South Carolina Department of Health and Environmental Control
Total Maximum Daily Load Development for
Middle Tyger River (Station B-148)
Fecal Coliform Bacteria

August 17, 1999
Bureau of Water

Middle Tyger River
03050107-040

BASIS FOR 303(d) LISTING

Introduction:

Levels of fecal coliform bacteria can be elevated in water bodies as the result of both point and nonpoint sources of pollution. Section 303(d) of the Clean Water Act and EPA's Water Quality Planning and Management Regulations (40 CFR Part 130) require states to develop total maximum daily loads (TMDLs) for water bodies that are not meeting designated uses under technology-based pollution controls. The TMDL process establishes the allowable loadings of pollutants or other quantifiable parameters for a water body based on the relationship between pollution sources and in stream water quality conditions so that states can establish water quality-based controls to reduce pollution and restore and maintain the quality of water resources (USEPA 1991).

Problem Definition:

Impaired Waterbody: Middle Tyger River (Greenville County)

Water Classification: Freshwater

The Middle Tyger River is designated as Class Freshwater. Waters of this class are described as follows:

> “"Freshwaters suitable for primary and secondary contact recreation and as a source for drinking water supply after conventional treatment in accordance with the requirements of the Department. Suitable for fishing and the survival and propagation of a balanced indigenous aquatic community of fauna and flora. Suitable also for industrial and agricultural uses. "(R.61-68)

Water Quality Standard Being Violated: Fecal Coliform Bacteria

Pollutant of Concern: Fecal Coliform Bacteria

Fecal Coliform Criteria:

> “"Not to exceed a geometric mean of 200/100 ml, based on five consecutive samples during any 30 day period; nor shall more than 10% of the total samples during any 30 day period exceed 400/100 ml. " (R.61-68)

The *South Carolina Watershed Water Quality Management Strategy: Broad Basin* (SCDHEC 1998) was used to identify this stream segment as impaired and for listing the water body on the 1998 South Carolina 303(d) list. Waters in which no more than 10% of the samples collected over a five year period are greater than 400 colonies/100 ml are considered to comply with the South Carolina water quality standard for fecal coliform bacteria. Waters with more than 10 percent of samples greater than 400 colonies/100 ml are considered impaired and listed for fecal coliform bacteria on South Carolina’s 303(d) List. There is one SCDHEC ambient monitoring station, B-148, on the

segment of the Middle Tyger River that is of concern. Station B-148 is located on the Middle Tyger River at SC 14 in Greenville County. Data from this station show that recreational uses are not supported due to violations of the 400/100 ml fecal coliform criterion. During the assessment period (1991-95), 38% of the samples did not meet the fecal coliform criterion.

TMDL TECHNICAL BASIS

Target Identification:

Target levels for fecal coliform bacteria in water bodies are those levels established in South Carolina's Water Quality Standards, Regulation 61-68, as described earlier. The criterion used in this TMDL will be "not to exceed a geometric mean of 175/100 ml," allowing an explicit margin of safety of 25/100 ml to ensure that the 200/100 ml criterion will be met.

This target of a geometric mean of 175/100 ml is expected also to satisfy the criterion, "nor shall more than 10% of the total samples during any 30 day period exceed 400/100 ml." Based on a review of water quality assessments in South Carolina, over 75% of waters that have a fecal coliform geometric mean of 175/100ml also meet the criterion "not more that 10% of samples exceed 400/100ml" (SCDHEC unpublished data). Most of the data in those assessments, however, reflect fecal coliform concentrations in areas that do not have sufficient best management practices (BMPs) in place. Thus, implementation of BMPs as described in this TMDL will likely achieve an even greater rate of compliance with the latter criterion since the BMPs are generally focused on reducing fecal loadings during runoff events, the condition most likely to result in an exceedence of the 400/100ml criterion.

Source Assessment:

General Sources of Fecal Coliform:

Both point and nonpoint sources may contribute fecal coliform to a given water body. Potential sources of fecal coliform are numerous and often occur in combination. Nationwide, poorly treated municipal sewage is a major source of fecal coliform, but data presented below suggest this is not the case here. Urban storm water runoff, sanitary sewer overflows, and combined sewer overflows can be sources of fecal coliform. Rural storm water runoff can transport significant loads of fecal coliform from livestock pastures and animal feedlots. Failing septic systems and wildlife can also be sources of bacteria. Sources of fecal coliform loads to water bodies can be assigned to two broad classes: point source loads and nonpoint source loads.

Point Sources in the Middle Tyger River Watershed:

There are no point sources in the Middle Tyger River watershed upstream of station B-148.

Nonpoint Sources in the Middle Tyger River Watershed:

As there are no point sources, fecal coliform loadings in this watershed can be attributed to nonpoint sources. The land use in the watershed is 90.9% forest, 7.9% agriculture/grass, and 1.3% other.

Agricultural land can be a significant source of fecal coliform bacteria. Runoff from pastures, animal operations, improper handling and land application of animal wastes, and animals having access to

creeks are all sources of fecal coliform. Agricultural best management practices (BMPs), such as buffer strips, alternative watering sources, fencing cattle out of creeks, and proper land application of animal wastes reduce fecal coliform loading to water bodies. Failing septic systems at homes scattered in rural areas can also be a source of fecal coliform bacteria. Proper siting and maintenance of these systems can drastically reduce their contributions of bacteria to water bodies.

Fecal coliform bacteria also originate in forested areas. Sources are generally wild animals such as deer, racoons, wild turkeys, water fowl, etc. The primary means for directly controlling fecal coliform from forested lands would include relocating or killing wildlife. These are generally not acceptable management alternatives.

Linkage Between Numeric Targets and Sources:

The types of land use existing in this watershed indicate that the major sources of fecal coliform are forested areas and agricultural areas. As previously described, wildlife is the main source of fecal coliform in forested areas, and there are no acceptable management tools for controlling fecal coliform from wildlife sources at this time. On the other hand, acceptable BMPs exist for agricultural lands that can successfully reduce fecal coliform levels in adjacent water bodies. Therefore, load reductions in this TMDL will be allocated to agricultural lands.

The loading from forested lands will be considered background conditions. The geometric mean of fecal coliform concentration in water bodies flowing through forested areas in South Carolina during all flow conditions is estimated to be 30 colonies/100 ml (SCDHEC unpublished data). The 30 colonies/100 ml observed in South Carolina falls well within the range reported by Schueler (1999) of 10 to 100 colonies/100 ml of fecal coliform from forested lands. Thus, 30 colonies/ 100 ml will be considered the background condition.

Data Availability and Analysis:

Watershed Characteristics:
The Middle Tyger River, located in the Broad River basin, is a tributary to the Tyger River. The drainage area of concern for this TMDL is located in watershed 03050107-040 in Greenville County and consists of the area of land draining to station B-148. All references to the Middle Tyger River watershed in this TMDL refer specifically to the area draining to B-148. This includes 11,438 acres in the Piedmont region of South Carolina.

Middle Tyger River Watershed Land Use

Land Use	Acres	Percentage
Forest	10393	90.9%
Agriculture/Grass	898	7.9%
Urban	21	0.2%
Scrub/Shrub	30	0.3%
Barren/Disturbed	94	0.8%

Fecal Coliform

SCDHEC monitors water chemistry on the Middle Tyger River at ambient monitoring station B-148 once a month year-round every year. Existing data from this monitoring station is available through STORET and included in the data appendix. The geometric mean of fecal coliform using the most recent available data (1994-98) is 313 colonies/100ml if all data are considered, or 490/100ml using only data from warm weather months.

Flow

Flow information for the Middle Tyger River was estimated using flow data for water years 1989-1997 from USGS gage station 02154790 on the South Pacolet River near Campobello. A warm weather generation coefficient was established by dividing the average flow from May through October at the USGS station by the drainage area for the station. The warm weather generation coefficient (Gc) is established as follows:

$$Gc = \frac{\text{Mean flow from May-Oct in cfs}}{\text{Drainage area in square miles}}$$

Gc = 86.7 cfs/55.4 square miles = 1.56 cfs/square mile

The warm weather generation coefficient is multiplied by the Middle Tyger River drainage area (17.87 square miles) to obtain the average warm weather flow for the Middle Tyger River of 28.0 cfs.

Critical Conditions:

Novotny & Olem (1994) find statistically lower fecal coliform counts in cold weather urban runoff samples than in warmer weather urban runoff. To substantiate this, winter and summer fecal coliform values were compared at ambient water quality monitoring stations thought to be impacted by nonpoint sources in the Piedmont Region of South Carolina. This analysis showed summer fecal levels to be generally higher than or approximately the same as winter levels. Therefore, summer months (May-October) are generally considered critical conditions. This can be explained by the nature of summer and winter storm events. Thunderstorms are typical in the summer months. This pattern of rainfall allows for the accumulation and washing off of fecal coliforms into the streams resulting in spikes of fecal coliform concentrations. In the winter, longer and slower rain events are the norm. This pattern of rainfall does not allow for the high build-up of coliform that characterizes

the summer. Rather, coliform are washed into the stream at a more even rate. This, coupled with the increased winter flows that provide more dilution, usually results in lower winter fecal coliform concentrations.

In the Middle Tyger River watershed, the fecal coliform geometric mean for warm weather months is substantially higher than the geometric mean for a full year. Thus, warm weather months (May through October) will be used as the critical condition in this TMDL.

Load Calculations:

With the observed warm weather geometric mean of 490 colonies/100 ml and the average flow of 28.0 cfs, the current summer loading at B-148 is determined to be 3.35×10^{11} colonies/day using the equation below.

Fecal Coliform * Qa * Factor = Loading

where: Fecal Coliform = # colonies/100ml
Qa = average warm weather flow in cfs
Factor = conversion factor = 24468984
Loading = # fecal coliform colonies/day

Using a geometric mean of 200 colonies/100 ml, the allowable load during average warm weather flow is 1.37×10^{11}.

Assuming the flow attributable to forest lands is proportional to the percent of forest land in the watershed, the loading from forest lands was calculated to be 1.86×10^{10} colonies/day (using the equation above and the geometric mean of 30 colonies/100 ml). The remaining fecal loading from the watershed, 3.17×10^{11} colonies/day, is the load attributable to agriculture/grass land. This loading translates to a mean in-stream concentration of 5895/100ml. This concentration falls within the range reported by Doran et al (1981) of 1.20×10^{2} to 1.30×10^{6} colonies/100 ml for fecal coliform from agricultural lands.

TMDL Development:

A total maximum daily load (TMDL) for a given pollutant and waterbody is comprised of the sum of individual wasteload allocations (WLAs) for point sources, and load allocations (LAs) for both nonpoint sources and natural background levels. In addition, the TMDL must include a margin of safety (MOS), either implicitly or explicitly, to account for the uncertainty in the relationship between pollutant loads and the quality of the receiving water body. Conceptually, this definition is represented by the equation:

$$TMDL = \sum WLAs + \sum LAs + MOS$$

The TMDL is the total amount of pollutant that can be assimilated by the receiving water body while still achieving water quality standards. In TMDL development, allowable loadings from all pollutant sources that cumulatively amount to no more than the TMDL must be established and thereby provide the basis to establish water quality-based controls.

For some pollutants, TMDLs are expressed on a mass loading basis (e.g., pounds per day). For bacteria, however, TMDLs can be expressed in terms of organism counts (or resulting concentration), in accordance with 40 CFR 130.2(l).

Since there are no contributing point sources, the TMDL for the Middle Tyger River is equal to the load allocations from nonpoint sources and background conditions plus the MOS.

$$\text{Middle Tyger River TMDL} = \sum \text{LAs} + \text{MOS}$$

Margin of Safety:

There are two basic methods for incorporating the MOS (USEPA 1991): 1) implicitly incorporate the MOS using conservative model assumptions to develop allocations, or 2) explicitly specify a portion of the total TMDL as the MOS; use the remainder for allocations.

An explicit MOS is used for this TMDL by establishing a target concentration level of 175 colonies/ 100 ml. This level is below the state standard of 200 colonies/ 100 ml.

TMDL

TMDL calculation:

The target level of fecal coliform bacteria is 175 colonies/100ml. For the Middle Tyger River watershed, this is equivalent to a loading of 1.20×10^{11} colonies/day. The load from agricultural lands plus the load from forest lands must equal this target of 175 colonies/100ml.

Allocation of Load:

The existing 1.86×10^{10} colonies/day load from forest land can not reasonably be targeted for reduction. Thus, the existing load of 3.17×10^{11} colonies/day from agricultural lands must be reduced by 68% (to 1.01×10^{11}) to obtain the TMDL of 1.20×10^{11} colonies/day. So, an allocation strategy that will allow the target TMDL to be maintained is as follows:

Middle Tyger River Land Use	Current Loading	% Reduction	Final Loading
Forest (Background)	1.86×10^{10}	0%	1.86×10^{10}
Agriculture/Grass	3.17×10^{11}	68%	1.01×10^{11}
Total	*3.35×10^{11}*	*64%*	*1.20×10^{11}*

Implementation Strategy:

As discussed in the *Implementation Plan for Achieving Total Maximum Daily Load Reductions From*

Nonpoint Sources for the State of South Carolina (SCDHEC 1998), South Carolina has several tools available for implementing this nonpoint source (NPS)TMDL. SCDHEC will work with the existing agencies in this area to implement best management practices (BMPs) and provide nonpoint source education in the Middle Tyger River watershed. Local sources of nonpoint source education include Clemson Extension Service, the Natural Resource Conservation Service (NRCS) and the South Carolina Department of Natural Resources. Clemson Extension Service offers a Farm-A-Syst package to farmers. Farm-A-Syst is a guide that allows farmers to evaluate practices on their property for potential NPS impacts and recommends BMPs to correct these NPS problems on the farm. NRCS can provide cost share money to land owners installing BMPs. In addition, Clemson Extension has developed a Home-A-Syst handbook that can help urban or rural homeowners reduce sources of NPS pollution on their property. This document guides homeowners through a self-assessment, including information on proper siting and maintenance practices for septic systems. SCDHEC also employs a nonpoint source educator who can assist with distribution of these tools as well as provide additional BMP information. Additionally, SC DHEC's Section 319 program may be used to fund both BMP implementation and educational efforts.

In addition, as part of their Municipal Separate Storm Sewer System (MS4) permit (to be public noticed in September 1999), Greenville County will develop and implement public education program about storm water impacts on water bodies and how citizens can reduce storm water pollution. Impaired waters, including the Middle Tyger River, will be a focus for activities in the MS4 permit.

DHEC will continue to monitor water quality in the Middle Tyger River according to the basin monitoring schedule in order to evaluate use support and the effectiveness of implementation measures.

References

Doran, J.W., J.S. Schepers, and N.P. Swanson. 1981. Chemical and Bacteriological Quality of Pasture Runoff. J. Soil Water Conserv. May-June:166-171.

Novotny, Vladimir. Olem, Harvey. 1994. Water Quality Prevention, Identification, and Management of Diffuse Pollution. Van Nostrand Reinhold, New York.

SCDHEC. 1998. Watershed Water Quality Management Strategy: Broad Basin. Technical Report No. 001-98.

SCDHEC. 1998. Implementation Plan for Achieving Total Maximum Daily Load Reductions From Nonpoint Sources for the State of South Carolina.

Scheuler, T. R. 1999. Microbes and Urban Watersheds: Concentrations, Sources, and Pathways. Watershed Protection Techniques 3(1): 554-565.

United States Environmental Protection Agency (USEPA). 1991. Guidance for Water Quality-Based Decisions: The TMDL Process. Office of Water, EPA 440/4-91-001.

Public Participation

The public notice on pages 12-13 was sent to a mailing list of over 300 individuals statewide interested in water quality issues. In addition, the notice was sent to local organizations and county and city officials in Greenville County with a possible interest in this TMDL.

The public notice on page 14 was published in the following six South Carolina newspapers on July 9, 1999: *The Greenville News*, the Anderson *Independent-Mail*, Charleston's *The Post & Courier*, Columbia's *The State*, *The Herald* in Rock Hill, and Camden's *Chronicle-Independent* .

Comments Received and Responsiveness Summary

Comments were received from the Southern Environmental Law Center (SELC), the South Carolina Department of Natural Resources (SC DNR), the Sierra Club South Carolina Chapter, and the South Carolina Department of Parks, Recreation & Tourism (SC PRT).

The comments are enclosed in Appendix B. A summary of the comments and DHEC's response are found in the Responsiveness Summary on page 15.

Responsiveness Summary:

Summarized comments received on fecal TMDLs public noticed on July 9, 1999, are listed below along with DHEC response. (Summarized comments are in italics, name of respondent is in parentheses**)**

Middle Tyger River, Camp Creek, Beaverdam Creek TMDLs:

1) *Respondent questions the assumption that no fecal coliform contamination originates from forested land. Forestry activities, including land clearing, cultivating, and harvesting, can generate non-point source pollution, particularly if carried out without using Best Management Practices.* (SELC)

Estimates of fecal coliform bacteria loading from forested lands were made using SC DHEC water quality monitoring data from forested areas. As stated in the TMDLs, the estimates used are consistent with the typical values of loadings from forested areas seen in the literature and in other studies.

2) *Agricultural land is treated as a single source of fecal loadings, without assessing individual contributions from intensive livestock operations. Monitoring data pinpointing the locations of major contribution areas or sources within the watershed are not provided. These data are necessary to develop an adequate implementation strategy*. (SELC)

The implementation of these TMDLs will include education about and installation of best management practices that reduce fecal coliform loadings from agricultural lands. These BMPs, to be implemented to the extent possible under voluntary programs such as the Section 319 program and agricultural cost-sharing programs, will be focused on lands that are likely sources of fecal coliform loadings, including the intensive livestock operations and land application sites mentioned by the respondent. As any livestock operation or land application site that does not have adequate BMPs in place is a probable source of fecal coliform bacteria, such implementation measures will reduce fecal loadings to the waterbodies.

3) *The TMDLs do not provide "reasonable assurance" that nonpoint sources of fecals will be adequately addressed by the measures identified, as required by EPA guidance. No statement specifying when implementation actions by DHEC or other agencies will occur is provided. No information or commitments are provided regarding future monitoring and steps to be taken if impairment is not resolved*. (SELC)

EPA guidance acknowledges that in watersheds impaired solely by nonpoint sources, the primary implementation mechanism will be the Section 319 program and other state or federal assistance programs such as cost-sharing and incentive programs (Robert Perciasepe memo, 1997). As these are all voluntary programs, they involve a process of landowners, agencies, or organizations submitting and receiving approval for project proposals to implement appropriate practices. This project development and evaluation process, which will target fecal sources in these watersheds, will take place after TMDL approval by EPA has been granted. According to EPA guidance (1991), implementation of the TMDL is to take place after the state has obtained EPA approval. Commitment and funding for implementing these BMPs will thus be arranged after TMDLs have been approved.

As is stated in the TMDLs, DHEC will continue to monitor water quality in these waters according to

the basin monitoring schedule in order to evaluate use support and the effectiveness of implementation measures.

Brushy Creek and Unnamed tributary to Catawba River TMDLs:

1) *The TMDLs do not adequately identify the location of the causes of the impairment.* *Respondent submits that TMDLs should specifically describe additional monitoring work to pinpoint the primary sources of the contamination*. (SELC)

Fecal coliform is present in all sources of urban runoff including streets, lawns, parking lots, commercial and residential rooftops, and storm water drains (Schueler, Thomas R., ed. 1999. Microbes and Urban Watersheds: Concentrations, Sources, and Pathways. *Watershed Protection Techniques.* April 1999:3-1). It is difficult if not impossible to isolate all the contributing sources of fecal coliform in urban watersheds. However, the Municipal Separate Storm Sewer System (MS4) permit for Greenville County (to be public noticed in September 1999) and the MS4 Phase II permit for Rock Hill (Phase II regulations to be published in the Federal Register in November 1999) will require the identification of illicit discharges to the storm sewer system, a potential major contributor of fecal coliform. Language has been added to the Unnamed Tributary to the Catawba River TMDL discussing the MS4 permit for Rock Hill.

2) *The TMDLs do not provide "reasonable assurance" that nonpoint sources of fecals will be adequately addressed by the measures identified, as required by EPA guidance. No statement specifying when implementation actions by DHEC will occur is provided. No information or commitments are provided regarding future monitoring and steps to be taken if impairment is not resolved*. (SELC)

EPA guidance acknowledges that in watersheds impaired solely by nonpoint sources, the primary implementation mechanism will be the Section 319 program and other state or federal assistance programs such as cost-sharing and incentive programs (Robert Perciasepe memo, 1997). As these are all voluntary programs, they involve a process of landowners, agencies, or organizations submitting and receiving approval for project proposals to implement appropriate practices. This project development and evaluation process, which will target fecal sources in these watersheds, will take place after TMDL approval by EPA has been granted. According to EPA guidance (1991), implementation of the TMDL is to take place after the state has obtained EPA approval. Commitment and funding for implementing these BMPs will thus be arranged after TMDLs have been approved.

In addition to voluntary measures, both of the watersheds will be subject to (MS4) permits. These permits for Greenville County and Rock Hill will require the identification and removal of illicit discharges to the storm sewer system, a potential major contributor of fecal coliform. MS4 permits will also require the development and implementation of a public education program about storm water and how citizens can reduce storm water pollution. Language has been added to the Unnamed Tributary to the Catawba River TMDL discussing the MS4 permitting program.

As is stated in the TMDLs, DHEC will continue to monitor water quality in these waters according to the basin monitoring schedule in order to evaluate use support and the effectiveness of

implementation measures.

Other Comments on all five Fecal TMDLs
1) *Respondent commends DHEC on TMDLs and believes implementation of the strategies will make waters safe for recreation. (SC DNR)*

No response necessary.

2) *Respondent has reviewed TMDLs and administrative record and has no questions, comments, or additional information to offer. (Sierra Club - SC Chapter)*

No response necessary.

3) *Respondent supports DHEC's effort to establish TMDLs and believes they are consisted with recommendations in Lower Saluda River Corridor Plan and the Catawba River Corridor Plan. (SC PRT)*

No response necessary.

Data

FLOW	
South Pacolet River near Campobello, SC - USGS Station 02154790	
average annual flow water yrs 1989-97	111
drainage area in sq miles	55.4
Generation coefficient 111/55.4	2.00361
average May-Oct flow	86.66667
warm months generation coefficient	1.56438
warm months generation coefficient *B-148 drainage	27.95293

Qa flow in cfs	**FC #/day**
27.9529342	3.3515E+11
27.9529342	1.36796E+11
difference	1.98354E+11
% difference	59.18%
27.9529342	1.19696E+11
	2.15454E+11

64.29%

SCDHEC Monitoring Data for B-148 (Middle Tyger River)
Most Recent 10 Years

DATE	Fecal Coliform Bacteria (#/100ml)	NOTES* *J = estimated
1/19/89	50	J
2/2/89	60	
4/13/89	60	J
5/16/89	75	J
6/1/89	75	J
7/26/89	55	J
8/23/89	420	J
9/5/89	190	
10/2/89	260	
11/1/89	470	J
12/4/89	40	J
1/3/90	75	J
2/8/90	34	J
3/1/90	40	
4/5/90	100	
5/31/90	300	
6/6/90	300	
7/19/90	250	
8/16/90	690	J
9/17/90	300	
10/3/90	240	
11/2/90	310	
12/7/90	460	
1/2/91	70	J
2/1/91	28	J
3/1/91	74	
4/4/91	88	
5/10/91	270	
6/7/91	460	
7/25/91	1400	J
8/9/91	380	
9/13/91	270	
11/14/91	170	
12/5/91	200	
1/2/92	290	

	1994-98
#Samples=	59
%Exc=	44%
Avg Exc=	1163
Geometric Mean=	313

May -Oct Only

	1994-98
#Samples=	29
%Exc=	66%
Avg Exc=	1147
Geometric Mean=	490

2/14/92	230	
3/2/92	170	
4/6/92	85	J
5/12/92	720	
6/5/92	680	
7/9/92	270	
8/3/92	200	
9/1/92	490	
10/1/92	370	
11/4/92	7400	J
12/10/92	400	
1/5/93	460	
1/7/93	460	
2/19/93	30	J
3/3/93	85	J
4/15/93	100	
5/10/93	280	
6/4/93	680	
7/14/93	220	
8/16/93	370	
9/10/93	280	
10/5/93	360	
11/5/93	940	
12/7/93	340	
1/12/94	1200	
2/1/94	68	
3/10/94	540	
4/13/94	3300	J
5/6/94	540	
6/2/94	540	
7/1/94	230	
8/4/94	2600	J
9/29/94	210	
10/26/94	60	J
11/17/94	200	
12/15/94	130	
1/26/95	160	
2/15/95	900	
3/16/95	110	
4/20/95	400	
5/3/95	410	
6/6/95	1200	J
7/20/95	7500	J
8/2/95	1300	J
9/5/95	210	
10/4/95	1200	J
11/8/95	580	

12/7/95	400	
1/18/96	250	
2/7/96	240	
3/14/96	100	
4/12/96	45	J
5/14/96	440	
6/3/96	260	
7/1/96	640	
8/6/96	740	
9/13/96	900	
10/9/96	220	
11/22/96	170	
12/5/96	210	
1/14/97	100	
2/6/97	200	
3/5/97	74	
4/1/97	440	
5/15/97	140	
6/27/97	460	
8/12/97	450	
9/17/97	430	
10/24/97	240	
11/20/97	86	
12/17/97	60	J
1/22/98	91	
2/13/98	120	
3/6/98	200	
4/3/98	1500	J
5/7/98	290	
6/4/98	480	
7/22/98	480	
8/13/98	1000	
9/17/98	480	
10/20/98	370	
11/4/98	310	
12/9/98	10	J