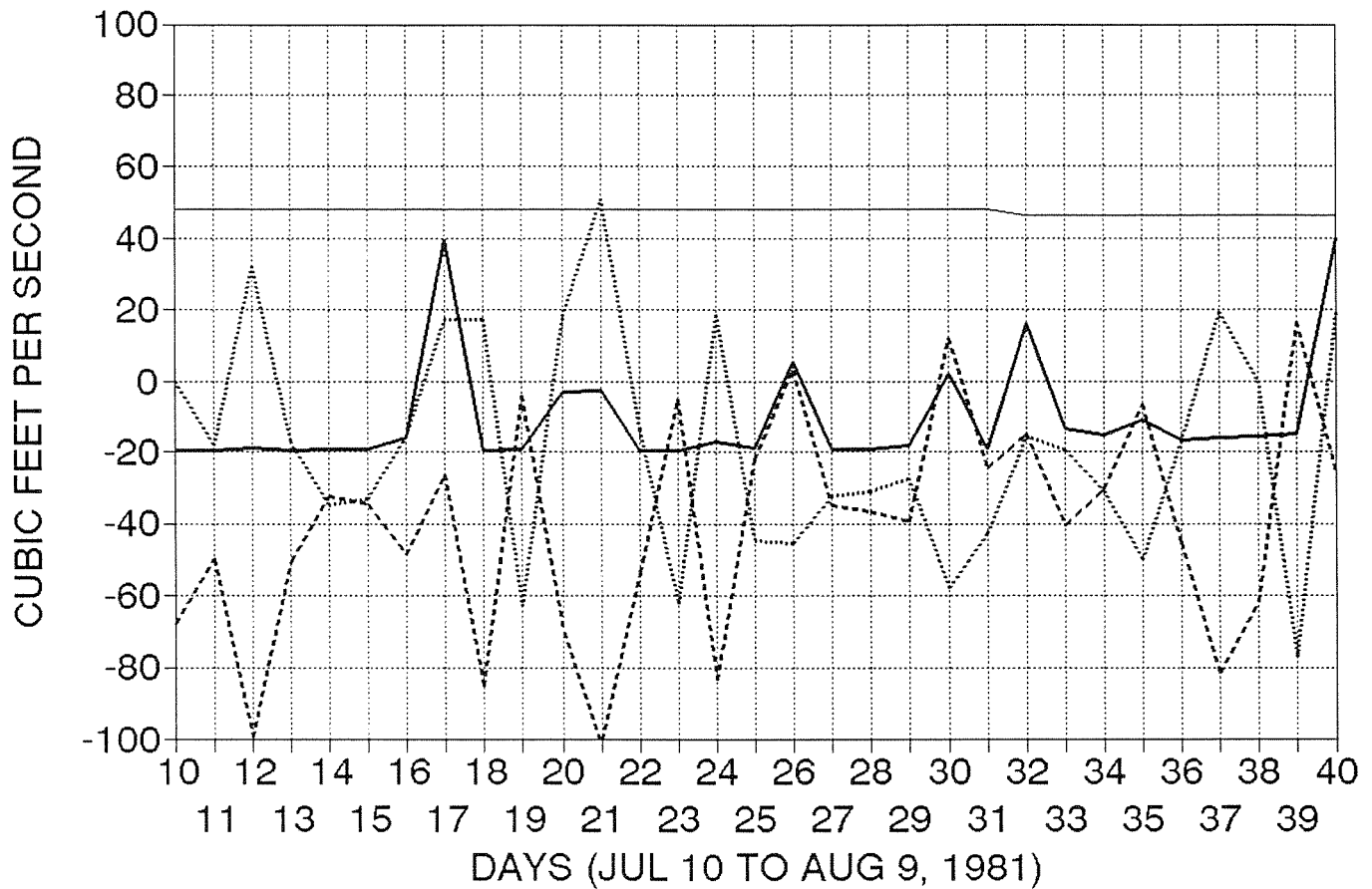
The unregulated flow in the Pacolet River calculated by method 2 and the regulated flow were also used to calculate the daily losses or gains in the river flow (100 - 600 cfs) that could be used to generate energy at the hydropower facilities. Annual summaries of most variables are given in Table 2. The loss was 6.75 percent of the flow that could be used to generate hydropower at the facilities. The model-calculated loss for the same period (1984 - 1991) was 7.52 percent.

A comparison of monthly average runoff in the basin for two periods 1940-1970 and 1981-1991 is shown in Table 3. This comparison indicates that the runoff has increased in the lower part of the basin and is higher than in the upper part of the basin. This increase in runoff in the lower part of the basin may be due to land conversion and basin development.

The loss of water to the power facilities may be minimized or eliminated by changing the regulation of the impoundments operated in the Pacolet River System by SWS.

Table 1. Annual losses or gains in Pacolet River flow that could be used for hydropower generation using the unregulated flow from the model (method 1)

YEAR	UNREG. FLOW AT CLIFTON (CFS)	REG. FLOW AT CLIFTON (CFS)	WITHDR BY SWS (CFS)	LOSSES OR GAINS IN FLOW (CFS)	POTENT. HYDRO ENERGY (FLOW)	PERCENT OF LOSS OR GAIN	TOTAL RAINFALL (INCHES)
1981	38677	30881	7370	- 7213	37301	-19.34	19.19
1982	194259	179560	13714	-11349	150261	- 7.55	58.22
1983	237661	223320	14501	- 8847	164413	- 5.38	56.42
1984	247875	231706	14948	- 5870	183394	- 3.20	60.23
1985	166260	149640	15485	- 9455	137018	- 6.90	49.21
1986	150591	129315	15922	-13434	123964	-10.84	45.82
1987	190272	171828	16224	-12645	155297	- 8.14	46.84
1988	105138	88582	16562	-14668	99461	-14.75	40.76
1989	168727	149116	16531	-11515	143333	- 8.03	58.15
1990	247158	226439	17612	-10828	169227	- 6.40	53.87
1991	201586	185948	13509	- 8418	142482	- 5.91	48.15
TOTAL	1948204	176335	162378	-114242	1506151	- 7.59	



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Figure 3. Daily changes in the Pacolet River flow, reservoir storage, water withdrawals, and net rainfall minus evaporation.

Table 2. Annual losses or gains in Pacolet River flow that could be used for hydropower generation using the unregulated flow from method 2

YEAR	UNREG. FLOW AT CLIFTON (CFS)	REG. FLOW AT CLIFTON (CFS)	WITHDR BY SWS (CFS)	LOSSES OR GAINS IN FLOW (CFS)	POTENT. HYDRO ENERGY FLOW	PERCENT OF LOSS OR GAIN	TOTAL RAINFALL (INCHES)
1984	250564	245185	14948	- 3097	183168	- 1.69	60.23
1985	182021	172544	15485	- 8198	147309	- 5.57	49.21
1986	165958	145831	15922	-13240	131869	-10.04	45.82
1987	190380	167843	16224	-13033	158086	- 8.24	46.84
1988	116355	100801	16562	-12211	105950	-11.53	40.76
1989	179511	166391	16531	-12707	146123	- 8.70	58.15
1990	264416	244741	17612	-11696	169010	- 6.92	53.87
1991	217787	211153	13509	- 6031	147679	- 4.08	48.15
TOTAL	1566992	1454489	162378	-80213	1189194	- 6.75	

Table 3. Average monthly runoff from upper and lower drainage areas of the Pacolet River basin in the study area.

Period	Runoff in Inches	
	Upper	Lower
1940 to 1971	1.98	1.62
1981 to 1991	1.74	2.47

The upper drainage area refers to the drainage area of the North Pacolet Station at Fingerville (116 sq mi).

The lower drainage area refers to the drainage area of the Pacolet River between the Pacolet River station near Fingerville and the hydropower facilities (109 sq mi).

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American Society of Agricultural Engineers, 1985, Advances in evapotranspiration: Proceedings of the National Conference on Advances in Evapotranspiration, December 16-17, 1985. Chicago, Ill.

APPENDIX A

Input Data for Model and Source of Data

Data	Source
(1) Daily flow of North Pacolet River gaging station (02154500), and Pacolet River gaging station (02155500)	USGS
(2) Spartanburg Water System (SWS) withdrawal by R.B. Simms Plant July 1981 to December 1990	Charles Mierek's files
January 1991 to September 1991	SWS
1 Mgd was subtracted from SWS water withdrawal due to the discharge of Hoechst Celanese Corp. (one of the water users of SWS) in Pacolet River and upstream of the hydropower facilities.	
(3) Pan daily evaporation at R.B. Simms Plant	
July 1981 to December 1990	Charles Mierek's files
January 1991 to September 1991	SWS
(4) Lake Bowen, Reservoir 1, and Lake Blalock data	
A. Daily elevation	SWS
B. Elevation and surface area and storage relationships	SWS
(5) Daily discharge from Lake Blalock	SWS

APPENDIX B

DAILY DIFFERENCE IN REGULATED FLOW AND UNREGULATED FLOW IN THE
PACOLET RIVER FOR THE PERIOD FROM JULY 1981 TO SEPTEMBER 1991

DAY OF THE YEARThe daily difference between regulated and unregulated flow of Pacolet River at Clifton....

YEAR	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
1		0.00	-73.54	67.04	40.83	0.00	0.00	0.00	0.00	0.00	-51.11
2		0.00	-133.35	111.25	-12.01	-10.74	0.00	31.25	-161.53	0.00	-87.97
3		0.00	-23.93	48.17	0.00	-37.32	0.00	-24.63	-73.87	-12.05	-70.97
4		0.00	11.71	35.21	0.00	-68.00	-34.48	-2.08	-52.30	-9.07	49.20
5		0.00	24.88	118.18	0.00	-157.27	-58.83	36.83	-83.57	0.00	-26.26
6		0.00	-5.82	230.60	0.00	-91.46	-5.27	14.54	-150.32	0.00	-78.21
7		0.00	-26.17	31.06	95.33	-62.77	12.74	87.38	18.77	0.00	20.56
8		0.00	-41.54	119.92	-40.26	-126.06	56.64	33.62	-106.22	0.00	-41.50
9		0.00	-41.45	50.11	-49.32	4.95	35.70	67.85	-68.03	0.00	-108.18
10		56.66	-39.11	0.00	-49.96	-24.58	-15.15	-113.97	-85.52	0.00	-19.53
11		24.46	-12.00	0.00	-10.82	-5.25	-26.17	56.12	-21.66	0.00	0.00
12		-61.27	-10.48	0.00	15.71	3.87	-14.89	-10.51	-244.93	-40.03	0.00
13		-84.28	-18.32	45.86	3.50	-30.23	39.24	-17.84	-147.05	-48.59	0.00
14		-66.02	-18.80	-9.37	3.59	-38.25	-7.31	-99.50	-106.53	11.24	0.00
15		-79.47	-41.09	-43.01	40.67	-36.01	-2.25	-19.41	-124.90	33.24	0.00
16		-44.49	-14.57	-38.64	50.98	-22.15	12.19	44.60	-62.47	-27.62	0.00
17		-41.19	-8.64	-54.59	-24.82	-73.64	-15.80	-106.68	-125.95	-11.38	0.00
18		-9.73	-19.95	-53.99	21.76	-121.23	0.00	0.00	-82.96	-24.71	0.00
19		-5.26	-51.30	0.00	0.63	-31.96	0.00	0.00	-66.70	4.55	0.00
20		-60.91	-40.80	0.00	61.03	-53.78	0.00	0.00	-80.30	-21.62	0.00
21		-14.10	-52.87	0.00	17.62	-252.89	0.00	0.00	-64.22	0.00	-18.18
22		0.00	0.00	65.45	33.50	-66.32	0.00	0.00	-54.64	0.00	-52.87
23		0.00	0.00	101.13	-3.77	-31.39	0.00	0.00	-14.41	0.00	-22.16
24		0.00	0.00	-35.01	34.79	6.21	0.00	2.29	-136.28	-4.04	2.70
25		0.00	0.00	0.00	-6.24	-102.25	0.00	-58.50	-35.16	0.00	94.17
26		0.00	0.00	0.00	13.75	-84.09	0.00	-15.33	-51.82	0.00	29.71
27		22.32	0.00	-7.91	-4.52	-58.94	0.00	-52.08	-41.41	0.00	76.65
28		-12.96	0.00	-51.61	16.95	0.44	39.29	13.08	-51.71	0.00	34.16
29		-26.84	0.00	-50.58	6.66	-54.30	0.00	-23.34	-72.17	-8.09	-25.01
30		-80.74	-15.28	12.65	0.93	-51.98	0.00	-20.23	-96.55	0.00	0.00
31		-37.57	-18.11	0.00	-4.71	-111.22	0.00	58.75	-57.99	0.00	82.45
32		-75.29	14.97	78.66	0.00	-68.68	-19.25	-165.33	-51.12	0.00	-36.13
33		0.00	0.00	-100.92	0.00	-82.55	0.00	49.39	-68.70	0.00	52.19
34		0.00	0.00	-0.71	0.00	-92.47	0.00	127.30	-67.19	0.00	58.35
35		0.00	0.00	-16.50	0.00	-69.55	0.00	-39.89	-52.54	0.00	-5.53
36		0.00	0.00	-15.79	0.00	-124.89	0.00	-47.28	-49.59	0.00	69.62
37		0.00	0.00	86.56	0.00	-6.33	6.20	1.58	-71.61	0.00	94.67
38		0.00	0.00	-45.65	0.00	-70.28	0.00	-2.36	-52.02	0.00	-86.77
39		0.00	0.00	25.66	85.49	-45.58	-3.67	-49.42	-83.02	32.79	-49.57
40		0.00	0.00	10.19	-12.03	-68.77	-20.42	64.90	-51.31	0.00	-53.07
41		0.00	0.00	4.34	-25.92	-70.87	65.04	40.62	-68.67	0.00	-75.71
42		0.00	0.00	-30.95	-83.13	-115.93	35.15	-30.17	-51.46	0.00	-57.19
43		85.96	0.00	-11.04	0.00	-49.22	-20.42	17.23	-53.16	0.00	-52.52
44		-40.85	0.00	0.00	0.00	-95.64	6.61	86.62	-67.02	0.00	-153.62
45		-66.75	0.00	0.00	0.00	-62.13	-7.65	-106.19	-29.43	0.00	25.33
46		-66.31	0.00	0.00	28.37	-111.18	-12.22	-109.01	-61.19	0.00	-68.59
47		0.00	0.00	0.00	0.00	-84.71	0.00	-103.35	-52.95	0.00	-42.51
48		0.00	0.00	0.00	112.42	-6.15	0.00	-30.41	-40.75	0.00	-56.10
49		0.00	-12.54	0.00	57.68	-54.05	0.00	-105.05	-99.41	0.00	-36.93
50		0.00	-19.94	0.00	63.60	-26.00	33.08	-82.33	-125.32	0.00	-69.30
51		0.00	-36.44	0.00	118.94	-38.37	0.00	-91.82	-68.95	0.00	10.81
52		-51.08	-6.33	129.17	-5.17	-47.97	0.00	-48.38	-183.70	0.00	-59.30
53		-19.38	-38.41	12.90	92.04	-76.51	0.00	-29.08	-193.31	0.00	-21.09
54		-13.87	0.00	0.00	115.72	-83.08	0.00	-37.76	-79.23	0.00	-54.16
55		-50.04	0.00	0.00	8.17	-83.92	0.00	-29.62	-69.95	0.00	-24.36

56	-49.84	0.00	0.00	88.33	-93.99	-18.13	-21.85	-77.88	0.00	-51.56
57	-48.33	0.00	0.00	0.00	-12.29	0.00	-55.26	-92.93	0.00	-10.20
58	-33.12	0.00	0.00	0.00	-22.65	0.00	-11.65	-45.87	0.00	-45.43
59	0.00	-6.70	0.00	3.43	-68.20	0.00	-63.23	0.00	0.00	-15.29
60	0.00	-26.34	0.00	73.06	-66.25	0.00	-90.85	0.00	0.00	-26.45
61	-34.98	-126.41	0.00	-43.38	-124.63	0.00	-59.57	-65.27	0.00	-50.12
62	-20.73	-93.36	0.00	-69.18	-38.44	0.00	-95.90	-61.83	0.00	0.00
63	-15.04	98.66	0.00	-76.76	-81.06	0.00	-92.30	0.00	0.00	0.00
64	-31.84	45.97	0.00	-132.41	-110.70	0.00	-71.41	0.00	0.00	-35.55
65	-31.60	0.00	0.00	-24.73	-56.84	0.00	-40.21	0.00	0.00	-88.81
66	0.00	0.00	0.00	-31.06	-89.11	0.00	-75.05	18.63	0.00	-39.83
67	0.00	0.00	0.00	-71.44	-83.05	0.00	-59.93	-13.82	0.00	0.00
68	-35.63	0.00	0.00	-45.81	-76.07	0.00	-74.65	10.73	0.00	0.00
69	-51.55	0.00	0.00	-43.85	-68.48	0.00	-44.92	-68.66	0.00	-17.67
70	-31.99	0.00	0.00	-17.02	-64.71	0.00	-70.76	-52.28	0.00	-50.12
71	-35.60	0.00	0.00	-33.58	-80.71	0.00	8.44	-19.50	0.00	10.76
72	-43.19	0.00	0.00	-13.19	0.00	0.00	-68.08	12.42	0.00	-69.73
73	-67.88	0.00	0.00	46.21	6.23	0.00	-100.94	-43.91	0.00	-33.62
74	-13.95	-21.06	0.00	-44.35	45.08	0.00	-39.50	-91.09	0.00	-112.56
75	-65.43	-35.71	0.00	-110.30	-85.09	0.00	-69.94	-72.51	0.00	-50.04
76	-34.68	0.00	0.00	-40.68	-102.29	-9.61	-31.76	-93.04	0.00	-56.94
77	-30.67	0.00	0.00	-47.80	-58.14	0.00	-137.15	-45.84	0.00	-53.99
78	-12.08	0.00	0.00	-76.07	-134.56	0.00	-25.44	-94.63	0.00	-62.95
79	-16.18	0.00	0.00	-111.04	-164.08	0.00	-113.95	-18.22	0.00	-43.79
80	-63.32	0.00	-2.52	-29.00	11.86	0.00	-115.51	-58.97	0.00	-66.54
81	-15.62	0.00	0.00	-43.29	31.41	28.85	-92.46	0.00	0.00	-71.01
82	-34.72	0.00	0.00	-117.45	-248.86	-29.59	-34.24	0.00	0.00	-64.76
83	-14.21	0.00	-9.83	-127.59	-91.73	0.00	-107.75	0.00	0.00	-97.60
84	-50.10	0.00	0.00	-40.19	-110.40	0.00	-75.29	187.11	0.00	-41.57
85	-13.74	0.00	0.00	-99.97	-68.22	0.00	-46.67	95.51	0.00	-73.83
86	-34.38	0.00	0.00	-65.86	-90.37	0.00	-67.94	-20.74	0.00	-95.11
87	-49.80	0.00	12.05	-65.64	-119.80	0.00	-175.53	37.07	0.00	-67.92
88	-1.78	0.00	0.00	-72.03	-76.28	0.00	-70.40	5.44	0.00	0.00
89	1.19	0.00	0.00	-102.08	-107.22	0.00	-87.31	-0.86	0.00	0.00
90	-72.12	0.00	0.00	-96.13	-84.14	0.00	-80.58	-37.39	0.00	0.00
91	-71.97	0.00	0.00	-65.94	-111.90	0.00	-40.60	-24.98	0.00	0.00
92	-39.35	0.00	0.00	-184.19	-77.59	0.00	-64.65	-57.54	0.00	0.00
93	-29.29	0.00	0.00	-65.17	-45.91	0.00	-16.63	-73.04	0.00	0.00
94	-57.22	0.00	0.00	-102.34	-59.43	0.00	-99.50	-64.16	0.00	0.00
95	42.02	0.00	0.00	-49.02	-36.23	0.00	-102.09	-27.48	0.00	0.00
96	-49.10	0.00	0.00	-104.29	-103.94	0.00	-69.76	-8.25	0.00	0.00
97	47.02	0.00	0.00	-140.33	-80.42	0.00	-94.29	-27.26	0.00	0.00
98	-36.97	0.00	0.00	-129.95	-32.70	0.00	42.04	-48.59	0.00	0.00
99	-125.28	0.00	0.00	-81.43	-91.45	0.00	-7.65	-95.72	-38.38	0.00
100	-37.46	0.00	0.00	-56.13	-99.38	0.00	-67.33	-64.63	0.00	0.00
101	-20.17	0.00	0.00	-89.32	-80.31	0.00	-23.99	-22.33	0.00	0.00
102	-71.69	0.00	0.00	-81.42	-72.81	-27.15	-54.60	-21.50	0.00	0.00
103	-52.68	0.00	0.00	-54.20	-91.12	-28.61	-124.76	-39.82	19.23	0.00
104	-10.27	0.00	0.00	-130.61	-72.74	0.00	-61.83	-84.67	-26.02	0.00
105	-112.22	0.00	0.00	-61.89	-85.97	0.00	36.88	-119.92	0.00	0.00
106	-112.41	0.00	0.00	-74.07	-72.68	0.00	35.76	-18.78	0.00	0.00
107	-102.79	0.00	0.00	-140.70	-72.58	0.00	-59.42	-99.10	35.94	0.00
108	30.49	0.00	0.00	-74.61	-29.65	0.00	-18.62	-30.28	2.98	0.00
109	-51.84	0.00	0.00	-110.73	-72.57	-19.33	-20.65	-46.07	-32.75	0.00
110	-8.99	0.00	0.00	-67.65	-35.20	-42.59	-44.06	-8.01	-13.75	0.00
111	-31.26	0.00	0.00	-105.83	-59.88	-44.82	-77.20	-28.69	0.00	0.00
112	-73.22	0.00	0.00	-78.45	-65.02	-58.47	-32.58	-64.04	16.29	0.00
113	-74.39	0.00	0.00	-28.47	-75.84	-40.03	-51.43	-30.29	-59.03	0.00
114	-73.79	0.00	0.00	-127.40	-83.79	-34.99	-41.82	-103.03	-48.29	0.00
115	-80.10	0.00	0.00	-116.75	-34.18	-50.09	-61.11	-45.86	-65.19	0.00

116	0.00	0.00	0.00	-77.42	29.42	-19.34	-41.51	-90.37	-73.33	0.00
117	0.00	0.00	0.00	-66.74	30.38	-50.50	-33.50	0.00	-35.32	0.00
118	0.00	0.00	0.00	-40.28	12.32	-34.17	-66.35	-62.39	0.00	0.00
119	0.00	0.00	8.51	-58.50	-45.94	-67.14	-242.99	307.58	0.00	0.00
120	53.18	0.00	0.00	-58.39	-30.21	-65.61	-66.16	-69.11	-44.46	0.00
121	-66.55	0.00	0.00	-72.93	40.81	-68.96	134.23	-9.13	-62.71	0.00
122	-31.32	0.00	0.00	-103.66	-21.59	-70.88	-40.71	87.93	0.00	0.00
123	-35.12	0.00	0.00	-36.12	54.81	-62.95	-60.25	-33.61	0.00	0.00
124	-42.01	0.00	0.00	-164.70	13.49	-55.78	-41.83	-25.90	81.09	0.00
125	-49.49	-8.72	0.00	-59.89	-53.66	-22.63	-91.18	0.00	-51.19	0.00
126	-60.43	-14.24	0.00	-94.36	13.35	-25.74	-43.79	0.00	-36.80	0.00
127	-60.68	-56.00	0.00	-28.11	-0.19	-51.18	-127.11	178.96	-46.12	0.00
128	-64.80	-2.06	0.00	-155.77	33.31	-59.41	-52.24	30.66	-68.75	0.00
129	-31.53	-0.24	0.00	-30.93	-65.43	-44.54	-50.55	0.84	0.00	0.00
130	-5.01	-57.20	0.00	-108.92	-2.43	-42.35	-58.53	-45.02	0.00	0.00
131	-26.06	-122.00	0.00	-37.11	-66.83	-91.54	-91.18	-51.02	0.00	0.00
132	-43.27	-128.34	0.00	-134.38	-7.49	-59.24	-75.61	-0.80	-8.40	0.00
133	-29.23	-131.40	0.00	-129.39	-23.67	-93.12	-50.58	-23.29	-58.47	0.00
134	-61.99	-114.12	0.00	-22.65	-256.76	-90.81	-64.03	-41.93	-55.27	0.00
135	-12.05	-140.09	0.00	-40.11	-124.41	-68.50	-51.34	-55.15	-86.51	0.00
136	-40.97	-76.00	0.00	-142.92	12.41	-111.03	-63.60	-48.55	-47.21	0.00
137	-68.85	-12.75	0.00	-61.85	-117.83	-43.56	-49.94	-47.72	-67.01	-10.44
138	-63.29	-12.41	0.00	-76.12	-96.28	-8.74	-79.06	-62.67	-78.59	-33.92
139	-40.96	0.00	-8.71	-59.81	-124.51	-42.94	-60.96	-58.62	-68.73	0.00
140	-212.07	0.00	-10.95	-86.21	-141.49	-124.02	-43.58	-106.17	-71.13	0.00
141	-57.27	0.00	-33.87	-58.64	-26.53	-18.40	-51.06	-75.67	-90.00	0.00
142	-40.43	0.00	-37.79	-98.90	-96.50	-67.10	-41.90	-109.37	-40.86	0.00
143	-28.39	0.00	-36.11	-0.31	-64.77	-100.85	-42.82	21.59	-62.54	0.00
144	-82.74	0.00	0.00	-85.32	-35.75	-67.00	-58.14	-37.42	-98.00	0.00
145	-80.92	0.00	0.00	-67.94	-89.55	-142.91	-11.80	25.12	-121.21	0.00
146	-51.76	0.00	-0.92	-92.92	-30.97	-75.00	-66.52	-56.42	-97.86	0.00
147	0.00	0.00	-23.28	-36.50	-76.94	-157.81	-19.08	-58.79	-67.45	0.00
148	0.00	-29.65	-31.39	-56.21	-142.34	-63.10	-20.40	-72.06	0.00	0.00
149	0.00	-42.40	0.00	-76.09	-39.12	-82.38	-42.65	-29.42	-150.46	118.71
150	84.26	-54.09	0.00	-67.81	-51.25	-103.77	-11.74	-39.52	-14.83	0.00
151	-79.86	-77.86	0.00	-85.81	-82.34	-77.99	-51.45	-71.98	-102.24	0.00
152	-76.02	-40.66	-18.80	-26.03	-40.25	-96.38	-41.62	-33.96	-24.00	-37.85
153	40.99	-80.79	-44.52	-69.13	-79.57	-74.52	-44.32	-27.01	-160.77	-56.84
154	-7.10	-80.89	-22.34	-57.21	-30.45	-60.82	32.86	-26.75	-170.53	-116.65
155	-0.05	-27.37	-22.10	-7.06	-63.88	-33.31	32.64	-48.49	-90.69	-10.98
156	-96.02	-81.73	-50.07	-5.13	-79.56	-137.92	11.88	92.79	-7.59	-38.18
157	-81.69	-29.46	-31.10	85.17	-72.74	-70.72	-41.46	-165.46	-121.05	-35.61
158	-27.39	-18.11	-8.64	12.66	-64.55	-59.27	-66.55	-93.00	-97.11	-81.67
159	-25.32	-13.97	-91.94	-163.71	-48.86	-33.02	7.83	-89.93	-87.70	-107.12
160	-78.52	-16.28	-42.24	-107.41	-32.45	-30.63	4.01	-91.55	-71.41	-103.92
161	85.71	-30.93	-77.00	-61.37	0.00	-15.67	56.89	-103.09	-99.98	-126.17
162	-58.22	-16.18	6.85	-58.16	0.00	-48.66	13.42	-94.39	-116.44	-73.25
163	109.09	-81.42	-56.09	-53.09	0.00	-95.97	-10.23	-61.48	-64.56	-100.92
164	-34.12	-32.13	3.78	-21.83	197.12	-51.42	-4.72	-70.34	-79.89	-149.77
165	-28.13	-32.68	-97.21	-57.18	2.79	-80.21	-37.52	-20.22	-104.84	-90.50
166	-29.14	20.82	-40.30	-7.56	-13.15	-80.37	5.30	-67.71	-55.26	-140.00
167	-8.50	-62.51	-26.28	-81.77	-21.40	-64.10	22.77	-65.37	-77.49	-176.45
168	-64.60	-80.44	-0.75	-74.27	46.89	28.75	13.29	-129.97	-97.82	-30.54
169	0.00	-43.07	-7.32	-32.97	1.77	-102.74	-126.82	-52.58	-77.42	-28.74
170	0.00	-145.66	-38.91	-57.02	19.60	0.00	-62.67	-125.93	-11.84	-136.95
171	0.00	-143.27	26.75	-56.62	-99.15	-59.09	-189.45	0.00	-35.29	0.00
172	-25.12	-98.59	-97.51	-38.60	85.71	137.73	-65.63	0.00	9.66	0.00
173	21.44	-86.16	-10.85	26.16	45.26	4.92	-43.96	0.00	-21.62	0.00
174	-8.20	-67.88	-91.55	-55.84	116.33	-48.75	-38.74	0.00	-40.31	-66.97
175	-61.57	-11.55	0.00	-31.76	-124.24	-64.31	5.44	67.10	-95.98	-10.38

176		-82.05	-47.51	0.00	-115.50	-10.87	-36.13	-45.27	209.06	-8.08	-30.94
177		-30.12	-63.11	-46.60	-41.35	26.07	-36.23	-23.95	-35.12	-63.24	-44.27
178		3.85	-63.01	-57.31	-41.84	65.17	-152.86	-24.75	19.29	-50.35	-53.93
179		37.05	-68.07	-70.25	-3.32	38.06	-20.12	8.07	38.16	-45.15	-106.28
180		12.42	-63.96	-60.26	21.42	-22.61	2.27	-30.96	-35.17	-102.81	-112.70
181		-122.07	-100.28	0.00	-82.96	-39.86	-17.59	-22.25	-18.84	-69.32	-103.04
182		-42.39	0.00	0.00	-91.80	-7.42	-68.58	-21.62	-34.38	-68.44	-107.77
183		-60.14	0.00	0.00	-61.38	-9.62	-86.63	-9.67	-11.26	-37.79	-82.20
184		-60.04	0.00	75.08	-103.30	-60.31	-177.08	-89.53	0.00	-44.78	-121.37
185		-42.89	-63.10	-57.91	-59.65	-45.81	-19.59	6.36	0.00	1.11	-90.52
186		-28.87	-45.31	-28.83	-86.35	-44.51	-142.72	-105.73	-30.79	-84.16	-68.82
187		-27.22	-59.28	-74.87	-59.30	-40.76	11.22	-91.24	98.97	-63.33	-61.52
188		-20.54	-21.11	-75.36	-77.57	-15.70	-96.15	-15.46	0.00	10.32	-33.92
189		-96.63	-41.77	-34.38	-50.91	0.00	-31.15	-60.53	0.00	-88.84	0.35
190		-94.72	13.59	-36.00	73.35	-38.69	-50.03	-28.48	-3.68	-53.58	-58.49
191	-67.65	50.57	110.76	-45.23	-61.55	-12.48	-98.06	-7.86	154.46	-81.05	-31.30
192	-49.58	50.53	-23.82	-18.78	-51.74	-9.25	-28.20	-26.08	-24.85	38.52	-20.07
193	-99.23	-185.22	-124.40	-35.99	-29.75	-0.87	-60.47	-27.08	49.85	-37.79	-57.89
194	-50.57	-41.82	-22.37	-80.06	-101.71	0.00	-44.21	-14.15	-26.32	-26.79	-77.15
195	-32.38	-100.75	-89.67	-68.29	-27.98	0.00	-43.42	-74.73	-57.94	5.09	-9.82
196	-34.27	-82.25	8.13	0.00	-56.07	3.42	-12.91	-55.07	-21.86	-179.13	-118.03
197	-48.69	-21.74	-18.03	0.00	18.89	-79.36	-50.69	-28.33	-18.41	-44.91	-125.11
198	-26.28	-60.91	-35.57	0.00	-80.09	0.00	-57.98	-21.92	30.49	-42.40	-109.69
199	-85.20	-85.51	-52.52	0.00	0.03	0.00	-33.90	-2.21	-16.61	-28.30	-174.75
200	-4.21	-34.82	-20.25	0.00	-25.17	-19.84	-66.72	-17.51	94.45	-168.69	-85.05
201	-69.51	-61.46	-53.22	0.00	-37.85	0.00	-49.06	0.00	-125.28	-157.16	-105.56
202	-101.70	-77.62	-3.31	0.00	-40.97	0.00	-2.56	-14.34	27.03	-80.43	-49.36
203	-53.73	-14.82	13.08	0.00	-40.82	0.00	-13.35	0.00	-111.00	-100.05	-32.93
204	-5.51	-78.34	-3.86	72.72	-79.14	-0.63	-35.15	-28.34	11.96	-173.39	0.00
205	-83.42	-59.38	-5.39	-8.71	-3.67	0.00	-44.11	-38.04	-43.64	-67.25	-61.69
206	-22.19	-45.07	-27.71	-52.72	-50.98	-30.93	-59.62	-68.39	50.06	-61.15	-47.78
207	2.81	-79.48	-160.31	-36.22	-108.54	-15.43	-50.09	-60.00	-36.20	-206.69	-97.93
208	-34.97	-27.58	-87.36	-74.90	-117.37	0.00	-67.22	-16.43	-95.20	-60.57	-53.16
209	-36.49	-5.98	-37.25	0.00	-76.43	-69.09	-43.15	-22.37	-40.85	-61.92	0.00
210	-39.39	-104.72	-20.10	-22.10	-28.90	-27.69	-65.75	-18.06	-72.66	-108.26	0.00
211	11.95	-89.52	-4.74	0.00	-184.09	-6.61	-63.06	-15.64	-48.94	-52.10	0.00
212	-24.73	0.00	-53.65	0.00	-130.55	0.00	-182.96	-45.99	28.08	-19.53	0.00
213	-14.55	0.00	-193.78	0.00	-82.11	0.00	-168.73	-25.70	-126.58	-61.00	257.20
214	-40.28	28.16	-75.77	0.00	-59.84	0.00	68.42	0.00	-95.35	-62.65	0.00
215	-30.25	-32.15	-68.12	0.00	-103.03	-31.63	-120.47	0.00	-35.02	-77.48	0.00
216	-6.81	-47.06	-71.87	0.00	18.95	0.00	-0.10	-19.39	-36.45	-0.68	100.62
217	-45.53	-53.93	-83.80	0.00	-79.89	-48.42	-41.59	-13.20	16.84	-96.57	103.99
218	-81.71	-35.01	-13.83	0.00	-73.54	-88.57	-92.51	0.00	-59.47	-22.93	-54.97
219	-61.64	-58.92	-99.20	26.72	-65.24	-45.12	-49.03	-46.91	-35.58	-104.96	-55.19
220	16.30	-62.32	-68.00	-75.30	-103.34	0.00	-104.51	-9.61	-19.21	-56.07	-164.88
221	-25.36	-80.57	-67.95	-92.11	-73.36	-113.88	-86.26	-3.74	-53.90	-19.91	46.22
222	-42.34	-17.19	-79.48	-121.20	-85.87	-81.29	-82.16	0.00	-46.76	-89.07	0.00
223	1.54	-54.12	-48.41	-43.20	-43.14	-71.21	-67.27	0.00	5.34	-72.56	-107.94
224	-58.27	-25.65	-57.97	-104.47	-64.79	57.88	-49.45	-126.16	-68.59	-36.20	0.00
225	-16.44	-35.67	1.59	-48.44	-29.29	-114.81	-28.50	-15.07	-110.21	-34.28	221.42
226	-16.41	47.63	-39.89	0.00	-45.62	-4.11	-64.63	0.00	-41.90	-22.38	0.00
227	-63.05	-119.46	-48.45	0.00	-39.61	-33.78	23.62	0.00	-93.73	-77.73	0.00
228	2.92	-24.84	-17.95	0.00	0.00	0.00	-41.46	0.00	-89.49	-32.59	0.00
229	-42.96	-0.46	-82.69	84.83	0.00	0.00	79.00	0.00	-20.21	-49.26	13.53
230	-62.16	-26.91	-17.98	89.73	0.00	0.00	-147.27	0.00	-54.80	-31.41	0.00
231	-30.33	-25.08	-12.63	80.70	722.44	0.00	8.91	0.00	-96.59	-40.75	27.41
232	-12.57	-59.21	-17.02	-86.01	177.58	0.00	-85.80	0.00	-85.39	-46.73	-99.92
233	-11.69	-42.09	-48.69	-61.51	239.55	344.01	-67.65	0.00	-55.12	-21.29	-92.72
234	-16.96	-62.41	-143.46	-64.31	119.50	-100.65	3.59	-23.72	-26.07	-68.93	-72.46
235	-32.35	-58.97	-32.11	-144.18	-43.51	-0.25	-39.96	-49.69	-31.52	-201.80	-96.01

236	-30.81	-10.94	-100.67	21.44	-65.83	-126.85	-59.63	0.00	-41.60	-64.95	-107.32
237	-32.31	-7.47	-46.63	-80.18	-48.38	-47.51	-39.76	-21.42	-31.10	-56.94	-43.57
238	-15.24	-10.75	-51.87	-63.87	-61.72	-72.73	1.60	-12.04	-81.64	-72.73	0.00
239	-32.24	-26.11	-99.92	-62.69	94.57	-35.61	57.34	0.00	-101.92	-72.88	0.00
240	-11.37	-48.82	-51.75	-130.22	-82.60	-47.34	-5.62	0.00	-68.35	-49.14	0.00
241	-17.29	-66.21	-88.15	-48.64	-87.86	-49.26	-2.50	0.00	-138.40	-76.74	0.00
242	-45.29	-41.51	-22.38	-141.61	-125.12	-50.98	-0.21	-65.71	-91.99	0.00	0.00
243	-16.71	11.98	4.71	-49.22	36.07	-58.18	-4.09	-98.69	-75.68	0.00	0.00
244	-31.31	-50.99	40.72	-53.77	86.62	-73.84	-19.88	-27.00	-27.73	-147.64	15.56
245	-10.79	-59.75	-25.55	-6.87	12.28	0.00	-19.37	0.00	-35.74	64.87	-83.85
246	-42.95	-14.50	-79.10	-82.98	-38.14	0.00	12.13	-1.44	-63.31	-90.02	-59.46
247	12.39	-19.60	-80.09	-49.21	-120.43	0.00	-12.76	-6.39	-19.97	20.10	-50.37
248	-14.60	11.61	-104.68	15.47	-48.53	0.00	-6.20	-37.06	-17.69	-92.34	-63.89
249	0.00	-38.50	-49.62	-79.89	-0.93	-104.23	-86.57	-153.19	-36.16	-6.33	-59.59
250	0.00	-22.97	-107.75	-60.68	-32.58	-92.28	-155.66	-26.34	-74.23	-30.40	-9.41
251	-83.42	-1.04	-42.60	-90.00	-53.63	-55.42	49.17	-13.68	-87.48	-40.25	-90.57
252	-33.76	-38.24	-60.88	-56.11	-57.75	-70.45	5.96	-10.29	-39.77	-108.73	-39.67
253	-50.66	70.23	-46.87	-63.43	-35.47	-137.26	-23.80	-38.66	-42.35	-84.01	-46.38
254	-17.10	-316.38	-45.31	-34.67	6.76	-71.44	0.00	-76.69	-81.51	-16.06	-140.94
255	-30.81	-87.53	-42.31	-112.52	-53.48	-63.43	-97.38	-19.27	-13.08	-52.83	-34.95
256	-32.16	-53.16	-49.92	-56.94	-7.08	-89.92	-57.07	-36.65	-60.26	-51.11	-89.32
257	-65.27	-34.47	-42.52	-126.50	-76.24	-47.88	-21.33	-33.38	-12.70	-22.40	-80.84
258	-59.84	-90.20	-39.94	-41.56	-53.26	-55.17	-33.28	-11.20	-66.84	82.74	-104.89
259	-41.46	-34.90	-28.58	-66.08	-37.70	-55.10	-11.96	-6.04	-4.56	-25.59	-71.08
260	-12.81	-73.15	-54.94	-63.02	-20.63	-63.06	-28.40	-10.88	-80.78	21.40	-49.86
261	-30.36	-22.00	-45.24	-66.48	-60.47	-43.34	-83.84	-54.46	-35.63	99.85	-79.01
262	-31.77	-23.42	-9.90	41.88	-50.05	-55.42	-20.35	-149.34	-6.64	-59.24	-42.57
263	-31.70	-38.65	6.40	-79.78	-27.10	-68.24	-82.88	-49.68	45.49	-2.73	-99.71
264	-31.65	-20.66	-37.87	-28.21	-9.24	28.39	-16.93	-80.16	167.24	7.80	-71.88
265	-27.81	-29.89	-84.14	-19.13	-60.88	-73.34	-85.54	-9.03	86.71	-46.82	-63.36
266	-26.20	-67.05	-44.47	-22.83	-44.67	-27.87	-135.86	-6.52	-70.61	-57.34	-68.44
267	-31.50	-72.98	-42.56	-70.70	20.87	-43.87	84.97	-33.31	-9.99	-40.07	-69.96
268	-31.44	-53.72	-57.85	-65.61	-45.28	-70.22	-40.97	1.70	0.00	6.82	-63.88
269	-32.94	10.80	-9.31	-39.14	-44.47	-35.61	-0.31	-21.99	38.11	-72.34	-105.10
270	-31.37	-4.50	-26.24	-41.95	-37.08	-61.99	-47.12	-73.02	-185.42	-40.26	-84.85
271	-12.40	-53.69	25.29	-58.83	10.89	-43.86	24.55	-19.86	-72.56	-72.18	-74.78
272	-17.30	-18.14	-28.06	6.81	-67.78	-46.32	-33.16	-7.12	-87.66	-56.71	-15.17
273	-26.69	-31.20	-27.32	-74.44	-52.33	-36.32	51.03	-18.63	0.00	-73.14	-31.44
274	-22.13	38.32	-49.45	38.36	-38.10	-77.80	11.72	-33.12	0.00	-48.77	
275	-9.48	-31.79	-34.98	-33.04	-47.92	-35.30	-28.03	0.00	0.00	-65.71	
276	-40.36	50.04	-19.40	5.44	-46.21	0.45	-27.20	-215.84	455.09	-26.60	
277	4.50	-48.38	-51.55	-13.72	-44.05	-60.13	-40.06	-158.52	493.62	-23.83	
278	-6.49	-16.78	-9.93	-49.05	-77.09	-12.16	-36.46	-68.77	0.00	-114.17	
279	-8.02	-32.66	-22.31	-37.81	-28.51	-20.04	5.40	5.26	0.00	-18.02	
280	-24.79	-45.78	-4.38	-28.29	-43.90	-36.25	22.76	-17.48	266.63	-50.13	
281	-26.30	-2.30	57.59	-17.86	-12.32	-12.06	19.27	-54.89	196.28	-66.87	
282	-23.23	-137.70	54.53	-1.24	-69.50	16.84	7.55	-32.32	130.00	-41.39	
283	-14.93	-73.45	37.48	-37.20	-28.44	-63.60	-0.50	-38.83	51.21	-41.62	
284	-39.65	-71.74	77.77	-26.56	-45.44	-33.30	-4.90	-39.86	-4.30	0.00	
285	-40.32	-75.55	13.78	-40.83	-20.28	-74.61	-120.35	-20.92	-18.20	0.00	
286	-8.85	5.30	-18.02	-36.92	-76.82	-74.94	95.36	-50.38	-17.98	0.00	
287	-26.30	0.00	-88.25	-41.34	-43.83	-194.38	-96.12	-14.82	-57.01	13.08	
288	-54.12	-82.73	-51.83	-14.36	-45.36	-46.11	-25.65	-31.99	-11.77	230.19	
289	-7.20	-23.15	-63.89	-13.87	-49.50	-37.25	-85.49	-15.68	-48.81	58.04	
290	-40.13	-23.34	-60.82	-49.53	-12.89	-30.01	-80.40	-34.78	-69.47	41.03	
291	-26.05	-48.70	-29.77	-29.36	-29.85	-52.76	-61.98	-55.23	-68.80	89.27	
292	-39.40	-48.70	-51.38	-50.29	-26.23	-11.72	-34.13	-37.58	-99.18	104.77	
293	-17.93	-36.04	-51.31	-29.39	-76.75	-92.46	-6.64	-23.28	-104.65	114.40	
294	-15.87	-44.82	-2.00	50.67	-44.58	-36.03	-49.13	-17.46	-103.88	0.00	
295	-28.71	-61.33	-41.96	-93.66	-70.40	-36.20	-43.83	-57.57	-104.05	0.00	

296	-42.90	-61.25	-83.44	-100.57	-60.13	-60.33	-79.86	-10.56	-57.52	0.00
297	-106.62	-23.22	-103.14	-63.35	-59.70	-60.26	-30.04	-16.84	-59.41	0.00
298	-73.71	-57.21	-15.37	-157.01	-36.25	0.00	-61.99	-53.89	-10.83	0.00
299	-1.25	-1.42	-51.97	11.47	-54.48	0.00	-70.09	-41.41	67.48	0.00
300	-106.49	-48.91	-39.66	-83.38	-59.52	0.00	42.25	-29.38	-64.66	0.00
301	-108.68	-48.77	-22.24	-18.97	-22.56	174.14	-117.72	-45.79	-83.79	0.00
302	-74.58	-48.69	-65.48	-73.85	-61.29	136.95	-60.50	-44.84	-92.80	114.92
303	-54.97	-73.83	-51.52	-81.88	-34.77	17.58	-47.15	-58.16	-70.58	136.31
304	-40.92	-48.65	-6.62	-52.83	0.00	-14.14	-54.04	-9.16	-83.95	94.69
305	-46.54	-17.56	-36.09	-26.37	0.00	-17.68	-73.05	-17.82	-66.00	95.01
306	-27.20	-20.92	-18.61	-44.26	0.00	-60.31	-29.54	-73.59	-42.10	87.20
307	-27.14	-28.82	-5.12	-63.04	0.00	-37.73	-62.63	-66.82	-18.85	86.08
308	-65.64	-104.89	-106.10	-54.87	0.00	-33.45	-33.65	-25.75	-28.13	99.90
309	-35.84	-51.36	-47.96	16.59	0.00	-11.50	-55.09	21.15	-28.35	77.56
310	-45.94	33.54	-18.51	-26.24	57.02	0.00	-29.39	-75.43	-65.96	16.81
311	-38.00	-59.09	-47.92	-87.33	9.63	0.00	-41.01	-247.85	-87.77	-94.42
312	-38.17	-32.83	-47.92	-68.24	256.72	21.46	-54.93	-128.07	-15.93	-21.15
313	-13.72	-21.36	-2.32	2.09	171.75	-76.14	-72.53	-78.42	-38.81	0.00
314	-8.03	-46.07	-42.14	-20.92	29.11	71.62	-104.96	-14.83	-57.60	0.00
315	-27.04	-75.36	-60.03	-44.86	217.10	19.57	-84.53	-37.31	-87.28	65.12
316	-46.31	-106.75	-47.91	-33.05	103.40	-48.59	-134.35	-48.75	-80.35	-26.06
317	-46.26	-42.85	-35.93	-41.77	131.58	23.91	-74.51	-39.19	-66.28	0.28
318	-46.26	47.98	-35.45	-41.52	75.10	9.32	-44.74	-54.75	-11.67	-84.28
319	-46.35	-33.26	-78.53	-82.90	26.13	13.23	-44.64	-54.75	-29.31	-33.46
320	-26.27	-16.99	-34.33	-120.88	53.06	-21.59	-47.10	-39.11	-32.69	-33.28
321	-23.58	-45.44	-95.41	23.33	42.72	12.01	-13.50	-94.14	-3.49	-33.16
322	-46.23	-28.42	-112.84	-28.82	-46.66	-4.37	-119.48	-38.75	-68.50	-25.44
323	-45.42	-54.41	-48.43	-57.53	-17.93	58.11	-29.97	-30.23	-103.24	-19.37
324	-45.47	-85.95	-114.47	-48.71	0.00	16.70	-33.83	-53.87	-118.11	9.76
325	-45.52	-23.96	-74.41	-73.99	0.00	-15.60	-24.99	-77.37	-66.25	-107.76
326	-46.18	-59.46	-61.07	-41.25	0.00	14.67	-55.73	-74.54	22.76	-102.61
327	-46.23	-17.99	-48.60	-39.14	0.00	-48.95	-8.28	-75.15	-20.98	-125.25
328	-6.09	-31.10	0.00	-58.03	0.00	-135.52	-55.63	-35.13	46.89	-81.47
329	-60.27	-17.02	0.00	-82.62	0.58	0.00	-56.10	-81.89	3.22	-44.42
330	-59.43	-21.81	0.00	-12.45	231.43	0.00	-54.15	-52.37	18.91	-42.96
331	-31.19	23.74	-81.07	-20.22	-106.18	0.00	-72.48	-88.02	0.08	-77.41
332	-59.39	10.59	-22.79	-82.38	-39.31	0.00	-88.14	-184.19	3.41	-97.31
333	-73.37	0.00	0.00	-95.87	0.00	37.08	-166.85	-129.67	-43.75	-54.42
334	-12.44	0.00	-62.45	-39.34	0.00	0.00	-10.62	-38.03	46.23	-5.98
335	-108.20	0.00	56.51	-59.50	0.00	0.00	-40.92	-47.74	30.37	-101.49
336	-156.92	0.00	133.21	149.86	-11.46	0.00	-25.33	-47.52	20.12	-19.13
337	-102.76	-4.93	-1.37	-74.86	103.32	0.00	-17.72	-20.82	61.48	-52.58
338	-49.75	19.02	0.00	48.70	-74.72	37.96	-26.81	-64.33	5.63	22.05
339	-69.12	-17.63	0.00	21.45	-18.80	0.00	-18.12	-54.93	2.25	-37.82
340	-72.38	0.00	0.00	12.96	5.01	59.08	-61.04	-51.33	8.33	-85.27
341	-39.47	0.00	0.00	0.00	-36.59	46.75	-55.55	-51.90	-15.45	-81.24
342	-58.72	-1.48	0.00	0.00	29.79	8.35	-61.41	-54.52	0.00	-21.97
343	-20.10	22.53	7.37	-41.57	45.05	28.41	-27.70	-59.34	0.00	-54.09
344	-20.37	39.06	0.00	13.39	11.73	0.00	-113.25	-58.06	0.00	-34.45
345	-39.22	-7.45	0.00	-30.15	-17.79	0.00	-144.02	-79.31	-29.70	-28.24
346	-53.12	0.00	0.00	21.33	-5.38	0.00	-102.26	-46.86	0.00	-71.55
347	-39.20	0.00	0.00	-25.09	44.35	0.00	-14.46	-46.77	0.00	-70.67
348	58.23	0.00	0.00	48.34	-83.00	34.30	10.74	-4.81	0.00	-84.51
349	-130.21	50.25	0.00	18.47	54.84	-42.27	-40.75	-40.84	0.00	-30.60
350	-147.37	0.00	1.14	-2.80	83.65	-39.62	-24.45	-34.32	-16.48	-27.98
351	-2.99	0.00	45.55	8.50	24.82	-4.59	-148.22	-34.32	-2.00	-47.91
352	-96.34	0.00	127.93	60.83	54.45	89.16	-24.04	-46.66	8.93	11.23
353	-40.12	0.00	63.28	-39.78	13.84	-24.07	-54.67	-52.61	-63.23	-88.56
354	-16.04	28.09	98.76	18.81	40.59	-0.65	-81.05	-46.60	25.46	-10.42
355	-141.59	-26.45	121.88	52.82	22.41	-5.54	-163.80	-7.77	6.68	-23.44

356	-46.78	-41.61	0.00	-33.30	43.68	-9.02	30.18	-45.57	22.71	-26.64
357	-159.12	-25.93	143.09	45.27	23.81	0.00	0.68	-83.86	53.41	-76.46
358	-96.43	-153.08	21.04	-1.01	-23.99	0.00	-8.70	-49.14	52.18	-99.08
359	-79.35	23.00	14.18	14.97	-19.48	0.00	-116.38	-51.26	53.71	-27.40
360	-103.48	-24.51	-12.50	59.91	215.62	0.00	-188.97	-73.56	7.79	-69.32
361	-151.78	-104.05	303.07	17.66	7.94	0.00	12.19	-79.03	22.19	-54.18
362	-102.55	35.20	0.00	7.64	24.36	0.00	-119.44	-54.17	45.79	-63.67
363	-52.10	0.00	0.00	40.87	166.73	0.00	-43.22	-45.04	-12.37	-146.47
364	-40.44	18.74	0.00	8.87	-126.54	-21.61	-52.70	-54.16	-58.30	-120.69
365	0.00	-35.25	0.00	32.52	133.55	-17.44	-32.40	-95.11	-56.89	-85.98
366				-7.64				-94.83		