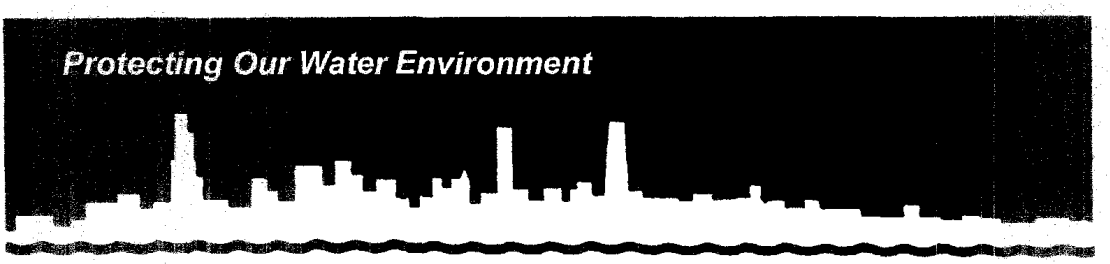

Metropolitan Water Reclamation District of Greater Chicago

RESEARCH AND DEVELOPMENT DEPARTMENT

REPORT NO. 02-12

INVESTIGATION OF THE ROLE OF MAJOR POINT SOURCE CONTRIBUTIONS TO PEAK AMMONIA AND ORGANIC NITROGEN LOADINGS TO THE STICKNEY WRP

November 2002

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INVESTIGATION OF THE ROLE OF MAJOR POINT SOURCE CONTRIBUTIONS TO PEAK AMMONIA AND ORGANIC NITROGEN LOADINGS TO THE STICKNEY WRP

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ACKNOWLEDGMENTS

The assistance given by Mr. Dale MacDonald, Research Scientist I, and Ms. Tiffiany Tate, Laboratory Technician II, is greatly appreciated.

The assistance of the Industrial Waste Division (IWD), particularly Messrs. Gregory Yarnik, Pollution Control Officer III, and James Chodora, Pollution Control Officer III, in providing intensive field sampling is deeply appreciated. Without the active cooperation and assistance from Messrs. Yarnik and Chodora this study could not have been completed successfully. The assistance of the staff of the Analytical Laboratories Division (ALD) in providing the analytical support is also sincerely appreciated.

The authors wish to acknowledge the assistance of the staff of the Maintenance and Operations Department at the Stickney Water Reclamation Plant (WRP) and Lawndale Avenue Sludge Management Area during the study.

The cooperation of the staff of Corn Products International in calculating hourly flow rates for this study is also acknowledged.

Particular thanks are due Ms. Laura Franklin, Principal Office Support Specialist, for her diligence in typing and proofreading the manuscript of this report.

DISCLAIMER

Mention of proprietary equipment and chemicals in this report does not constitute endorsement by the Metropolitan Water Reclamation District of Greater Chicago.

SUMMARY AND CONCLUSIONS

A study was conducted in 2000 at the Stickney Water Reclamation Plant (WRP) to determine the major sources of ammonia nitrogen (ammonia) loading variability and the influence of these sources on peak ammonia loadings. This was of concern because of the ability to comply with a new daily maximum ammonia limit in the NPDES permit. Although four major sources were identified, questions remained. A follow-up study was carried out in 2001 to investigate the magnitude of the previously identified four major point sources in contributing to peak ammonia and total Kjeldahl nitrogen (TKN) loadings to the Stickney WRP.

The four previously identified point sources were TARP pumpback, discharge from Corn Products International (CPI), centrate from the post-digestion centrifuges (Post-DC), and overflow from the sludge lagoons in the Lawndale Avenue Solids Management Area (LASMA). These four major point sources, along with several locations within the Stickney WRP, were investigated for hourly variations in concentrations of ammonia and TKN (ammonia plus organic nitrogen), and the corresponding wastewater flow rates to determine peak ammonia and TKN loadings at these locations.

For this study, ten sampling locations were selected to collect samples. A list of these ten locations is given below:

1. Corn Products International at the 2AT sampling site (CPI).
2. LASMA East (LASMAE) Manhole.
3. LASMA West (LASMAW) Manhole.
4. Interceptor SW-12 upstream of CPI (SW-12).
5. Centrate from the Stickney Post-DC.
6. TARP Pumpback to the Stickney WRP (TARP).
7. Southwest Raw Sewage (SWRAW).
8. Southwest Preliminary Effluent (SWPREF).
9. West Side Raw Sewage (WSRAW).
10. West Side Imhoff Effluent (WSIMEF).

In the previous study, location 2AT at CPI had been identified as the major ammonia discharge point for CPI, accounting for more than 95 percent of the ammonia discharge from CPI. Therefore, this location was chosen to monitor the discharge from CPI in this study. In the LASMA area, two sampling sites were set up to collect (1) the overflow from sludge lagoons discharging directly to the interceptor, and (2) the overflow from the LASMA drying cells and from a

desilting basin at the Marathon Solids Drying Area, which is located at the west end of LASMA.

To monitor background concentrations before the main discharge from CPI, one sampling station was set up on Interceptor SW-12 upstream of CPI. For centrate from the Stickney post-digestion centrifuges, three individual centrifuges were sampled and then the three samples were composited into one. Raw sewage entering the Stickney West Side and Southwest plants and the WSIMEF and SWPREF were monitored in this study in order to examine the changes in concentrations of TKN and ammonia through settling of the sewage in the Imhoff and primary settling tanks.

The sample collection was carried out during the period of September 17 through October 15, 2001. The Industrial Waste Division (IWD) was responsible for collecting samples and delivering them to appropriate laboratories of the Analytical Laboratory Division (ALD). Auto-samplers were employed at each sampling location to collect a composite sample every two hours with an aliquot taken every 15 minutes. For Post-DC and TARP pumpback, which do not have flow at all times, some two-hour intervals will be missing from the data set.

The ammonia and TKN loadings (lbs/day) at each monitored location during the study period were calculated using the concentrations and the corresponding flow rates. The data for wastewater flow rates at the ten sampling locations were gathered in several ways. At CPI, the data from the totalizer that records daily total discharge and strip charts that record instant discharge for the study period were obtained from the staff of CPI. The measurement of flow rates at LASMAE, LASMAW, and SW-12 was contracted to Elan Industries, Inc. The discharge rates of centrate at Post-DC were estimated based on the solids contents of centrifuge feed, sludge cake, and centrate, and the feeding rates to the centrifuges in operation at the time of sampling. The flow rates for TARP pumpback, raw sewage, SWPREF, and WSIMEF were obtained from the pumping records of the M&O Department.

All data collected for the study period September 17 through October 15, 2001, were analyzed. The ammonia and TKN concentrations of two-hour composite samples and the corresponding flow rates were used to calculate the hourly mean loads of ammonia and TKN for each two-hour sampling period. Daily loads of ammonia and TKN were calculated as the sum of hourly loads over a 24-hour period.

Hourly loads of ammonia and TKN were used to examine the variation of ammonia and TKN loads for each of the four major point sources as well as at the sampling locations within the Stickney WRP. The significant hourly peak ammonia and TKN loads of the wastewater entering the Stickney WRP aeration tanks (SWPREF + WSIMEF) were identified, and the contributions from the four major point sources were determined. Daily loads of ammonia were used to examine any changes that occurred since the previous study conducted in 2000.

As a result of this study, the following conclusions can be drawn:

1. Of the four major point sources of ammonia to the Stickney WRP, identified as CPI, Post-DC, TARP, and LASMA in the previous study, CPI, Post-DC, and TARP remained as the major point sources in this study that contributed significant amounts of ammonia nitrogen to the Stickney WRP. LASMA was not found to be a major point source during this study period. The average hourly loadings of ammonia and TKN from the four point sources investigated during September 17 through October 15, 2001, and the individual percent contributions are summarized in Table 1.

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TABLE 1

AVERAGE LOAD OF AMMONIA AND TKN CONTRIBUTED FROM THE FOUR POINT SOURCES TO THE STICKNEY WRP FOR THE PERIOD SEPTEMBER 17 THROUGH OCTOBER 15, 2001

Parameter	Post-DC	TARP	CPI	LASMA
Ammonia Load (lbs/h)	478	413	340	39
Standard Deviation (lbs/h)	232	401	201	71
Contribution (%)	22.5	19.5	16.0	1.8
TKN Load (lbs/h)	563	791	407	53
Standard Deviation (lbs/h)	290	948	224	96
Contribution (%)	8.2	11.3	5.9	0.8

Notes:

1. Post-DC is the centrate from the post-digestion centrifuges.
2. TARP is the TARP Pumpback to the Stickney WRP.
3. CPI is the discharge at 2AT of Corn Products International.
4. LASMA is the overflow from the sludge lagoons in the Lawndale Avenue Solids Management Area.
5. Percent contribution was calculated based on the average total load of 2,122 pounds per hour of ammonia and 6,903 pounds per hour of TKN to the Stickney WRP from all sources.

2. Although LASMA was not considered a major point source, LASMA was an extremely variable source of ammonia and TKN. The recorded maximum hourly loads of ammonia and TKN from LASMA in this study were nine and eight times higher, respectively, than its hourly mean loads.
3. Most of the significant hourly peak ammonia loads to SWPREF + WSIMEF were related to the peak loads to SWPREF, based on the hourly ammonia loads. However, less than half of these significant ammonia peak loads appeared to be related to the peak loads discharged at the three major point sources.
4. The analysis of hourly TKN loads revealed that the significant peak TKN loads observed in SWRAW were not related to the peaks observed at the three major point sources. No correlation between significant peak TKN loads to the Stickney WRP aeration tanks and those at the three major point sources was found, although the actual portion of TKN loads from these major point sources is difficult to determine due to the

removal of particulate organic nitrogen in the preliminary settling tanks.

5. Although a considerable amount of organic nitrogen was removed in the Imhoff and preliminary settling tanks, about 65 percent removal in the preliminary settling tanks and 18 percent in the Imhoff tanks, organic nitrogen constituted a significant portion of TKN entering the Stickney WRP aeration tanks (SWPREF + WSIMEF), accounting for 46 percent of the TKN.

6. The background sewage, as represented by the samples collected at the Interceptor SW-12 upstream of CPI and raw sewage to the Stickney West Side plant (WSRAW), had a much larger portion of organic nitrogen, compared to the wastewater from the three major point sources.

7. The contribution of organic nitrogen from Post-DC and CPI was relatively small. Based on the hourly mean load of organic nitrogen, and assuming that all of the organic nitrogen from these two sources reaches the Stickney WRP aeration tanks (SWPREF + WSIMEF), the organic nitrogen from Post-DC accounted for 4.0 percent and CPI

3.1 percent of the total to the aeration tanks. TARP, on the other hand, contributed 17.2 percent of the organic nitrogen loading to the Stickney WRP aeration tanks.

8. Of the three major point sources, TARP pumpback had the greatest influence on peak TKN and ammonia loading to the aeration tanks. TARP pumpback, along with the operations of Stickney WRP aeration tanks, needs to be carefully controlled to avoid potential violations of the daily maximum ammonia limit in the Stickney WRP final effluent.

INTRODUCTION

Background

The current NPDES permit for the Stickney WRP requires ammonia-nitrogen (ammonia) in the final effluent not to exceed a maximum daily concentration of 8 mg/L in winter and 5 mg/L in summer, in addition to continuation of the monthly average concentration limits contained in the previous permit. In the expired NPDES permit (which expired in 2001), the ammonia limit is seasonal and set at a maximum monthly average concentration of 2.5 mg/L (April-October) and 4.0 mg/L (November-March). Twice in the year 2000, on April 7 and again on July 22, the daily ammonia concentration in the final effluent of the Stickney WRP exceeded 5 mg/L.

As a result of these two incidents that occurred in 2000, the M&O Department expressed a concern, and requested the R&D Department to identify major ammonia contributing sources to the Stickney WRP and to determine the likely cause(s) of ammonia spikes (i.e., exceedance of the proposed daily ammonia limits) in the final effluent of the Stickney WRP on April 7 and July 22, 2000. In response to this request from the M&O Department, the R&D Department conducted a study in 2000, in which field sampling collection was performed during August 14

through September 5, 2000. The purpose of this study was to identify main sources contributing ammonia to the Stickney WRP with the purpose of determining possible cause(s) of ammonia spikes that occurred twice in the year 2000 in the final effluent of the Stickney WRP. The findings of this study were published as R&D Department Report No. 01-3 dated February 2001.

The above mentioned study identified four major ammonia contributing sources to the Stickney WRP in addition to the regular domestic loading (domestic source), which is considered normal background ammonia load. The four major ammonia contributing sources identified were TARP pumpback, discharge from CPI, centrate from the Post-DC, and overflow from the sludge lagoons at LASMA.

In the 2000 study, loading of ammonia to the Stickney WRP was determined on a daily basis but insufficient data was collected with respect to hourly variations of the ammonia loading which could be responsible for spikes of ammonia exceeding the proposed daily maximum ammonia limit in the final effluent. Also, no data were collected to determine amounts of organic nitrogen contributed from these major ammonia contributing sources. In addition, two major operational changes took place at the Stickney WRP concerning sludge processing and

recycle streams after the 2000 study. The post-digestion centrifuge building was expanded and new centrifuges were installed. Beginning early 2001, all digested sludge at the Stickney WRP is being dewatered at the post-digestion centrifuge building, and low solids sludge has no longer been sent to the lagoons at the LASMA area on a regular basis. At the same time, several lagoons have been taken out of service to make room for the future McCook reservoir. These changes could have major impact on the loading of ammonia from some of the previously identified point sources.

2001 Study

Therefore, another study, which is the subject of this report, was conducted in 2001 to determine hourly fluctuations in ammonia and organic nitrogen loadings from the four identified sources to the Stickney WRP.

In the 2001 study, site visits were conducted to identify and locate proper sampling sites prior to the collection of field samples. As a result of these visits, ten sampling locations were selected to collect samples for ammonia and organic nitrogen contributing sources as well as to collect samples for the raw sewage entering the Stickney West Side and Southwest primary settling tanks, and the effluents leaving

these tanks. Two-hour composite samples at these ten locations were collected by auto-samplers for 28 consecutive days from September 17 through October 15, 2001. All samples were analyzed for ammonia and TKN, which is the sum of ammonia and organic nitrogen. The corresponding flow rates at each sampling location were determined for the calculation of hourly ammonia and TKN loads, to evaluate hourly variations in ammonia and TKN concentrations, and to determine the contribution of ammonia and organic nitrogen from each of the major point sources identified for this study.

Objectives of the Study

The present study was designed to achieve the following objectives:

1. To determine hourly ammonia concentrations and loads at the four major point sources identified in the previous study.
2. To determine the amounts of organic nitrogen generated at each of the identified sources by including TKN analysis for each sample collected.

3. To examine the changes of ammonia and TKN concentrations through the primary treatments at the Stickney Southwest and West Side plants.
4. To investigate the contributions of the identified major point sources to the significant peak ammonia and TKN loads entering the Stickney aeration tanks.
5. To examine the changes in the amounts of ammonia contributions from each of the identified point sources between the 2000 and 2001 studies.

This report presents the methodology used in this study, the data collected, and the findings from the study. Wherever appropriate, comparisons of the data obtained in this study with that of the 2000 study are made. The results from this study are discussed based on the data collected for the sampling period of September 17 through October 15, 2001.

METHODOLOGY

Sampling Locations

Ten sampling locations were selected for this study. A list of these locations, along with their abbreviated names is given in Table 2. The interrelationships among these sampling locations are shown in Figure 1.

There were twelve sampling stations set up in the ten locations. One station is set up for each of the locations in Table 2 except for Post-DC. The sampling station for TARP pumpback was located where the daily composite sample is collected. The sampling station for CPI was located within the premises of CPI at 2AT. This location was identified as one of the major ammonia nitrogen discharge points in the previous study. One sampling station was set up on the Interceptor SW-12, which was located upstream of CPI, for monitoring the background.

In the LASMA sludge processing area, two sampling stations were set up. The overflow from sludge storage lagoons, which are located on the eastern side of the current desilting basins, are divided into two streams. One stream is intercepted and sent to one of the desilting basins and the other stream discharged to the sewer interceptor. One sampling

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TABLE 2

LIST OF SAMPLING LOCATIONS FOR AMMONIA AND ORGANIC NITROGEN SOURCE INVESTIGATION IN 2001

Name of Sampling Site	Acronym
Corn Products International at 2AT	CPI
LASMA East Manhole	LASMAE
LASMA West Manhole	LASMAW
Interceptor SW-12 (Upstream of CPI)	SW-12
Stickney Post-Digestion Centrifuge	Post-DC
TARP Pumpback to Stickney WRP	TARP
Southwest Raw Sewage	SWRAW
Southwest Preliminary Effluent	SWPREF
West Side Raw Sewage	WSRAW
West Side Imhoff Effluent	WSIMEF

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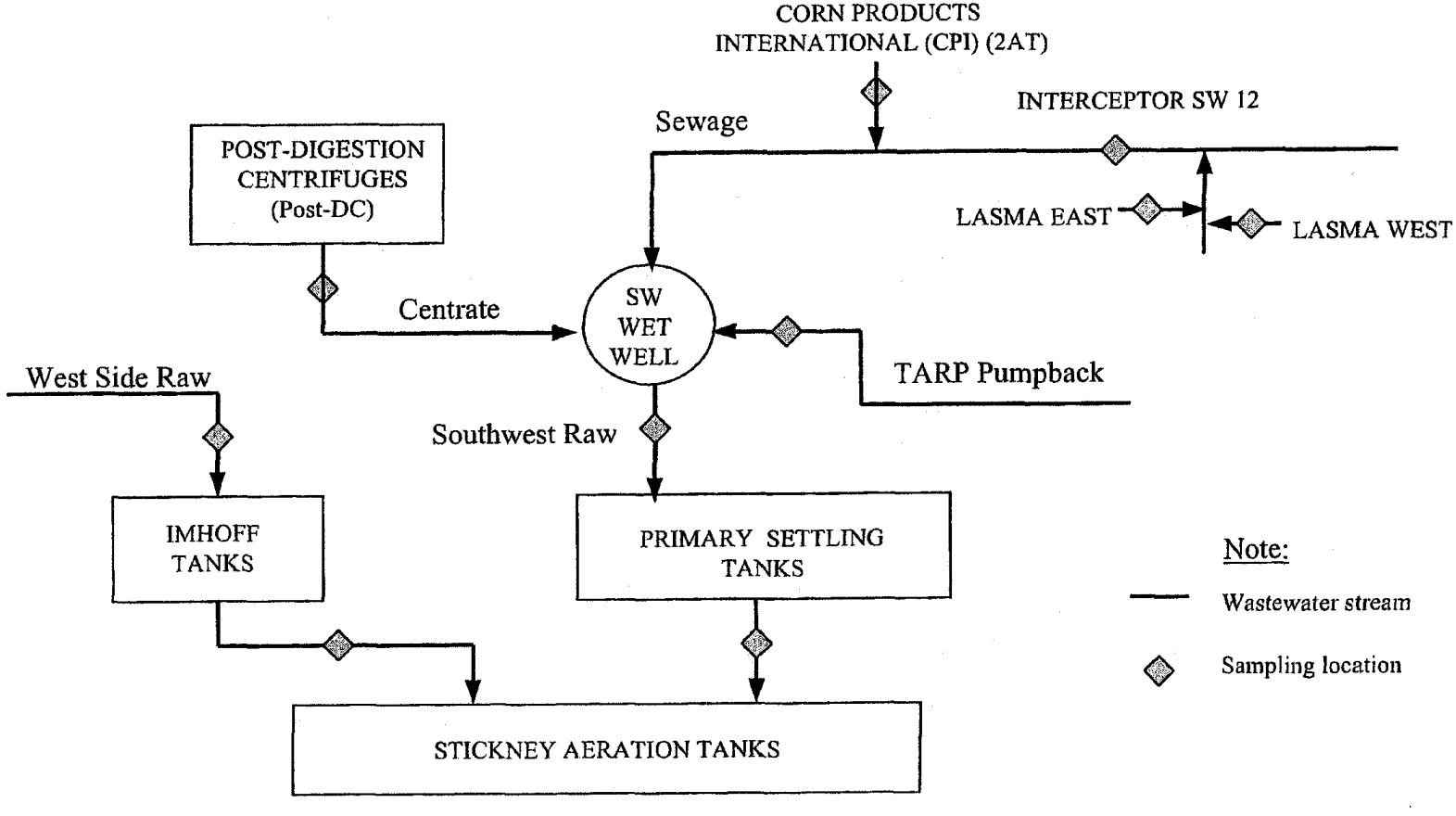
FIGURE 1

SCHEMATIC DIAGRAM OF SAMPLING LOCATIONS FOR THE AMMONIA STUDY IN 2001



station was set up to collect the overflow entering the interceptor directly. The other sampling station was set up to collect the overflow from the LASMA drying cells, which are located on the western side of the desilting basins, and from a desilting basin at the Marathon Solids Drying Area. There was no overflow from the LASMA desilting basins during the sampling period of this study.

Three sampling stations were used for the centrate from Post-DC. As there is no single location that the combined centrate from all operational post-digestion centrifuges can be collected without dilution, individual centrifuges have to be sampled. Considering the relatively constant feed to all the centrifuges, only three centrifuges, representative of all the centrifuges, were selected and sampled. The samples collected from these three locations were combined into one sample for Post-DC.

Four additional sampling stations were set up to monitor the raw sewage entering the Stickney WRP and effluents coming out of the Imhoff tanks and the preliminary settling tanks. These stations were the SWRAW, WSRAW, SWPREF, and WSIMEF (Table 2).

Samples at these sampling locations were collected 24 hours a day from September 17 through October 15, 2001. At

each sampling station, aliquots from the targeted wastewater stream were collected every 15 minutes by an auto-sampler. Each individual sample was a two-hour composite sample containing 8 aliquots. The aliquots from three sampling stations for Post-DC were combined as one sample per every two hours. All the samples were stored in cold temperature, acid-preserved and transported to the analytical laboratory on a daily basis except for weekends. Weekend samples were collected, stored in the cool room at a temperature of 4°C, and delivered to the analytical laboratory on the following Monday. Each two-hour composite sample was analyzed for ammonia and TKN. TKN is the sum of organic and ammonia nitrogen.

Flow Rates

Wastewater flow rates at each sampling location constantly varied. For the sake of simplicity, wastewater flow rates used in this study were calculated as the average hourly flow over the two-hour period in which a two-hour composite sample was collected. A forward averaging scheme was used to calculate the average hourly flow rates. For example, a flow rate at 2:00 a.m. represents the mean flow rate over a two-hour period from 2:00 a.m. to 4:00 a.m. This scheme agrees with that for two-hour composite samples.

At CPI, a totalizer records daily total discharge, and strip charts record instant discharge. The data from the totalizer and strip charts for the field-sampling period of this study were provided by CPI personnel. Hourly flow rates were derived from the strip charts. However, using the conversion factors provided, the calculated daily total flow rates from the strip charts did not match well with those from the totalizer. After meeting CPI staff, it was decided that the daily total flow rates from the totalizer should be more accurate and used as a base for flow rate calculation. Therefore, average hourly flow rates at the sampling location 2AT, derived from the strip charts, were adjusted accordingly to match the daily total flow rates from the totalizer.

The measurement of flow rates at LASMA East and West sampling sites and Interceptor SW-12 was contracted to Elan Industries, Inc. Instantaneous flow rates were calculated every 5 minutes based on the mean area velocities and wastewater levels in the sewer. The mean area velocities and wastewater levels were detected by sensors and recorded in a digital format. The data of instantaneous flow rates at these three locations were provided by Elan Industries, Inc., at the end of the field sampling of this study. The average hourly flow

rates were calculated over the corresponding two-hour periods for each sampling location.

The centrate discharge rates were estimated by combining the centrate flow from each individual working centrifuge. The total discharge rates of centrate at the Post-DC were estimated based on the solids contents of centrifuge feed, sludge cake and centrate as well as the feeding rates. The following assumptions were made in the calculations: (1) the daily mean solids contents of the feed, cake and centrate could be used to represent the hourly solids contents on that day; (2) the mean values of solids contents of the sludge cake and centrate from individual centrifuges could be used to represent the values for combined cake and centrate; (3) the specific gravity of the feed to the centrifuges was identical to that of the centrate. The estimated values of the discharge rates were calculated using the following equation:

$$Q_r = \frac{C_c - C_f}{C_c - C_r} Q_f$$

where: C_c = solids content in cake as percent by weight

C_f = solids content in feed as percent by weight

c_r = solids content in centrate as percent by weight

Q_f = the feeding rate of digester draw to all the centrifuges in million gallons per hour (MGH), and

Q_r = the discharge rate of combined centrate in MGH.

The daily mean values of c_c were directly obtained from LIMS. The daily mean values of solids contents of cake and centrate from individual centrifuges were also obtained from the LIMS. The values of c_f and c_r were calculated using the averages of the individual values, respectively. Hourly feeding rate to each working centrifuge at the Post-DC building was obtained from the operational records of the M&O Department. The total feeding rate was the sum of feeding rates to the individual centrifuges.

For TARP pumpback, the flow rates were estimated using the pumping log obtained from the operational records of the M&O Department. In the operational records, the number of working pumps and the pumping capacity of each working pump were given. The pumpback flow rates were the sum of the flow generated by each working pump. The average flow rates were

calculated according to the sampling intervals. Sample collection occurred only when the pumps were in operation.

The wastewater flow rates at SWRAW, SWPREF, WSRAW and WSIMEF were calculated using the hourly flow rates recorded by the M&O Department. The flow rate corresponding to each sample collected at these locations was an average of two hourly flow rates and the calculation was made with a forward averaging method.

Loading Rates

Loading rates of ammonia and TKN in terms of pounds per hour or per day were computed using concentrations and the corresponding flow rates. The hourly loads of ammonia and TKN were the products of the ammonia and TKN concentrations and the average hourly flow rates over the corresponding sampling periods based on two-hour composite samples. In other words, an hourly load in this study represented the mean hourly load over a two-hour period, in which a composite sample was collected and analyzed for ammonia and TKN. Thus, the ammonia or TKN loads over a two-hour sampling period is equal to the calculated hourly loads multiplied by 2.

A daily load of ammonia or TKN was the sum of hourly loads over a 24-hour period, which was typically a calendar

day. However, for the sake of convenience, the calculation of daily loads was not strictly bounded by a calendar day. If the two-hour sampling period started at 1:00 a.m., the daily load covered a 24-hour period from 1:00 a.m. to the next 1:00 a.m., off by one hour to a calendar day.

DATA ANALYSIS AND DISCUSSION OF RESULTS

Data Analysis

Field sampling for this study started in the morning of September 17, 2001. The sample collection continued for 24 hours per day for 28 days and ended the morning of October 15, 2001. One two-hour composite sample with aliquots taken every 15 minutes was collected every 2 hours at each sampling location except for the Post-DC and TARP pumpback. No aliquot could be collected when centrate from the centrifuge and/or TARP pumpback were not being discharged. The total number of samples collected from ten sampling locations was 3,203. No samples were missed from five of the ten locations. Less than 12 samples were missed from each of another four locations, and 17 samples were missed at SWRAW.

Each sample was analyzed for ammonia and TKN. The values of ammonia and TKN concentrations of all samples collected during this study were obtained from the LIMS and are listed in the Tables AI-1 through AI-7 in Appendix AI. The collection time was the beginning of a two-hour aliquot collection period except for a few samples from TARP pumpback. The sampling schedules for all locations were predetermined and fixed. But, TARP pumpback started and ended according to M&O

Department operational schedule. For the sake of uniformity, all samples from TARP pumpback are considered as two-hour composite samples, including those collected at the beginning and end of a pumpback, during the data analysis.

Table 3 presents the summary of ammonia and TKN concentrations of two-hour composite samples collected from ten sampling locations during September 17 through October 15, 2001. This table contains mean, minimum, and maximum of all ammonia and TKN concentrations for each sampling location. Standard deviation (Std. Dev.) and the coefficient of variation (CV) as measures of variation in the concentrations during the 28-day sampling period are also given in Table 3.

Tables 4 and 5 present the summary of daily average ammonia and TKN concentrations for the ten sampling locations during September 17 through October 15, 2001. These tables contain mean, minimum, and maximum values of all ammonia and TKN concentrations for each location. Standard deviation (Std. Dev.) and the coefficient of variation (CV) as measures of variation in the concentrations during the 28-day sampling period are also given in Tables 4 and 5. In these tables, the daily average concentrations were calculated using the values obtained from two-hour composite samples collected in a calendar day.

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TABLE 3

SUMMARY OF AMMONIA AND TKN CONCENTRATIONS OF TWO-HOUR COMPOSITE SAMPLES COLLECTED FROM TEN SAMPLING LOCATIONS
SEPTEMBER 17 THROUGH OCTOBER 15, 2001 STUDY

	CPI	LASMAE	LASMAW	SW-12	Post-DC	TARP	SWRAW	SWPREF	WSRAW	WSIMEF
					NH_3-N					
No. of Samples	336	336	328	325	330	225	319	332	336	336
Mean (mg/L)	156.89	184.55	48.34	10.56	565.46	4.74	7.97	9.61	7.22	7.47
Min (mg/L)	16.45	17.27	5.04	2.99	9.82	0.55	0.72	1.32	0.72	1.22
Max (mg/L)	415.53	529.72	242.78	57.65	760.30	13.15	27.11	23.71	14.05	13.23
Std. Dev. (mg/L)	85.83	124.45	48.20	5.56	182.73	2.45	4.67	4.56	3.15	2.56
CV (%)	54.7	67.4	99.7	52.6	32.3	51.7	58.6	47.4	43.6	34.3
					TKN					
No. of Samples	336	336	328	325	330	225	319	332	336	336
Mean (mg/L)	188.13	215.75	85.93	26.69	667.03	9.25	28.7	16.38	17.02	15.28
Min (mg/L)	28.48	21.84	6.85	9.32	11.69	0.71	7.5	3.33	2.70	3.23
Max (mg/L)	579.25	603.79	869.59	99.49	1,501.88	72.33	103.2	43.75	30.87	26.79
Std. Dev .(mg/L)	95.41	144.65	125.19	11.16	233.13	8.78	15.0	6.25	6.29	4.95
CV (%)	50.7	67.0	145.7	41.8	35.0	94.9	52.4	38.2	37.0	32.4

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TABLE 4

SUMMARY OF DAILY MEAN AMMONIA CONCENTRATIONS BASED ON TWO-HOUR COMPOSITE SAMPLES
COLLECTED FROM TEN LOCATIONS
SEPTEMBER 17 THROUGH OCTOBER 15, 2001 STUDY

Date	CPI	LASMAE	LASMAW	SW-12	Post-DC	TARP	SWRAW	SWPREF	WSRAW	WSIMEF
9/17/01[a]	120.96	52.04	16.47	13.73	692.31	13.15	22.00	19.07	11.86	10.45
9/18/01[b]	142.05	69.57	34.29	18.33	676.71	8.61	13.92	13.67	9.30	10.57
9/19/01	256.05	87.07	127.80	10.28	642.81	8.65	10.58	10.26	3.75	5.60
9/20/01[c]	143.86	138.91	116.84	8.40	642.92	3.44	13.17	11.44	6.64	6.91
9/21/01	153.09	97.22	90.21	8.93	581.34	2.17	4.50	5.01	4.28	5.67
9/22/01	178.42	74.14	42.46	7.09	408.89	2.13	6.10	6.70	6.47	6.59
9/23/01	127.25	110.31	74.38	7.74	484.49	2.99	5.21	5.56	5.07	6.64
9/24/01[c]	138.17	125.44	69.08	5.94	510.79	3.63	5.34	5.87	5.35	5.34
9/25/01	210.74	114.01	80.44	7.42	544.85	2.88	8.44	9.21	6.71	6.64
9/26/01	164.01	243.61	19.42	15.42	516.35	3.87	9.11	10.20	8.14	8.03
9/27/01	175.73	428.60	9.69	14.13	519.01	6.07	10.01	12.25	8.45	8.49
9/28/01[d]	149.87	397.12	7.30	18.81	518.02	5.46	7.30	8.23	9.28	9.19
9/29/01[d]	180.67	370.88	7.19	11.19	332.32	4.72	5.13	7.31	8.54	9.11
9/30/01	205.85	284.35	6.66	13.81	655.57	5.58	5.64	9.70	9.45	9.67
10/1/01[e]	163.28	139.07	8.70	11.44	666.29	5.14	7.08	12.32	11.11	10.05
10/2/01[e]	95.59	88.68	8.54	9.52	655.55	6.99	9.57	12.97	9.85	9.35
10/3/01[c]	205.03	93.18	6.67	12.24	644.76	8.27	9.76	14.53	10.74	10.56
10/4/01	113.31	92.47	44.46	10.62	642.92	10.23	9.50	13.74	8.34	10.41
10/5/01	133.05	74.84	112.36	8.27	655.79	9.30	5.69	7.76	3.70	4.33
10/6/01	147.73	215.03	26.68	10.59	300.52	4.17	4.90	6.97	5.33	5.14
10/7/01	154.03	349.95	9.66	13.26	537.91	3.14	4.27	6.33	7.65	7.20
10/8/01	163.72	323.71	6.82	9.43	694.33	5.20	10.04	11.48	8.52	7.76
10/9/01	163.61	266.21	6.71	5.38	594.38	8.11	11.54	13.57	8.58	8.02
10/10/01	180.11	179.90	41.79	8.48	552.39	5.88	9.62	12.08	8.71	8.11
10/11/01[c]	137.99	148.14	72.79	7.29	641.07	5.64	8.16	10.39	9.39	9.04
10/12/01	116.02	175.57	92.91	10.78	635.62	5.88	4.02	6.19	4.91	6.02
10/13/01	152.74	233.64	88.32	8.96	496.82	2.95	4.18	6.20	3.73	4.01

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 4 (Continued)

SUMMARY OF DAILY MEAN AMMONIA CONCENTRATIONS BASED ON TWO-HOUR COMPOSITE SAMPLES
COLLECTED FROM TEN LOCATIONS
SEPTEMBER 17 THROUGH OCTOBER 15, 2001 STUDY

Date	CPI	LASMAE	LASMAW	SW-12	Post-DC	TARP	SWRAW	SWPREF	WSRAW	WSIMEF
10/14/01	83.48	158.12	88.68	9.67	530.23	1.60	2.53	3.30	2.07	2.73
10/15/01[a]	230.53	137.39	67.10	10.32	394.71	SM	SM	SM	3.08	3.15
Mean	158.17	181.70	47.74	10.60	564.47	5.57	8.12	9.72	7.21	7.41
Min	83.48	52.04	6.66	5.38	300.52	1.60	2.53	3.30	2.07	2.73
Max	256.05	428.60	127.80	18.81	694.33	13.15	22.00	19.07	11.86	10.57
Std Dev	38.57	108.57	39.74	3.32	106.49	2.78	4.00	3.62	2.62	2.29
CV (%)	24.4	59.8	83.2	31.3	18.9	49.9	49.2	37.2	36.4	30.9

[a]The daily mean concentrations in all locations were based on partial data.
[b]The daily mean concentration for LASMAW was based on partial data due to missing samples.
[c]The daily mean concentrations for TARP pumpback were based on partial data due to missing samples.
[d]The daily mean concentrations for SW RAW were based on partial data due to missing sampes.
[e]The daily mean concentrations for SW-12 were based on partial data due to missing samples.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 5

SUMMARY OF DAILY MEAN TKN CONCENTRATIONS BASED ON TWO-HOUR COMPOSITE SAMPLES
COLLECTED FROM TEN SAMPLING LOCATIONS
SEPTEMBER 17 THROUGH OCTOBER 15, 2001 STUDY

Date	CPI	LASMAE	LASMAW	SW-12	Post-DC	TARP	SWRAW	SWPREF	WSRAW	WSIMEF
9/17/01[a]	133.18	67.78	20.82	33.98	728.32	29.22	70.38	30.93	26.55	19.63
9/18/01[b]	152.01	80.72	45.07	40.07	719.70	29.97	42.31	28.12	23.23	20.94
9/19/01	279.75	99.01	228.32	24.43	693.55	19.86	34.38	21.10	11.65	11.74
9/20/01[c]	173.96	152.27	173.76	22.43	680.76	8.51	47.87	20.95	16.12	13.90
9/21/01	171.57	111.43	125.94	22.43	723.25	4.98	25.15	11.98	11.55	11.51
9/22/01	231.34	88.46	53.67	20.46	468.55	5.29	27.86	15.09	15.77	13.00
9/23/01	153.60	130.00	177.51	17.47	596.90	6.75	26.77	13.26	11.98	11.27
9/24/01[c]	158.28	143.56	94.09	15.22	579.13	6.92	21.28	12.66	11.99	10.54
9/25/01	248.43	125.01	189.55	21.14	652.84	5.44	34.00	15.59	16.48	13.42
9/26/01	177.84	284.18	24.63	36.67	592.42	6.87	32.94	16.92	19.00	16.21
9/27/01	202.35	526.41	12.21	37.54	580.92	9.72	33.08	20.58	21.24	19.11
9/28/01[d]	176.25	442.33	9.54	42.44	605.57	8.75	26.79	19.45	21.78	19.82
9/29/01[d]	213.75	431.92	9.22	27.78	395.06	8.07	17.63	15.52	20.31	18.55
9/30/01	241.14	331.44	9.06	35.50	732.18	8.58	28.56	16.76	21.00	18.81
10/1/01[d]	202.83	168.28	12.15	34.06	773.03	8.55	21.79	18.58	22.06	19.85
10/2/01[d]	120.88	111.59	11.57	23.13	764.79	10.76	28.60	19.38	21.77	19.56
10/3/01[c]	239.49	103.64	9.23	28.37	843.33	38.08	33.09	19.21	23.79	21.48
10/4/01	143.25	110.06	72.66	37.48	785.44	21.86	34.60	18.41	20.96	20.95
10/5/01	154.42	89.90	223.30	23.93	735.58	28.66	20.39	11.71	10.08	10.42
10/6/01	174.05	255.73	47.88	25.06	367.07	7.87	20.62	11.55	14.24	13.17
10/7/01	181.15	413.52	13.62	26.02	629.12	4.06	20.96	9.95	16.70	14.70
10/8/01	201.49	374.44	9.27	25.68	806.08	5.80	30.60	16.44	17.93	16.12
10/9/01	208.93	296.61	8.76	21.67	770.87	11.97	32.40	19.75	20.36	17.45
10/10/01	264.92	204.98	85.59	26.29	925.09	7.63	30.76	16.78	20.83	17.35
10/11/01[c]	173.66	164.56	106.43	25.38	748.81	8.31	21.58	15.82	20.39	16.56
10/12/01	144.69	231.63	135.74	22.76	724.01	11.45	19.43	10.93	12.45	10.63

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 5 (Continued)

SUMMARY OF DAILY MEAN TKN CONCENTRATIONS BASED ON TWO-HOUR COMPOSITE SAMPLES
COLLECTED FROM TEN SAMPLING LOCATIONS
SEPTEMBER 17 THROUGH OCTOBER 15, 2001 STUDY

Date	CPI	LASMAE	LASMAW	SW-12	Post-DC	TARP	SWRAW	SWPREF	WSRAW	WSIMEF
10/13/01	193.02	267.65	133.19	21.84	563.45	4.41	13.09	9.43	8.74	8.85
10/14/01	107.12	196.88	293.82	16.97	615.73	1.72	17.76	6.58	5.59	6.17
10/15/01[a]	266.36	156.48	103.65	17.84	439.74				7.11	7.86
Mean	189.30	212.43	84.15	26.69	663.49	11.79	29.09	16.55	16.95	15.16
Min	107.12	67.78	8.76	15.22	367.07	1.72	13.09	6.58	5.59	6.17
Max	279.75	526.41	293.82	42.44	925.09	38.08	70.38	30.93	26.55	21.48
Std Dev	45.02	127.15	81.40	7.42	132.44	9.30	11.22	5.32	5.46	4.38
CV (%)	23.8	59.9	96.7	27.8	20.0	78.9	38.6	32.1	32.2	28.9

[a] The daily mean concentrations in all locations were based on partial data.
[b] The daily mean concentration for LASMAW was based on partial data due to missing samples.
[c] The daily mean concentrations for TARP pumpback were based on partial data due to missing samples.
[d] The daily mean concentrations for SW RAW were based on partial data due to missing samples.
[e] The daily mean concentrations for SW-12 were based on partial data due to missing samples.

The wastewater flow rates at the ten locations were collected in various ways in this study. The mean flow rates corresponding to each two-hour composite sample are listed in the Appendix Tables AI-1 through AI-7. Table 6 shows the summary of hourly flow rates in million gallons per hour (MGH) at the ten sampling locations during September 17 through October 15, 2001. Table 6 contains the data of hourly flow rates for all locations beginning September 17 at 12:00 a.m., except for CPI at which the collection of flow data started at 8:00 a.m. of September 17, 2001. All the flow data collection was terminated the morning of October 15, 2001, at the conclusion of the field study. Table 6 also contains analyses on minimum, mean, and maximum flow rates over the entire field-sampling period. Standard deviation (Std. Dev.) and the coefficient of variation (CV) as measures of variations in flow rates for each sampling location are also presented in Table 6.

Table 7 presents the summary of daily mean flow rates in million gallons per day (MGD) at the ten sampling locations. A daily mean flow rate was the average of hourly flow rates over a 24-hour period, which was typically a calendar day. However, for the sake of convenience, the calculation of daily mean flow rate was not strictly bounded by a calendar day. If the two hour sampling period started at 1:00 a.m., the daily

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 6

SUMMARY OF HOURLY FLOW RATES AT THE TEN SAMPLING LOCATIONS
SEPTEMBER 17 THROUGH OCTOBER 15, 2001 STUDY

	CPI	LASMAE	LASMAW	SW-12[a]	Post-DC	TARP	SWRAW	SWPREF	WSRAW	WSIMEF
No. of Values	336	341	341	261	341	341	341	341	341	341
Mean (MGH)	0.26	0.014	0.025	0.70	0.09	10.28	24.11	24.11	12.54	12.55
Min (MGH)	0.18	0	0	0	0	0	7.71	7.71	5.83	5.83
Max (MGH)	0.44	0.161	0.361	1.53	0.16	23.78	39.17	39.17	20.00	19.90
Std. Dev. (MGH)	0.05	0.028	0.066	0.32	0.03	7.94	8.11	8.11	3.23	3.27
CV (%)	17.8	203.0	263.2	46.3	36.5	77.3	33.6	33.6	25.7	26.1

[a]Missing flow values due to the blockage of the velocity sensors were not included in the calculation.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 7

SUMMARY OF DAILY MEAN FLOW RATES IN MGD AT THE TEN SAMPLING LOCATIONS[a]
SEPTEMBER 17 THROUGH OCTOBER 15, 2001 STUDY

Date	CPI	LASMAE	LASMAW	SW-12	Post-DC	TARP	SWRAW	SWPREF	WSRAW	WSIMEF
9/17/01[b]	5.09	0.00	0.03	21.46	3.05	74	336	336	256	257
9/18/01	5.44	0.09	0.27	21.08	2.05	82	413	413	234	234
9/19/01	6.35	0.53	2.88	26.71	2.34	87	616	616	339	344
9/20/01[c]	5.73	0.72	0.28	N/A	2.75	183	458	458	328	331
9/21/01[c]	6.86	0.81	0.57	N/A	2.78	316	761	761	317	317
9/22/01[c]	7.43	0.75	0.13	N/A	1.80	316	603	603	326	321
9/23/01[c]	7.49	0.69	1.51	N/A	1.82	316	746	746	234	229
9/24/01[c]	6.83	0.00	0.18	N/A	2.29	249	722	722	350	358
9/25/01[c]	7.12	0.46	0.10	N/A	2.44	203	455	455	305	301
9/26/01	6.83	0.36	0.08	14.10	2.36	193	482	482	260	259
9/27/01	6.73	0.00	0.07	12.32	2.37	169	402	402	261	263
9/28/01	6.57	0.38	0.05	8.14	2.02	243	494	494	282	287
9/29/01	6.96	0.02	0.04	10.87	1.42	456	692	692	388	388
9/30/01[c]	6.96	0.00	0.03	N/A	1.93	492	673	673	378	378
10/1/01[c]	6.52	0.20	0.03	N/A	2.54	274	538	538	291	289
10/2/01[c]	5.71	0.13	0.03	N/A	2.79	256	463	463	280	275
10/3/01	5.74	0.00	0.03	10.92	2.61	213	506	506	226	224
10/4/01	5.97	0.38	1.68	11.88	2.67	108	546	546	223	222
10/5/01	5.68	1.09	2.00	18.99	2.70	76	611	611	303	313
10/6/01	4.74	0.11	0.05	19.91	1.13	420	625	625	390	389
10/7/01	4.66	0.00	0.03	14.60	1.71	479	689	689	381	381
10/8/01	6.40	0.16	0.03	14.02	3.04	260	484	484	335	334
10/9/01	6.10	0.01	0.02	13.50	2.52	250	461	461	309	308
10/10/01	5.30	0.04	0.06	13.07	2.16	238	430	430	335	335
10/11/01	5.80	0.01	0.03	13.41	2.56	292	586	586	283	279
10/12/01	5.84	1.58	1.43	27.75	2.32	159	682	682	339	345
10/13/01	7.33	0.81	3.99	19.87	1.28	221	784	784	293	284

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 7 (Continued)

SUMMARY OF DAILY MEAN FLOW RATES IN MGD AT THE TEN SAMPLING LOCATIONS[a]
SEPTEMBER 17 THROUGH OCTOBER 15, 2001 STUDY

Date	CPI	LASMAE	LASMAW	SW-12	Post-DC	TARP	SWRAW	SWPREF	WSRAW	WSIMEF
10/14/01	4.72	0.00	1.26	30.84	2.33	255	914	914	162	173
10/15/01[d]	4.98	0.00	0.73	35.40	2.10	316	654	654	350	343
Mean	6.13	0.32	0.61	17.94	2.27	248	580	580	302	302
Min	4.66	0.00	0.02	8.14	1.13	74	336	336	162	173
Max	7.49	1.58	3.99	35.40	3.05	492	914	914	390	389
Std Dev	0.85	0.40	0.99	7.41	0.49	114	137	137	55	55
CV (%)	13.9	126.0	162.6	41.3	21.6	46.1	23.5	23.5	18.4	18.3

[a]The daily mean flow rate at a location was calculated corresponding to the sampling period at that location.
[b]The daily mean flow rate at CPI was calculated based on partial data because the data collection started at late morning of September 17, 2001.
[c]The daily mean flow rate at SW-12 was not calculated because of incomplete data due to sensor blockage.
[d]The daily mean flow rates at all locations were calculated based on partial data because the end of the sampling period was at the morning of October 15, 2001.

mean flow rate covered a 24-hour period from 1:00 a.m. to the next 1:00 a.m. The results of statistical analyses on the daily mean flow rates for each sampling location are also included in the table.

Mean hourly loads of ammonia and TKN, along with the minimum, maximum, Std. Dev., and CV for all the sampling locations are presented in Table 8. The hourly ammonia and TKN load values were calculated using the concentrations of two-hour composite samples taken from these locations and the corresponding hourly mean flow rates. In case of missing samples, the daily mean concentrations were used for each missing sample to calculate the hourly loads except for those noted in the table. Zero hourly loading of ammonia and TKN was assigned to the hours that TARP pumpback did not occur, due to zero flow rate for TARP.

Daily loads of ammonia and TKN, along with statistical values for the sampling locations selected in this study are presented in Tables 9 and 10. A daily loading is the sum of hourly loads over a 24-hour period, typically a calendar day. If a sample or samples on a particular day were missing, the daily mean concentrations, as mentioned above, were used to calculate the loads for the time period with missing samples, and the daily loads on that day were noted as estimated in the

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 8

SUMMARY OF HOURLY AMMONIA AND TKN LOADS AT THE SAMPLING LOCATIONS SELECTED IN THIS STUDY
SEPTEMBER 17 THROUGH OCTOBER 15, 2001 STUDY

	CPI	LASMA[a]	SW-12	Post-DC	TARP	SWRAW	SWPREF	WSRAW	WSIMEF
					NH_3-N				
No. of Values	336	336	257	336	336	331	332	336	336
Mean (lb/h)	340	39	64	478	413	1,367	1,725	755	775
Min (lb/h)	27	0	0	0	0	230	431	41	72
Max (lb/h)	1,071	335	343	983	1,530	3,960	4,950	1,880	1,569
Std Dev (lb/h)	201	71	44	232	401	518	652	338	298
CV (%)	59.2	181.9	68.6	48.6	97.2	37.9	37.8	44.8	38.5

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 8 (Continued)

SUMMARY OF HOURLY AMMONIA AND TKN LOADS AT THE SAMPLING LOCATIONS SELECTED IN THIS STUDY
SEPTEMBER 17 THROUGH OCTOBER 15, 2001 STUDY

	CPI	LASMA[a]	SW-12	Post-DC	TARP	SWRAW	SWPREF	WSRAW	WSIMEF
					TKN				
No. of Values	336	336	257	336	336	331	332	336	336
Mean (lb/h)	407	53	155	563	781	5,127	3,046	1,776	1,595
Min (lb/h)	46	0	0	0	0	2,100	652	160	191
Max (lb/h)	1,208	438	608	1,611	7,947	13,211	10,106	3,594	2,913
Std Dev (lb/h)	224	96	88	290	948	2,066	1,082	696	606
CV (%)	55.0	181.4	56.8	51.6	121.7	40.3	35.5	39.2	38.0

[a]LASMA combined were the sum of values from east and west sampling locations, not including those from the desilting pond.
[b]The missing loading data were caused by missing flow rates due to the sensor blockage during flow measurement.
[c]There were a total of 9 samples missing at this site. However, the hourly loads for the period when samples were missing were included in this table using the daily mean concentrations in the calculations.
[d]There were a total of 17 samples missing at this site. However, the hourly loads for the period when 7 samples were missed on 9/28 and 5 on 9/29 were included in this table. These hourly loads were calculated using the daily mean concentrations. Five hourly loads on 10/15 were not included in this table because of missing samples.
[e]Four hourly loads on 10/15, which was at the end of the sampling period, were not included in this table due to missing samples.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 9

SUMMARY OF DAILY AMMONIA LOADS (LB/D) AT THE SAMPLING LOCATIONS SELECTED IN THIS STUDY
FOR THE STICKNEY WRP
SEPTEMBER 17 THROUGH OCTOBER 15, 2001 STUDY

Date	CPI	LASMA[a]	SW-12	Post-DC	TARP	SWRAW	SWPREF	WSRAW	WSIMEF
9/17/01	5,232[b]	3[b]	2,604[b]	16,845[b]	8,133[b]	61,295[b]	51,017[b]	22,966[b]	20,399[b]
9/18/01	6,177	343[b]	3,100	11,597	5,949	48,685	47,476	18,186	20,621
9/19/01	12,890	3,190	2,486	12,489	5,848[b]	47,141	45,589	11,562	15,105
9/20/01	7,126	1,091	n/a[c]	14,721	5,260[b]	42,349	41,275	17,611	18,982
9/21/01	8,620	1,338	n/a[c]	13,581	5,709	28,247	31,373	11,731	15,779
9/22/01	10,958	484	n/a[c]	7,555	5,604	30,899	34,194	17,061	17,582
9/23/01	7,689	1,823	n/a[c]	8,854	7,873	30,403	33,264	10,716	12,985
9/24/01	7,876	108	n/a[c]	9,965	8,029[b]	31,893	35,145	16,093	16,193
9/25/01	12,584	531	n/a[c]	11,286	4,917	31,907	34,901	16,319	16,483
9/26/01	9,108	352	1,865	10,445	6,195	36,142	40,671	17,713	17,333
9/27/01	9,885	6	1,425	10,906	8,989	32,663	40,158	18,532	18,602
9/28/01	8,307	1,506	1,042	8,747	11,159	30,042[b]	33,184	22,192	22,383
9/29/01	10,512	182	1,002	4,560	18,218	29,633[b]	42,225	27,652	29,474
9/30/01	11,862	2	n/a[c]	9,191	22,466	31,552	54,306	29,811	30,514
10/1/01	8,935	188	n/a[c]	14,097	11,782	30,906	54,086	26,586	24,214
10/2/01	4,621	103	n/a[c]	15,236	15,232	29,959	45,416	21,919	21,224
10/3/01	9,953	1	1,120	14,026	13,950[b]	40,089	58,828	20,298	19,668
10/4/01	5,852	1,911	1,080	14,322	9,238	37,762	57,893	16,417	19,034
10/5/01	6,645	2,717	1,310	14,753	5,831	27,386	37,515	10,210	10,827
10/6/01	5,983	87	1,755	4,033	14,086	24,019	34,303	17,398	16,670
10/7/01	6,094	3	1,645	9,607	12,945	24,514	36,346	24,227	22,850
10/8/01	8,669	421	1,073	17,601	11,581	30,942	40,207	23,454	21,789
10/9/01	8,857	14	616	12,985	16,487	37,375	45,378	21,744	20,834
10/10/01	7,959	78	947	11,470	12,065	28,581	38,453	24,097	22,768
10/11/01	6,717	32	824	13,791	14,140[b]	38,156	49,709	21,731	20,940
10/12/01	5,468	4,172	2,510	12,664	7,025	22,342	34,552	14,163	17,157

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 9 (Continued)

SUMMARY OF DAILY AMMONIA LOADS (LB/D) AT THE SAMPLING LOCATIONS SELECTED IN THIS STUDY
FOR THE STICKNEY WRP
SEPTEMBER 17 THROUGH OCTOBER 14, 2001 STUDY

Date	CPI	LASMA[a]	SW-12	Post-DC	TARP	SWRAW	SWPREF	WSRAW	WSIMEF
10/13/01	8,916	4,430	1,485	6,249	5,822	26,254	39,822	10,225	10,276
10/14/01	3,262	924	2,506	13,348	3,379	19,109	24,957	2,837	3,970
Mean	8,099	930	1,600	11,604	9,925	33,223	41,509	18,338	18,738
Min	3,262	1	616	4,033	3,379	19,109	24,957	2,837	3,970
Max	12,890	4,430	3,100	17,601	22,466	61,295	58,828	29,811	30,514
Std. Dev.	2,392	1,284	721	3,407	4702	8,805	8,481	6,116	5,414
CV, (%)	29.5	138.0	45.1	29.4	47.4	26.5	20.4	33.4	28.9

[a]LASMA combined were the sum of values from east and west sampling locations, not including those from the desilting pond.
[b]Daily loads were estimated because of missing samples.
[c]Data are not available due to missing flow data.

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TABLE 10

SUMMARY OF DAILY TKN LOADS (LB/D) AT THE SAMPLING LOCATIONS SELECTED IN THIS STUDY FOR THE STICKNEY WRP
SEPTEMBER 17 THROUGH OCTOBER 15, 2001 STUDY

Date	CPI	LASMA[a]	SW-12	Post-DC	TARP	SWRAW	SWPREF	WSRAW	WSIMEF
9/17/01	5,769[b]	4[b]	6,441[b]	17,721[b]	18,072[b]	188,537[b]	82,543[b]	51,449[b]	38,296[b]
9/18/01	6,621	462[b]	6,853	12,348	20,644	144,162	97,896	45,375	40,834
9/19/01	14,097	4,490	5,906	13,459	15,652[b]	149,406	104,271	33,675	31,849
9/20/01	8,539	1,323	n/a[c]	15,594	12,999[b]	154,761	77,952	42,850	38,267
9/21/01	9,659	1,564	n/a[c]	16,962	13,126	156,284	75,540	31,479	32,496
9/22/01	14,174	583	n/a[c]	8,451	13,941	137,809	76,498	42,754	35,298
9/23/01	9,317	2,829	n/a[c]	10,759	17,789	162,505	81,073	24,907	22,408
9/24/01	9,019	148	n/a[c]	11,301	14,760[b]	128,299	75,838	35,943	32,105
9/25/01	14,884	651	n/a[c]	13,534	9,135	128,090	59,168	40,719	33,328
9/26/01	9,933	411	4,392	11,944	11,009	129,103	67,690	41,330	34,965
9/27/01	11,387	7	3,838	12,212	14,389	106,635	69,186	46,738	42,000
9/28/01	9,768	1,585	2,487	10,100	17,986	109,949[b]	77,700	51,442	47,924
9/29/01	12,456	209	2,522	5,351	31,258	101,803[b]	89,583	65,720	60,007
9/30/01	13,928	2	n/a[c]	10,275	34,699	158,595	93,843	66,296	59,488
10/1/01	11,127	253	n/a[c]	16,362	19,184	94,859	81,986	52,232	48,210
10/2/01	5,825	132	n/a[c]	17,749	23,468	94,340	71,738	48,544	44,130
10/3/01	11,604	2	2,607	18,310	58,408[b]	135,721	79,130	44,952	39,986
10/4/01	7,360	2,798	3,983	17,482	18,422	144,939	79,822	40,742	38,237
10/5/01	7,695	3,990	3,845	16,590	17,522	93,901	56,262	27,486	27,026
10/6/01	7,021	108	4,168	4,649	26,317	104,853	58,082	46,416	42,759
10/7/01	7,164	4	3,212	11,301	16,306	120,307	57,155	52,978	46,730
10/8/01	10,690	475	2,972	20,438	12,884	102,043	59,713	49,110	45,701
10/9/01	11,159	16	2,467	16,922	26,036	106,179	72,761	51,169	44,973
10/10/01	11,714	143	2,867	20,007	15,528	92,122	56,374	57,689	48,789
10/11/01	8,435	44	2,842	16,058	20,805[b]	102,349	75,353	47,988	38,899
10/12/01	6,863	5,264	5,332	14,420	16,367	105,388	62,400	35,474	30,342

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TABLE 10 (Continued)

SUMMARY OF DAILY TKN LOADS (LB/D) AT THE SAMPLING LOCATIONS SELECTED IN THIS STUDY FOR THE STICKNEY WRP
SEPTEMBER 17 THROUGH OCTOBER 15, 2001 STUDY

Date	CPI	LASMA[a]	SW-12	Post-DC	TARP	SWRAW	SWPREF	WSRAW	WSIMEF
10/13/01	11,320	6,438	3,460	6,948	13,411	83,726	60,352	23,055	22,843
10/14/01	4,191	1,466	4,378	14,999	3,603	135,833	49,912	7,637	9,113
Mean	9,704	1,264	3,925	13,652	19,061	124,018	73,208	43,077	38,464
Min	4,191	2	2,467	4,649	3,603	83,726	49,912	7,637	9,113
Max	14,884	6,438	6,853	20,438	58,408	188,537	104,271	66,296	60,007
Std. Dev.	2,822	1,792	1,357	4,207	10,045	26,606	13,545	12,696	10,819
CV (%)	29.1	141.8	34.6	30.8	52.7	21.5	18.5	29.5	28.1

[a]LASMA combined were the sum of values from east and west sampling locations, not including those from the desilting pond.
[b]Daily loads were estimated because of missing samples.
[c]Data are not available due to missing flow data.

tables. For SW-12, located upstream of the discharge point of CPI, daily loads were not calculated on the days when flow data were missing due to sensor blockage. The average values of daily mean loads of ammonia and TKN for the period of this study, along with statistical values (mean, maximum, Std. Dev., and CV), are also given in Tables 9 and 10.

Discussion of Results

CONCENTRATIONS

A summary of ammonia and TKN concentrations for the two-hour composite samples collected in this study was presented in Table 3. Some of the locations sampled in this study were also sampled in the 2000 study. The changes in ammonia concentrations between these two studies and the organic nitrogen concentrations at various locations are discussed below. The difference between TKN and ammonia was the organic nitrogen in particulate matter and solution. The portion of organic nitrogen in TKN is defined as the difference between TKN and ammonia divided by TKN.

At 2AT of CPI, the mean ammonia concentration of the 371 hourly grab samples collected in the 2000 study was 159.69 mg/L, ranging from 0.06 to 655.59 mg/L, with a standard deviation of 118.74 mg/L (1). As can be seen in Table 3, the mean

ammonia concentration of the 336 two-hour composite samples collected at the same location in this study was 156.89 mg/L, ranging from 16.45 to 415.53 mg/L, with a standard deviation of 85.83 mg/L. It is obvious that the ammonia concentrations in the wastewater discharged at 2AT of CPI are fairly consistent during the sampling periods of these two studies.

TKN was measured for the samples collected in this study, but not in the 2000 study. At 2AT of CPI, the mean portion of organic nitrogen was about 17 percent, as derived from Table 3 data, and the variation of TKN was similar to that of ammonia.

At LASMA, although the sampling location in the 2000 study was not exactly the same as that in this study, the overflow taken in the 2000 study from the sludge lagoons in the LASMA eastern area was similar to what was collected at LASMAE in this study. The mean ammonia concentration of the 444 hourly grab samples collected in the 2000 study was 712.28 mg/L, ranging from 48.00 to 1,009.01 mg/L, with a standard deviation of 169.07 mg/L (1). However, the mean concentration of the 336 two-hour composite samples collected at LASMAE in this study was much lower, being 184.55 mg/L, ranging from 17.27 to 529.72 mg/L, with a standard deviation of 124.45 mg/L. This significant change in ammonia concentration in the overflow of sludge lagoons in the LASMA eastern area appears

to be due to the phase-out of digester draw discharge to the lagoons.

In this study, the overflows from the sludge drying beds in the LASMA western area and the Marathon area were sampled at LASMAW and analyzed for ammonia and TKN. As can be seen in Table 3, LASMAW has lower mean concentrations of ammonia and TKN, compared to those at LASMAE, with a larger CV. This was because the overflows from the LASMA western area and the Marathon area were mainly generated by storm runoff. Further evidence is provided by the measurement of flow rate at LASMAW, which will be presented later in this report. It is noted that the mean portion of organic nitrogen was significantly higher at LASMAW, which was about 44 percent, than that at LASMAE, which was about 14 percent.

At the Post-DC, centrate was collected immediately after individual centrifuges in both 2000 and the current study. The mean ammonia concentration of the 41 grab samples collected between September 13 and 20, 2000 in the 2000 study was 572.4 mg/L, ranging from 428.5 to 706.4 mg/L (1). The mean ammonia concentration of the 330 two-hour composite samples collected during September 17 through October 15, 2001 in this study was 565.46 mg/L, ranging from 9.82 to 760.30 mg/L. The ammonia concentrations in both the 2000 and 2001 studies were

thus very close. As shown in Appendix Table AI-4, most low concentrations occurred at the time when the centrate flows were low, which could include the process water for cleaning, particularly during the centrifuge maintenance between Saturday evening and Sunday morning. This perhaps explains a wide range of ammonia concentrations experienced in the Post-DC centrate in this study.

On average, organic nitrogen in the centrate from the Post-DC was 15 percent. The variation of TKN was similar to that of ammonia, indicating the ratio of TKN to ammonia to be about the same during the study period.

Unlike this study, TARP pumpback samples were not analyzed in two-hour increments in the 2000 study. In 2000, a daily composite sample of TARP pumpback was collected by the M&O Department and analyzed for various chemical constituents, including ammonia and TKN. Table 11 presents the comparison of ammonia and TKN concentrations of daily composite samples during the sampling periods of the two studies. In the 2001 study, although the means of hourly ammonia and TKN concentrations, as shown in Table 3, were somewhat lower, the calculated daily mean concentrations based on the two-hour composite samples, as presented in Tables 4 and 5, were comparable to those of daily composite samples given in Table 11. As can

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TABLE 11

COMPARISON OF AMMONIA AND TKN CONCENTRATIONS OF DAILY COMPOSITE SAMPLES FROM TARP PUMPBACK BETWEEN THE TWO SAMPLING PERIODS IN 2000 AND 2001

Date	FLOW MGD	NH_3-N mg/L	TKN mg/L	Date	FLOW MGD	NH_3-N mg/L	TKN mg/L
8/14/00	17	ns	ns	9/17/01	74	6.73	29.79
8/15/00	53	31.49	54.58	9/18/01	82	13.11	33.17
8/16/00	17	ns	ns	9/19/01	87	12.18	30.09
8/17/00	63	30.78	70.26	9/20/01	183	4.27	11.98
8/18/00	189	6.27	18.26	9/21/01	316	2.51	7.22
8/19/00	357	3.64	8.36	9/22/01	316	2.71	7.41
8/20/00	191	2.44	9.77	9/23/01	315	3.30	8.00
8/21/00	0	ns	ns	9/24/01	251	3.54	7.36
8/22/00	17	4.91	35.52	9/25/01	203	3.91	36.50
8/23/00	33	13.35	40.54	9/26/01	193	3.52	9.07
8/24/00	39	14.21	26.68	9/27/01	171	6.04	13.40
8/25/00	17	10.55	33.34	9/28/01	245	5.11	12.25
8/26/00	67	19.95	41.75	9/29/01	454	4.41	9.77
8/27/00	0	ns	ns	9/30/01	495	5.60	11.22
8/28/00	17	8.80	36.06	10/1/01	275	4.81	10.22
8/29/00	42	14.37	33.13	10/2/01	260	6.03	13.24
8/30/00	0	ns	ns	10/3/01	211	7.46	37.83
8/31/00	6	9.90	27.27	10/4/01	107	10.59	29.36
9/1/00	60	14.88	39.32	10/5/01	76	10.16	40.22
9/2/00	0	ns	ns	10/6/01	424	4.15	12.30
9/3/00	0	ns	ns	10/7/01	484	3.09	7.42
9/4/00	3	14.49	24.75	10/8/01	259	5.12	10.10
9/5/00	0	ns	ns	10/9/01	252	7.50	15.42
				10/10/01	241	9.59	12.23
				10/11/01	291	5.31	14.13
				10/12/01	158	4.84	12.17
				10/13/01	220	2.82	6.57
				10/14/01	255	1.42	2.98
Observations	23	15	15		28	28	28
Mean	52	13.34	33.31		246	5.71	16.12
Min	0	2.44	8.36		74	1.42	2.98
Max	357	31.49	70.26		495	13.11	40.22

ns = no sample.

be seen from Table 11 there are significant differences in the mean concentrations of ammonia, TKN, and flows between the time periods of the two studies. These differences can be attributed to the difference in rainfalls during the two periods, as well as the diversion of the Salt Creek sewer, with an estimated flow of 60 MGD, to TARP during the 2001 study period. The total rainfalls recorded at the Stickney WRP during September 17 through October 15, 2001 were 10.73 inches, much larger than the monthly mean of 2.92 inches in August and September of 2000.

TARP pumpback is composed of combined sewer overflow (CSO) caused by rainfall. The sources of pollutants in the CSO are from domestic sewage and industrial wastewater discharged to the sewer within the TARP service area. Strictly speaking, TARP is not a source that generates ammonia and organic nitrogen, but collects these pollutants. During the storage of CSO in the TARP, ammonia may have been produced through biological breakdown (deamination) of organic nitrogen. When the CSO in the TARP is pumped to the Stickney WRP, the TARP pumpback becomes a source of ammonia and organic nitrogen to the plant.

The organic nitrogen content in the TARP pumpback, based on the two-hour composite samples, is the highest, averaging

49 percent, of the four major point sources investigated in this study. The high content of organic nitrogen in TARP is consistent with the fact that the TARP pumpback is mainly composed of domestic wastewater. In this study, the background sewage, mainly domestic wastewater, was sampled at a location on Interceptor SW-12, which was located upstream of CPI. The mean ammonia concentration of the 325 two-hour composite samples collected from this location, SW-12, was 10.56 mg/L, ranging from 2.99 to 57.65 mg/L, as shown in Table 3, while the mean TKN concentration was 26.69 mg/L, ranging from 9.32 to 99.49 mg/L. The organic nitrogen portion in the samples collected at this location averaged at 60 percent, which is much higher than found in the wastewaters from the four major point sources investigated in this study. It appears that organic nitrogen is mainly from the background sewage, consisting of mainly domestic sewage.

Unlike this study, the sampling location on Interceptor SW-12 in the 2000 study was located downstream of CPI, and the samples collected contained the wastewater discharged from CPI. The mean ammonia concentration of the 444 grab samples collected in the 2000 study was 63.70 mg/L, ranging from 0.04 to 249.80 mg/L (1). It is obvious that the mean ammonia concentration of the sewage that included the discharge from CPI

is much higher than the one excluding CPI wastewater. However, TKN was not analyzed in the 2000 study.

The mean and maximum values of ammonia and TKN concentrations at the four major point sources investigated in this study were ranked based on the data presented in Tables 3 through 5. These rankings are shown in Table 12. As can be seen in Table 12, Post-DC had the highest mean and maximum ammonia and TKN concentrations, followed by LASMA, CPI and TARP.

As particulate organic nitrogen may be removed through settling in the primary treatment, the raw sewage entering the Stickney Southwest and West Side plants and the effluents exiting the primary treatment tanks at these plants were sampled in this study to examine the changes in the ammonia and TKN concentrations. As can be derived from the data shown in Table 3, the average removal of TKN through primary settling in the 28-day sampling period of this study was approximately 43 percent and 10 percent in the Stickney Southwest preliminary settling tanks and West Side Imhoff tanks, respectively. The removal of TKN, mainly particulate organic nitrogen, resulted in the drop of organic nitrogen content. In this study, the mean organic nitrogen contents dropped from 72 percent in SWRAW to 41 percent in SWPREF and from 58 percent in WSRAW to

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TABLE 12

SUMMARY OF RANKS OF AMMONIA AND TKN CONCENTRATIONS AT THE FOUR MAJOR POINT SOURCES
SEPTEMBER 17 THROUGH OCTOBER 15, 2001 STUDY

Parameter	1st Site	2nd Site	3rd Site	4th Site
Hourly Mean NH_3-N Concentration, (mg/L)	Post-DC (565.46)	LASMA[a] (184.5)	CPI (156.89)	TARP (4.74)
Hourly Mean TKN Concentration, (mg/L)	Post-DC (667.03)	LASMA (215.7)	CPI (188.13)	TARP (9.25)
Max Hourly NH_3-N Concentration, (mg/L)	Post-DC (760.3)	LASMA (529.7)	CPI (415.53)	TARP (13.15)
Max Hourly TKN Concentration, (mg/L)	Post-DC (1,501.88)	LASMA (869.59)	CPI (579.25)	TARP (72.33)
Daily Mean NH_3-N Concentration, (mg/L)	Post-DC (564.47)	LASMA (181.7)	CPI (158.17)	TARP (5.57)
Max Daily NH_3-N Concentration, (mg/L)	Post-DC (694.33)	LASMA (428.60)	CPI (256.05)	TARP (13.15)
Daily Mean TKN Concentration, (mg/L)	Post-DC (663.49)	LASMA (212.43)	CPI (189.30)	TARP (11.79)
Max Daily TKN Concentration, (mg/L)	Post-DC (925.09)	LASMA (526.41)	CPI (279.75)	TARP (38.08)

[a]LASMA represents the combination of LASMAE and LASMAW.

51 percent in WSIMEF, as can be computed from the data given in Table 3.

However, ammonia nitrogen, which is soluble, can not be removed through primary settling. It is evident from Table 3 that there was no significant change in the mean ammonia concentrations between WSRAW and WSIMEF. The increase in mean ammonia concentration through the primary treatment at the Stickney Southwest plant was likely due to the configuration of raw sewage entering the plant. This configuration results in two streams that have to be sampled separately, making difficult to collect representative samples for SWRAW.

FLOW RATES

The wastewater flow rates at the sampling locations selected for this study varied widely. Tables 6 and 7 summarize results of hourly and daily flow rates for all the locations. Based on the values of mean and maximum hourly flow rates at each of the major point sources, the sites are ranked and the results are listed in Table 13. As can be seen in Tables 6 and 13, TARP had the highest flow rates, which were much higher than the flow rates at the other three sites, over 40 times higher. Among the other three sites, CPI, Post-DC and LASMA, CPI had the highest mean and maximum hourly flow rates,

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TABLE 13

SUMMARY OF RANKS OF WASTEWATER DISCHARGE RATES AT THE FOUR MAJOR POINT SOURCES
SEPTEMBER 17 THROUGH OCTOBER 15, 2001 STUDY

Parameter	1st Site	2nd Site	3rd Site	4th Site
Hourly Mean Flow Rate (MGH)	TARP 10.28	CPI 0.26	Post-DC 0.09	LASMA[a] 0.04
Maximum Hourly Flow Rate (MGH)	TARP 23.78	CPI 0.44	LASMA 0.36	Post-DC 0.16
Daily Mean Flow Rate (MGD)	TARP 248	CPI 6.13	Post-DC 2.27	LASMA 0.93
Maximum Daily Flow Rate (MGD)	TARP 492	CPI 7.49	LASMA 4.80	Post-DC 3.05

[a]LASMA represents the combination of LASMAE and LASMAW.

LASMA had the lowest mean hourly flow rate, and the Post-DC had the lowest maximum hourly flow rate.

Daily flow rates at the four major point sources were measured or estimated during the 2000 study. By comparing the daily mean flow rates between the two studies, it is found that the average value of daily mean discharge rates at 2AT of CPI are comparable, 6.13 MGD in the 2001 study compared to 6.56 MGD in the 2000 study. However, 0.93 MGD average value of daily mean flow rates at the LASMA in the 2001 study was much lower than 2.84 MGD estimated in the 2000 study. Also, the daily mean flow rates at the LASMA in the 2001 study, ranging from 0.03 to 4.80 MGD, were more variable than those in the 2000 study. At the Post-DC with all digester draws being centrifuged on a regular basis in 2001, the average value 2.27 MGD of daily mean discharge rates of centrate in the 2001 was higher than 1.81 MGD measured in the 2000 study. The variation of the daily mean flow rates at the Post-DC between the two field-sampling periods was almost identical with CVs of 21.6 percent in 2001 and 21.1 percent in 2000. At TARP, the average value 246 MGD of the daily mean pumpback rates in the 2001 study was much higher than 52 MGD measured in the 2000 study.

The variation of flow rates at each discharging point may be evaluated by using CVs of the hourly mean flow rates in Table 6. Among the six sampling locations in which samples were collected to monitor the major point sources and the background domestic sewage, the variation of discharge rates was the smallest at 2AT of CPI with a CV of 17.8 percent and the largest in the LASMA area with a CV of 263.2 percent for LASMAW and 203.0 percent for LASMAE. Figures 2 through 4 present hourly flow rates at CPI, LASMAE, and LASMAW, respectively, for the 2001 study. At the Post-DC, the variation of centrate discharge rate was mainly caused by the weekend maintenance, during which all the centrifuges were shut down and the hourly centrate discharge rates were zero. The variation of hourly wastewater discharge rates at the Post-DC was the second smallest with a CV of 36.5 percent. The nature of intermittent pumping for the TARP pumpback made the pumpback flow rates quite variable. The hourly mean pumping rates of the TARP pumpback during September 17 through October 15, 2001 are shown in Figure 5.

LOADING RATES

Ammonia Loading Rates. One of the main objectives of this study was to examine changes in ammonia loadings from the

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FIGURE 2

HOURLY DISCHARGE RATES AT 2AT OF CORN PRODUCTS INTERNATIONAL
DURING SEPTEMBER 17 THROUGH OCTOBER 15, 2001

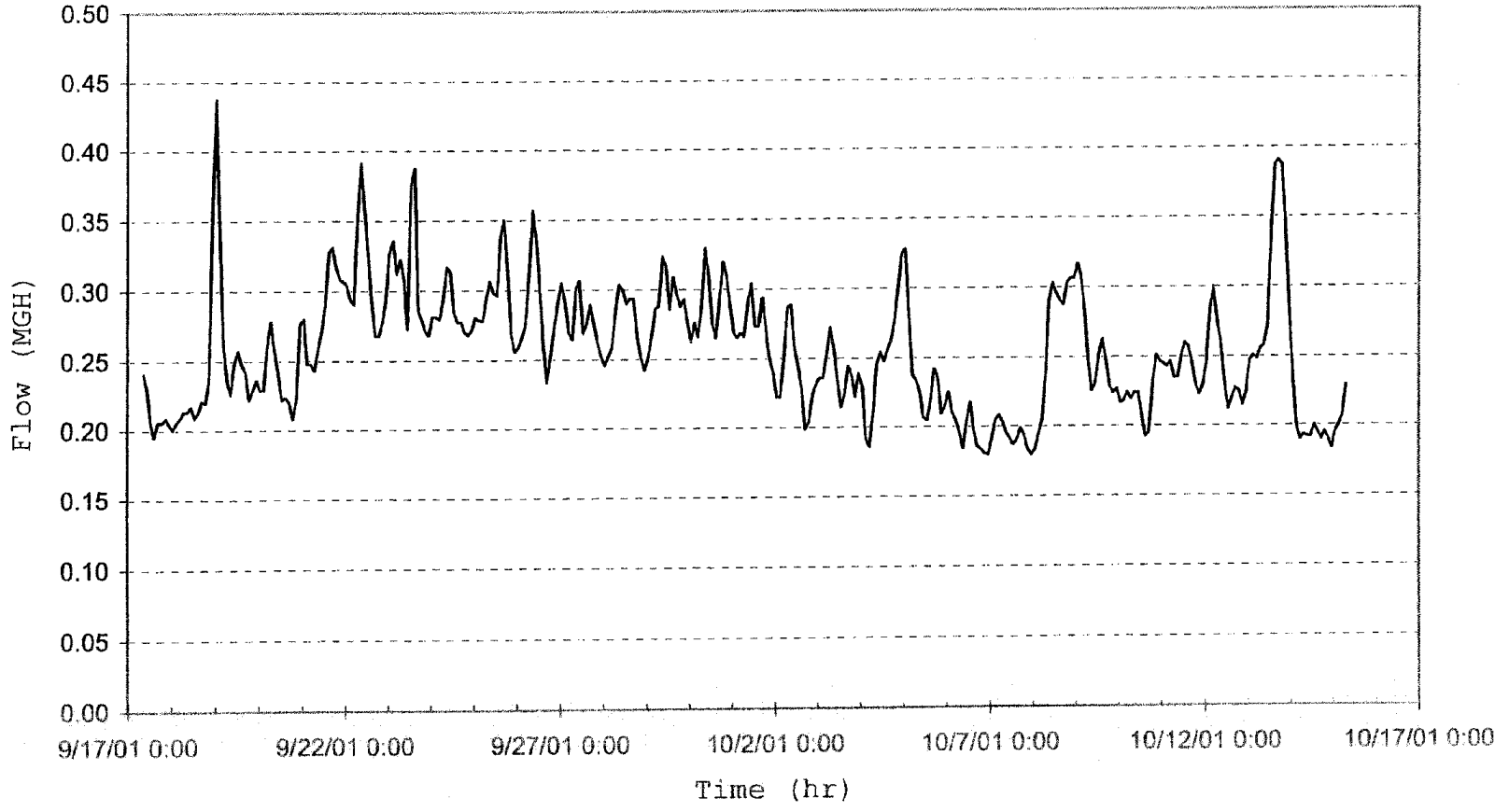

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FIGURE 3

HOURLY DISCHARGING RATES AT THE LASMA EAST SAMPLING SITE
DURING SEPTEMBER 17 THROUGH OCTOBER 15, 2001

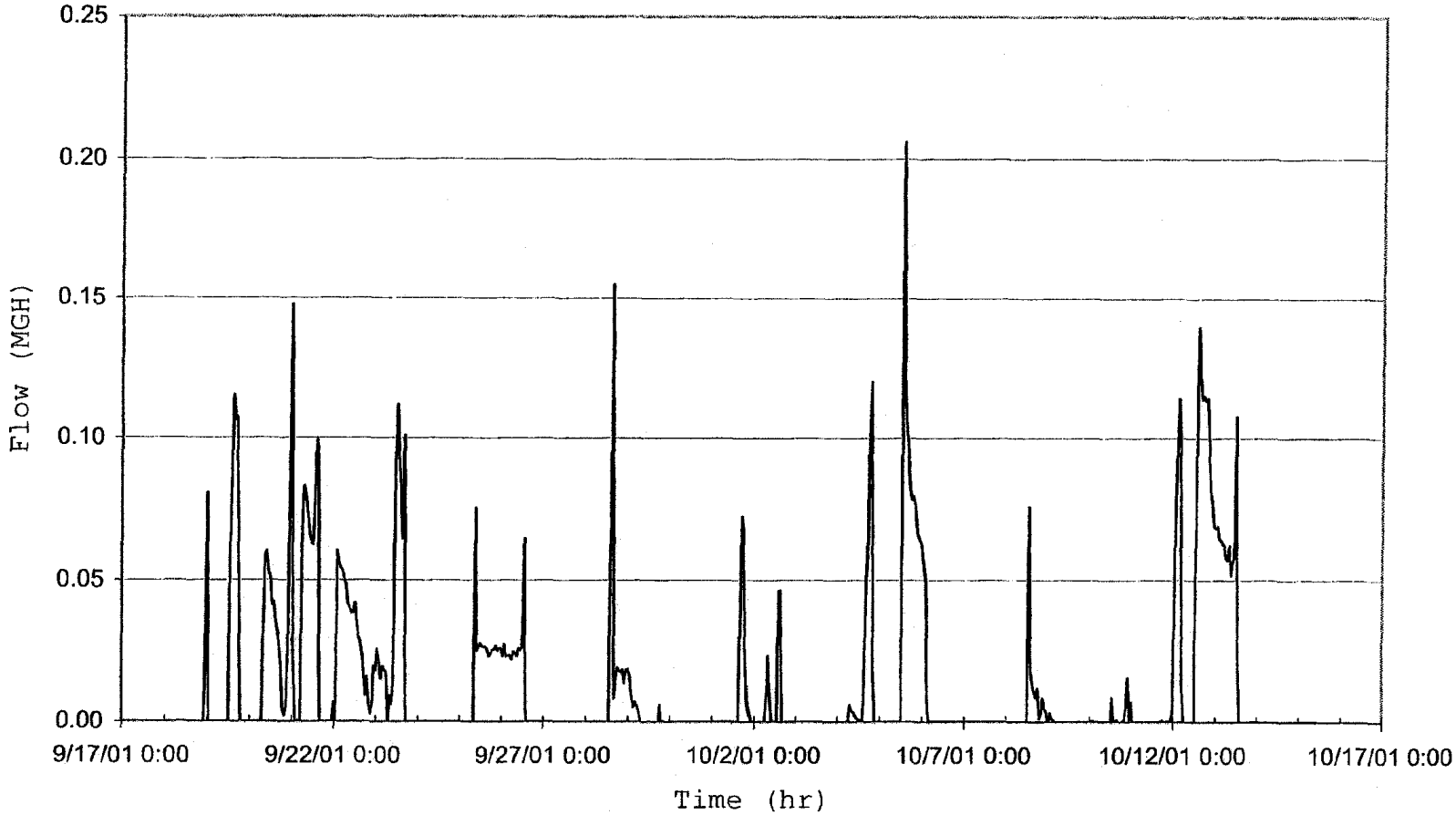

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FIGURE 4

HOURLY DISCHARGING RATES AT THE LASMA WEST SAMPLING SITE
DURING SEPTEMBER 17 THROUGH OCTOBER 15, 2001

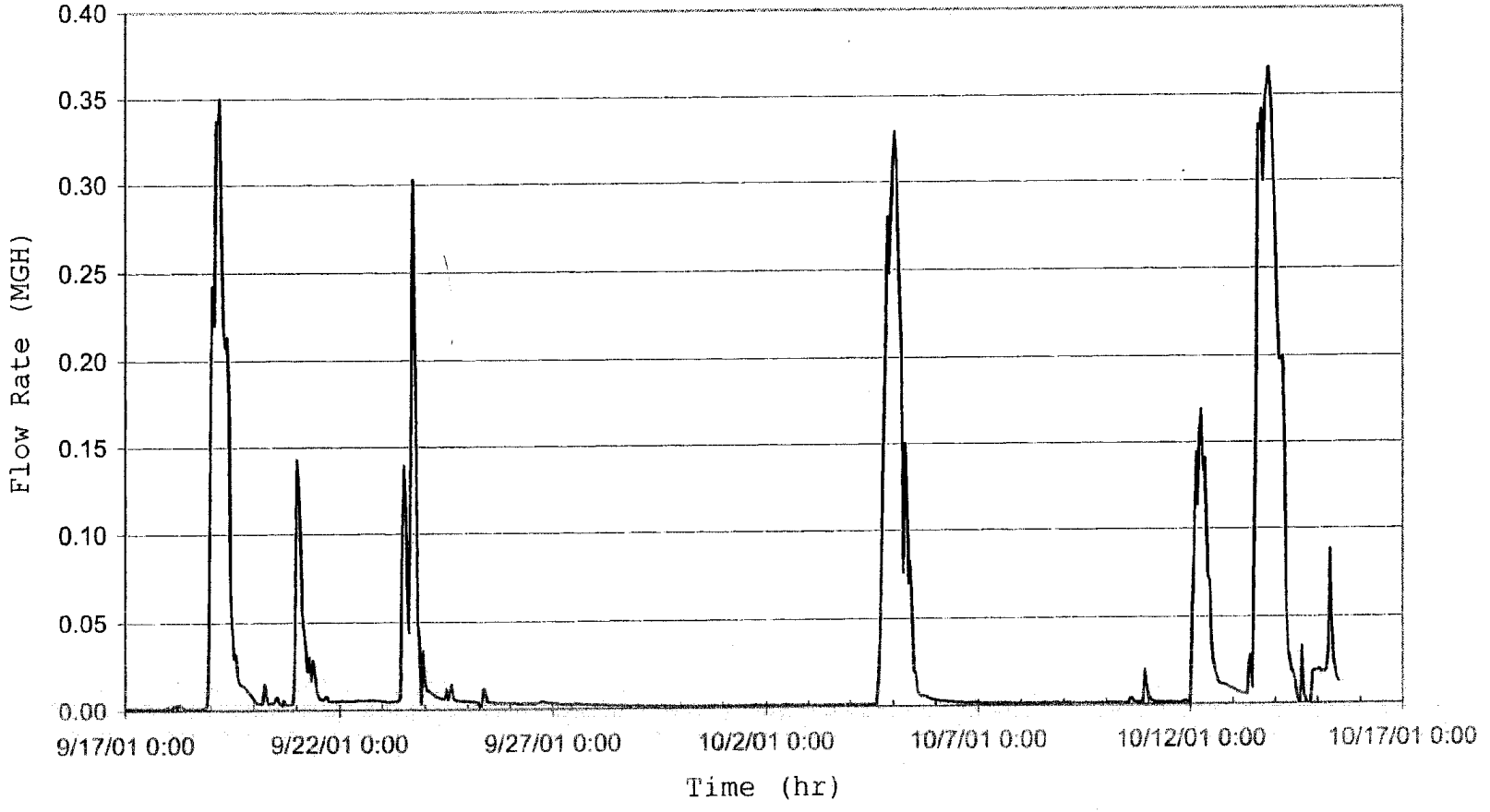

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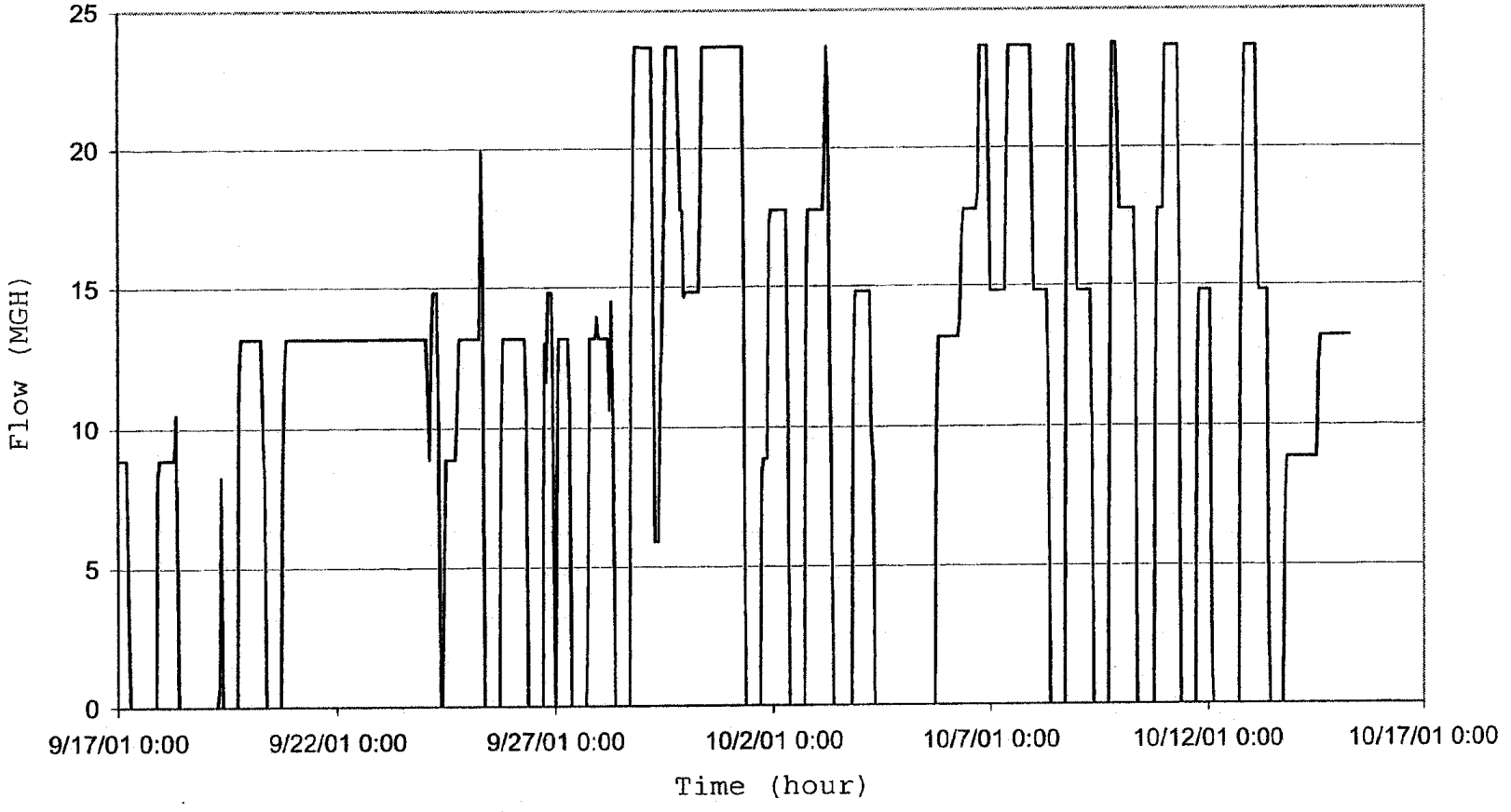
FIGURE 5

HOURLY PUMPING RATES OF THE TARP PUMPBACK
DURING SEPTEMBER 17 THROUGH OCTOBER 15, 2001



four major point sources identified in the 2000 study. In the 2000 study, hourly loads of ammonia from the selected point sources were unavailable due to the lack of hourly flow information, such as at CPI and LASMA, or hourly concentrations, such as at the Post-DC and TARP. However, daily mean ammonia loads discharged at these sources could be calculated or estimated. Therefore, comparison of the amounts of ammonia discharged at various locations between the two studies was made based on the daily ammonia loads.

The summary of daily ammonia loads from the four major point sources investigated for the two study periods can be found in Table 9 of this report and in Table 2 of R&D Report No. 01-3 for the 2000 study. At CPI, mean daily ammonia loading of 8,099 lb/d from the 2001 study is comparable to 8,764 lb/d estimated from the 2000 study, with comparable variations in daily ammonia loads with CVs of 29.5 percent for 2001 and 32.1 percent for 2000. These findings are as expected since the ammonia concentrations and wastewater discharge rates were quite comparable in the two studies, as discussed earlier in this report.

At LASMA, the mean daily ammonia loading of 930 lb/d estimated from this study is considerably lower than ammonia loading of 16,752 lb/d estimated for the 2000 study. This can

be attributed to the major change in the sludge processing operation at the Stickney WRP since 2001. Because of addition of new centrifuges at the Stickney WRP, the necessity of pumping anaerobic digester draw to lagoons was eliminated. Moreover, the approach used in this study to measure ammonia loads from LASMA was more accurate than that used in the 2000 study. Although mean daily ammonia loading from the LASMA area was much lower in the 2001 study, the variation in the amount discharged increased dramatically. The maximum daily ammonia loading from the 2001 study was 4,430 lb/d, almost four times higher than the mean daily value of 930 lb/d.

At the Post-DC location, mean daily ammonia loading of 11,604 lb/d from the 2001 study, was about 36 percent higher than that of 8,526 lb/d found from the 2000 study. This is due to the addition of new sludge centrifuges, thereby increasing the amount of centrate discharged at the Post-DC. However, the variations of the daily ammonia loads discharged during the two study periods were comparable with CVs of 29.4 percent in 2001 and 21.1 percent in 2000.

For TARP pumpback, mean daily ammonia loading of 9,925 lb/d from the 2001 study was about 55 percent higher than the 6,393 lb/d estimated from the 2000 study. The increase in mean daily ammonia loading in 2001 can be attributed to: (1)

more rainfall during the 2001 study period, resulting in more CSOs to TARP, and (2) the diversion of Salt Creek interceptor to TARP. As can be seen in Table 11, daily mean TARP pumpback rate was much higher in the 2001 study (246 MGD) compared to the 2000 study (52 MGD). However, the variation of daily ammonia loads from the TARP in this study (CV = 47.4 percent) was much less than that found in the 2000 study (CV = 83.6 percent).

To evaluate the contribution of ammonia and organic nitrogen loads from the four major point sources investigated, this study gathered mean hourly loads of ammonia and TKN over every two-hour period for 28 continuous days from September 17 to October 15, 2001. The four major point sources; namely, CPI, LASMA, Post-DC and TARP, investigated in this study were ranked based on mean and maximum hourly and daily loads and ranking are summarized in Table 14. On a mean hourly loading basis, Post-DC contributed the maximum amount of ammonia, averaging 19.1 percent of the total that entered the Stickney aeration tanks (SWPREF + WSIMEF), followed by TARP pumpback accounting for 16.5 percent, CPI 13.6 percent, and LASMA 1.6 percent. However, in the case of TKN, which includes organic nitrogen in particulate matter and solution, TARP pumpback was

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TABLE 14

SUMMARY OF RANKS OF AMMONIA AND TKN LOADS AT THE FOUR MAJOR POINT SOURCES
SEPTEMBER 17 THROUGH OCTOBER 15, 2001 STUDY

Parameter	1st Site	2nd Site	3rd Site	4th Site
Mean Hourly Ammonia Load (lb/h) % of SWPREF (% of SWPREF+WSIMEF)	Post-DC (478) 27.7% (19.1%)	TARP (413) 23.9% (16.5%)	CPI (340) 19.7% (13.6%)	LASMA[a] (39) 2.3% (1.6%)
Maximum Hourly Ammonia Load (lb/h)	TARP (1,530)	CPI (1,071)	Post-DC (983)	LASMA (335)
Mean Hourly TKN Load (lb/h) % of SWRAW (% of SWRAW+WSRAW)	TARP (781) 15.2% (11.3%)	Post-DC (563) 11.0% (8.2%)	CPI (407) 7.9% (5.9%)	LASMA (53) 1.0% (0.8%)
Maximum Hourly TKN Load (lb/h)	TARP (7,947)	Post-DC (1,611)	CPI (1,208)	LASMA (438)
Mean Daily Ammonia Load (lb/d)	Post-DC (11,604)	TARP (9,925)	CPI (8,099)	LASMA (930)
Maximum Daily Ammonia Load (lb/d)	TARP (22,466)	Post-DC (17,601)	CPI (12,890)	LASMA (4,430)
Mean Daily TKN Load (lb/d)	TARP (19,061)	Post-DC (13,652)	CPI (9,704)	LASMA (1,264)
Maximum Daily TKN Load (lb/d)	TARP (58,408)	Post-DC (20,438)	CPI (14,884)	LASMA (6,438)

[a]LASMA represents the sum of LASMAE and LASMAW.

the leading contributing source, followed by Post-DC, CPI, and LASMA.

Hourly variation of ammonia and TKN loads over time may be examined through graphic presentation which will be presented later in this report. As the LASMA contributed considerably less ammonia and TKN to the Stickney WRP during the period of this study, compared to the contributions from the other three major sources, the data for ammonia and TKN loading for LASMA is not included in graphical presentation of hourly ammonia and TKN loads.

The hourly loads of ammonia at the three identified major point sources, namely CPI, Post-DC and TARP, and in the Southwest preliminary effluent (SWPREF), are presented in Figures 6 through 10. As seen in Figures 6 through 10, the hourly ammonia loads from Post-DC were fairly constant excepting during the maintenance of the centrifuges on weekends when the ammonia hourly rates dropped significantly. The hourly ammonia loads from CPI fluctuated from hour to hour during the study period of 28 days. There does not appear to be any definite pattern of fluctuation. However, peaks are normally sharp, indicating short duration of peak loads. The highest hourly ammonia loading from CPI during this sampling period was 1,071 lb/h. Considering the fact of intermittent pumping, TARP

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FIGURE 6

HOURLY AMMONIA LOADS AT THE THREE MAJOR POINT SOURCES AND SWPREF DURING 9/17 TO 9/22/2001

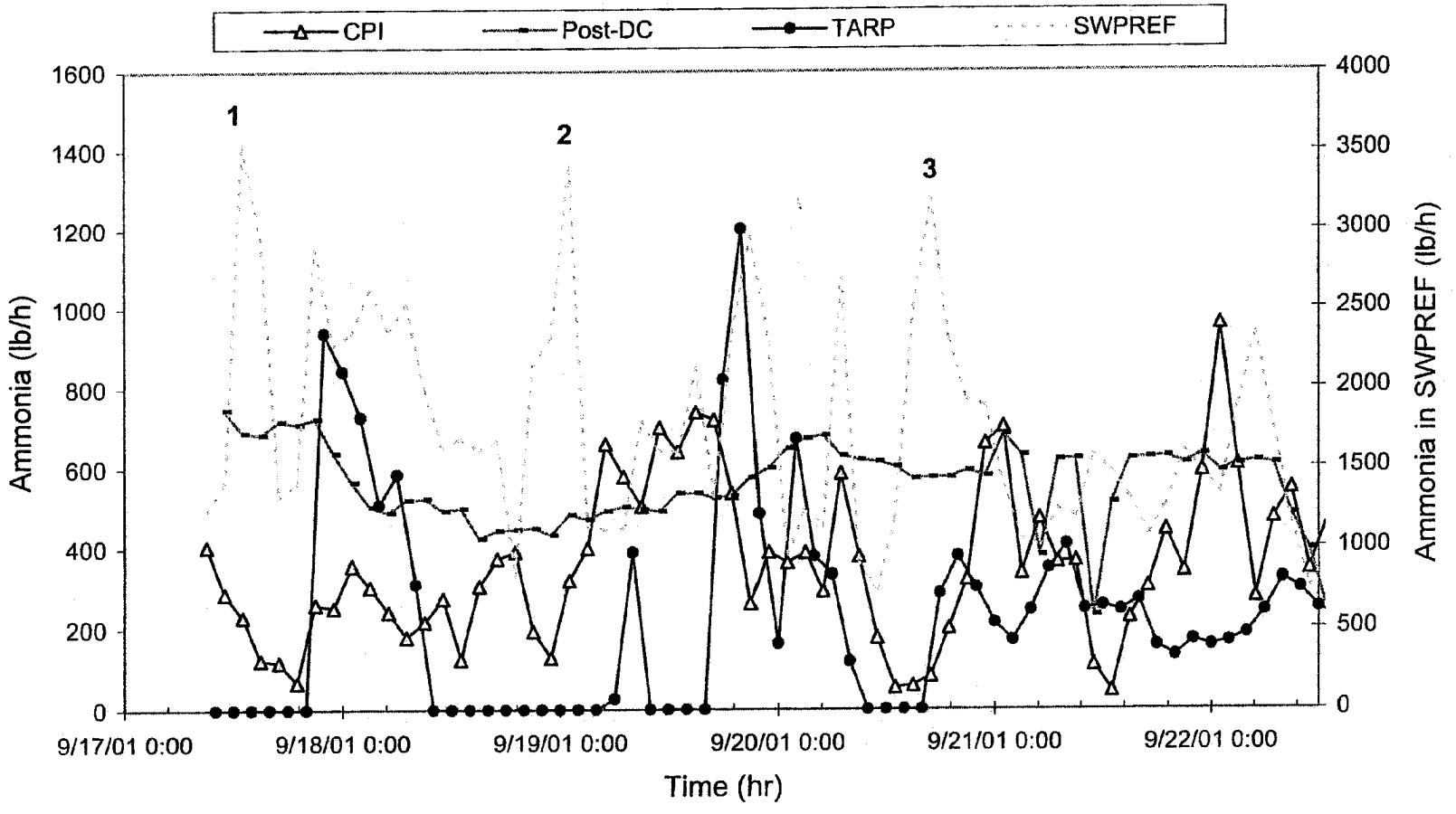

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FIGURE 7

HOURLY AMMONIA LOADS AT THE THREE MAJOR POINT SOURCES AND SWPREF
DURING 9/22 TO 9/28/2001

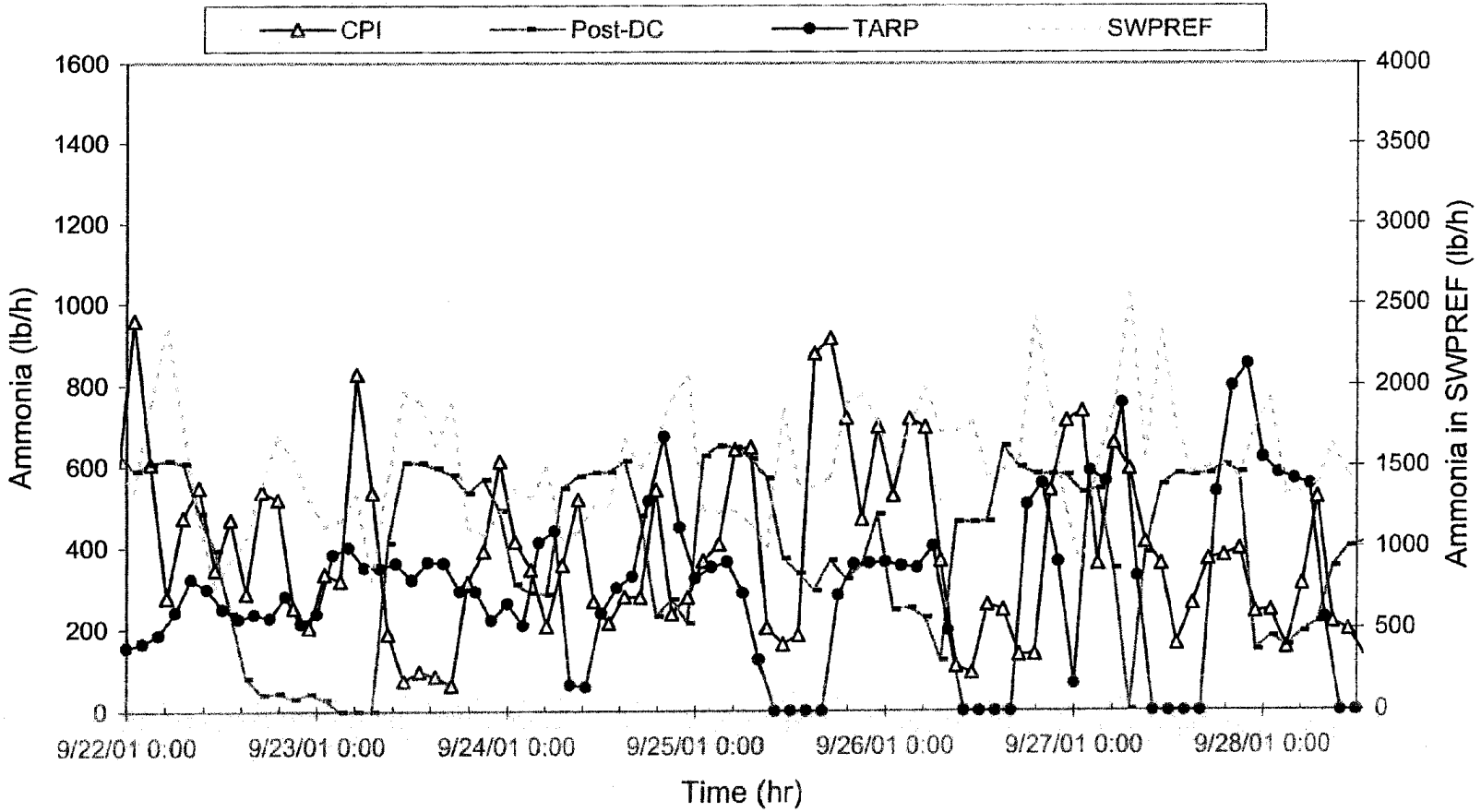

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FIGURE 8

HOURLY AMMONIA LOADS AT THE THREE MAJOR POINT SOURCES AND SWPREF DURING 9/28 TO 10/4/2001

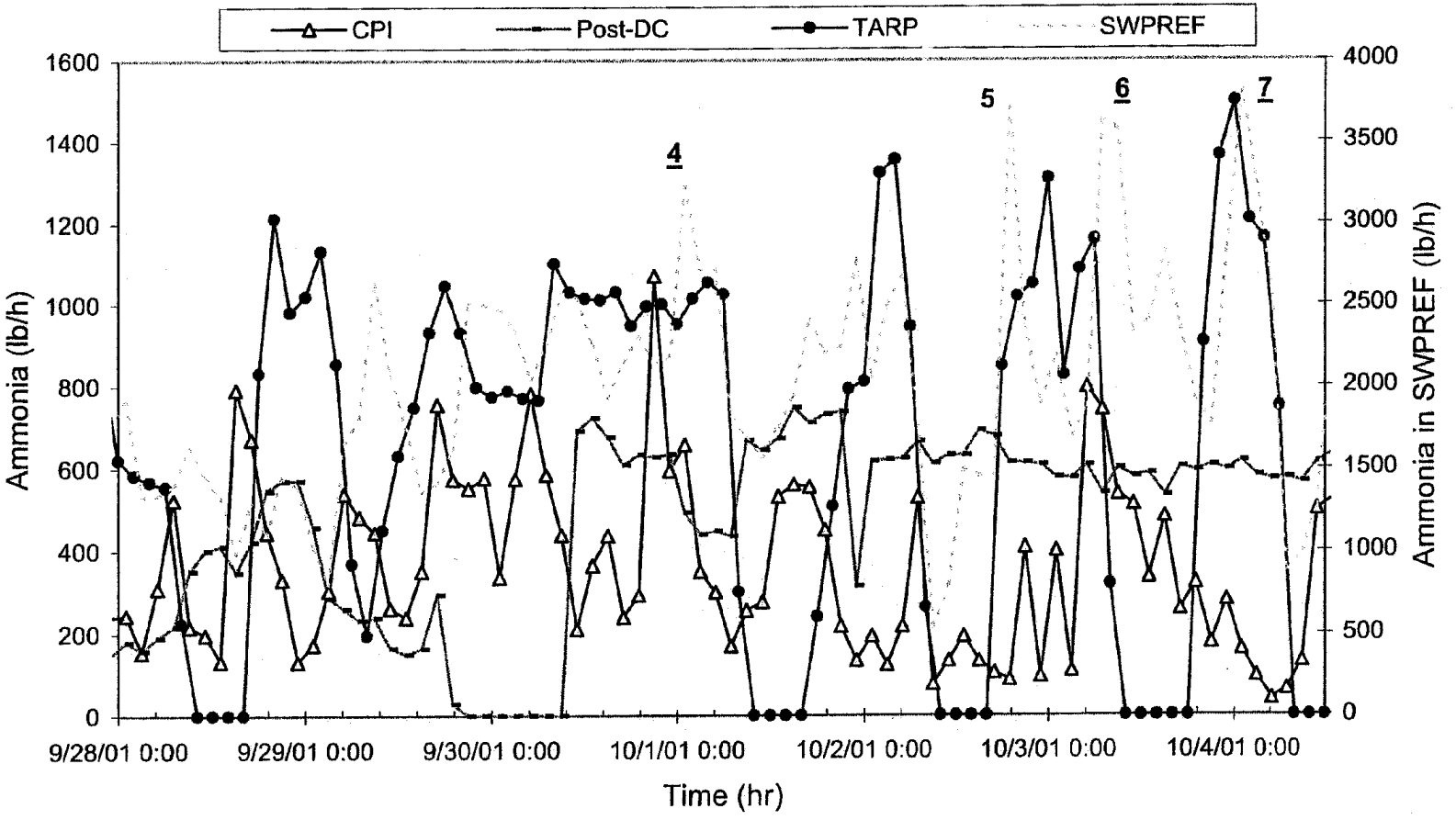

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FIGURE 9

HOURLY AMMONIA LOADS AT THE THREE MAJOR POINT SOURCES AND SWPREF
DURING 10/4 TO 10/10/2001

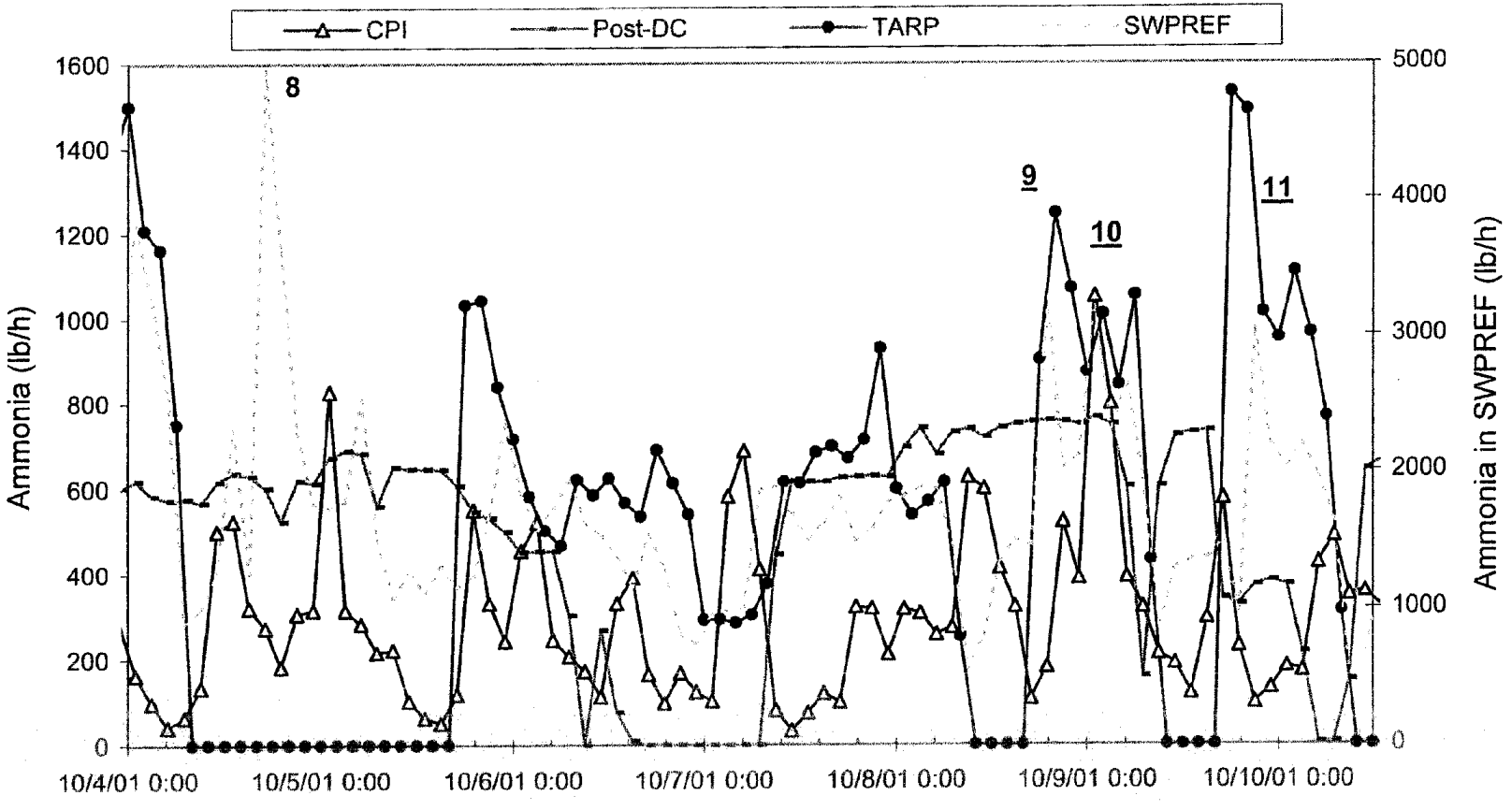

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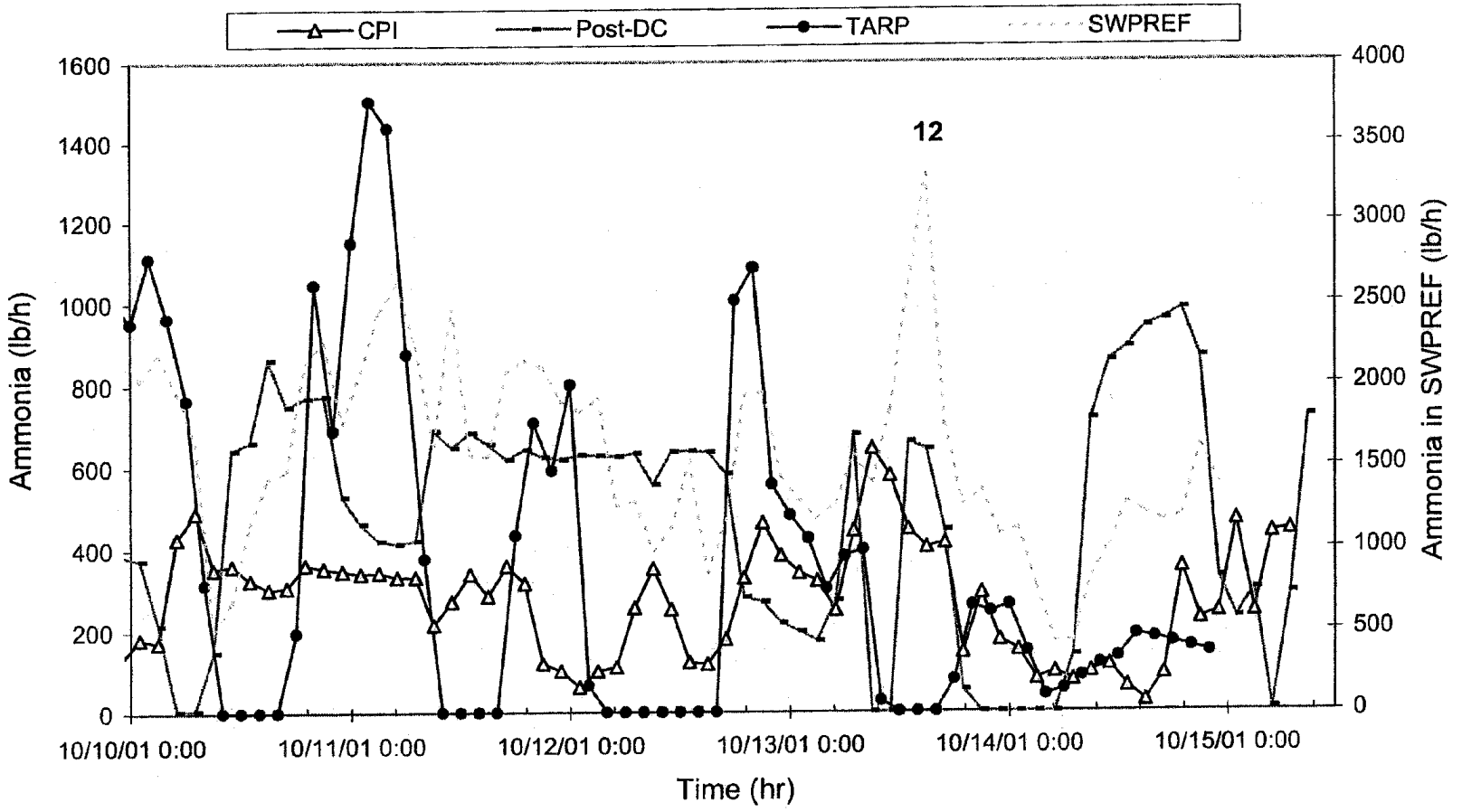
FIGURE 10

HOURLY AMMONIA LOADS AT THE THREE MAJOR POINT SOURCES AND SWPREF
DURING 10/10 TO 10/15/2001



pumpback was the most variable source of ammonia discharge to the Stickney WRP with the highest hourly loading of 1,530 lb/h.

It appears that the peak ammonia loads identified at SWPREF during the sampling period of this study were not all related to the peak loads identified at the major point sources. Of the 12 peaks over 3,000 lb/h at SWPREF numbered 1 through 12 in Figures 6 through 10, six peaks (4, 6, 7, 9-11), which are underlined in the figures, might be related to the peaks at one or more major point sources. For example, Peak No. 4 with a peak load of 3,224 lb/h at SWPREF at 1:00 a.m. on October 1, 2001 in Figure 8 might be caused by the peaks of 1,071 lb/h at CPI and nearly 1,000 lb/h at the TARP. Peak No. 7 with a peak load of 3,819 lb/h at 1:00 a.m. on October 4, 2001 could only be related to the peak of 1,498 lb/h at the TARP.

Figures 11 through 15 present a comparison of the sum of hourly ammonia loads from the three major point sources (CPI + Post-DC + TARP) with the hourly ammonia loads entering the Stickney WRP aeration tanks (SWPREF + WSIMEF). On average, the hourly ammonia loads from the three major point sources identified in this study, namely CPI, Post-DC and TARP, accounted for 49.2 percent of SWPREF + WSIMEF during the field-

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FIGURE 11

COMPARISON OF HOURLY AMMONIA LOADS AT THE SELECTED MAJOR SOURCES AND STICKNEY WRP DURING 9/17 TO 9/22/2001

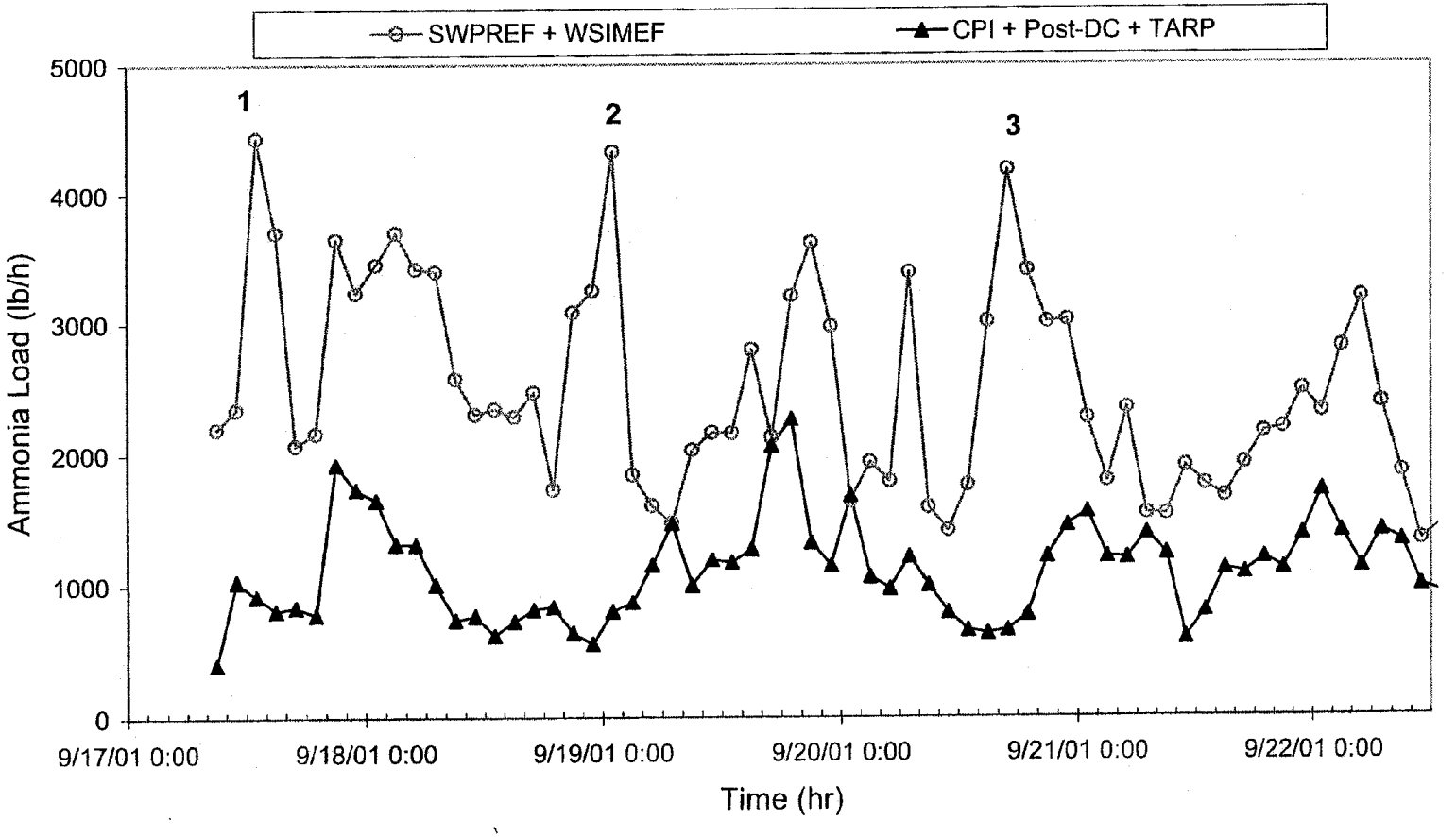

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FIGURE 12

COMPARISON OF HOURLY AMMONIA LOADS AT THE SELECTED MAJOR SOURCES
AND STICKNEY WRP
DURING 9/22 TO 9/28/2001

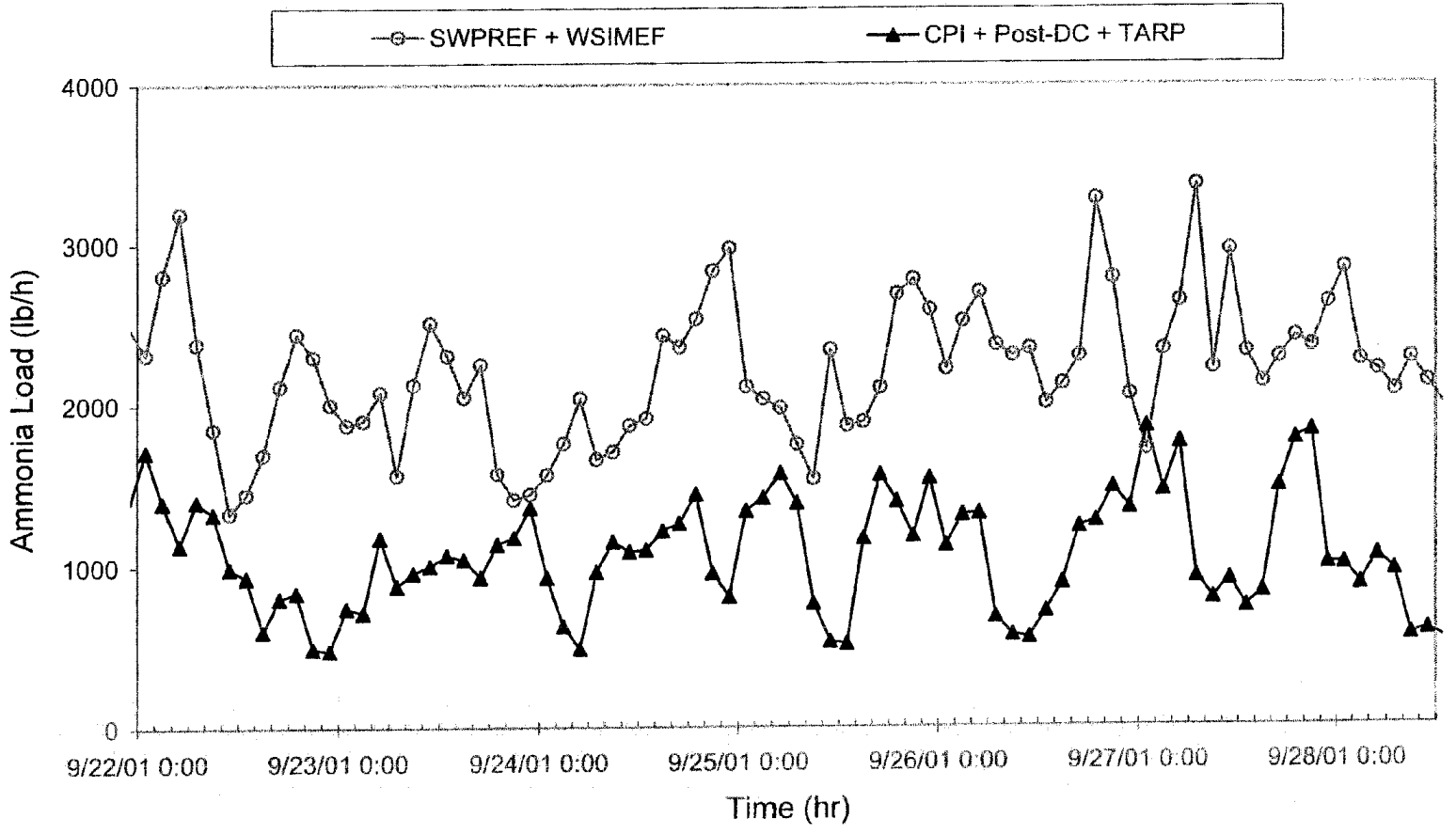

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FIGURE 13

COMPARISON OF HOURLY AMMONIA LOADS AT THE SELECTED MAJOR SOURCES
AND STICKNEY WRP
DURING 9/28 TO 10/4/2001

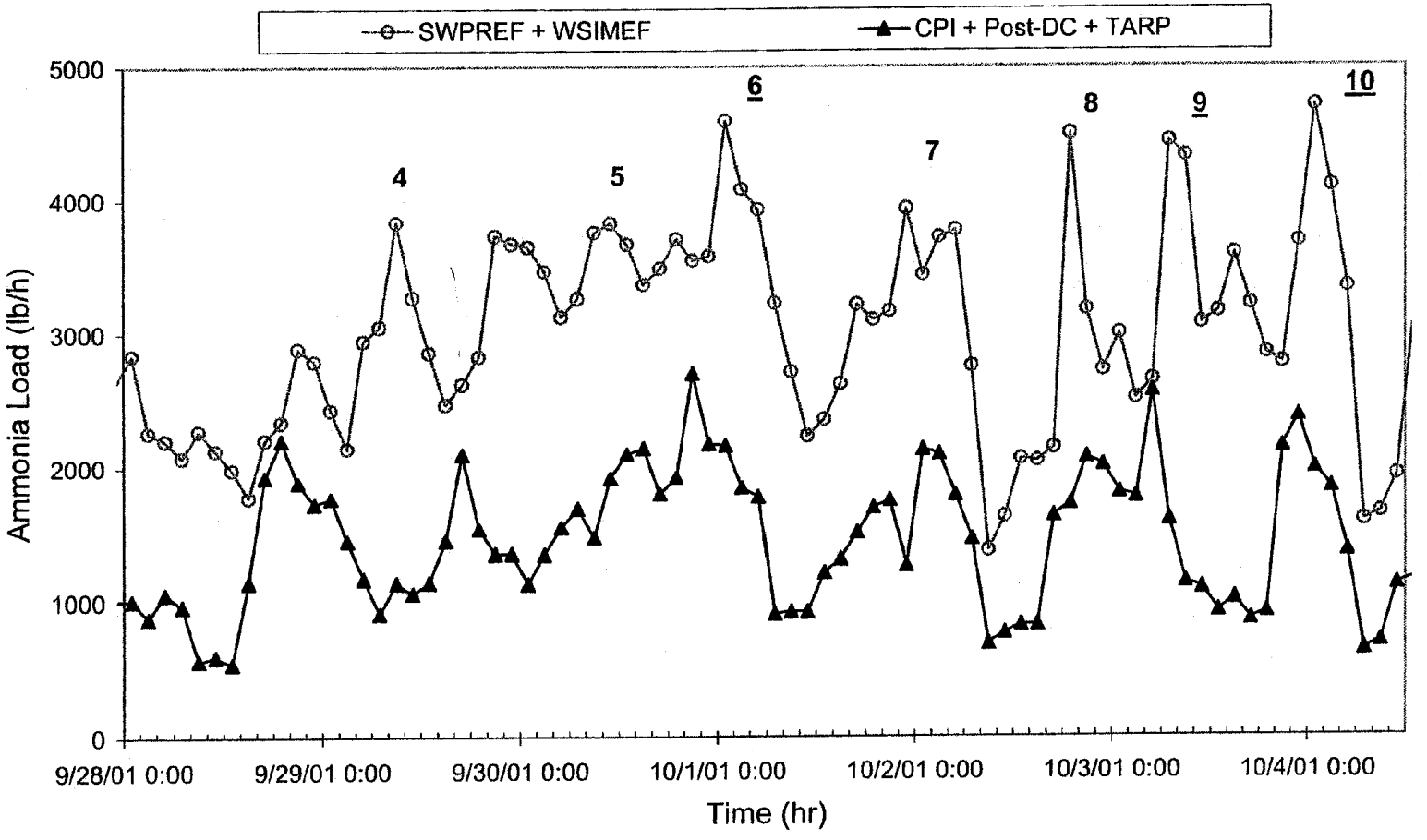

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FIGURE 14

COMPARISON OF HOURLY AMMONIA LOADS AT THE SELECTED MAJOR SOURCES AND STICKNEY WRP DURING 10/4 TO 10/10/2001

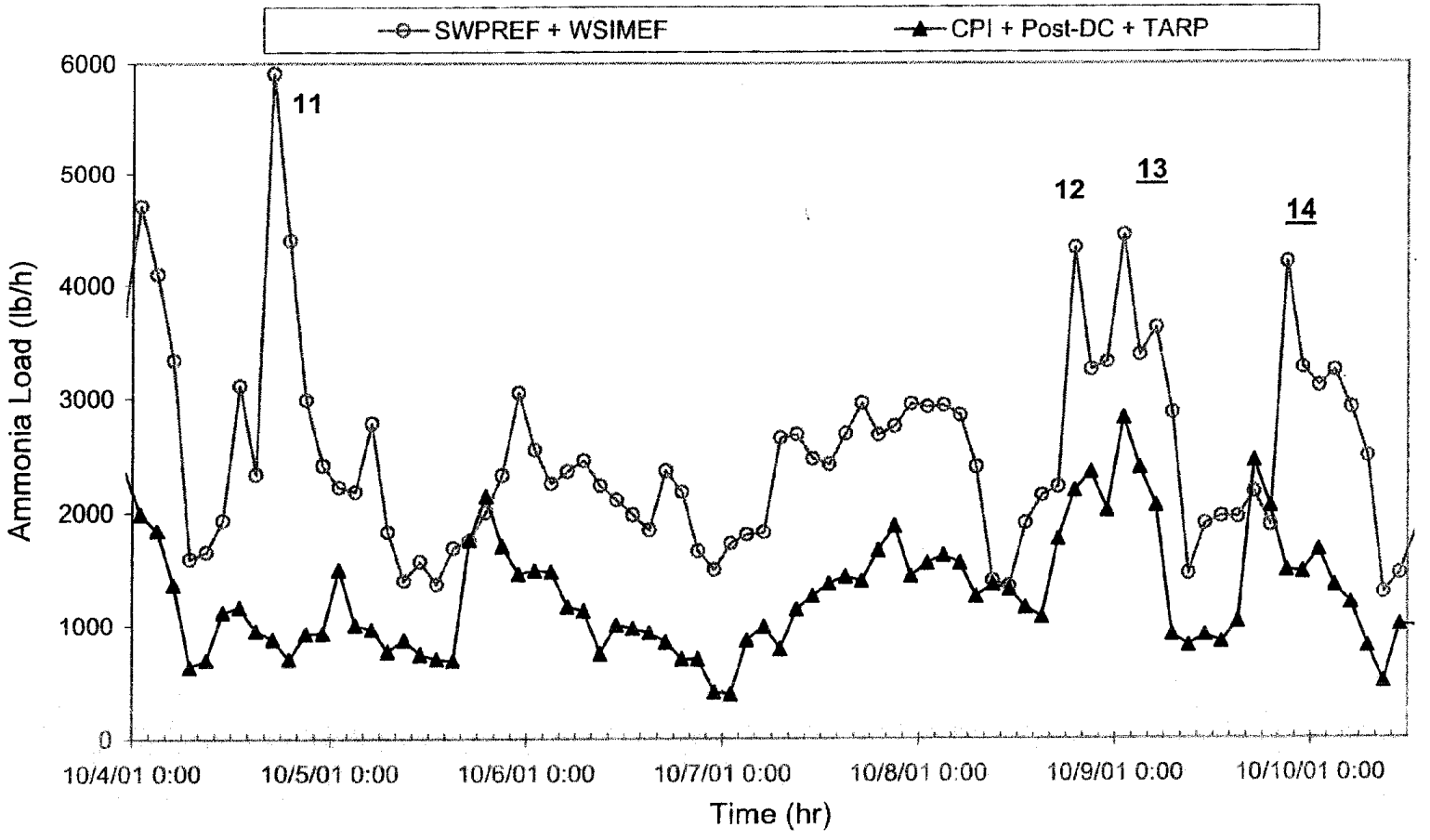

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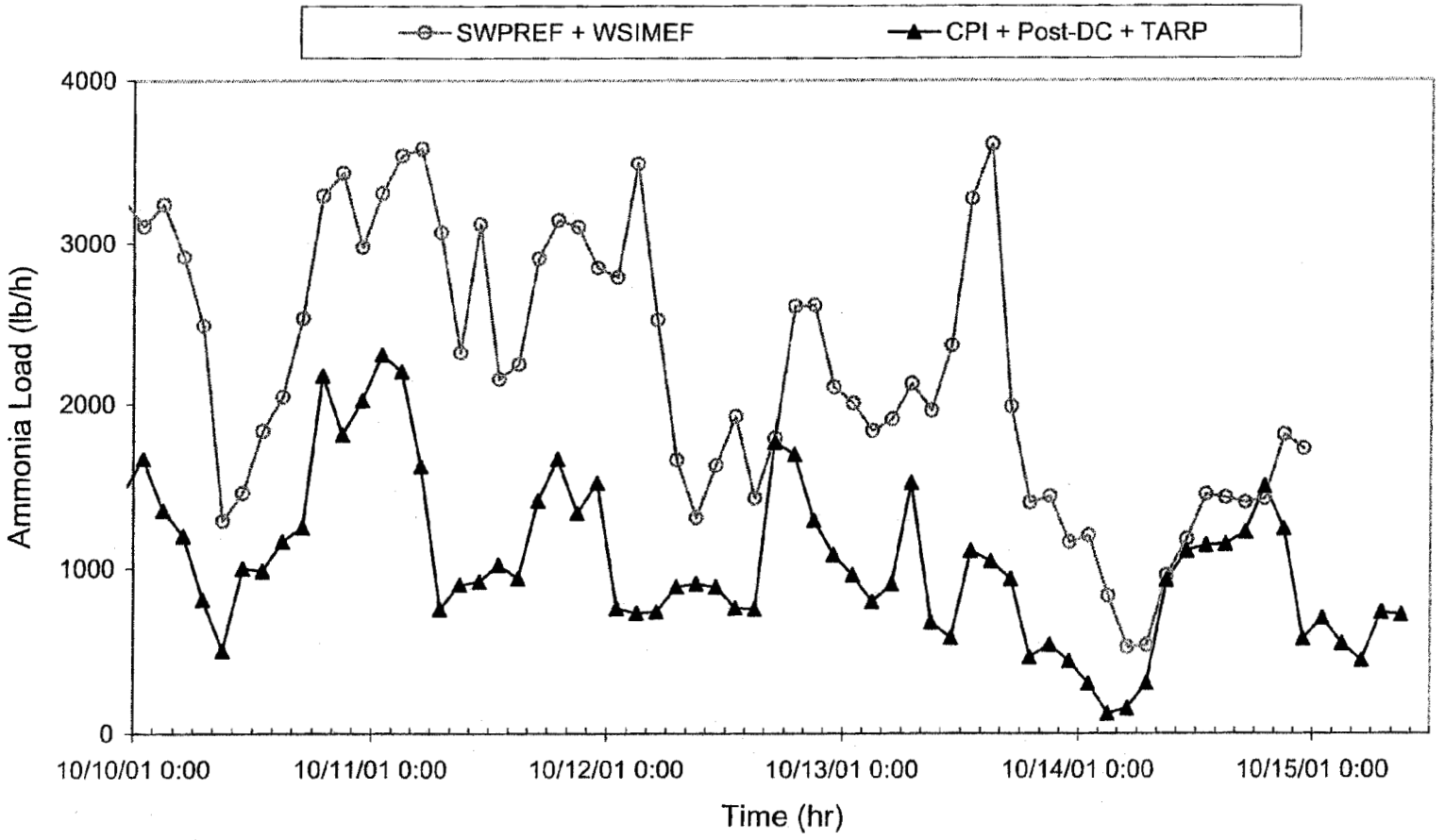
FIGURE 15

COMPARISON OF HOURLY AMMONIA LOADS AT THE SELECTED MAJOR SOURCES AND STICKNEY WRP DURING 10/10 TO 10/15/2001



sampling period of this study. However, among the 14 significant peaks which are numbered in the figures, at SWPREF + WSIMEFF, only five peaks (6, 9, 10, 13, and 14), which are underlined, might be linked to the peaks of CPI + Post-DC + TARP that made up at least 49.2 percent of SWPREF + WSIMEF. It appears that most of the significant hourly peak ammonia loads entering the Stickney WRP aeration tanks were related to the peak loads from the normal Stickney Southwest Side Plant domestic and commercial loading, while about one-third may have been caused by the discharge at the three identified major point sources.

TKN Loading Rates. Another major objective of this study was to examine the amounts of TKN, which is the sum of ammonia and organic nitrogen, at the selected major point sources and the background sewage. Examining TKN is necessary, as organic nitrogen is converted to ammonia in the aeration tanks when the organic substances that contain nitrogen are degraded. As particulate materials that contain organic nitrogen may be removed in the settling tanks, the portion of organic nitrogen from the three major point sources reaching the Stickney aeration tanks could not be determined. Thus, TKN loads from each of the three major point sources were first compared with each

other and then against those in the raw sewage entering the Stickney Southwest Plant (SWRAW).

Figures 16 through 20 present the hourly TKN loads from each of the three major point sources, namely CPI, Post-DC and TARP, along with those at SWRAW. As can be seen in the figures, the hourly TKN loads in all three major point sources varied over time during the period of this study. The variation of hourly TKN loads at CPI and Post-DC is comparable as seen in Table 8 with the CVs of the hourly TKN loads at these two locations being 55.0 percent and 51.6 percent, respectively. There was no clear pattern of variation at either of the two locations. However, the hourly TKN loads from TARP pumpback were much more variable, compared to those from CPI and Post-DC, even more variable, a CV of 122 percent, than its hourly ammonia loads with a CV of 97 percent. Significant peaks in TKN loading values, more than three times the mean value of 781 lb/h, were observed at TARP during this study. There were 14 hourly TKN loads from TARP greater than 2,340 lb/h with the highest value of 7,947 lb/h, whereas the highest hourly TKN loads from CPI and Post-DC were 1,280 and 1,611 lb/h, respectively.

It appears that the peak TKN loads observed at SWRAW during the field-sampling period of this study were rarely

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FIGURE 16

HOURLY TKN LOADS AT THE THREE MAJOR POINT SOURCES AND SWRAW
DURING 9/17 TO 9/22/2001

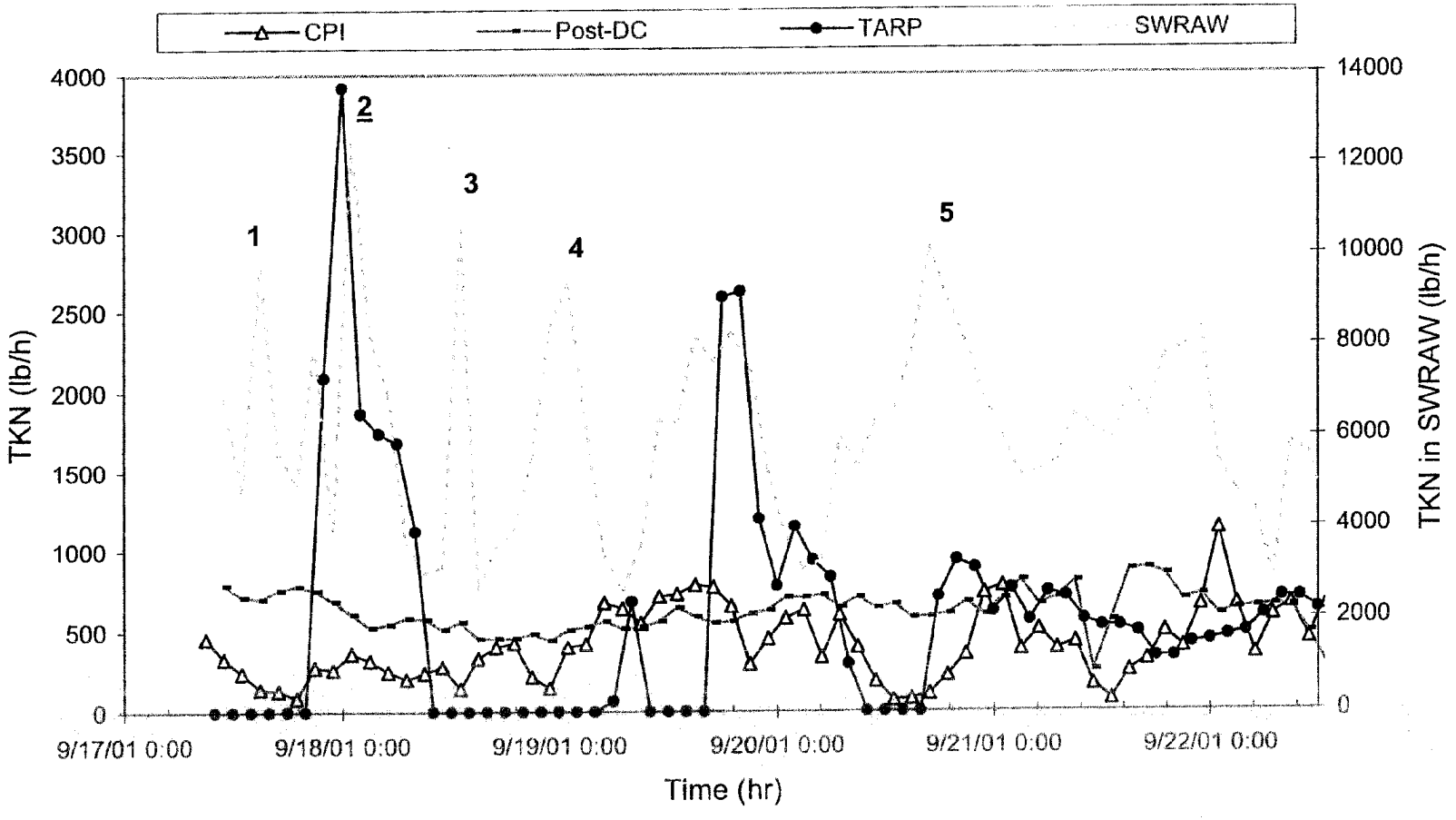

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FIGURE 17

HOURLY TKN LOADS AT THE THREE MAJOR POINT SOURCES AND SWRAW
DURING 9/22 TO 9/28/2001

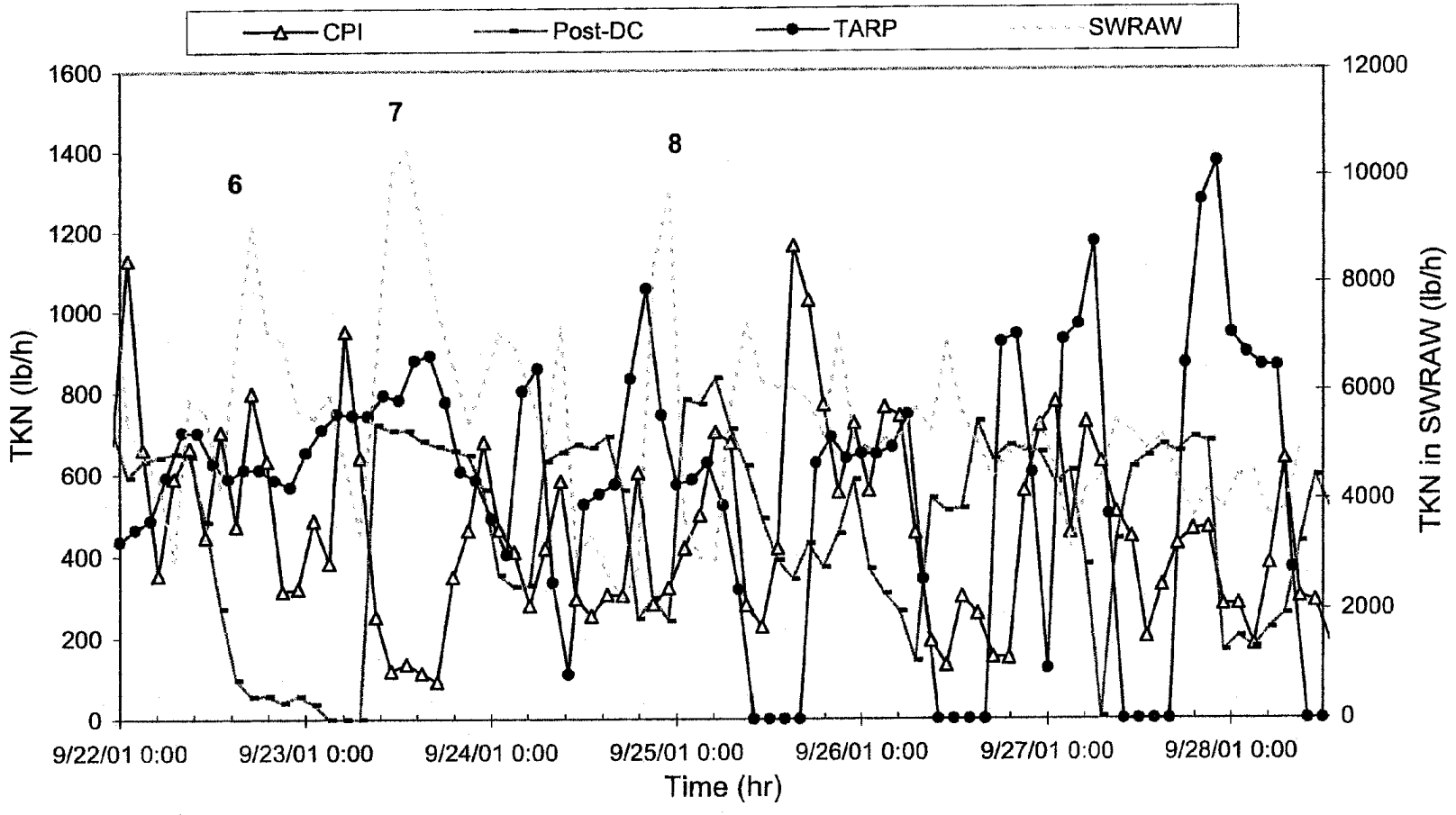

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FIGURE 18

HOURLY TKN LOADS AT THE THREE MAJOR POINT SOURCES AND SWRAW
DURING 9/28 TO 10/4/2001

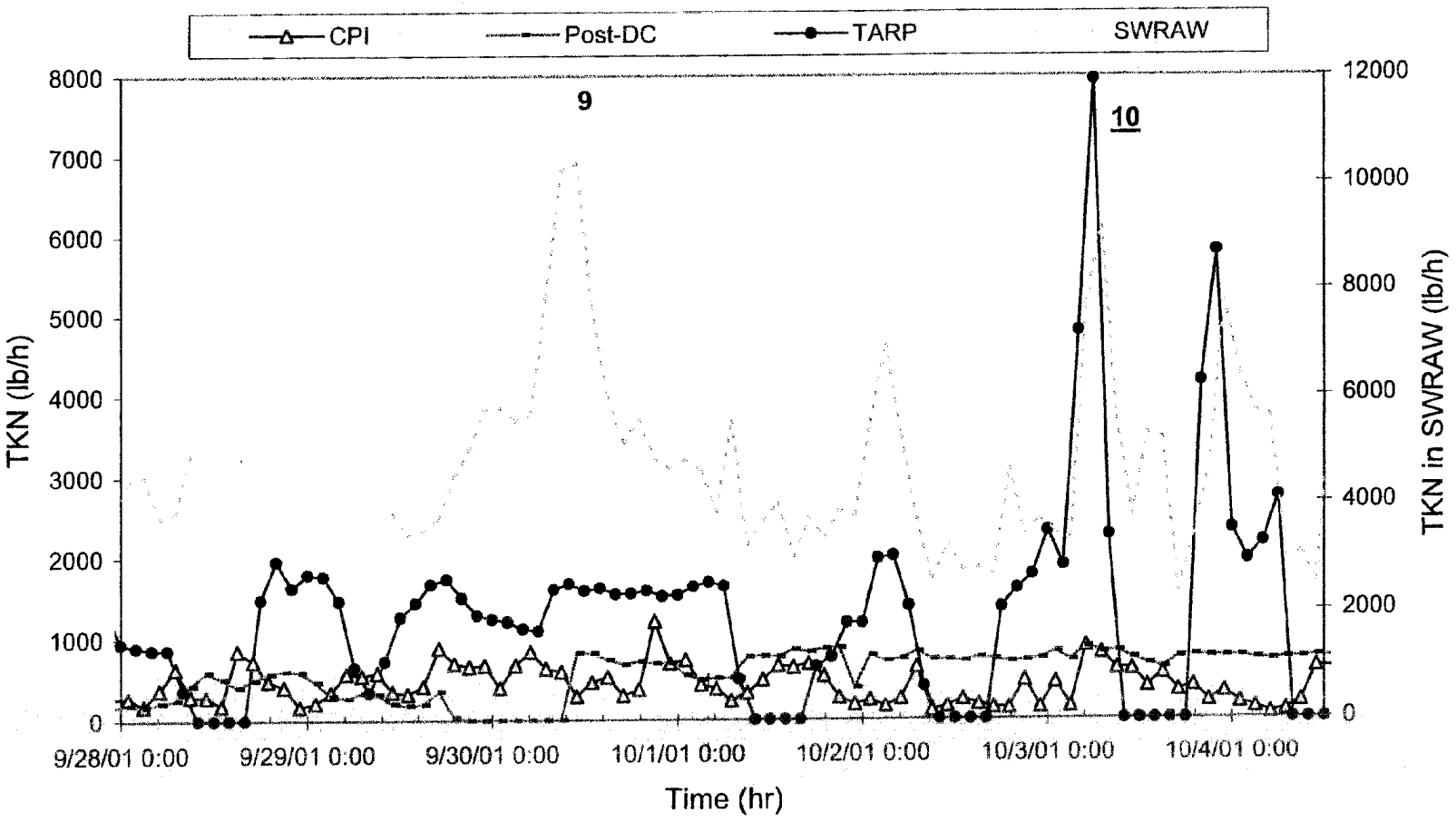

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FIGURE 19

HOURLY TKN LOADS AT THE THREE MAJOR POINT SOURCES AND SWRAW
DURING 10/4 TO 10/10/2001

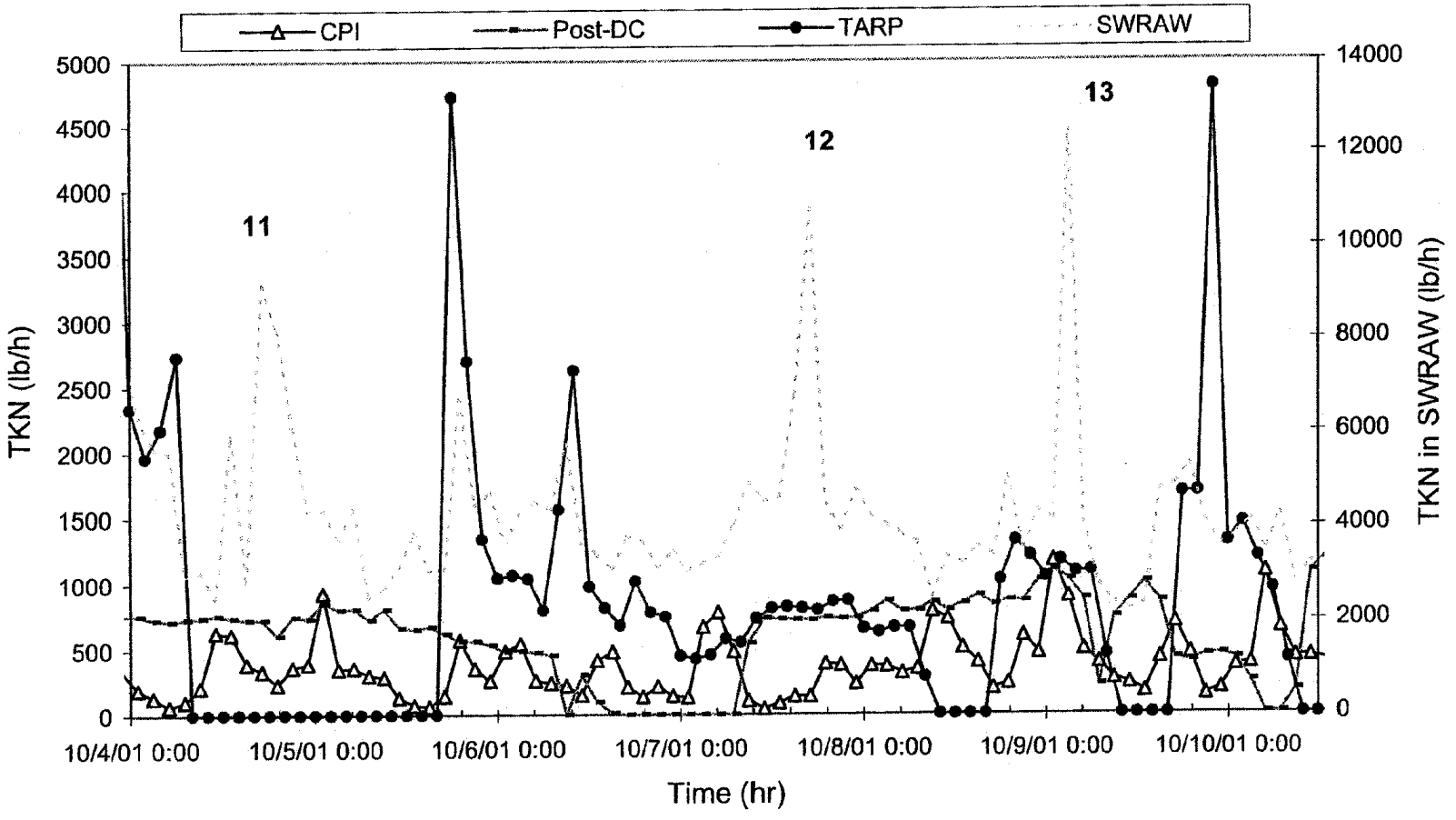

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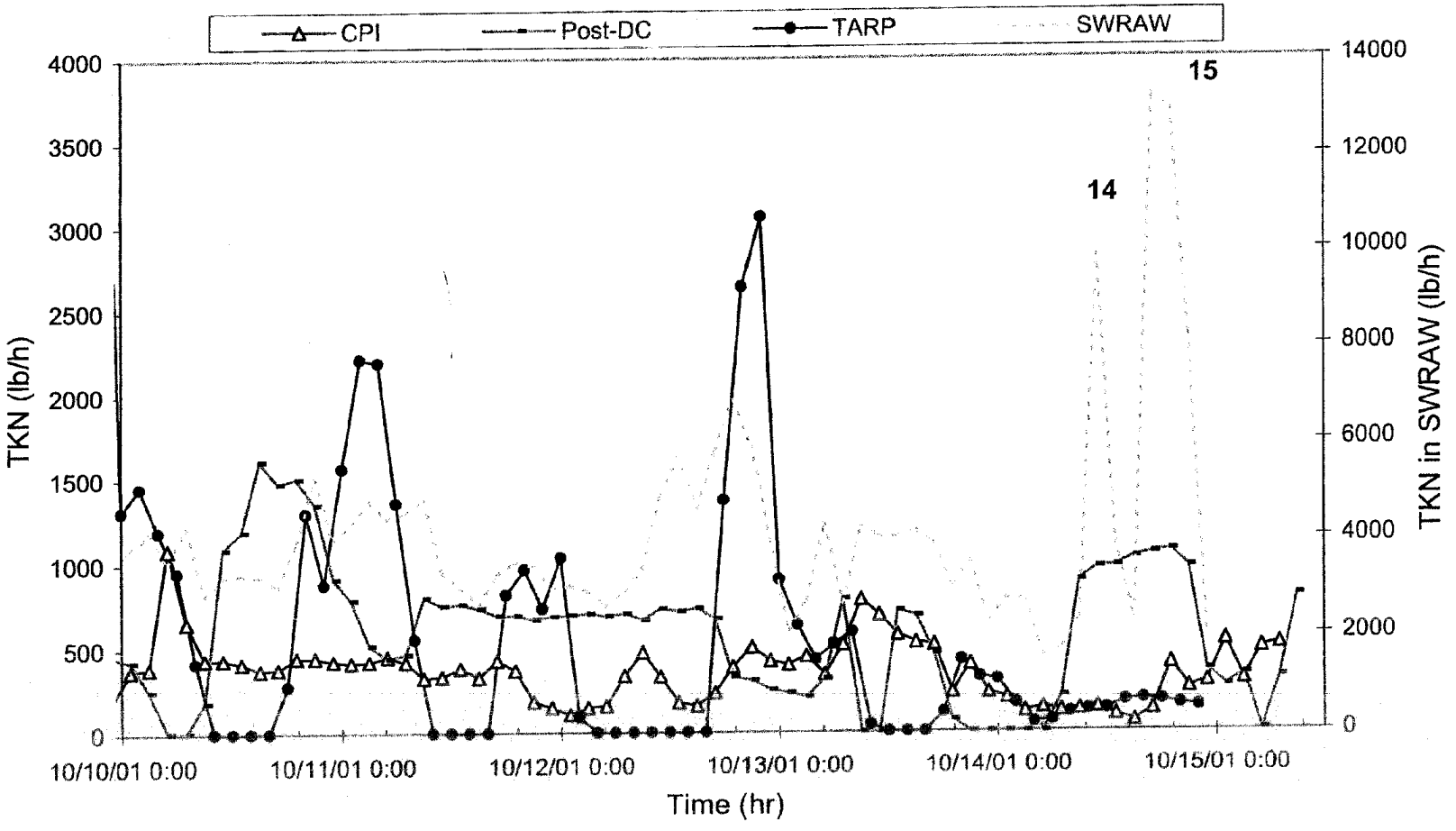
FIGURE 20

HOURLY TKN LOADS AT THE THREE MAJOR POINT SOURCES AND SWRAW
DURING 10/10 TO 10/15/2001



correlated with the peak TKN loads observed at the three major point sources investigated in this study. Among the 15 peaks over 9,000 lb/h at SWRAW observed in Figures 16 to 20, as numbered 1 through 15 in the figures, only two peaks (Nos. 2 and 10) seem to be related to those from the three major point sources. Both peaks, underlined in the figures, were from TARP. As can be seen in these figures, many significant peak TKN loads from TARP resulted only in smaller peaks at SWRAW. The observations from Figures 16 through 20 agree with the findings, discussed earlier in this report, that the background sewage contains significantly larger portion of organic nitrogen than the wastewater from the three major point sources including TARP pumpback. TARP pumpback consists mainly of the background sewage mixed with rainwater and contains a larger portion of organic nitrogen than the other two major point sources, namely, CPI and Post-DC.

However, as approximately 40 percent of TKN in the raw sewage entering the Stickney Southwest Side Plant was removed in the Southwest preliminary settling tanks, the peaks of TKN loads from SWRAW may not necessarily travel to the Stickney WRP aeration tanks, and hence it is difficult to evaluate the exact impact of peak TKN loads from the identified point sources on the aeration tanks.

REFERENCES

1. Zhang, H, J. S. Jain, B. Sawyer, and P. Tata. "Investigation of Final Effluent Ammonia Spike Incidents on April 7 and July 22, 2000, at the Stickney Water Reclamation Plant and the Impact of Major Ammonia-Contributing Sources." Metropolitan Water Reclamation District of Greater Chicago, Research and Development Department Report No. 01-3, February 2001.

APPENDIX AI

TABULATION OF ALL DATA COLLECTED DURING THE 2001 STUDY

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TABLE AI-1

DATA COLLECTED FOR 2AT OF CPI IN 2001 AMMONIA STUDY
SEPTEMBER 17 THROUGH OCTOBER 15, 2001

Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)	Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)
9/17/01 1:00	NS	NS	NS	9/20/01 1:00	5.49	190.11	301.28
9/17/01 3:00	NS	NS	NS	9/20/01 3:00	5.49	203.02	326.66
9/17/01 5:00	NS	NS	NS	9/20/01 5:00	6.22	135.27	154.76
9/17/01 7:00	NS	NS	NS	9/20/01 7:00	6.67	252.51	256.35
9/17/01 9:00	5.78	201.54	227.21	9/20/01 9:00	6.19	176.09	185.00
9/17/01 11:00	5.53	149.34	172.26	9/20/01 11:00	5.78	87.79	92.55
9/17/01 13:00	4.93	134.13	140.60	9/20/01 13:00	5.32	29.48	36.80
9/17/01 15:00	4.69	76.07	86.73	9/20/01 15:00	5.36	31.93	41.01
9/17/01 17:00	4.93	68.91	76.19	9/20/01 17:00	5.28	45.46	58.27
9/17/01 19:00	4.93	39.95	50.39	9/20/01 19:00	4.99	115.24	128.07
9/17/01 21:00	5.01	149.64	157.87	9/20/01 21:00	5.35	173.27	189.20
9/17/01 23:00	4.90	148.11	154.16	9/20/01 23:00	6.64	286.13	317.59
9/18/01 1:00	4.81	213.58	216.02	9/21/01 1:00	6.72	300.47	331.83
9/18/01 3:00	4.93	177.11	185.67	9/21/01 3:00	5.95	163.39	184.94
9/18/01 5:00	5.01	138.53	142.79	9/21/01 5:00	5.95	228.87	245.04
9/18/01 7:00	5.12	100.33	113.09	9/21/01 7:00	5.83	179.61	191.40
9/18/01 9:00	5.12	121.58	134.81	9/21/01 9:00	6.20	170.51	199.24
9/18/01 11:00	5.20	151.96	154.84	9/21/01 11:00	6.50	49.18	73.01
9/18/01 13:00	5.01	71.87	82.09	9/21/01 13:00	6.98	19.07	29.81
9/18/01 15:00	5.11	172.66	187.72	9/21/01 15:00	7.87	83.26	91.08
9/18/01 17:00	5.30	202.79	217.02	9/21/01 17:00	7.95	110.19	115.05
9/18/01 19:00	5.27	213.34	231.98	9/21/01 19:00	7.59	168.11	186.94
9/18/01 21:00	5.65	98.20	110.40	9/21/01 21:00	7.40	132.96	154.06
9/18/01 23:00	8.71	42.63	47.69	9/21/01 23:00	7.35	231.43	256.48
9/19/01 1:00	10.50	87.62	109.40	9/22/01 1:00	7.30	378.28	445.03
9/19/01 3:00	8.00	143.64	149.95	9/22/01 3:00	7.06	247.19	269.70
9/19/01 5:00	6.22	305.59	310.82	9/22/01 5:00	6.98	114.38	145.91
9/19/01 7:00	5.65	294.11	323.19	9/22/01 7:00	8.47	161.14	200.27
9/19/01 9:00	5.41	267.92	290.42	9/22/01 9:00	9.39	167.87	203.70
9/19/01 11:00	5.98	337.14	342.11	9/22/01 11:00	8.58	116.15	149.81
9/19/01 13:00	6.17	297.93	338.61	9/22/01 13:00	7.77	173.79	260.75
9/19/01 15:00	5.93	358.52	379.90	9/22/01 15:00	7.00	117.82	194.44
9/19/01 17:00	5.82	355.44	381.10	9/22/01 17:00	6.43	240.81	356.93

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TABLE AI-1 (Continued)

DATA COLLECTED FOR 2AT OF CPI IN 2001 AMMONIA STUDY
SEPTEMBER 17 THROUGH OCTOBER 15, 2001

Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)	Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)
9/19/01 19:00	5.33	289.54	350.12	9/22/01 19:00	6.43	231.54	282.99
9/19/01 21:00	5.49	136.93	152.50	9/22/01 21:00	6.67	108.85	135.46
9/19/01 23:00	5.65	198.20	228.88	9/22/01 23:00	7.04	83.23	131.04
9/23/01 1:00	7.85	122.90	177.75	9/26/01 1:00	6.22	244.04	257.59
9/23/01 3:00	8.05	113.78	137.25	9/26/01 3:00	6.38	323.40	343.42
9/23/01 5:00	7.48	318.45	365.18	9/26/01 5:00	6.62	302.22	321.36
9/23/01 7:00	7.72	199.18	238.25	9/26/01 7:00	7.51	140.91	174.19
9/23/01 9:00	7.40	73.10	97.83	9/26/01 9:00	8.56	37.35	64.24
9/23/01 11:00	6.54	33.00	52.27	9/26/01 11:00	8.05	34.12	47.26
9/23/01 13:00	9.00	31.20	43.54	9/26/01 13:00	7.21	103.59	119.66
9/23/01 15:00	9.29	26.61	35.20	9/26/01 15:00	6.27	113.11	118.32
9/23/01 17:00	6.87	26.73	38.76	9/26/01 17:00	5.61	71.11	77.86
9/23/01 19:00	6.71	134.92	149.70	9/26/01 19:00	6.04	66.51	71.19
9/23/01 21:00	6.51	172.81	204.18	9/26/01 21:00	6.54	238.46	244.30
9/23/01 23:00	6.43	274.32	303.24	9/26/01 23:00	7.00	293.30	294.66
9/24/01 1:00	6.75	177.04	197.19	9/27/01 1:00	7.32	289.50	304.46
9/24/01 3:00	6.75	147.43	174.37	9/27/01 3:00	7.00	148.53	187.19
9/24/01 5:00	6.71	88.83	119.66	9/27/01 5:00	6.46	292.76	322.57
9/24/01 7:00	7.03	146.40	170.69	9/27/01 7:00	6.35	269.53	284.18
9/24/01 9:00	7.59	196.48	220.34	9/27/01 9:00	7.24	164.61	200.34
9/24/01 11:00	7.51	102.43	112.79	9/27/01 11:00	7.35	141.03	174.03
9/24/01 13:00	6.82	90.48	106.74	9/27/01 13:00	6.46	73.36	89.61
9/24/01 15:00	6.66	120.37	131.58	9/27/01 15:00	6.62	114.11	142.46
9/24/01 17:00	6.66	119.88	131.06	9/27/01 17:00	6.95	154.12	176.98
9/24/01 19:00	6.50	239.98	266.56	9/27/01 19:00	6.62	165.30	200.62
9/24/01 21:00	6.43	106.17	126.23	9/27/01 21:00	6.30	181.14	212.88
9/24/01 23:00	6.51	122.57	142.20	9/27/01 23:00	6.06	114.82	132.86
9/25/01 1:00	6.74	156.60	178.53	9/28/01 1:00	5.90	119.61	137.12
9/25/01 3:00	6.69	175.58	213.76	9/28/01 3:00	6.06	73.78	86.32
9/25/01 5:00	6.67	276.51	302.20	9/28/01 5:00	6.22	143.51	176.07
9/25/01 7:00	7.04	264.21	275.43	9/28/01 7:00	6.83	220.64	267.02
9/25/01 9:00	7.35	79.48	109.18	9/28/01 9:00	7.29	85.72	118.15

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AI-1 (Continued)

DATA COLLECTED FOR 2AT OF CPI IN 2001 AMMONIA STUDY
SEPTEMBER 17 THROUGH OCTOBER 15, 2001

Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)	Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)
9/25/01 11:00	7.16	65.28	91.18	9/28/01 11:00	7.21	78.93	115.02
9/25/01 13:00	7.11	74.68	168.75	9/28/01 13:00	6.96	54.89	76.61
9/25/01 15:00	8.11	311.63	412.32	9/28/01 15:00	7.04	323.36	348.60
9/25/01 17:00	8.40	313.61	350.88	9/28/01 17:00	7.04	274.08	295.10
9/25/01 19:00	7.51	275.43	294.04	9/28/01 19:00	6.40	200.11	216.19
9/25/01 21:00	6.46	208.76	246.05	9/28/01 21:00	6.03	158.52	195.36
9/25/01 23:00	6.14	327.08	338.84	9/28/01 23:00	5.82	65.31	83.39
9/29/01 1:00	6.03	82.95	100.30	10/2/01 1:00	5.33	105.41	128.80
9/29/01 3:00	6.40	136.99	154.12	10/2/01 3:00	5.33	67.25	88.71
9/29/01 5:00	6.88	225.24	237.92	10/2/01 5:00	5.98	105.20	123.55
9/29/01 7:00	6.92	200.57	228.10	10/2/01 7:00	6.88	221.73	268.66
9/29/01 9:00	7.76	165.08	214.93	10/2/01 9:00	6.92	31.99	45.04
9/29/01 11:00	7.59	99.15	132.88	10/2/01 11:00	6.19	62.44	75.23
9/29/01 13:00	6.87	100.42	134.35	10/2/01 13:00	5.86	95.60	121.34
9/29/01 15:00	7.40	136.81	160.86	10/2/01 15:00	5.46	70.77	98.00
9/29/01 17:00	7.13	305.14	355.60	10/2/01 17:00	4.77	63.67	85.17
9/29/01 19:00	6.92	238.98	287.60	10/2/01 19:00	4.88	52.18	82.35
9/29/01 21:00	7.03	226.23	267.20	10/2/01 21:00	5.36	220.17	256.52
9/29/01 23:00	6.62	250.52	291.09	10/2/01 23:00	5.53	50.67	77.20
9/30/01 1:00	6.30	154.13	180.92	10/3/01 1:00	5.65	204.70	229.03
9/30/01 3:00	6.62	249.71	293.29	10/3/01 3:00	5.65	56.04	80.48
9/30/01 5:00	6.38	352.30	376.45	10/3/01 5:00	6.06	379.30	425.24
9/30/01 7:00	6.90	243.92	260.65	10/3/01 7:00	6.53	327.48	355.38
9/30/01 9:00	7.90	159.88	215.33	10/3/01 9:00	6.20	249.63	286.14
9/30/01 11:00	7.42	82.02	113.05	10/3/01 11:00	5.63	262.66	311.29
9/30/01 13:00	6.61	159.19	200.78	10/3/01 13:00	5.15	189.09	224.33
9/30/01 15:00	6.37	197.83	237.29	10/3/01 15:00	5.35	260.24	300.21
9/30/01 17:00	7.01	98.67	121.40	10/3/01 17:00	5.86	127.57	170.67
9/30/01 19:00	7.66	110.29	139.88	10/3/01 19:00	5.70	164.40	203.85
9/30/01 21:00	7.42	415.53	468.83	10/3/01 21:00	5.33	97.22	120.11
9/30/01 23:00	6.93	246.73	285.82	10/3/01 23:00	5.74	142.02	167.19
10/1/01 1:00	6.45	293.59	325.70	10/4/01 1:00	5.51	85.40	102.31

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AI-1 (Continued)

DATA COLLECTED FOR 2AT OF CPI IN 2001 AMMONIA STUDY
SEPTEMBER 17 THROUGH OCTOBER 15, 2001

Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)	Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)
10/1/01 3:00	6.37	158.80	194.78	10/4/01 3:00	4.60	61.12	85.47
10/1/01 5:00	6.45	134.67	169.77	10/4/01 5:00	4.46	26.89	43.75
10/1/01 7:00	6.38	76.94	104.33	10/4/01 7:00	5.01	37.02	60.07
10/1/01 9:00	6.96	105.85	135.22	10/4/01 9:00	5.90	65.20	103.39
10/1/01 11:00	7.29	109.22	192.63	10/4/01 11:00	6.11	236.39	296.88
10/1/01 13:00	6.56	233.53	289.79	10/4/01 13:00	5.95	254.28	298.52
10/1/01 15:00	6.56	246.31	281.35	10/4/01 15:00	6.14	150.21	184.01
10/1/01 17:00	7.04	226.84	279.64	10/4/01 17:00	6.30	124.99	152.69
10/1/01 19:00	6.46	200.95	238.12	10/4/01 19:00	6.62	79.02	101.30
10/1/01 21:00	5.98	105.14	129.84	10/4/01 21:00	7.19	122.69	145.90
10/1/01 23:00	5.75	67.51	92.79	10/4/01 23:00	7.79	116.52	144.70
10/5/01 1:00	7.87	302.32	341.22	10/8/01 1:00	4.39	208.81	244.72
10/5/01 3:00	6.75	134.13	149.52	10/8/01 3:00	4.65	190.83	228.94
10/5/01 5:00	5.70	142.81	181.48	10/8/01 5:00	4.90	152.01	185.84
10/5/01 7:00	5.61	110.92	155.63	10/8/01 7:00	5.69	139.10	176.98
10/5/01 9:00	5.40	118.36	155.12	10/8/01 9:00	6.98	258.20	324.39
10/5/01 11:00	4.96	59.43	77.28	10/8/01 11:00	7.27	237.47	288.71
10/5/01 13:00	4.91	36.74	44.96	10/8/01 13:00	7.11	168.45	206.83
10/5/01 15:00	5.27	27.86	35.21	10/8/01 15:00	6.98	133.97	164.82
10/5/01 17:00	5.80	58.50	72.65	10/8/01 17:00	6.90	45.19	82.56
10/5/01 19:00	5.67	279.48	290.66	10/8/01 19:00	7.27	72.08	93.89
10/5/01 21:00	5.02	190.09	202.61	10/8/01 21:00	7.35	205.00	235.42
10/5/01 23:00	5.15	135.93	146.67	10/8/01 23:00	7.35	153.47	184.74
10/6/01 1:00	5.40	243.07	259.50	10/9/01 1:00	7.59	398.73	445.08
10/6/01 3:00	5.04	298.00	310.85	10/9/01 3:00	7.35	312.47	351.50
10/6/01 5:00	4.91	144.07	153.74	10/9/01 5:00	6.79	167.59	210.39
10/6/01 7:00	4.70	126.50	147.60	10/9/01 7:00	5.98	155.67	190.59
10/6/01 9:00	4.43	111.92	144.51	10/9/01 9:00	5.41	113.57	143.61
10/6/01 11:00	4.90	66.20	88.26	10/9/01 11:00	5.54	98.76	123.19
10/6/01 13:00	5.22	183.10	229.82	10/9/01 13:00	6.03	57.46	82.40
10/6/01 15:00	4.75	237.20	293.40	10/9/01 15:00	6.30	135.67	196.05
10/6/01 17:00	4.46	106.12	135.09	10/9/01 17:00	5.93	279.73	339.06
10/6/01 19:00	4.41	63.37	88.59	10/9/01 19:00	5.49	121.02	243.55

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AI-1 (Continued)

DATA COLLECTED FOR 2AT OF CPI IN 2001 AMMONIA STUDY
SEPTEMBER 17 THROUGH OCTOBER 15, 2001

Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)	Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)
10/6/01 21:00	4.35	111.21	142.48	10/9/01 21:00	5.38	52.48	78.49
10/6/01 23:00	4.31	82.03	94.81	10/9/01 23:00	5.44	70.15	103.28
10/7/01 1:00	4.59	64.12	83.26	10/10/01 1:00	5.20	101.10	205.25
10/7/01 3:00	4.91	341.12	392.39	10/10/01 3:00	5.25	94.81	212.48
10/7/01 5:00	4.99	396.07	448.21	10/10/01 5:00	5.38	228.62	579.25
10/7/01 7:00	4.88	243.26	285.29	10/10/01 7:00	5.27	267.74	357.75
10/7/01 9:00	4.69	49.13	63.94	10/10/01 9:00	5.38	188.21	233.69
10/7/01 11:00	4.60	20.59	28.48	10/10/01 11:00	5.38	192.33	234.09
10/7/01 13:00	4.49	47.56	56.50	10/10/01 13:00	4.99	187.41	239.01
10/7/01 15:00	4.57	75.92	87.40	10/10/01 15:00	4.62	187.99	231.22
10/7/01 17:00	4.77	60.31	83.08	10/10/01 17:00	4.69	188.06	233.63
10/7/01 19:00	4.65	200.17	240.52	10/10/01 19:00	5.54	187.95	231.61
10/7/01 21:00	4.41	208.58	246.64	10/10/01 21:00	6.03	168.62	213.33
10/7/01 23:00	4.31	141.48	158.14	10/10/01 23:00	5.91	168.53	207.70
10/11/01 1:00	5.88	166.56	203.96	10/13/01 1:00	5.93	165.25	193.90
10/11/01 3:00	5.83	169.30	208.61	10/13/01 3:00	6.01	154.02	215.85
10/11/01 5:00	5.91	161.48	220.09	10/13/01 5:00	5.96	120.70	164.30
10/11/01 7:00	5.64	169.48	214.32	10/13/01 7:00	6.14	208.09	242.42
10/11/01 9:00	5.64	110.08	166.50	10/13/01 9:00	6.19	299.40	363.81
10/11/01 11:00	6.03	130.28	159.46	10/13/01 11:00	6.54	254.05	303.95
10/11/01 13:00	6.24	156.70	177.04	10/13/01 13:00	8.16	157.91	202.40
10/11/01 15:00	6.17	133.25	153.14	10/13/01 15:00	9.29	124.92	163.16
10/11/01 17:00	5.88	175.70	210.52	10/13/01 17:00	9.37	127.09	158.11
10/11/01 19:00	5.51	165.14	193.33	10/13/01 19:00	9.29	45.48	72.23
10/11/01 21:00	5.35	64.78	99.40	10/13/01 21:00	8.24	102.00	139.69
10/11/01 23:00	5.51	53.14	77.51	10/13/01 23:00	6.87	74.02	96.41
10/12/01 1:00	5.91	30.16	51.81	10/14/01 1:00	5.70	76.97	100.69
10/12/01 3:00	6.83	42.89	62.40	10/14/01 3:00	4.81	48.33	70.93
10/12/01 5:00	7.16	44.71	63.83	10/14/01 5:00	4.56	61.56	89.08
10/12/01 7:00	6.59	112.25	146.10	10/14/01 7:00	4.64	48.32	76.41
10/12/01 9:00	6.22	162.93	219.71	10/14/01 9:00	4.60	61.36	82.55
10/12/01 11:00	5.57	130.68	170.10	10/14/01 11:00	4.60	72.18	90.70

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AI-1 (Continued)

DATA COLLECTED FOR 2AT OF CPI IN 2001 AMMONIA STUDY
SEPTEMBER 17 THROUGH OCTOBER 15, 2001

Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)	Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)
10/12/01 13:00	5.09	69.80	99.50	10/14/01 13:00	4.80	37.38	58.08
10/12/01 15:00	5.28	64.36	85.59	10/14/01 15:00	4.67	16.45	36.82
10/12/01 17:00	5.44	94.80	123.34	10/14/01 17:00	4.56	58.49	81.90
10/12/01 19:00	5.40	175.24	206.62	10/14/01 19:00	4.69	217.26	246.50
10/12/01 21:00	5.15	258.81	281.28	10/14/01 21:00	4.57	143.67	162.20
10/12/01 23:00	5.36	205.58	225.95	10/14/01 23:00	4.41	159.74	189.56
				10/15/01 1:00	4.69	287.98	329.15
				10/15/01 3:00	4.80	147.28	182.59
				10/15/01 5:00	4.96	254.03	284.92
				10/15/01 7:00	5.49	232.83	268.79

Note: NS = not sampled.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AI-2

DATA COLLECTED FOR LASMA IN 2001 AMMONIA STUDY
SEPTEMBER 17 THROUGH OCTOBER 15, 2001

	LAMSA East Site				LAMSA West Site		
Date & Time	Flow (gpm)	NH_3-N (mg/L)	TKN (mg/L)	Date & Time	Flow (gpm)	NH_3-N (mg/L)	TKN (mg/L)
9/17/01 1:00	NS	NS	NS	9/17/01 1:00	NS	NS	NS
9/17/01 3:00	NS	NS	NS	9/17/01 3:00	NS	NS	NS
9/17/01 5:00	NS	NS	NS	9/17/01 5:00	NS	NS	NS
9/17/01 7:00	NS	NS	NS	9/17/01 7:00	NS	NS	NS
9/17/01 9:00	NS	NS	NS	9/17/01 9:00	NS	NS	NS
9/17/01 11:00	0.00	43.74	60.34	9/17/01 11:00	16.43	15.00	18.54
9/17/01 13:00	0.00	44.73	58.94	9/17/01 13:00	21.20	16.81	20.70
9/17/01 15:00	0.00	48.81	64.42	9/17/01 15:00	18.91	17.07	22.13
9/17/01 17:00	0.00	52.17	68.40	9/17/01 17:00	16.81	16.80	21.65
9/17/01 19:00	0.00	55.87	73.25	9/17/01 19:00	17.02	16.57	20.69
9/17/01 21:00	0.00	59.71	76.53	9/17/01 21:00	16.23	16.54	21.23
9/17/01 23:00	0.00	59.23	72.61	9/17/01 23:00	22.86	MS	MS
9/18/01 1:00	0.00	64.73	80.19	9/18/01 1:00	16.49	MS	MS
9/18/01 3:00	0.00	65.19	81.17	9/18/01 3:00	48.33	MS	MS
9/18/01 5:00	0.00	71.22	80.05	9/18/01 5:00	43.17	MS	MS
9/18/01 7:00	0.00	80.34	97.58	9/18/01 7:00	44.84	MS	MS
9/18/01 9:00	0.00	78.64	98.65	9/18/01 9:00	16.26	MS	MS
9/18/01 11:00	0.00	63.61	65.35	9/18/01 11:00	17.48	21.53	26.10
9/18/01 13:00	0.00	19.11	21.84	9/18/01 13:00	17.63	20.70	24.36
9/18/01 15:00	0.00	40.12	41.44	9/18/01 15:00	16.05	19.24	22.72
9/18/01 17:00	0.00	46.94	48.31	9/18/01 17:00	17.82	17.94	20.54
9/18/01 19:00	0.00	89.97	111.74	9/18/01 19:00	17.10	17.19	19.12
9/18/01 21:00	0.00	102.15	124.53	9/18/01 21:00	41.97	16.63	18.56
9/18/01 23:00	787.49	112.78	117.75	9/18/01 23:00	1986.83	126.78	184.10
9/19/01 1:00	0.00	81.99	86.21	9/19/01 1:00	3861.32	116.26	138.90
9/19/01 3:00	0.00	81.99	85.07	9/19/01 3:00	5616.44	118.95	146.50
9/19/01 5:00	0.00	84.50	88.29	9/19/01 5:00	5164.64	110.26	141.60
9/19/01 7:00	0.00	85.51	91.00	9/19/01 7:00	3549.56	106.00	127.80
9/19/01 9:00	0.00	90.93	95.00	9/19/01 9:00	3289.72	108.44	138.70
9/19/01 11:00	0.00	109.33	131.70	9/19/01 11:00	953.76	129.72	511.15
9/19/01 13:00	1294.80	100.87	118.33	9/19/01 13:00	512.49	138.56	518.52
9/19/01 15:00	1845.74	100.97	124.11	9/19/01 15:00	302.81	139.12	258.90

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AI-2 (Continued)

DATA COLLECTED FOR LASMA IN 2001 AMMONIA STUDY
SEPTEMBER 17 THROUGH OCTOBER 15, 2001

	LAMSA East Site				LAMSA West Site		
Date & Time	Flow (gpm)	NH_3-N (mg/L)	TKN (mg/L)	Date & Time	Flow (gpm)	NH_3-N (mg/L)	TKN (mg/L)
9/19/01 17:00	1304.15	84.36	101.21	9/19/01 17:00	232.00	149.66	206.15
9/19/01 19:00	0.00	75.60	88.52	9/19/01 19:00	210.45	141.24	192.72
9/19/01 21:00	0.00	64.47	77.17	9/19/01 21:00	167.31	139.56	181.93
9/19/01 23:00	0.00	84.28	101.53	9/19/01 23:00	119.18	135.83	177.02
9/20/01 1:00	0.00	94.85	112.95	9/20/01 1:00	77.47	133.45	165.12
9/20/01 3:00	0.00	103.61	121.71	9/20/01 3:00	69.04	117.97	145.33
9/20/01 5:00	0.00	85.60	104.27	9/20/01 5:00	156.35	143.44	198.84
9/20/01 7:00	311.97	106.37	124.02	9/20/01 7:00	109.94	169.36	236.82
9/20/01 9:00	996.90	195.45	225.36	9/20/01 9:00	69.49	120.85	138.40
9/20/01 11:00	866.92	199.76	211.99	9/20/01 11:00	81.49	76.75	111.07
9/20/01 13:00	698.64	191.39	200.54	9/20/01 13:00	100.59	97.58	166.11
9/20/01 15:00	570.28	187.40	197.74	9/20/01 15:00	53.56	169.92	375.82
9/20/01 17:00	418.59	168.12	173.80	9/20/01 17:00	76.12	91.27	116.54
9/20/01 19:00	50.40	157.68	162.45	9/20/01 19:00	56.75	84.07	87.91
9/20/01 21:00	256.12	134.01	137.89	9/20/01 21:00	60.83	94.52	170.42
9/20/01 23:00	1868.27	42.68	54.50	9/20/01 23:00	1412.77	102.92	172.70
9/21/01 1:00	205.04	96.39	100.74	9/21/01 1:00	1924.89	117.23	140.81
9/21/01 3:00	0.00	142.94	154.93	9/21/01 3:00	851.89	134.09	162.91
9/21/01 5:00	617.04	157.81	166.97	9/21/01 5:00	483.43	129.78	163.09
9/21/01 7:00	1357.74	120.43	129.37	9/21/01 7:00	389.29	138.04	199.24
9/21/01 9:00	1167.09	121.81	128.37	9/21/01 9:00	407.20	124.78	138.55
9/21/01 11:00	1055.09	133.10	151.18	9/21/01 11:00	154.99	77.61	102.31
9/21/01 13:00	1472.95	101.20	119.21	9/21/01 13:00	102.29	99.07	209.81
9/21/01 15:00	782.15	85.37	97.58	9/21/01 15:00	107.71	72.16	145.84
9/21/01 17:00	0.00	86.33	101.11	9/21/01 17:00	106.83	55.29	78.07
9/21/01 19:00	0.00	22.13	67.11	9/21/01 19:00	84.65	49.74	65.13
9/21/01 21:00	0.00	42.76	51.97	9/21/01 21:00	83.28	43.79	55.62
9/21/01 23:00	58.82	56.40	68.63	9/21/01 23:00	83.23	40.88	49.87
9/22/01 1:00	503.81	56.08	71.31	9/22/01 1:00	85.38	40.17	47.47
9/22/01 3:00	920.95	59.16	71.15	9/22/01 3:00	85.12	38.70	45.87
9/22/01 5:00	866.82	65.83	76.22	9/22/01 5:00	85.70	36.70	43.75

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AI-2 (Continued)

DATA COLLECTED FOR LASMA IN 2001 AMMONIA STUDY
SEPTEMBER 17 THROUGH OCTOBER 15, 2001

	LAMSA East Site				LAMSA West Site		
Date & Time	Flow (gpm)	NH_3-N (mg/L)	TKN (mg/L)	Date & Time	Flow (gpm)	NH_3-N (mg/L)	TKN (mg/L)
9/22/01 7:00	753.38	70.12	80.22	9/22/01 7:00	84.80	81.59	99.07
9/22/01 9:00	657.72	54.18	62.33	9/22/01 9:00	89.78	103.79	125.32
9/22/01 11:00	673.81	84.88	109.47	9/22/01 11:00	91.38	33.81	46.54
9/22/01 13:00	546.77	81.61	101.08	9/22/01 13:00	91.13	30.81	42.44
9/22/01 15:00	453.09	82.82	97.81	9/22/01 15:00	90.59	31.22	42.53
9/22/01 17:00	248.70	80.99	95.62	9/22/01 17:00	93.45	29.95	41.11
9/22/01 19:00	189.32	81.66	95.34	9/22/01 19:00	91.43	28.71	37.94
9/22/01 21:00	74.49	84.37	97.34	9/22/01 21:00	86.91	27.52	36.77
9/22/01 23:00	331.33	87.92	103.67	9/22/01 23:00	85.01	26.51	35.24
9/23/01 1:00	397.78	91.40	109.05	9/23/01 1:00	81.23	21.93	29.42
9/23/01 3:00	292.78	97.52	113.14	9/23/01 3:00	78.50	19.20	25.87
9/23/01 5:00	303.00	101.31	120.58	9/23/01 5:00	78.86	18.95	25.03
9/23/01 7:00	77.83	79.40	96.29	9/23/01 7:00	81.19	18.56	24.51
9/23/01 9:00	169.23	92.56	109.49	9/23/01 9:00	100.24	21.48	30.65
9/23/01 11:00	1641.22	50.47	63.96	9/23/01 11:00	1918.16	89.05	144.54
9/23/01 13:00	1494.06	103.96	124.97	9/23/01 13:00	1598.40	111.29	153.04
9/23/01 15:00	1378.82	165.79	193.91	9/23/01 15:00	1730.41	102.76	137.19
9/23/01 17:00	0.00	58.58	78.86	9/23/01 17:00	4383.71	90.40	129.87
9/23/01 19:00	0.00	142.34	166.00	9/23/01 19:00	1784.89	109.33	166.75
9/23/01 21:00	0.00	182.05	199.89	9/23/01 21:00	359.65	142.45	487.79
9/23/01 23:00	0.00	158.32	183.81	9/23/01 23:00	406.27	147.18	775.41
9/24/01 1:00	0.00	134.41	156.24	9/24/01 1:00	179.64	108.58	161.39
9/24/01 3:00	0.00	109.70	129.67	9/24/01 3:00	159.37	95.13	117.41
9/24/01 5:00	0.00	104.96	127.04	9/24/01 5:00	135.34	85.37	102.87
9/24/01 7:00	0.00	90.84	106.11	9/24/01 7:00	112.62	76.87	91.59
9/24/01 9:00	0.00	128.12	158.23	9/24/01 9:00	105.47	72.02	87.77
9/24/01 11:00	0.00	139.01	159.19	9/24/01 11:00	146.93	76.48	116.64
9/24/01 13:00	0.00	146.27	161.29	9/24/01 13:00	134.83	65.72	110.35
9/24/01 15:00	0.00	153.01	171.18	9/24/01 15:00	169.66	54.43	78.35
9/24/01 17:00	0.00	144.45	160.04	9/24/01 17:00	87.87	52.96	71.88
9/24/01 19:00	0.00	130.56	143.87	9/24/01 19:00	82.75	48.73	66.33
9/24/01 21:00	0.00	116.28	130.64	9/24/01 21:00	81.68	47.56	64.42

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AI-2 (Continued)

DATA COLLECTED FOR LASMA IN 2001 AMMONIA STUDY
SEPTEMBER 17 THROUGH OCTOBER 15, 2001

	LAMSA East Site				LAMSA West Site		
Date & Time	Flow (gpm)	NH_3-N (mg/L)	TKN (mg/L)	Date & Time	Flow (gpm)	NH_3-N (mg/L)	TKN (mg/L)
9/24/01 23:00	0.00	107.66	119.21	9/24/01 23:00	79.15	45.10	60.07
9/25/01 1:00	0.00	105.66	116.76	9/25/01 1:00	74.44	42.99	57.13
9/25/01 3:00	0.00	106.00	115.80	9/25/01 3:00	73.45	242.78	661.70
9/25/01 5:00	0.00	97.19	114.05	9/25/01 5:00	68.95	232.95	635.49
9/25/01 7:00	0.00	90.85	100.47	9/25/01 7:00	29.52	176.02	525.53
9/25/01 9:00	840.21	109.42	118.44	9/25/01 9:00	179.75	59.82	73.42
9/25/01 11:00	451.82	128.80	141.48	9/25/01 11:00	71.51	55.67	95.92
9/25/01 13:00	444.99	136.25	148.90	9/25/01 13:00	66.14	36.25	56.22
9/25/01 15:00	436.98	116.73	128.18	9/25/01 15:00	63.49	26.07	39.37
9/25/01 17:00	398.29	123.71	133.48	9/25/01 17:00	60.75	21.97	31.57
9/25/01 19:00	427.24	123.66	133.19	9/25/01 19:00	59.82	22.14	31.04
9/25/01 21:00	436.77	118.74	127.04	9/25/01 21:00	59.87	23.05	31.95
9/25/01 23:00	435.73	111.09	122.29	9/25/01 23:00	59.19	25.55	35.22
9/26/01 1:00	426.41	112.65	122.57	9/26/01 1:00	58.70	27.11	35.58
9/26/01 3:00	392.06	116.93	127.71	9/26/01 3:00	56.43	25.50	33.62
9/26/01 5:00	384.54	115.66	132.11	9/26/01 5:00	55.12	25.16	32.82
9/26/01 7:00	412.09	117.45	129.34	9/26/01 7:00	55.03	27.27	34.29
9/26/01 9:00	414.65	117.42	129.74	9/26/01 9:00	54.80	27.85	35.80
9/26/01 11:00	432.55	100.09	113.26	9/26/01 11:00	55.14	13.11	15.53
9/26/01 13:00	537.22	111.89	157.57	9/26/01 13:00	53.22	14.72	17.70
9/26/01 15:00	0.00	122.85	164.14	9/26/01 15:00	55.91	15.78	19.18
9/26/01 17:00	0.00	496.60	556.22	9/26/01 17:00	66.21	16.37	20.45
9/26/01 19:00	0.00	529.72	603.47	9/26/01 19:00	63.25	16.43	20.33
9/26/01 21:00	0.00	478.97	578.14	9/26/01 21:00	57.49	7.87	10.21
9/26/01 23:00	0.00	503.13	595.89	9/26/01 23:00	56.65	15.88	20.08
9/27/01 1:00	0.00	489.91	584.59	9/27/01 1:00	54.75	20.66	26.02
9/27/01 3:00	0.00	474.72	588.27	9/27/01 3:00	48.95	14.64	17.39
9/27/01 5:00	0.00	494.78	603.79	9/27/01 5:00	47.94	10.86	12.39
9/27/01 7:00	0.00	487.41	594.18	9/27/01 7:00	45.35	11.78	13.56
9/27/01 9:00	0.00	471.71	565.89	9/27/01 9:00	45.94	12.14	14.15
9/27/01 11:00	0.00	328.98	395.16	9/27/01 11:00	45.67	6.49	9.06

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AI-2 (Continued)

DATA COLLECTED FOR LASMA IN 2001 AMMONIA STUDY
SEPTEMBER 17 THROUGH OCTOBER 15, 2001

	LAMSA East Site				LAMSA West Site		
Date & Time	Flow (gpm)	NH_3-N (mg/L)	TKN (mg/L)	Date & Time	Flow (gpm)	NH_3-N (mg/L)	TKN (mg/L)
9/27/01 13:00	0.00	367.96	453.82	9/27/01 13:00	49.63	6.57	8.86
9/27/01 15:00	0.00	360.60	422.80	9/27/01 15:00	48.30	6.70	8.87
9/27/01 17:00	0.00	415.14	530.75	9/27/01 17:00	46.56	6.65	9.00
9/27/01 19:00	0.00	418.04	519.25	9/27/01 19:00	41.75	6.48	8.73
9/27/01 21:00	0.00	417.36	531.21	9/27/01 21:00	41.69	6.40	8.89
9/27/01 23:00	0.00	416.55	527.24	9/27/01 23:00	40.73	6.93	9.54
9/28/01 1:00	0.00	385.50	494.09	9/28/01 1:00	40.94	7.07	9.66
9/28/01 3:00	0.00	356.19	451.69	9/28/01 3:00	40.08	7.32	9.62
9/28/01 5:00	0.00	367.32	459.01	9/28/01 5:00	37.81	7.08	9.55
9/28/01 7:00	0.00	216.58	259.86	9/28/01 7:00	35.66	7.24	9.56
9/28/01 9:00	0.00	144.72	180.82	9/28/01 9:00	33.99	7.00	9.21
9/28/01 11:00	0.00	470.78	485.07	9/28/01 11:00	33.19	7.31	9.58
9/28/01 13:00	604.43	476.96	504.27	9/28/01 13:00	32.78	7.12	9.40
9/28/01 15:00	1360.11	491.35	513.45	9/28/01 15:00	31.02	7.28	9.45
9/28/01 17:00	296.17	484.08	501.33	9/28/01 17:00	29.99	7.35	9.08
9/28/01 19:00	300.63	471.46	498.18	9/28/01 19:00	28.03	7.46	9.38
9/28/01 21:00	270.61	465.98	484.25	9/28/01 21:00	29.37	7.20	9.33
9/28/01 23:00	309.05	434.50	475.98	9/28/01 23:00	27.39	8.15	10.67
9/29/01 1:00	220.57	427.66	479.47	9/29/01 1:00	27.31	7.08	9.29
9/29/01 3:00	103.07	402.96	475.87	9/29/01 3:00	26.44	10.43	11.71
9/29/01 5:00	80.93	467.05	549.00	9/29/01 5:00	25.64	6.80	8.45
9/29/01 7:00	-25.22	457.77	579.66	9/29/01 7:00	25.09	6.83	8.77
9/29/01 9:00	-30.81	435.20	511.56	9/29/01 9:00	25.96	7.13	8.99
9/29/01 11:00	-27.62	249.32	281.39	9/29/01 11:00	26.23	7.18	10.05
9/29/01 13:00	-49.17	353.71	398.52	9/29/01 13:00	27.79	6.58	8.95
9/29/01 15:00	-67.93	350.11	392.87	9/29/01 15:00	26.70	6.48	8.78
9/29/01 17:00	16.71	337.88	377.24	9/29/01 17:00	25.99	6.79	8.95
9/29/01 19:00	-7.29	325.97	383.17	9/29/01 19:00	25.44	6.88	8.86
9/29/01 21:00	-34.19	307.91	345.57	9/29/01 21:00	23.35	7.14	8.90
9/29/01 23:00	-44.74	335.02	408.70	9/29/01 23:00	23.22	6.94	8.93
9/30/01 1:00	-16.93	392.49	538.99	9/30/01 1:00	22.38	6.71	8.97

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AI-2 (Continued)

DATA COLLECTED FOR LASMA IN 2001 AMMONIA STUDY
SEPTEMBER 17 THROUGH OCTOBER 15, 2001

	LAMSA East Site				LAMSA West Site		
Date & Time	Flow (gpm)	NH_3-N (mg/L)	TKN (mg/L)	Date & Time	Flow (gpm)	NH_3-N (mg/L)	TKN (mg/L)
9/30/01 3:00	-7.83	370.03	438.33	9/30/01 3:00	20.66	6.79	8.68
9/30/01 5:00	0.00	389.41	439.87	9/30/01 5:00	19.64	6.72	9.01
9/30/01 7:00	-7.91	385.18	440.16	9/30/01 7:00	19.52	6.72	9.12
9/30/01 9:00	0.00	350.19	390.87	9/30/01 9:00	19.95	6.59	9.03
9/30/01 11:00	0.00	282.29	319.79	9/30/01 11:00	21.47	6.34	8.89
9/30/01 13:00	0.00	258.78	297.12	9/30/01 13:00	22.40	6.31	8.79
9/30/01 15:00	-5.95	240.72	273.25	9/30/01 15:00	23.23	6.57	9.05
9/30/01 17:00	0.00	214.76	240.93	9/30/01 17:00	22.37	6.75	9.57
9/30/01 19:00	0.00	150.96	172.28	9/30/01 19:00	22.08	6.74	9.34
9/30/01 21:00	0.00	177.28	198.77	9/30/01 21:00	20.55	6.82	8.96
9/30/01 23:00	0.00	200.07	226.95	9/30/01 23:00	20.23	6.84	9.31
10/1/01 1:00	0.00	191.22	220.00	10/1/01 1:00	19.37	6.66	8.93
10/1/01 3:00	0.00	191.13	217.33	10/1/01 3:00	19.09	6.77	8.75
10/1/01 5:00	0.00	181.69	207.86	10/1/01 5:00	18.68	6.46	8.57
10/1/01 7:00	0.00	169.23	190.51	10/1/01 7:00	18.74	6.50	8.29
10/1/01 9:00	0.00	163.05	183.60	10/1/01 9:00	21.43	6.37	11.86
10/1/01 11:00	0.00	167.50	196.76	10/1/01 11:00	20.44	6.64	10.17
10/1/01 13:00	0.00	165.89	186.90	10/1/01 13:00	21.79	6.91	9.99
10/1/01 15:00	215.53	147.14	167.03	10/1/01 15:00	22.87	8.21	11.37
10/1/01 17:00	1147.25	126.29	171.90	10/1/01 17:00	23.88	21.64	29.38
10/1/01 19:00	249.34	27.59	52.15	10/1/01 19:00	22.56	12.24	15.48
10/1/01 21:00	28.22	61.93	106.40	10/1/01 21:00	21.62	8.29	11.72
10/1/01 23:00	0.00	76.14	118.88	10/1/01 23:00	21.89	7.75	11.30
10/2/01 1:00	0.00	87.11	119.23	10/2/01 1:00	21.10	7.29	10.47
10/2/01 3:00	0.00	88.37	118.75	10/2/01 3:00	20.78	7.96	10.15
10/2/01 5:00	0.00	93.59	116.12	10/2/01 5:00	19.40	7.52	9.75
10/2/01 7:00	270.91	73.31	94.43	10/2/01 7:00	19.60	MS	MS
10/2/01 9:00	66.52	73.42	95.91	10/2/01 9:00	20.70	MS	MS
10/2/01 11:00	0.00	92.22	128.16	10/2/01 11:00	21.33	7.99	11.30
10/2/01 13:00	386.69	97.24	128.46	10/2/01 13:00	25.22	6.81	9.84
10/2/01 15:00	387.30	101.02	123.55	10/2/01 15:00	22.62	8.90	12.36
10/2/01 17:00	0.00	100.10	118.43	10/2/01 17:00	21.63	7.87	10.68

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AI-2 (Continued)

DATA COLLECTED FOR LASMA IN 2001 AMMONIA STUDY
SEPTEMBER 17 THROUGH OCTOBER 15, 2001

	LAMSA East Site				LAMSA West Site		
Date & Time	Flow (gpm)	NH_3-N (mg/L)	TKN (mg/L)	Date & Time	Flow (gpm)	NH_3-N (mg/L)	TKN (mg/L)
10/2/01 19:00	0.00	91.19	104.37	10/2/01 19:00	22.09	13.67	17.49
10/2/01 21:00	0.00	78.88	91.38	10/2/01 21:00	20.79	9.84	13.17
10/2/01 23:00	0.00	87.75	100.25	10/2/01 23:00	18.37	7.52	10.52
10/3/01 1:00	0.00	97.80	112.69	10/3/01 1:00	17.07	6.86	9.63
10/3/01 3:00	0.00	95.64	110.41	10/3/01 3:00	18.33	7.09	9.51
10/3/01 5:00	0.00	98.53	112.73	10/3/01 5:00	16.34	6.83	9.39
10/3/01 7:00	0.00	100.77	115.19	10/3/01 7:00	16.70	6.97	9.56
10/3/01 9:00	0.00	89.83	112.75	10/3/01 9:00	17.67	7.41	9.92
10/3/01 11:00	0.00	97.82	105.07	10/3/01 11:00	18.27	6.70	9.78
10/3/01 13:00	0.00	96.07	103.44	10/3/01 13:00	18.71	6.58	9.29
10/3/01 15:00	0.00	95.72	102.96	10/3/01 15:00	19.19	6.12	8.45
10/3/01 17:00	0.00	95.18	104.85	10/3/01 17:00	19.19	5.54	7.89
10/3/01 19:00	0.00	91.58	96.95	10/3/01 19:00	20.17	6.19	8.44
10/3/01 21:00	0.00	81.49	85.53	10/3/01 21:00	20.97	7.04	9.63
10/3/01 23:00	0.00	77.75	81.16	10/3/01 23:00	21.72	6.68	9.27
10/4/01 1:00	0.00	95.40	99.90	10/4/01 1:00	20.36	6.64	9.70
10/4/01 3:00	0.00	95.40	102.12	10/4/01 3:00	19.43	6.66	9.85
10/4/01 5:00	2.56	94.49	99.41	10/4/01 5:00	19.77	6.82	10.25
10/4/01 7:00	87.30	94.47	99.10	10/4/01 7:00	19.37	6.70	10.02
10/4/01 9:00	48.08	95.70	104.31	10/4/01 9:00	18.60	6.73	10.28
10/4/01 11:00	17.36	38.25	51.73	10/4/01 11:00	20.23	7.42	10.20
10/4/01 13:00	3.83	49.36	62.59	10/4/01 13:00	20.18	7.78	10.03
10/4/01 15:00	459.75	64.96	80.33	10/4/01 15:00	161.36	19.15	54.66
10/4/01 17:00	1355.75	80.28	96.93	10/4/01 17:00	1268.96	107.11	205.03
10/4/01 19:00	1169.11	118.41	142.10	10/4/01 19:00	3107.53	124.92	227.95
10/4/01 21:00	0.00	145.19	191.54	10/4/01 21:00	4403.17	121.37	161.83
10/4/01 23:00	0.00	137.74	190.68	10/4/01 23:00	4959.42	112.16	152.16
10/5/01 1:00	0.00	95.13	108.24	10/5/01 1:00	5348.12	104.22	153.92
10/5/01 3:00	0.00	91.57	102.41	10/5/01 3:00	4212.45	107.39	151.22
10/5/01 5:00	0.00	41.57	63.54	10/5/01 5:00	2326.74	116.08	158.90
10/5/01 7:00	0.00	25.57	36.57	10/5/01 7:00	2248.29	111.95	177.34

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AI-2 (Continued)

DATA COLLECTED FOR LASMA IN 2001 AMMONIA STUDY
SEPTEMBER 17 THROUGH OCTOBER 15, 2001

	LAMSA East Site				LAMSA West Site		
Date & Time	Flow (gpm)	NH_3-N (mg/L)	TKN (mg/L)	Date & Time	Flow (gpm)	NH_3-N (mg/L)	TKN (mg/L)
10/5/01 9:00	0.00	17.27	28.79	10/5/01 9:00	1270.54	132.58	298.66
10/5/01 11:00	0.00	112.46	131.50	10/5/01 11:00	642.52	188.89	355.03
10/5/01 13:00	2681.07	104.24	122.15	10/5/01 13:00	224.98	138.32	442.50
10/5/01 15:00	1661.54	107.75	132.52	10/5/01 15:00	98.98	109.78	195.83
10/5/01 17:00	1337.94	102.23	118.43	10/5/01 17:00	91.05	97.65	210.43
10/5/01 19:00	1296.23	76.08	85.42	10/5/01 19:00	81.03	98.17	212.49
10/5/01 21:00	1094.67	54.73	66.55	10/5/01 21:00	64.89	78.99	171.31
10/5/01 23:00	1038.90	69.52	82.67	10/5/01 23:00	56.84	64.28	152.00
10/6/01 1:00	871.79	82.30	92.65	10/6/01 1:00	50.46	55.15	125.80
10/6/01 3:00	34.66	81.99	94.52	10/6/01 3:00	46.00	49.65	104.27
10/6/01 5:00	0.00	82.42	93.43	10/6/01 5:00	42.22	40.45	75.32
10/6/01 7:00	0.00	73.24	80.79	10/6/01 7:00	38.92	33.76	59.46
10/6/01 9:00	0.00	87.78	124.03	10/6/01 9:00	38.72	32.04	51.17
10/6/01 11:00	0.00	150.34	200.26	10/6/01 11:00	33.36	26.98	45.40
10/6/01 13:00	0.00	355.20	417.69	10/6/01 13:00	32.26	24.84	35.97
10/6/01 15:00	0.00	368.69	451.86	10/6/01 15:00	31.05	18.36	25.03
10/6/01 17:00	0.00	342.22	405.75	10/6/01 17:00	27.70	11.46	14.84
10/6/01 19:00	0.00	329.52	381.63	10/6/01 19:00	27.45	9.34	12.26
10/6/01 21:00	0.00	315.86	363.64	10/6/01 21:00	27.67	9.18	12.51
10/6/01 23:00	0.00	310.85	362.55	10/6/01 23:00	27.36	8.98	12.58
10/7/01 1:00	0.00	318.85	374.83	10/7/01 1:00	25.98	9.40	13.49
10/7/01 3:00	0.00	330.94	380.30	10/7/01 3:00	24.67	10.88	15.52
10/7/01 5:00	0.00	331.57	372.55	10/7/01 5:00	23.58	10.96	16.00
10/7/01 7:00	0.00	332.75	373.74	10/7/01 7:00	24.03	10.97	16.38
10/7/01 9:00	0.00	329.90	382.40	10/7/01 9:00	22.56	10.58	15.82
10/7/01 11:00	0.00	379.31	466.15	10/7/01 11:00	22.14	11.07	16.08
10/7/01 13:00	0.00	367.15	457.32	10/7/01 13:00	22.00	9.40	13.01
10/7/01 15:00	0.00	364.17	443.58	10/7/01 15:00	21.13	10.31	13.67
10/7/01 17:00	0.00	361.93	430.31	10/7/01 17:00	21.20	9.52	12.88
10/7/01 19:00	0.00	359.27	433.60	10/7/01 19:00	20.75	8.36	11.31
10/7/01 21:00	0.00	361.45	418.97	10/7/01 21:00	18.99	7.89	10.10
10/7/01 23:00	0.00	362.11	428.54	10/7/01 23:00	18.77	6.59	9.18

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AI-2 (Continued)

DATA COLLECTED FOR LASMA IN 2001 AMMONIA STUDY
SEPTEMBER 17 THROUGH OCTOBER 15, 2001

	LAMSA East Site				LAMSA West Site		
Date & Time	Flow (gpm)	NH_3-N (mg/L)	TKN (mg/L)	Date & Time	Flow (gpm)	NH_3-N (mg/L)	TKN (mg/L)
10/8/01 1:00	0.00	360.79	440.67	10/8/01 1:00	17.83	5.61	8.01
10/8/01 3:00	0.00	361.64	439.65	10/8/01 3:00	18.52	5.63	7.68
10/8/01 5:00	0.00	350.57	423.97	10/8/01 5:00	18.22	5.41	7.61
10/8/01 7:00	0.00	339.73	398.31	10/8/01 7:00	17.91	6.93	9.68
10/8/01 9:00	0.00	333.37	396.14	10/8/01 9:00	18.06	7.46	9.49
10/8/01 11:00	0.00	330.30	373.37	10/8/01 11:00	17.51	6.75	9.89
10/8/01 13:00	783.67	330.70	377.72	10/8/01 13:00	21.26	6.47	9.29
10/8/01 15:00	203.57	324.46	355.64	10/8/01 15:00	18.08	8.19	10.60
10/8/01 17:00	174.34	319.98	349.68	10/8/01 17:00	18.26	7.23	9.54
10/8/01 19:00	30.47	297.31	334.09	10/8/01 19:00	19.11	7.20	9.52
10/8/01 21:00	108.99	229.66	251.54	10/8/01 21:00	19.46	7.84	10.63
10/8/01 23:00	14.48	305.95	352.48	10/8/01 23:00	17.37	7.07	9.31
10/9/01 1:00	38.09	299.30	335.82	10/9/01 1:00	17.38	6.61	8.89
10/9/01 3:00	5.82	293.57	328.82	10/9/01 3:00	17.84	6.27	8.43
10/9/01 5:00	0.00	282.31	312.78	10/9/01 5:00	17.97	6.28	8.11
10/9/01 7:00	0.00	273.24	310.15	10/9/01 7:00	15.28	6.44	8.36
10/9/01 9:00	0.00	281.76	312.81	10/9/01 9:00	14.67	6.47	8.50
10/9/01 11:00	0.00	272.22	306.80	10/9/01 11:00	14.53	9.47	12.69
10/9/01 13:00	0.00	272.04	307.97	10/9/01 13:00	17.87	6.15	8.54
10/9/01 15:00	0.00	274.51	306.36	10/9/01 15:00	16.05	5.92	8.02
10/9/01 17:00	0.00	266.39	290.89	10/9/01 17:00	16.44	6.48	8.79
10/9/01 19:00	0.00	252.12	275.53	10/9/01 19:00	15.66	6.32	8.59
10/9/01 21:00	0.00	184.19	200.48	10/9/01 21:00	16.31	6.38	8.22
10/9/01 23:00	0.00	242.89	270.86	10/9/01 23:00	17.29	7.71	7.96
10/10/01 1:00	7.04	247.33	274.12	10/10/01 1:00	16.69	5.64	7.82
10/10/01 3:00	0.00	236.52	265.77	10/10/01 3:00	18.58	5.10	6.96
10/10/01 5:00	0.00	230.88	258.97	10/10/01 5:00	18.57	5.04	6.85
10/10/01 7:00	0.00	219.17	248.73	10/10/01 7:00	17.79	5.08	6.88
10/10/01 9:00	0.00	211.57	244.09	10/10/01 9:00	14.01	5.17	7.25
10/10/01 11:00	0.00	203.49	228.63	10/10/01 11:00	15.33	5.18	8.32
10/10/01 13:00	63.57	107.09	137.76	10/10/01 13:00	38.14	6.53	10.41
10/10/01 15:00	11.39	113.85	130.70	10/10/01 15:00	42.74	55.41	126.74

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AI-2 (Continued)

DATA COLLECTED FOR LASMA IN 2001 AMMONIA STUDY
SEPTEMBER 17 THROUGH OCTOBER 15, 2001

	LAMSA East Site				LAMSA West Site		
Date & Time	Flow (gpm)	NH_3-N (mg/L)	TKN (mg/L)	Date & Time	Flow (gpm)	NH_3-N (mg/L)	TKN (mg/L)
10/10/01 17:00	-24.14	180.51	206.18	10/10/01 17:00	24.42	85.27	122.08
10/10/01 19:00	7.64	195.66	216.58	10/10/01 19:00	21.20	111.02	164.32
10/10/01 21:00	177.09	110.90	127.28	10/10/01 21:00	176.08	91.21	261.13
10/10/01 23:00	68.25	101.87	120.92	10/10/01 23:00	131.47	120.85	298.37
10/11/01 1:00	-8.19	144.52	165.95	10/11/01 1:00	45.80	123.55	220.17
10/11/01 3:00	0.00	167.51	188.44	10/11/01 3:00	26.42	110.32	156.34
10/11/01 5:00	0.00	157.59	175.65	10/11/01 5:00	22.16	97.00	127.96
10/11/01 7:00	0.00	138.53	153.76	10/11/01 7:00	18.93	85.30	113.05
10/11/01 9:00	0.00	161.03	176.48	10/11/01 9:00	17.66	79.40	104.05
10/11/01 11:00	0.00	128.53	141.74	10/11/01 11:00	17.81	62.44	91.03
10/11/01 13:00	0.00	130.52	143.76	10/11/01 13:00	18.23	60.66	88.77
10/11/01 15:00	0.00	131.02	142.31	10/11/01 15:00	17.38	56.14	82.53
10/11/01 17:00	5.95	128.71	144.42	10/11/01 17:00	15.24	51.61	76.51
10/11/01 19:00	0.00	137.35	151.31	10/11/01 19:00	20.18	51.49	75.52
10/11/01 21:00	2.82	168.21	189.57	10/11/01 21:00	28.43	48.42	72.40
10/11/01 23:00	53.44	184.12	201.38	10/11/01 23:00	18.51	47.20	68.85
10/12/01 1:00	1300.15	89.22	106.82	10/12/01 1:00	1163.06	84.85	183.84
10/12/01 3:00	1754.00	31.15	59.72	10/12/01 3:00	2142.21	80.52	163.78
10/12/01 5:00	101.58	34.95	54.15	10/12/01 5:00	2715.47	92.06	146.62
10/12/01 7:00	0.00	61.18	155.25	10/12/01 7:00	2282.70	105.38	144.89
10/12/01 9:00	0.00	76.27	306.01	10/12/01 9:00	1473.43	107.41	136.35
10/12/01 11:00	0.00	104.16	152.87	10/12/01 11:00	890.75	91.80	121.69
10/12/01 13:00	1895.49	266.69	310.76	10/12/01 13:00	361.70	91.42	120.63
10/12/01 15:00	1971.22	297.42	329.79	10/12/01 15:00	226.81	92.03	118.86
10/12/01 17:00	1906.69	301.31	326.66	10/12/01 17:00	186.47	96.06	119.99
10/12/01 19:00	1784.77	303.72	337.01	10/12/01 19:00	179.02	96.49	120.56
10/12/01 21:00	1327.20	273.49	324.81	10/12/01 21:00	155.57	94.35	125.32
10/12/01 23:00	1141.31	267.26	315.67	10/12/01 23:00	149.06	82.56	126.32
10/13/01 1:00	1113.34	278.23	318.20	10/13/01 1:00	126.27	104.43	134.46
10/13/01 3:00	1055.71	275.10	315.90	10/13/01 3:00	104.94	102.05	136.26
10/13/01 5:00	1002.03	276.02	310.37	10/13/01 5:00	96.69	98.62	131.47

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AI-2 (Continued)

DATA COLLECTED FOR LASMA IN 2001 AMMONIA STUDY
SEPTEMBER 17 THROUGH OCTOBER 15, 2001

	LAMSA East Site				LAMSA West Site		
Date & Time	Flow (gpm)	NH_3-N (mg/L)	TKN (mg/L)	Date & Time	Flow (gpm)	NH_3-N (mg/L)	TKN (mg/L)
10/13/01 7:00	992.69	276.28	315.74	10/13/01 7:00	88.70	91.99	121.97
10/13/01 9:00	898.42	276.12	321.38	10/13/01 9:00	431.99	92.94	121.92
10/13/01 11:00	1380.79	191.90	223.69	10/13/01 11:00	752.77	83.74	136.87
10/13/01 13:00	267.73	186.08	212.44	10/13/01 13:00	4200.74	75.01	148.39
10/13/01 15:00	0.00	193.84	221.41	10/13/01 15:00	5588.71	84.85	131.14
10/13/01 17:00	0.00	218.12	243.28	10/13/01 17:00	5383.90	80.21	118.78
10/13/01 19:00	0.00	195.42	229.61	10/13/01 19:00	6013.25	74.17	111.82
10/13/01 21:00	0.00	187.81	211.41	10/13/01 21:00	5717.14	88.54	143.81
10/13/01 23:00	0.00	248.72	288.34	10/13/01 23:00	4740.57	83.24	161.35
10/14/01 1:00	0.00	146.38	182.95	10/14/01 1:00	3525.93	85.33	126.60
10/14/01 3:00	0.00	50.85	72.42	10/14/01 3:00	3312.37	91.21	115.77
10/14/01 5:00	0.00	61.87	87.88	10/14/01 5:00	1735.41	91.37	112.08
10/14/01 7:00	0.00	65.85	94.46	10/14/01 7:00	470.90	91.22	120.29
10/14/01 9:00	0.00	112.14	141.27	10/14/01 9:00	306.63	85.53	119.62
10/14/01 11:00	0.00	230.47	256.71	10/14/01 11:00	152.71	87.70	127.38
10/14/01 13:00	0.00	224.77	255.43	10/14/01 13:00	15.08	72.87	110.96
10/14/01 15:00	0.00	214.55	298.11	10/14/01 15:00	318.33	88.69	340.64
10/14/01 17:00	0.00	201.88	286.91	10/14/01 17:00	22.12	109.40	869.59
10/14/01 19:00	0.00	200.88	238.71	10/14/01 19:00	0.00	106.80	836.99
10/14/01 21:00	0.00	203.31	234.47	10/14/01 21:00	306.37	92.70	553.08
10/14/01 23:00	0.00	184.53	213.29	10/14/01 23:00	311.23	61.28	92.87
10/15/01 1:00	0.00	166.25	181.78	10/15/01 1:00	316.28	57.88	85.92
10/15/01 3:00	0.00	152.83	170.33	10/15/01 3:00	302.12	53.92	83.90
10/15/01 5:00	0.00	132.45	153.31	10/15/01 5:00	423.87	53.26	79.83
10/15/01 7:00	0.00	118.09	132.95	10/15/01 7:00	1124.47	100.73	171.43
10/15/01 9:00	0.00	117.34	144.03	10/15/01 9:00	365.72	69.73	97.18

Note: NS = not sampled. MS = missing sample

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AI-3

DATA COLLECTED FOR SW-12 IN 2001 AMMONIA STUDY
SEPTEMBER 17 THROUGH OCTOBER 15, 2001

Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)	Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)
9/17/01 0:00	21.460	NS	NS	9/20/01 0:00	20.95	7.74	14.84
9/17/01 2:00	18.752	NS	NS	9/20/01 2:00	17.72	6.83	21.52
9/17/01 4:00	17.752	NS	NS	9/20/01 4:00	9.38	6.93	22.06
9/17/01 6:00	17.971	NS	NS	9/20/01 6:00	17.29	6.92	20.82
9/17/01 8:00	22.210	NS	NS	9/20/01 8:00	18.95	9.64	28.40
9/17/01 10:00	22.177	16.8	40.04	9/20/01 10:00	10.34	14.17	27.55
9/17/01 12:00	22.366	16.18	39.66	9/20/01 12:00	1.43	6.69	26.03
9/17/01 14:00	23.270	15.02	33.33	9/20/01 14:00	1.83	9.27	22.56
9/17/01 16:00	23.292	12.45	27.27	9/20/01 16:00	0.14	8.58	25.72
9/17/01 18:00	22.630	12.16	29.84	9/20/01 18:00	0.21	7.99	27.33
9/17/01 20:00	22.998	11.84	33.01	9/20/01 20:00	0.51	6.54	15.53
9/17/01 22:00	22.632	11.66	34.72	9/20/01 22:00	0.13	9.53	16.84
9/18/01 0:00	24.32	11.30	33.33	9/21/01 0:00	0.08	9.56	16.15
9/18/01 2:00	20.59	11.38	40.45	9/21/01 2:00	0.00	8.57	15.35
9/18/01 4:00	16.40	13.51	31.41	9/21/01 4:00	0.00	8.07	15.74
9/18/01 6:00	17.11	57.65	99.49	9/21/01 6:00	0.00	10.14	20.23
9/18/01 8:00	21.40	39.01	81.80	9/21/01 8:00	0.30	14.41	27.89
9/18/01 10:00	21.67	14.39	30.27	9/21/01 10:00	0.00	11.33	20.04
9/18/01 12:00	22.63	13.75	30.20	9/21/01 12:00	0.00	9.13	29.63
9/18/01 14:00	21.67	12.05	28.03	9/21/01 14:00	0.00	7.35	33.52
9/18/01 16:00	21.72	11.30	24.82	9/21/01 16:00	0.00	7.00	23.83
9/18/01 18:00	21.63	12.92	29.23	9/21/01 18:00	0.00	7.48	21.85
9/18/01 20:00	18.91	10.91	26.48	9/21/01 20:00	0.00	7.46	23.23
9/18/01 22:00	24.86	11.78	25.32	9/21/01 22:00	0.00	6.70	21.64
9/19/01 0:00	15.47	5.77	12.06	9/22/01 0:00	0.00	6.66	28.42
9/19/01 2:00	16.47	5.56	11.80	9/22/01 2:00	0.00	7.44	28.06
9/19/01 4:00	26.64	7.41	15.54	9/22/01 4:00	0.00	5.37	20.75
9/19/01 6:00	32.16	13.99	28.42	9/22/01 6:00	0.00	4.95	15.42
9/19/01 8:00	35.08	16.38	31.37	9/22/01 8:00	0.00	4.76	17.60
9/19/01 10:00	34.56	14.21	30.83	9/22/01 10:00	0.00	10.20	22.28
9/19/01 12:00	36.70	14.31	38.80	9/22/01 12:00	0.00	9.79	26.56
9/19/01 14:00	30.73	13.07	42.12	9/22/01 14:00	0.00	8.40	17.95
9/19/01 16:00	24.54	8.69	23.78	9/22/01 16:00	0.00	7.16	18.80

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AI-3 (Continued)

DATA COLLECTED FOR SW-12 IN 2001 AMMONIA STUDY
SEPTEMBER 17 THROUGH OCTOBER 15, 2001

Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)	Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)
9/19/01 18:00	23.87	7.97	18.91	9/22/01 18:00	0.00	6.67	16.25
9/19/01 20:00	22.49	7.88	15.40	9/22/01 20:00	0.00	6.84	17.95
9/19/01 22:00	21.75	8.09	24.09	9/22/01 22:00	0.00	6.78	15.44
9/23/01 0:00	0.00	6.75	15.90	9/26/01 0:00	14.38	9.66	32.45
9/23/01 2:00	0.00	7.54	15.69	9/26/01 2:00	12.08	9.55	24.46
9/23/01 4:00	0.00	6.17	11.64	9/26/01 4:00	11.40	6.28	21.38
9/23/01 6:00	0.00	5.22	12.72	9/26/01 6:00	11.48	9.00	29.39
9/23/01 8:00	0.00	5.43	18.88	9/26/01 8:00	14.59	11.14	31.08
9/23/01 10:00	0.00	10.30	16.28	9/26/01 10:00	15.16	10.62	34.59
9/23/01 12:00	0.00	10.10	30.31	9/26/01 12:00	14.96	9.94	25.90
9/23/01 14:00	0.00	10.66	27.90	9/26/01 14:00	15.47	12.09	30.16
9/23/01 16:00	0.00	7.43	16.42	9/26/01 16:00	15.20	18.83	39.72
9/23/01 18:00	0.00	9.79	19.97	9/26/01 18:00	15.43	36.91	67.31
9/23/01 20:00	0.00	7.04	13.47	9/26/01 20:00	14.50	27.42	55.92
9/23/01 22:00	0.00	6.43	10.47	9/26/01 22:00	14.52	23.56	47.63
9/24/01 0:00	0.00	7.95	13.66	9/27/01 0:00	13.17	22.49	48.77
9/24/01 2:00	0.00	6.97	12.07	9/27/01 2:00	10.76	19.33	42.53
9/24/01 4:00	0.00	6.31	11.08	9/27/01 4:00	9.91	20.42	43.16
9/24/01 6:00	0.00	4.78	9.32	9/27/01 6:00	9.63	18.34	41.54
9/24/01 8:00	0.00	5.86	12.64	9/27/01 8:00	12.46	11.46	33.49
9/24/01 10:00	0.21	6.89	14.45	9/27/01 10:00	13.36	14.98	39.05
9/24/01 12:00	0.00	7.55	22.59	9/27/01 12:00	14.04	14.47	37.11
9/24/01 14:00	0.00	6.97	24.73	9/27/01 14:00	13.27	11.61	47.76
9/24/01 16:00	0.00	4.79	17.93	9/27/01 16:00	13.12	10.16	26.20
9/24/01 18:00	0.00	4.40	15.17	9/27/01 18:00	12.98	8.49	30.10
9/24/01 20:00	0.00	4.70	14.70	9/27/01 20:00	13.03	8.55	31.35
9/24/01 22:00	0.00	4.10	14.32	9/27/01 22:00	12.14	9.21	29.45
9/25/01 0:00	0.00	3.90	14.22	9/28/01 0:00	11.34	16.75	42.91
9/25/01 2:00	0.00	4.29	14.25	9/28/01 2:00	9.64	18.38	47.10
9/25/01 4:00	0.00	4.88	16.93	9/28/01 4:00	1.63	41.98	79.58
9/25/01 6:00	0.00	8.34	21.57	9/28/01 6:00	0.00	30.03	59.03
9/25/01 8:00	0.48	8.50	18.00	9/28/01 8:00	3.38	17.31	45.88

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AI-3 (Continued)

DATA COLLECTED FOR SW-12 IN 2001 AMMONIA STUDY
SEPTEMBER 17 THROUGH OCTOBER 15, 2001

Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)	Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)
9/25/01 10:00	18.41	10.78	24.29	9/28/01 10:00	7.27	17.93	38.50
9/25/01 12:00	18.76	9.55	29.25	9/28/01 12:00	8.59	16.00	34.26
9/25/01 14:00	16.78	7.80	21.95	9/28/01 14:00	2.25	14.60	34.31
9/25/01 16:00	15.87	7.91	22.49	9/28/01 16:00	14.43	12.54	29.70
9/25/01 18:00	16.48	6.19	19.99	9/28/01 18:00	13.38	13.41	30.00
9/25/01 20:00	16.19	8.22	23.03	9/28/01 20:00	13.52	12.73	31.41
9/25/01 22:00	15.09	8.66	27.74	9/28/01 22:00	12.22	14.04	36.62
9/29/01 0:00	11.44	14.90	31.41	10/2/01 0:00	0.00	MS	MS
9/29/01 2:00	9.73	10.89	27.23	10/2/01 2:00	0.00	MS	MS
9/29/01 4:00	8.74	10.26	25.53	10/2/01 4:00	0.00	MS	MS
9/29/01 6:00	8.00	11.79	24.94	10/2/01 6:00	0.00	MS	MS
9/29/01 8:00	9.58	19.23	35.91	10/2/01 8:00	0.00	MS	MS
9/29/01 10:00	11.31	8.19	29.93	10/2/01 10:00	0.18	9.36	21.45
9/29/01 12:00	12.55	7.67	31.25	10/2/01 12:00	0.96	8.89	21.50
9/29/01 14:00	13.10	10.80	27.85	10/2/01 14:00	2.99	9.14	23.11
9/29/01 16:00	12.10	10.71	26.40	10/2/01 16:00	13.80	7.71	20.02
9/29/01 18:00	11.23	10.41	23.78	10/2/01 18:00	13.26	5.49	15.52
9/29/01 20:00	11.54	9.48	24.97	10/2/01 20:00	13.34	8.69	22.23
9/29/01 22:00	11.09	9.96	24.16	10/2/01 22:00	12.95	17.36	38.10
9/30/01 0:00	9.62	8.34	23.24	10/3/01 0:00	11.40	14.21	29.07
9/30/01 2:00	4.79	7.27	21.29	10/3/01 2:00	9.80	16.64	32.00
9/30/01 4:00	0.72	6.28	20.69	10/3/01 4:00	8.62	11.45	24.79
9/30/01 6:00	0.60	11.91	28.41	10/3/01 6:00	8.99	9.53	22.08
9/30/01 8:00	0.44	16.26	38.46	10/3/01 8:00	11.18	8.02	20.70
9/30/01 10:00	1.26	15.02	40.52	10/3/01 10:00	12.53	14.20	31.76
9/30/01 12:00	11.33	15.60	38.37	10/3/01 12:00	12.10	14.12	36.38
9/30/01 14:00	12.35	16.28	39.77	10/3/01 14:00	11.44	14.11	32.20
9/30/01 16:00	7.30	18.74	43.24	10/3/01 16:00	11.39	13.95	32.16
9/30/01 18:00	2.43	24.51	32.13	10/3/01 18:00	11.34	11.93	30.54
9/30/01 20:00	0.19	12.68	45.62	10/3/01 20:00	11.14	10.36	25.67
9/30/01 22:00	0.00	12.79	54.29	10/3/01 22:00	11.15	8.31	23.09
10/1/01 0:00	0.52	12.53	38.48	10/4/01 0:00	9.56	8.25	23.23

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AI-3 (Continued)

DATA COLLECTED FOR SW-12 IN 2001 AMMONIA STUDY
SEPTEMBER 17 THROUGH OCTOBER 15, 2001

Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)	Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)
10/1/01 2:00	0.07	13.18	38.26	10/4/01 2:00	8.52	11.62	32.16
10/1/01 4:00	0.00	13.33	36.04	10/4/01 4:00	4.04	11.66	31.31
10/1/01 6:00	0.00	8.36	33.10	10/4/01 6:00	2.86	6.74	20.19
10/1/01 8:00	0.00	9.33	33.13	10/4/01 8:00	10.63	12.32	32.01
10/1/01 10:00	0.00	11.91	25.32	10/4/01 10:00	11.47	13.01	44.35
10/1/01 12:00	1.39	MS	MS	10/4/01 12:00	11.01	10.98	31.29
10/1/01 14:00	2.80	MS	MS	10/4/01 14:00	11.04	10.58	48.24
10/1/01 16:00	0.00	MS	MS	10/4/01 16:00	13.77	8.36	75.63
10/1/01 18:00	0.00	MS	MS	10/4/01 18:00	23.16	11.92	51.79
10/1/01 20:00	0.00	MS	MS	10/4/01 20:00	18.06	14.10	35.24
10/1/01 22:00	0.00	MS	MS	10/4/01 22:00	18.42	7.89	24.26
10/5/01 0:00	13.88	4.85	16.31	10/8/01 0:00	12.53	11.39	24.31
10/5/01 2:00	17.89	4.57	15.01	10/8/01 2:00	11.19	10.99	26.19
10/5/01 4:00	20.46	4.75	18.73	10/8/01 4:00	10.45	9.99	23.04
10/5/01 6:00	7.87	6.07	21.22	10/8/01 6:00	10.40	10.56	24.58
10/5/01 8:00	8.11	10.50	30.03	10/8/01 8:00	12.34	12.55	40.61
10/5/01 10:00	8.18	10.91	25.73	10/8/01 10:00	14.85	13.46	31.04
10/5/01 12:00	9.24	11.74	27.77	10/8/01 12:00	16.04	11.24	31.10
10/5/01 14:00	28.31	14.75	48.89	10/8/01 14:00	16.07	8.91	25.32
10/5/01 16:00	30.70	9.11	26.97	10/8/01 16:00	14.85	7.25	22.25
10/5/01 18:00	29.25	7.72	17.89	10/8/01 18:00	16.09	6.03	24.58
10/5/01 20:00	27.79	7.09	19.05	10/8/01 20:00	17.43	5.75	17.53
10/5/01 22:00	26.21	7.20	19.53	10/8/01 22:00	16.06	5.04	17.65
10/6/01 0:00	23.72	6.26	19.09	10/9/01 0:00	14.78	4.83	18.72
10/6/01 2:00	20.37	6.66	20.32	10/9/01 2:00	12.55	3.49	15.83
10/6/01 4:00	19.10	6.98	19.74	10/9/01 4:00	10.87	3.61	15.77
10/6/01 6:00	17.98	7.04	20.59	10/9/01 6:00	11.64	3.62	16.48
10/6/01 8:00	19.19	5.80	21.14	10/9/01 8:00	14.04	8.15	33.44
10/6/01 10:00	21.32	8.41	22.74	10/9/01 10:00	14.98	8.14	27.56
10/6/01 12:00	22.61	13.11	28.88	10/9/01 12:00	14.84	5.76	19.78
10/6/01 14:00	20.70	18.41	33.51	10/9/01 14:00	13.93	4.76	23.45
10/6/01 16:00	19.89	16.31	38.62	10/9/01 16:00	13.77	5.10	21.88
10/6/01 18:00	19.20	14.05	28.26	10/9/01 18:00	13.33	5.13	19.94

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AI-3 (Continued)

DATA COLLECTED FOR SW-12 IN 2001 AMMONIA STUDY
SEPTEMBER 17 THROUGH OCTOBER 15, 2001

Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)	Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)
10/6/01 20:00	18.17	12.22	24.83	10/9/01 20:00	13.80	4.76	22.77
10/6/01 22:00	16.67	11.78	23.00	10/9/01 22:00	13.41	7.25	24.37
10/7/01 0:00	15.89	11.68	22.28	10/10/01 0:00	12.60	7.38	21.09
10/7/01 2:00	13.26	10.90	22.30	10/10/01 2:00	10.31	5.99	27.46
10/7/01 4:00	12.77	10.56	23.65	10/10/01 4:00	9.39	5.30	24.38
10/7/01 6:00	11.94	10.60	22.05	10/10/01 6:00	10.18	6.83	24.74
10/7/01 8:00	13.24	8.45	18.40	10/10/01 8:00	12.84	8.27	38.56
10/7/01 10:00	15.32	17.12	32.53	10/10/01 10:00	14.24	11.58	27.61
10/7/01 12:00	17.36	17.76	34.30	10/10/01 12:00	13.74	11.44	23.90
10/7/01 14:00	16.55	16.59	30.11	10/10/01 14:00	14.98	10.19	26.25
10/7/01 16:00	15.55	15.13	28.65	10/10/01 16:00	14.41	9.51	24.75
10/7/01 18:00	14.28	14.22	26.67	10/10/01 18:00	14.57	8.08	26.93
10/7/01 20:00	14.97	13.76	25.86	10/10/01 20:00	13.99	8.73	24.08
10/7/01 22:00	14.11	12.36	25.38	10/10/01 22:00	15.60	8.43	25.69
10/11/01 0:00	16.17	8.11	28.16	10/13/01 0:00	22.49	13.05	22.54
10/11/01 2:00	13.89	6.48	23.82	10/13/01 2:00	19.60	12.56	23.90
10/11/01 4:00	10.78	4.95	23.61	10/13/01 4:00	18.16	11.36	18.01
10/11/01 6:00	11.36	4.33	20.81	10/13/01 6:00	16.78	11.55	17.38
10/11/01 8:00	13.61	5.78	19.26	10/13/01 8:00	18.19	11.18	15.82
10/11/01 10:00	14.67	7.51	31.06	10/13/01 10:00	20.96	9.98	18.56
10/11/01 12:00	14.71	7.15	17.23	10/13/01 12:00	28.80	9.03	16.44
10/11/01 14:00	14.08	8.60	21.68	10/13/01 14:00	12.87	9.63	44.63
10/11/01 16:00	13.29	8.89	22.84	10/13/01 16:00	19.40	5.29	20.86
10/11/01 18:00	13.02	7.79	28.51	10/13/01 18:00	13.19	2.99	25.77
10/11/01 20:00	13.05	8.77	38.20	10/13/01 20:00	24.68	3.65	18.61
10/11/01 22:00	12.35	9.14	29.41	10/13/01 22:00	23.35	7.20	19.53
10/12/01 0:00	13.03	7.07	18.58	10/14/01 0:00	23.27	7.34	15.54
10/12/01 2:00	25.85	8.35	17.68	10/14/01 2:00	27.38	8.58	15.61
10/12/01 4:00	30.33	8.99	29.53	10/14/01 4:00	29.07	9.52	15.97
10/12/01 6:00	24.17	7.92	20.71	10/14/01 6:00	29.65	9.99	19.65
10/12/01 8:00	33.13	7.33	32.33	10/14/01 8:00	30.82	9.71	15.98
10/12/01 10:00	33.23	8.52	16.63	10/14/01 10:00	32.39	10.54	20.47

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AI-3 (Continued)

DATA COLLECTED FOR SW-12 IN 2001 AMMONIA STUDY
SEPTEMBER 17 THROUGH OCTOBER 15, 2001

Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)	Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)
10/12/01 12:00	31.42	7.36	17.47	10/14/01 12:00	32.46	11.19	18.34
10/12/01 14:00	31.55	11.84	24.91	10/14/01 14:00	31.29	9.87	17.76
10/12/01 16:00	29.19	14.62	21.04	10/14/01 16:00	32.29	8.74	13.92
10/12/01 18:00	29.04	15.95	23.63	10/14/01 18:00	33.03	9.59	15.41
10/12/01 20:00	27.50	16.08	25.47	10/14/01 20:00	33.52	10.41	16.65
10/12/01 22:00	24.57	15.33	25.12	10/14/01 22:00	34.87	10.53	18.38
				10/15/01 0:00	35.63	10.13	20.50
				10/15/01 2:00	36.07	10.50	18.13
				10/15/01 4:00	36.37	10.00	17.53
				10/15/01 6:00	34.70	9.80	15.27
				10/15/01 8:00	34.21	11.18	17.77

Note: NS = not sampled. MS = missing sample

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AI-4

DATA COLLECTED FOR POST-DC IN 2001 AMMONIA STUDY
SEPTEMBER 17 THROUGH OCTOBER 15, 2001

Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)	Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)
9/17/01 1:00	3.02	NS	NS	9/20/01 1:00	3.01	619.49	674.58
9/17/01 3:00	3.45	NS	NS	9/20/01 3:00	2.99	647.06	676.61
9/17/01 5:00	3.42	NS	NS	9/20/01 5:00	3.00	654.24	690.17
9/17/01 7:00	3.14	NS	NS	9/20/01 7:00	2.77	655.18	667.04
9/17/01 9:00	3.11	NS	NS	9/20/01 9:00	2.77	642.53	730.45
9/17/01 11:00	3.05	704.91	742.77	9/20/01 11:00	2.75	644.22	668.56
9/17/01 13:00	2.89	686.93	709.27	9/20/01 13:00	2.72	636.58	697.73
9/17/01 15:00	2.87	688.43	703.16	9/20/01 15:00	2.60	634.93	642.63
9/17/01 17:00	2.96	698.29	733.17	9/20/01 17:00	2.58	642.50	650.93
9/17/01 19:00	2.95	692.03	759.6	9/20/01 19:00	2.59	639.47	664.61
9/17/01 21:00	2.96	704.69	731.04	9/20/01 21:00	2.59	656.02	746.44
9/17/01 23:00	2.73	670.89	719.26	9/20/01 23:00	2.59	642.83	659.39
9/18/01 1:00	2.39	682.13	727.27	9/21/01 1:00	3.03	648.77	660.51
9/18/01 3:00	2.14	679.73	704.49	9/21/01 3:00	3.04	597.05	766.02
9/18/01 5:00	2.13	661.01	729.71	9/21/01 5:00	3.01	364.05	629.47
9/18/01 7:00	2.16	692.97	771.59	9/21/01 7:00	2.89	615.40	697.91
9/18/01 9:00	2.13	709.45	776.12	9/21/01 9:00	2.95	605.89	783.55
9/18/01 11:00	2.12	669.71	690.50	9/21/01 11:00	2.09	319.99	347.02
9/18/01 13:00	2.12	678.83	752.11	9/21/01 13:00	2.32	633.90	690.44
9/18/01 15:00	1.90	641.86	687.00	9/21/01 15:00	2.79	640.67	898.85
9/18/01 17:00	1.90	671.78	689.00	9/21/01 17:00	2.83	633.65	895.03
9/18/01 19:00	1.89	680.55	694.50	9/21/01 19:00	2.82	638.32	860.18
9/18/01 21:00	1.88	688.74	735.59	9/21/01 21:00	2.78	631.07	714.21
9/18/01 23:00	1.88	663.75	678.50	9/21/01 23:00	2.81	647.34	735.79
9/19/01 1:00	2.10	663.18	690.00	9/22/01 1:00	2.67	636.59	639.74
9/19/01 3:00	2.13	638.13	710.00	9/22/01 3:00	2.66	655.76	682.53
9/19/01 5:00	2.14	663.08	749.50	9/22/01 5:00	2.69	658.31	686.96
9/19/01 7:00	2.18	664.07	678.00	9/22/01 7:00	2.72	644.47	689.62
9/19/01 9:00	2.18	657.47	693.00	9/22/01 9:00	2.13	654.10	871.35
9/19/01 11:00	2.21	639.96	722.84	9/22/01 11:00	2.11	536.82	659.05
9/19/01 13:00	2.35	658.07	784.67	9/22/01 13:00	1.75	394.70	448.15
9/19/01 15:00	2.36	653.82	713.86	9/22/01 15:00	1.74	134.29	161.68
9/19/01 17:00	2.31	652.84	678.24	9/22/01 17:00	0.76	157.21	212.12

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AI-4 (Continued)

DATA COLLECTED FOR POST-DC IN 2001 AMMONIA STUDY
SEPTEMBER 17 THROUGH OCTOBER 15, 2001

Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)	Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)
9/19/01 19:00	2.52	606.11	635.17	9/22/01 19:00	0.77	166.81	215.22
9/19/01 21:00	2.78	596.29	621.97	9/22/01 21:00	0.79	113.24	149.86
9/19/01 23:00	2.78	620.65	645.34	9/22/01 23:00	0.79	154.33	206.29
9/23/01 1:00	0.78	106.99	140.18	9/26/01 1:00	2.15	328.17	493.05
9/23/01 3:00	0.00	162.91	211.57	9/26/01 3:00	2.12	339.56	416.54
9/23/01 5:00	0.00	343.78	476.93	9/26/01 5:00	2.12	309.02	357.04
9/23/01 7:00	0.00	390.60	477.59	9/26/01 7:00	1.91	186.75	214.97
9/23/01 9:00	2.49	475.62	832.11	9/26/01 9:00	2.08	638.21	741.56
9/23/01 11:00	2.75	637.21	738.76	9/26/01 11:00	2.13	623.80	686.02
9/23/01 13:00	2.77	630.92	732.28	9/26/01 13:00	2.10	634.20	701.49
9/23/01 15:00	2.68	641.05	730.12	9/26/01 15:00	2.96	631.22	705.23
9/23/01 17:00	2.64	632.29	728.03	9/26/01 17:00	2.69	640.66	678.67
9/23/01 19:00	2.59	593.77	730.21	9/26/01 19:00	2.72	614.71	704.32
9/23/01 21:00	2.55	641.28	728.41	9/26/01 21:00	2.67	625.58	708.06
9/23/01 23:00	2.53	557.49	636.58	9/26/01 23:00	2.67	624.26	702.08
9/24/01 1:00	1.80	496.85	565.38	9/27/01 1:00	2.40	643.08	691.88
9/24/01 3:00	1.80	461.83	519.21	9/27/01 3:00	2.43	644.74	716.82
9/24/01 5:00	1.85	443.41	509.89	9/27/01 5:00	2.39	419.37	455.47
9/24/01 7:00	2.64	594.83	685.39	9/27/01 7:00	1.05	12.75	16.08
9/24/01 9:00	2.54	652.41	738.98	9/27/01 9:00	2.60	427.12	485.11
9/24/01 11:00	2.56	656.83	753.58	9/27/01 11:00	2.55	626.77	692.71
9/24/01 13:00	2.57	656.76	743.35	9/27/01 13:00	2.60	644.96	710.17
9/24/01 15:00	2.65	666.57	750.21	9/27/01 15:00	2.59	641.76	741.03
9/24/01 17:00	2.35	583.20	681.63	9/27/01 17:00	2.58	648.34	726.07
9/24/01 19:00	2.25	295.42	314.68	9/27/01 19:00	2.61	664.56	755.49
9/24/01 21:00	2.25	348.01	379.54	9/27/01 21:00	2.61	644.82	743.98
9/24/01 23:00	2.25	273.41	307.74	9/27/01 23:00	2.04	209.82	236.20
9/25/01 1:00	2.74	656.84	820.19	9/28/01 1:00	2.01	259.74	289.40
9/25/01 3:00	2.79	669.85	793.86	9/28/01 3:00	2.11	217.77	238.09
9/25/01 5:00	2.77	671.22	865.15	9/28/01 5:00	1.71	323.09	373.15
9/25/01 7:00	2.73	652.67	747.79	9/28/01 7:00	1.18	528.89	624.80
9/25/01 9:00	2.49	660.18	714.79	9/28/01 9:00	1.65	615.46	752.20

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AI-4 (Continued)

DATA COLLECTED FOR POST-DC IN 2001 AMMONIA STUDY
SEPTEMBER 17 THROUGH OCTOBER 15, 2001

Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)	Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)
9/25/01 11:00	2.44	439.96	575.76	9/28/01 11:00	1.76	657.51	968.35
9/25/01 13:00	2.14	451.79	522.20	9/28/01 13:00	1.79	662.69	819.28
9/25/01 15:00	2.26	374.26	436.81	9/28/01 15:00	2.52	397.61	466.73
9/25/01 17:00	2.26	469.44	546.26	9/28/01 17:00	2.19	555.30	645.48
9/25/01 19:00	2.29	405.99	467.56	9/28/01 19:00	2.40	654.66	685.13
9/25/01 21:00	2.11	487.23	616.44	9/28/01 21:00	2.46	696.30	707.89
9/25/01 23:00	2.31	598.76	727.21	9/28/01 23:00	2.42	677.22	696.34
9/29/01 1:00	2.37	556.77	570.21	10/2/01 1:00	2.71	656.83	831.14
9/29/01 3:00	2.00	410.80	436.54	10/2/01 3:00	2.67	670.80	770.48
9/29/01 5:00	2.03	369.41	389.21	10/2/01 5:00	2.66	676.89	803.38
9/29/01 7:00	1.98	338.03	486.95	10/2/01 7:00	2.82	680.19	843.67
9/29/01 9:00	1.48	465.78	627.87	10/2/01 9:00	2.84	620.05	742.27
9/29/01 11:00	1.50	317.81	393.78	10/2/01 11:00	2.83	643.40	737.90
9/29/01 13:00	1.51	287.76	346.48	10/2/01 13:00	2.83	642.75	721.70
9/29/01 15:00	1.72	274.50	326.40	10/2/01 15:00	3.09	645.88	702.95
9/29/01 17:00	1.64	518.11	619.90	10/2/01 17:00	3.00	650.81	700.51
9/29/01 19:00	0.83	100.59	127.33	10/2/01 19:00	2.70	656.06	747.01
9/29/01 21:00	0.00	15.99	21.00	10/2/01 21:00	2.69	657.19	767.05
9/29/01 23:00	0.00	MS	MS	10/2/01 23:00	2.63	665.75	809.42
9/30/01 1:00	0.00	MS	MS	10/3/01 1:00	2.54	657.68	934.37
9/30/01 3:00	0.00	MS	MS	10/3/01 3:00	2.53	655.46	814.09
9/30/01 5:00	0.00	MS	MS	10/3/01 5:00	2.54	690.46	996.50
9/30/01 7:00	0.00	MS	MS	10/3/01 7:00	2.40	647.23	976.86
9/30/01 9:00	2.97	MS	MS	10/3/01 9:00	2.61	661.22	913.09
9/30/01 11:00	3.10	642.00	762.77	10/3/01 11:00	2.63	634.63	810.55
9/30/01 13:00	3.14	663.04	748.98	10/3/01 13:00	2.62	644.45	740.31
9/30/01 15:00	3.02	645.22	699.88	10/3/01 15:00	2.65	580.92	678.98
9/30/01 17:00	2.69	651.99	722.28	10/3/01 17:00	2.76	630.48	784.70
9/30/01 19:00	2.75	662.47	742.57	10/3/01 19:00	2.68	639.10	831.86
9/30/01 21:00	2.75	657.89	720.08	10/3/01 21:00	2.68	651.99	817.92
9/30/01 23:00	2.74	666.35	728.69	10/3/01 23:00	2.68	643.47	820.69
10/1/01 1:00	2.15	658.69	729.12	10/4/01 1:00	2.79	638.44	784.90

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AI-4 (Continued)

DATA COLLECTED FOR POST-DC IN 2001 AMMONIA STUDY
SEPTEMBER 17 THROUGH OCTOBER 15, 2001

Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)	Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)
10/1/01 3:00	1.91	663.01	733.71	10/4/01 3:00	2.57	654.29	820.11
10/1/01 5:00	1.91	675.54	768.76	10/4/01 5:00	2.53	653.03	815.66
10/1/01 7:00	1.91	656.58	770.19	10/4/01 7:00	2.57	645.22	821.88
10/1/01 9:00	2.85	674.57	776.17	10/4/01 9:00	2.55	639.01	839.08
10/1/01 11:00	2.84	653.02	786.04	10/4/01 11:00	2.75	644.28	795.32
10/1/01 13:00	2.90	668.30	763.40	10/4/01 13:00	2.75	666.75	776.80
10/1/01 15:00	3.19	674.16	773.02	10/4/01 15:00	2.78	651.86	754.81
10/1/01 17:00	3.17	646.26	750.54	10/4/01 17:00	2.67	648.85	784.82
10/1/01 19:00	3.15	667.81	791.95	10/4/01 19:00	2.67	565.89	655.10
10/1/01 21:00	3.13	677.75	804.83	10/4/01 21:00	2.72	654.32	792.62
10/1/01 23:00	1.34	679.84	828.66	10/4/01 23:00	2.70	653.12	784.20
10/5/01 1:00	2.97	652.18	828.38	10/8/01 1:00	2.87	697.16	790.17
10/5/01 3:00	2.98	666.47	780.82	10/8/01 3:00	3.11	683.84	798.80
10/5/01 5:00	2.96	663.30	790.54	10/8/01 5:00	2.88	677.95	786.04
10/5/01 7:00	2.47	652.08	849.55	10/8/01 7:00	3.05	687.94	746.29
10/5/01 9:00	2.88	648.47	808.63	10/8/01 9:00	3.06	693.59	801.51
10/5/01 11:00	2.88	646.20	666.28	10/8/01 11:00	3.05	678.36	749.49
10/5/01 13:00	2.85	652.83	662.20	10/8/01 13:00	3.06	696.99	796.19
10/5/01 15:00	2.84	653.94	681.83	10/8/01 15:00	3.07	701.63	848.50
10/5/01 17:00	2.70	645.88	662.61	10/8/01 17:00	3.10	699.41	776.43
10/5/01 19:00	2.38	662.18	685.46	10/8/01 19:00	3.06	710.73	815.83
10/5/01 21:00	2.30	665.56	705.06	10/8/01 21:00	3.08	705.24	806.02
10/5/01 23:00	2.18	660.39	705.62	10/8/01 23:00	3.08	699.12	957.67
10/6/01 1:00	1.97	661.84	712.53	10/9/01 1:00	3.02	727.58	1049.73
10/6/01 3:00	1.97	663.07	713.00	10/9/01 3:00	3.00	716.04	988.53
10/6/01 5:00	1.95	671.28	707.05	10/9/01 5:00	2.76	629.22	919.06
10/6/01 7:00	1.58	551.80	829.13	10/9/01 7:00	1.52	300.59	422.74
10/6/01 9:00	0.00	430.27	614.51	10/9/01 9:00	2.93	594.33	729.04
10/6/01 11:00	2.47	311.70	355.36	10/9/01 11:00	3.02	686.93	830.42
10/6/01 13:00	1.66	129.82	169.35	10/9/01 13:00	3.03	692.18	959.97
10/6/01 15:00	1.91	13.90	16.92	10/9/01 15:00	3.03	695.26	816.18
10/6/01 17:00	0.00	42.21	86.46	10/9/01 17:00	2.09	472.46	590.89
10/6/01 19:00	0.00	53.39	99.14	10/9/01 19:00	2.05	462.70	564.59

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AI-4 (Continued)

DATA COLLECTED FOR POST-DC IN 2001 AMMONIA STUDY
SEPTEMBER 17 THROUGH OCTOBER 15, 2001

Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)	Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)
10/6/01 21:00	0.00	39.46	51.40	10/9/01 21:00	2.00	538.10	647.29
10/6/01 23:00	0.00	37.47	50.01	10/9/01 23:00	1.80	617.18	731.97
10/7/01 1:00	0.00	211.90	247.03	10/10/01 1:00	1.58	684.98	781.93
10/7/01 3:00	0.00	303.92	325.45	10/10/01 3:00	1.47	422.45	491.55
10/7/01 5:00	0.00	446.14	489.20	10/10/01 5:00	1.09	13.85	17.63
10/7/01 7:00	0.00	105.41	144.86	10/10/01 7:00	1.08	18.47	23.35
10/7/01 9:00	2.10	611.50	746.79	10/10/01 9:00	1.07	402.49	495.36
10/7/01 11:00	2.62	678.57	806.48	10/10/01 11:00	2.54	728.37	1232.01
10/7/01 13:00	2.61	678.72	798.87	10/10/01 13:00	2.55	747.84	1342.97
10/7/01 15:00	2.63	674.93	791.83	10/10/01 15:00	3.33	745.22	1393.19
10/7/01 17:00	2.63	682.60	788.04	10/10/01 17:00	2.83	760.30	1501.88
10/7/01 19:00	2.66	679.43	799.21	10/10/01 19:00	2.93	754.91	1478.28
10/7/01 21:00	2.62	690.10	799.48	10/10/01 21:00	2.96	751.04	1308.04
10/7/01 23:00	2.61	691.64	812.14	10/10/01 23:00	2.54	598.75	1034.86
10/11/01 1:00	2.35	565.72	963.61	10/13/01 1:00	1.49	382.91	445.72
10/11/01 3:00	2.35	514.09	637.27	10/13/01 3:00	1.47	341.95	403.20
10/11/01 5:00	2.38	500.24	537.86	10/13/01 5:00	1.48	534.66	612.34
10/11/01 7:00	2.46	493.87	549.09	10/13/01 7:00	2.65	734.72	853.38
10/11/01 9:00	2.73	725.03	844.17	10/13/01 9:00	0.00	733.57	857.30
10/11/01 11:00	2.76	676.81	787.06	10/13/01 11:00	0.00	693.29	733.61
10/11/01 13:00	2.77	709.84	792.15	10/13/01 13:00	2.69	705.82	767.55
10/11/01 15:00	2.75	687.17	774.06	10/13/01 15:00	2.65	696.74	747.50
10/11/01 17:00	2.56	695.17	782.45	10/13/01 17:00	2.15	595.98	618.76
10/11/01 19:00	2.57	719.45	779.09	10/13/01 19:00	0.81	192.38	246.60
10/11/01 21:00	2.56	701.42	755.65	10/13/01 21:00	0.00	128.75	172.12
10/11/01 23:00	2.52	704.06	783.30	10/13/01 23:00	0.00	221.04	303.35
10/12/01 1:00	2.52	717.68	796.70	10/14/01 1:00	0.00	179.89	234.33
10/12/01 3:00	2.51	718.65	808.84	10/14/01 3:00	0.00	65.72	82.61
10/12/01 5:00	2.53	711.46	787.72	10/14/01 5:00	0.00	43.77	52.83
10/12/01 7:00	2.53	718.79	801.36	10/14/01 7:00	0.68	588.67	879.12
10/12/01 9:00	2.52	634.51	761.16	10/14/01 9:00	2.82	730.63	906.94
10/12/01 11:00	2.53	724.88	834.96	10/14/01 11:00	3.41	723.37	815.87

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AI-4 (Continued)

DATA COLLECTED FOR POST-DC IN 2001 AMMONIA STUDY
SEPTEMBER 17 THROUGH OCTOBER 15, 2001

Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)	Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)
10/12/01 13:00	2.50	732.87	823.62	10/14/01 13:00	3.41	749.28	818.48
10/12/01 15:00	2.52	725.11	838.55	10/14/01 15:00	3.63	745.63	811.49
10/12/01 17:00	2.47	680.22	787.39	10/14/01 17:00	3.68	748.34	820.55
10/12/01 19:00	1.76	459.88	533.59	10/14/01 19:00	3.73	759.67	822.42
10/12/01 21:00	1.78	435.13	493.27	10/14/01 21:00	3.41	730.97	816.36
10/12/01 23:00	1.71	368.31	420.92	10/14/01 23:00	3.18	296.79	327.80
				10/15/01 1:00	2.11	315.73	362.64
				10/15/01 3:00	1.87	460.49	511.63
				10/15/01 5:00	1.87	9.82	11.69
				10/15/01 7:00	1.87	446.36	490.55
				10/15/01 9:00	2.79	741.14	822.21

Note: NS = not sampled. MS = missing sample

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AI-5

DATA COLLECTED FOR TARP PUMPBACK IN 2001 AMMONIA STUDY
SEPTEMBER 17 THROUGH OCTOBER 15, 2001

Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)	Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)
9/17/01 0:00	8.88	NS	NS	9/20/01 0:00	13.17	1.47	7.08
9/17/01 2:00	8.88	NS	NS	9/20/01 2:00	13.17	6.12	10.41
9/17/01 4:00	8.88	NS	NS	9/20/01 4:00	13.17	MS	MS
9/17/01 6:00	1.88	NS	NS	9/20/01 6:00	11.64	MS	MS
9/17/01 8:00	0.00	-	-	9/20/01 8:00	4.13	MS	MS
9/17/01 10:00	0.00	-	-	9/20/01 10:00	0.00	-	-
9/17/01 12:00	0.00	-	-	9/20/01 12:00	0.00	-	-
9/17/01 14:00	0.00	-	-	9/20/01 14:00	0.00	-	-
9/17/01 16:00	0.00	-	-	9/20/01 16:00	0.00	-	-
9/17/01 18:00	0.00	-	-	9/20/01 18:00	9.97	MS	MS
9/17/01 20:00	0.00	-	-	9/20/01 20:00	13.17	MS	MS
9/17/01 22:00	8.57	13.15	29.22	9/20/01 22:00	13.17	2.74	8.04
9/18/01 0:00	8.88	11.39	52.90	9/21/01 0:00	13.17	1.94	5.58
9/18/01 2:00	8.88	9.82	25.19	9/21/01 2:00	13.17	1.54	6.89
9/18/01 4:00	8.88	6.87	23.48	9/21/01 4:00	13.17	2.22	5.10
9/18/01 6:00	8.88	7.89	22.69	9/21/01 6:00	13.17	3.17	6.70
9/18/01 8:00	5.25	7.09	25.57	9/21/01 8:00	13.17	3.70	6.46
9/18/01 10:00	0.00	-	-	9/21/01 10:00	13.17	2.25	5.14
9/18/01 12:00	0.00	-	-	9/21/01 12:00	13.17	2.32	4.76
9/18/01 14:00	0.00	-	-	9/21/01 14:00	13.17	2.22	4.77
9/18/01 16:00	0.00	-	-	9/21/01 16:00	13.17	2.47	4.45
9/18/01 18:00	0.00	-	-	9/21/01 18:00	13.17	1.42	3.03
9/18/01 20:00	0.00	-	-	9/21/01 20:00	13.17	1.20	3.04
9/18/01 22:00	0.00	-	-	9/21/01 22:00	13.17	1.54	3.83
9/19/01 0:00	0.00	-	-	9/22/01 0:00	13.17	1.42	3.97
9/19/01 2:00	0.00	-	-	9/22/01 2:00	13.17	1.51	4.23
9/19/01 4:00	0.00	-	-	9/22/01 4:00	13.17	1.69	4.43
9/19/01 6:00	0.38	-	-	9/22/01 6:00	13.17	2.20	5.39
9/19/01 8:00	4.13	11.31	19.68	9/22/01 8:00	13.17	2.94	6.40
9/19/01 10:00	0.00	-	-	9/22/01 10:00	13.17	2.72	6.39
9/19/01 12:00	0.00	-	-	9/22/01 12:00	13.17	2.27	5.70
9/19/01 14:00	0.00	-	-	9/22/01 14:00	13.17	2.05	5.35
9/19/01 16:00	0.00	-	-	9/22/01 16:00	13.17	2.15	5.56

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AI-5 (Continued)

DATA COLLECTED FOR TARP PUMPBACK IN 2001 AMMONIA STUDY
SEPTEMBER 17 THROUGH OCTOBER 15, 2001

Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)	Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)
9/19/01 18:00	12.43	7.92	24.99	9/22/01 18:00	13.17	2.07	5.56
9/19/01 20:00	13.17	10.94	23.87	9/22/01 20:00	13.17	2.55	5.32
9/19/01 22:00	13.17	4.42	10.91	9/22/01 22:00	13.17	1.94	5.16
9/23/01 0:00	13.17	2.16	5.94	9/26/01 0:00	13.17	3.32	5.90
9/23/01 2:00	13.17	3.48	6.45	9/26/01 2:00	13.17	3.23	5.89
9/23/01 4:00	13.17	3.65	6.80	9/26/01 4:00	13.17	3.19	6.04
9/23/01 6:00	13.17	3.19	6.76	9/26/01 6:00	13.17	3.67	6.77
9/23/01 8:00	13.17	3.18	6.75	9/26/01 8:00	5.53	4.26	7.44
9/23/01 10:00	13.17	3.29	7.21	9/26/01 10:00		-	-
9/23/01 12:00	13.17	2.92	7.11	9/26/01 12:00		-	-
9/23/01 14:00	13.17	3.32	7.99	9/26/01 14:00		-	-
9/23/01 16:00	13.17	3.30	8.09	9/26/01 16:00		-	-
9/23/01 18:00	13.17	2.67	7.06	9/26/01 18:00	12.32	4.92	8.96
9/23/01 20:00	13.17	2.66	5.51	9/26/01 20:00	14.80	4.52	7.61
9/23/01 22:00	13.17	2.02	5.31	9/26/01 22:00	11.40	3.84	6.31
9/24/01 0:00	13.17	2.39	4.46	9/27/01 0:00	4.05	1.99	3.67
9/24/01 2:00	10.17	2.47	4.75	9/27/01 2:00	13.17	5.36	8.43
9/24/01 4:00	13.84	MS	MS	9/27/01 4:00	13.17	5.13	8.78
9/24/01 6:00	14.80	MS	MS	9/27/01 6:00	13.17	6.89	10.66
9/24/01 8:00	5.00	1.55	8.02	9/27/01 8:00	5.53	7.16	10.79
9/24/01 10:00	2.63	2.72	5.04	9/27/01 10:00	0.00	-	-
9/24/01 12:00	8.88	3.22	7.08	9/27/01 12:00	0.00	-	-
9/24/01 14:00	8.88	4.07	7.41	9/27/01 14:00	0.00	-	-
9/24/01 16:00	8.88	4.45	7.73	9/27/01 16:00	0.00	-	-
9/24/01 18:00	11.90	5.17	8.38	9/27/01 18:00	8.89	7.25	11.71
9/24/01 20:00	13.17	6.13	9.60	9/27/01 20:00	13.17	7.27	11.60
9/24/01 22:00	13.17	4.09	6.76	9/27/01 22:00	13.56	7.54	12.12
9/25/01 0:00	13.17	2.96	5.21	9/28/01 0:00	13.17	5.66	8.57
9/25/01 2:00	13.17	3.20	5.32	9/28/01 2:00	13.17	5.31	8.13
9/25/01 4:00	13.17	3.32	5.70	9/28/01 4:00	13.17	5.17	7.85
9/25/01 6:00	16.55	2.09	3.77	9/28/01 6:00	12.57	5.30	8.21
9/25/01 8:00	7.95	1.89	4.78	9/28/01 8:00	5.25	5.15	8.42

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AI-5 (Continued)

DATA COLLECTED FOR TARP PUMPBACK IN 2001 AMMONIA STUDY
SEPTEMBER 17 THROUGH OCTOBER 15, 2001

Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)	Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)
9/25/01 10:00	0.00	-	-	9/28/01 10:00	0.00	-	-
9/25/01 12:00	0.00	-	-	9/28/01 12:00	0.00	-	-
9/25/01 14:00	0.00	-	-	9/28/01 14:00	0.00	-	-
9/25/01 16:00	0.00	-	-	9/28/01 16:00	0.00	-	-
9/25/01 18:00	11.14	3.05	6.72	9/28/01 18:00	16.68	5.98	10.65
9/25/01 20:00	13.17	3.27	6.26	9/28/01 20:00	23.68	6.14	9.91
9/25/01 22:00	13.17	3.29	5.79	9/28/01 22:00	23.68	4.97	8.25
9/29/01 0:00	23.66	5.17	9.08	10/2/01 0:00	17.76	5.48	7.99
9/29/01 2:00	23.66	5.74	8.96	10/2/01 2:00	17.76	8.93	13.37
9/29/01 4:00	23.66	4.33	7.43	10/2/01 4:00	17.76	9.15	13.60
9/29/01 6:00	11.17	3.96	6.94	10/2/01 6:00	17.76	6.38	9.41
9/29/01 8:00	5.92	3.96	6.86	10/2/01 8:00	5.63	5.61	8.55
9/29/01 10:00	12.56	4.30	6.89	10/2/01 10:00	0.00	-	-
9/29/01 12:00	20.69	3.66	7.31	10/2/01 12:00	0.00	-	-
9/29/01 14:00	23.68	3.79	7.29	10/2/01 14:00	0.00	-	-
9/29/01 16:00	23.68	4.72	8.46	10/2/01 16:00	0.00	-	-
9/29/01 18:00	23.68	5.30	8.79	10/2/01 18:00	16.01	6.36	10.31
9/29/01 20:00	19.26	5.80	9.35	10/2/01 20:00	17.76	6.88	10.84
9/29/01 22:00	16.20	5.90	9.53	10/2/01 22:00	17.76	7.09	12.01
9/30/01 0:00	14.80	6.27	10.02	10/3/01 0:00	17.76	8.84	15.65
9/30/01 2:00	14.80	6.39	9.77	10/3/01 2:00	17.76	5.58	12.78
9/30/01 4:00	14.80	6.24	9.06	10/3/01 4:00	21.72	6.00	26.50
9/30/01 6:00	14.80	6.20	8.84	10/3/01 6:00	17.59	7.91	54.17
9/30/01 8:00	21.12	6.26	9.10	10/3/01 8:00	3.75	10.25	72.33
9/30/01 10:00	23.68	5.22	8.49	10/3/01 10:00	0.00	-	-
9/30/01 12:00	23.68	5.14	8.05	10/3/01 12:00	0.00	-	-
9/30/01 14:00	23.68	5.12	8.21	10/3/01 14:00	0.00	-	-
9/30/01 16:00	23.68	5.22	7.82	10/3/01 16:00	0.00	-	-
9/30/01 18:00	23.68	4.80	7.86	10/3/01 18:00	0.00	-	-
9/30/01 20:00	23.68	5.04	8.05	10/3/01 20:00	13.15	MS	MS
9/30/01 22:00	23.68	5.07	7.70	10/3/01 22:00	14.80	11.05	47.05
10/1/01 0:00	23.68	4.82	7.77	10/4/01 0:00	14.80	12.14	18.94

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AI-5 (Continued)

DATA COLLECTED FOR TARP PUMPBACK IN 2001 AMMONIA STUDY
SEPTEMBER 17 THROUGH OCTOBER 15, 2001

Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)	Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)
10/1/01 2:00	23.68	5.14	8.31	10/4/01 2:00	14.80	9.79	15.89
10/1/01 4:00	23.68	5.34	8.55*	10/4/01 4:00	14.80	9.42	17.63
10/1/01 6:00	23.68	5.19	8.32	10/4/01 6:00	9.38	9.58	34.97
10/1/01 8:00	7.38	4.91	8.01	10/4/01 8:00	0.00	-	-
10/1/01 10:00	0.00	-	-	10/4/01 10:00	0.00	-	-
10/1/01 12:00	0.00	-	-	10/4/01 12:00	0.00	-	-
10/1/01 14:00	0.00	-	-	10/4/01 14:00	0.00	-	-
10/1/01 16:00	0.00	-	-	10/4/01 16:00	0.00	-	-
10/1/01 18:00	8.57	3.37	9.07	10/4/01 18:00	0.00	-	-
10/1/01 20:00	8.88	6.87	10.27	10/4/01 20:00	0.00	-	-
10/1/01 22:00	17.45	5.45	8.13	10/4/01 22:00	0.00	-	-
10/5/01 0:00	0.00	-	-	10/8/01 0:00	14.80	4.85	5.30
10/5/01 2:00	0.00	-	-	10/8/01 2:00	14.80	4.36	5.08
10/5/01 4:00	0.00	-	-	10/8/01 4:00	14.80	4.61	5.34
10/5/01 6:00	0.00	-	-	10/8/01 6:00	14.80	4.97	5.35
10/5/01 8:00	0.00	-	-	10/8/01 8:00	6.13	4.95	5.56
10/5/01 10:00	0.00	-	-	10/8/01 10:00	0.00	-	-
10/5/01 12:00	0.00	-	-	10/8/01 12:00	0.00	-	-
10/5/01 14:00	0.00	-	-	10/8/01 14:00	0.00	-	-
10/5/01 16:00	0.00	-	-	10/8/01 16:00	0.00	-	-
10/5/01 18:00	11.51	10.76	49.23	10/8/01 18:00	19.84	5.45	6.21
10/5/01 20:00	13.17	9.50	24.54	10/8/01 20:00	23.68	6.31	6.70
10/5/01 22:00	13.17	7.64	12.20	10/8/01 22:00	21.18	6.06	6.83
10/6/01 0:00	13.17	6.52	9.53	10/9/01 0:00	14.80	7.07	8.50
10/6/01 2:00	13.17	5.30	9.73	10/9/01 2:00	14.80	8.18	9.49
10/6/01 4:00	13.17	4.58	9.47	10/9/01 4:00	14.80	6.82	8.79
10/6/01 6:00	13.46	4.17	7.12	10/9/01 6:00	14.80	8.54	8.89
10/6/01 8:00	17.07	4.36	10.97	10/9/01 8:00	5.13	10.16	10.62
10/6/01 10:00	17.76	3.95	17.68	10/9/01 10:00	0.00	-	-
10/6/01 12:00	17.76	4.21	6.61	10/9/01 12:00	0.00	-	-
10/6/01 14:00	17.76	3.83	5.52	10/9/01 14:00	0.00	-	-
10/6/01 16:00	18.07	3.55	4.52	10/9/01 16:00	0.00	-	-
10/6/01 18:00	23.68	3.49	5.17	10/9/01 18:00	17.64	10.40	11.42

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AI-5 (Continued)

DATA COLLECTED FOR TARP PUMPBACK IN 2001 AMMONIA STUDY
SEPTEMBER 17 THROUGH OCTOBER 15, 2001

Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)	Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)
10/6/01 20:00	23.68	3.10	3.95	10/9/01 20:00	23.78	7.50	8.49
10/6/01 22:00	21.46	3.02	4.16	10/9/01 22:00	19.48	6.24	29.53
10/7/01 0:00	14.80	2.37	3.64	10/10/01 0:00	17.76	6.43	8.83
10/7/01 2:00	14.80	2.38	3.46	10/10/01 2:00	17.76	7.49	9.79
10/7/01 4:00	14.80	2.31	3.69	10/10/01 4:00	17.76	6.51	8.03
10/7/01 6:00	14.80	2.46	4.69	10/10/01 6:00	17.76	5.16	6.42
10/7/01 8:00	17.43	2.60	3.79	10/10/01 8:00	7.13	5.28	7.00
10/7/01 10:00	23.68	3.12	3.70	10/10/01 10:00	0.00	-	-
10/7/01 12:00	23.68	3.10	4.10	10/10/01 12:00	0.00	-	-
10/7/01 14:00	23.68	3.46	4.15	10/10/01 14:00	0.00	-	-
10/7/01 16:00	23.68	3.53	4.10	10/10/01 16:00	0.00	-	-
10/7/01 18:00	23.68	3.39	4.02	10/10/01 18:00	5.25	4.46	6.32
10/7/01 20:00	23.68	3.61	4.35	10/10/01 20:00	17.76	7.05	8.74
10/7/01 22:00	20.96	5.31	4.97	10/10/01 22:00	17.76	4.65	5.93
10/11/01 0:00	23.68	5.81	7.92	10/13/01 0:00	23.68	2.44	4.56
10/11/01 2:00	23.68	7.61	11.22	10/13/01 2:00	20.37	2.50	3.72
10/11/01 4:00	23.68	7.27	11.12	10/13/01 4:00	14.80	2.45	3.48
10/11/01 6:00	23.68	4.43	6.86	10/13/01 6:00	14.80	3.09	4.21
10/11/01 8:00	8.00	MS	MS	10/13/01 8:00	14.80	3.22	4.78
10/11/01 10:00	0.00	-	-	10/13/01 10:00	1.13	2.92	4.33
10/11/01 12:00	0.00	-	-	10/13/01 12:00	0.00	-	-
10/11/01 14:00	0.00	-	-	10/13/01 14:00	0.00	-	-
10/11/01 16:00	0.00	-	-	10/13/01 16:00	0.00	-	-
10/11/01 18:00	13.53	3.85	7.25	10/13/01 18:00	3.00	3.12	4.58
10/11/01 20:00	14.80	5.73	7.81	10/13/01 20:00	8.88	3.52	5.72
10/11/01 22:00	14.80	4.79	5.96	10/13/01 22:00	8.88	3.31	4.33
10/12/01 0:00	14.80	6.48	8.36	10/14/01 0:00	8.88	3.53	4.14
10/12/01 2:00	1.13	7.10	9.80	10/14/01 2:00	8.88	2.01	2.24
10/12/01 4:00	0.00	-	-	10/14/01 4:00	8.88	0.55	0.71
10/12/01 6:00	0.00	-	-	10/14/01 6:00	8.88	0.74	0.87
10/12/01 8:00	0.00	-	-	10/14/01 8:00	8.88	1.16	1.49
10/12/01 10:00	0.00	-	-	10/14/01 10:00	8.88	1.59	1.71

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AI-5 (Continued)

DATA COLLECTED FOR TARP PUMPBACK IN 2001 AMMONIA STUDY
SEPTEMBER 17 THROUGH OCTOBER 15, 2001

Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)	Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)
10/12/01 12:00	0.00	-	-	10/14/01 12:00	8.88	1.71	1.75
10/12/01 14:00	0.00	-	-	10/14/01 14:00	12.60	1.80	1.69
10/12/01 16:00	0.00	-	-	10/14/01 16:00	13.17	1.65	1.70
10/12/01 18:00	16.01	7.53	10.25	10/14/01 18:00	13.17	1.55	1.64
10/12/01 20:00	23.68	5.49	13.35	10/14/01 20:00	13.17	1.45	1.44
10/12/01 22:00	23.68	2.82	15.47	10/14/01 22:00	13.17	1.33	1.30
				10/15/01 0:00	13.17	MS	MS
				10/15/01 2:00	13.17	MS	MS
				10/15/01 4:00	13.17	MS	MS
				10/15/01 6:00	13.17	MS	MS

Note: NS = not sampled. - = no sample. MS = missing sample.
* Daily mean value was used to replace the original value because the original value was unreasonable low (much lower than the corresponding ammonia value).

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AI-6

DATA COLLECTED FOR SOUTHWEST PLANT IN 2001 AMMONIA STUDY
SEPTEMBER 17 THROUGH OCTOBER 15, 2001

	SWRAW				SWPREF		
Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)	Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)
9/17/01 1:00	430	NS	NS	9/17/01 1:00	430	NS	NS
9/17/01 3:00	430	NS	NS	9/17/01 3:00	430	NS	NS
9/17/01 5:00	430	NS	NS	9/17/01 5:00	430	NS	NS
9/17/01 7:00	195	NS	NS	9/17/01 7:00	195	NS	NS
9/17/01 9:00	200	NS	NS	9/17/01 9:00	200	17.81	35.21
9/17/01 11:00	200	27.11	98.67	9/17/01 11:00	200	20.14	30.63
9/17/01 13:00	430	22.46	56.49	9/17/01 13:00	430	23.71	33.84
9/17/01 15:00	430	18.76	64.72	9/17/01 15:00	430	19.77	24.84
9/17/01 17:00	215	21.66	75.49	9/17/01 17:00	215	17.64	28.52
9/17/01 19:00	215	17.55	66.48	9/17/01 19:00	215	18.83	27.15
9/17/01 21:00	430	26.50	53.63	9/17/01 21:00	430	19.25	43.75
9/17/01 23:00	425	19.94	77.19	9/17/01 23:00	425	15.37	23.52
9/18/01 1:00	425	20.14	84.29	9/18/01 1:00	425	15.90	24.92
9/18/01 3:00	425	17.69	55.60	9/18/01 3:00	425	17.76	28.95
9/18/01 5:00	425	17.17	47.11	9/18/01 5:00	425	16.00	31.87
9/18/01 7:00	440	16.02	23.69	9/18/01 7:00	440	16.50	27.95
9/18/01 9:00	438	12.22	19.80	9/18/01 9:00	438	13.07	25.04
9/18/01 11:00	440	10.24	20.39	9/18/01 11:00	440	10.62	32.65
9/18/01 13:00	440	12.97	69.09	9/18/01 13:00	440	11.06	24.34
9/18/01 15:00	425	12.94	18.24	9/18/01 15:00	425	10.90	30.62
9/18/01 17:00	425	11.82	24.06	9/18/01 17:00	425	11.32	34.13
9/18/01 19:00	220	8.52	51.53	9/18/01 19:00	220	10.89	20.92
9/18/01 21:00	425	11.93	37.60	9/18/01 21:00	425	14.53	26.55
9/18/01 23:00	430	15.35	56.28	9/18/01 23:00	430	15.52	29.50
9/19/01 1:00	858	12.02	31.30	9/19/01 1:00	858	11.42	20.05
9/19/01 3:00	865	5.94	20.85	9/19/01 3:00	865	3.79	12.04
9/19/01 5:00	865	3.71	11.15	9/19/01 5:00	865	3.69	12.39
9/19/01 7:00	865	3.79	8.72	9/19/01 7:00	865	3.74	33.62
9/19/01 9:00	865	4.78	11.96	9/19/01 9:00	865	5.94	15.57
9/19/01 11:00	538	8.66	34.15	9/19/01 11:00	538	8.61	15.27
9/19/01 13:00	435	11.51	41.91	9/19/01 13:00	435	10.59	17.38
9/19/01 15:00	428	13.73	54.91	9/19/01 15:00	428	14.28	22.73

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AI-6 (Continued)

DATA COLLECTED FOR SOUTHWEST PLANT IN 2001 AMMONIA STUDY
SEPTEMBER 17 THROUGH OCTOBER 15, 2001

	SWRAW				SWPREF		
Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)	Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)
9/19/01 17:00	410	13.33	53.74	9/19/01 17:00	410	9.25	22.52
9/19/01 19:00	410	22.64	58.06	9/19/01 19:00	410	16.47	24.92
9/19/01 21:00	425	15.98	50.62	9/19/01 21:00	425	20.01	31.08
9/19/01 23:00	430	10.91	35.24	9/19/01 23:00	430	15.28	25.61
9/20/01 1:00	430	7.68	25.70	9/20/01 1:00	430	6.38	16.04
9/20/01 3:00	430	11.42	20.86	9/20/01 3:00	430	8.30	20.77
9/20/01 5:00	430	12.48	24.92	9/20/01 5:00	430	7.56	19.71
9/20/01 7:00	665	10.38	28.27	9/20/01 7:00	665	11.66	21.58
9/20/01 9:00	330	18.17	46.64	9/20/01 9:00	330	7.85	14.78
9/20/01 11:00	188	22.07	97.12	9/20/01 11:00	188	11.25	17.97
9/20/01 13:00	185	25.96	103.18	9/20/01 13:00	185	18.39	26.59
9/20/01 15:00	323	18.16	69.82	9/20/01 15:00	323	22.35	34.76
9/20/01 17:00	548	10.63	53.33	9/20/01 17:00	548	16.79	26.68
9/20/01 19:00	655	7.43	39.42	9/20/01 19:00	655	10.09	18.80
9/20/01 21:00	655	7.73	35.38	9/20/01 21:00	655	8.44	17.30
9/20/01 23:00	663	5.90	29.80	9/20/01 23:00	663	8.20	16.42
9/21/01 1:00	665	4.71	25.86	9/21/01 1:00	665	6.01	13.44
9/21/01 3:00	665	3.89	22.32	9/21/01 3:00	665	4.57	11.11
9/21/01 5:00	665	4.09	22.67	9/21/01 5:00	665	4.35	11.27
9/21/01 7:00	880	3.61	17.93	9/21/01 7:00	880	4.05	10.48
9/21/01 9:00	880	4.16	21.32	9/21/01 9:00	880	3.91	11.27
9/21/01 11:00	880	3.66	20.31	9/21/01 11:00	880	5.18	12.00
9/21/01 13:00	878	4.51	19.53	9/21/01 13:00	878	4.83	12.21
9/21/01 15:00	880	4.17	22.90	9/21/01 15:00	880	4.30	10.80
9/21/01 17:00	690	4.64	26.93	9/21/01 17:00	690	4.53	11.27
9/21/01 19:00	690	5.33	32.37	9/21/01 19:00	690	5.27	13.47
9/21/01 21:00	690	5.80	33.22	9/21/01 21:00	690	6.67	13.02
9/21/01 23:00	665	5.47	36.41	9/21/01 23:00	665	6.41	13.38
9/22/01 1:00	665	5.71	23.52	9/22/01 1:00	665	5.81	14.02
9/22/01 3:00	665	8.52	20.73	9/22/01 3:00	665	8.18	15.81
9/22/01 5:00	665	8.16	19.00	9/22/01 5:00	665	10.13	18.62

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AI-6 (Continued)

DATA COLLECTED FOR SOUTHWEST PLANT IN 2001 AMMONIA STUDY
SEPTEMBER 17 THROUGH OCTOBER 15, 2001

	SWRAW				SWPREF		
Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)	Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)
9/22/01 7:00	645	7.74	13.08	9/22/01 7:00	645	7.77	16.06
9/22/01 9:00	545	5.67	31.11	9/22/01 9:00	545	6.08	14.58
9/22/01 11:00	443	6.89	36.47	9/22/01 11:00	443	4.93	13.02
9/22/01 13:00	440	4.54	27.83	9/22/01 13:00	440	6.03	13.92
9/22/01 15:00	550	4.96	35.61	9/22/01 15:00	550	5.46	13.64
9/22/01 17:00	650	4.79	40.22	9/22/01 17:00	650	6.16	13.44
9/22/01 19:00	650	7.20	31.63	9/22/01 19:00	650	7.45	14.56
9/22/01 21:00	650	4.82	30.58	9/22/01 21:00	650	6.82	14.76
9/22/01 23:00	665	4.19	24.49	9/22/01 23:00	665	5.59	18.59
9/23/01 1:00	665	3.82	23.87	9/23/01 1:00	665	4.89	10.67
9/23/01 3:00	665	5.38	25.56	9/23/01 3:00	665	5.06	11.63
9/23/01 5:00	665	4.34	20.30	9/23/01 5:00	665	5.70	15.02
9/23/01 7:00	445	9.50	21.90	9/23/01 7:00	445	5.18	12.04
9/23/01 9:00	445	8.07	42.03	9/23/01 9:00	445	9.27	18.31
9/23/01 11:00	673	6.00	43.17	9/23/01 11:00	673	8.38	17.64
9/23/01 13:00	900	4.56	33.53	9/23/01 13:00	900	6.05	17.37
9/23/01 15:00	900	4.20	28.88	9/23/01 15:00	900	5.21	13.64
9/23/01 17:00	900	7.40	24.09	9/23/01 17:00	900	6.02	13.71
9/23/01 19:00	900	2.76	20.74	9/23/01 19:00	900	3.61	9.67
9/23/01 21:00	900	3.16	17.44	9/23/01 21:00	900	3.44	9.57
9/23/01 23:00	900	3.35	19.73	9/23/01 23:00	900	3.88	9.89
9/24/01 1:00	900	3.41	22.67	9/24/01 1:00	900	4.34	9.74
9/24/01 3:00	705	4.49	27.85	9/24/01 3:00	705	5.33	10.48
9/24/01 5:00	705	7.16	24.60	9/24/01 5:00	705	6.09	11.63
9/24/01 7:00	700	3.24	20.51	9/24/01 7:00	700	4.27	10.40
9/24/01 9:00	700	4.50	29.70	9/24/01 9:00	700	4.52	12.41
9/24/01 11:00	700	4.27	12.36	9/24/01 11:00	700	5.12	10.86
9/24/01 13:00	700	5.64	13.68	9/24/01 13:00	700	5.15	12.61
9/24/01 15:00	710	5.90	10.76	9/24/01 15:00	710	6.72	14.14
9/24/01 17:00	710	6.12	8.93	9/24/01 17:00	710	6.08	13.48
9/24/01 19:00	710	7.09	11.21	9/24/01 19:00	710	6.69	14.25
9/24/01 21:00	710	5.98	33.84	9/24/01 21:00	710	7.80	16.50

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AI-6 (Continued)

DATA COLLECTED FOR SOUTHWEST PLANT IN 2001 AMMONIA STUDY
SEPTEMBER 17 THROUGH OCTOBER 15, 2001

	SWRAW				SWPREF		
Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)	Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)
9/24/01 23:00	710	6.25	39.27	9/24/01 23:00	710	8.30	15.39
9/25/01 1:00	470	6.81	22.10	9/25/01 1:00	470	7.51	14.51
9/25/01 3:00	470	7.12	18.10	9/25/01 3:00	470	7.40	15.01
9/25/01 5:00	470	6.05	17.85	9/25/01 5:00	470	7.52	16.37
9/25/01 7:00	435	8.64	38.16	9/25/01 7:00	435	7.53	14.12
9/25/01 9:00	435	10.56	47.91	9/25/01 9:00	435	6.63	10.91
9/25/01 11:00	445	8.52	40.01	9/25/01 11:00	445	11.94	17.74
9/25/01 13:00	445	7.67	39.23	9/25/01 13:00	445	9.03	15.85
9/25/01 15:00	455	8.30	38.42	9/25/01 15:00	455	8.62	14.16
9/25/01 17:00	455	9.48	36.84	9/25/01 17:00	455	9.06	16.29
9/25/01 19:00	455	10.62	32.85	9/25/01 19:00	455	11.93	18.33
9/25/01 21:00	455	9.32	44.63	9/25/01 21:00	455	12.29	17.24
9/25/01 23:00	465	8.17	31.87	9/25/01 23:00	465	11.01	16.54
9/26/01 1:00	465	8.12	30.45	9/26/01 1:00	465	8.75	14.19
9/26/01 3:00	465	10.23	31.65	9/26/01 3:00	465	10.79	16.75
9/26/01 5:00	465	9.30	32.18	9/26/01 5:00	465	12.27	17.75
9/26/01 7:00	430	9.64	38.02	9/26/01 7:00	430	11.51	18.40
9/26/01 9:00	430	10.23	35.33	9/26/01 9:00	430	11.51	18.54
9/26/01 11:00	430	8.89	46.01	9/26/01 11:00	430	11.88	18.47
9/26/01 13:00	430	8.97	37.51	9/26/01 13:00	430	9.68	18.14
9/26/01 15:00	440	8.95	33.00	9/26/01 15:00	440	9.64	17.20
9/26/01 17:00	440	10.16	28.93	9/26/01 17:00	440	10.15	17.60
9/26/01 19:00	675	8.17	23.98	9/26/01 19:00	675	10.29	17.94
9/26/01 21:00	675	7.07	22.77	9/26/01 21:00	675	8.00	14.13
9/26/01 23:00	443	9.55	35.39	9/26/01 23:00	443	7.92	13.94
9/27/01 1:00	235	17.47	56.30	9/27/01 1:00	235	10.68	15.53
9/27/01 3:00	235	9.00	38.50	9/27/01 3:00	235	18.88	23.62
9/27/01 5:00	348	8.95	34.55	9/27/01 5:00	348	15.33	22.36
9/27/01 7:00	450	9.66	28.35	9/27/01 7:00	450	16.36	22.94
9/27/01 9:00	450	9.80	34.91	9/27/01 9:00	450	10.00	19.05
9/27/01 11:00	450	8.99	33.63	9/27/01 11:00	450	14.90	26.58

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AI-6 (Continued)

DATA COLLECTED FOR SOUTHWEST PLANT IN 2001 AMMONIA STUDY
SEPTEMBER 17 THROUGH OCTOBER 15, 2001

	SWRAW				SWPREF		
Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)	Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)
9/27/01 13:00	450	8.87	31.49	9/27/01 13:00	450	11.02	20.94
9/27/01 15:00	440	9.25	33.93	9/27/01 15:00	440	9.55	20.23
9/27/01 17:00	440	8.65	28.82	9/27/01 17:00	440	9.78	17.45
9/27/01 19:00	440	9.32	24.26	9/27/01 19:00	440	9.88	18.23
9/27/01 21:00	440	10.56	27.27	9/27/01 21:00	440	9.32	18.56
9/27/01 23:00	445	9.55	24.93	9/27/01 23:00	445	11.30	21.42
9/28/01 1:00	568	7.04	22.47	9/28/01 1:00	568	9.72	17.37
9/28/01 3:00	445	6.99	29.24	9/28/01 3:00	445	8.61	15.04
9/28/01 5:00	445	6.54	24.17	9/28/01 5:00	445	8.67	16.13
9/28/01 7:00	435	7.00	25.43	9/28/01 7:00	435	9.28	15.40
9/28/01 9:00	435	8.93	32.62	9/28/01 9:00	435	10.77	31.11
9/28/01 11:00	435	MS	MS	9/28/01 11:00	435	9.57	26.47
9/28/01 13:00	435	MS	MS	9/28/01 13:00	435	8.78	25.17
9/28/01 15:00	450	MS	MS	9/28/01 15:00	450	6.28	21.09
9/28/01 17:00	450	MS	MS	9/28/01 17:00	450	8.26	22.53
9/28/01 19:00	450	MS	MS	9/28/01 19:00	450	6.99	16.61
9/28/01 21:00	690	MS	MS	9/28/01 21:00	690	6.04	13.60
9/28/01 23:00	690	MS	MS	9/28/01 23:00	690	5.77	12.88
9/29/01 1:00	690	MS	MS	9/29/01 1:00	690	4.25	11.48
9/29/01 3:00	690	MS	MS	9/29/01 3:00	690	3.32	10.76
9/29/01 5:00	690	MS	MS	9/29/01 5:00	690	6.91	17.60
9/29/01 7:00	690	MS	MS	9/29/01 7:00	690	7.54	19.64
9/29/01 9:00	690	MS	MS	9/29/01 9:00	690	10.98	19.81
9/29/01 11:00	690	5.98	15.83	9/29/01 11:00	690	8.61	16.75
9/29/01 13:00	690	4.98	14.21	9/29/01 13:00	690	7.29	13.36
9/29/01 15:00	695	4.14	14.45	9/29/01 15:00	695	5.61	11.77
9/29/01 17:00	695	3.76	15.52	9/29/01 17:00	695	5.83	13.07
9/29/01 19:00	695	4.32	18.79	9/29/01 19:00	695	6.68	14.71
9/29/01 21:00	695	6.20	20.76	9/29/01 21:00	695	10.40	18.63
9/29/01 23:00	695	6.56	23.88	9/29/01 23:00	695	10.35	18.67
9/30/01 1:00	695	6.26	23.99	9/30/01 1:00	695	10.20	17.63

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AI-6 (Continued)

DATA COLLECTED FOR SOUTHWEST PLANT IN 2001 AMMONIA STUDY
SEPTEMBER 17 THROUGH OCTOBER 15, 2001

	SWRAW				SWPREF		
Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)	Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)
9/30/01 3:00	695	5.62	22.88	9/30/01 3:00	695	9.68	17.27
9/30/01 5:00	695	5.13	23.54	9/30/01 5:00	695	8.44	14.91
9/30/01 7:00	640	6.55	35.44	9/30/01 7:00	640	10.12	15.61
9/30/01 9:00	640	7.81	46.00	9/30/01 9:00	640	11.57	25.34
9/30/01 11:00	640	6.85	46.63	9/30/01 11:00	640	11.42	19.65
9/30/01 13:00	640	4.70	34.49	9/30/01 13:00	640	10.16	15.08
9/30/01 15:00	655	5.17	26.21	9/30/01 15:00	655	8.47	13.90
9/30/01 17:00	695	4.86	21.29	9/30/01 17:00	695	8.91	15.03
9/30/01 19:00	695	5.28	22.99	9/30/01 19:00	695	9.54	16.20
9/30/01 21:00	695	3.98	20.00	9/30/01 21:00	695	8.82	15.17
9/30/01 23:00	695	5.46	19.25	9/30/01 23:00	695	9.01	15.28
10/1/01 1:00	695	6.39	19.97	10/1/01 1:00	695	13.35	19.28
10/1/01 3:00	695	6.45	19.02	10/1/01 3:00	695	11.26	16.98
10/1/01 5:00	695	7.31	15.90	10/1/01 5:00	695	11.27	17.00
10/1/01 7:00	655	5.51	24.37	10/1/01 7:00	655	7.94	13.74
10/1/01 9:00	533	5.90	17.48	10/1/01 9:00	533	9.11	15.96
10/1/01 11:00	410	7.00	25.80	10/1/01 11:00	410	11.01	18.15
10/1/01 13:00	410	8.81	27.98	10/1/01 13:00	410	12.31	18.93
10/1/01 15:00	425	7.33	20.43	10/1/01 15:00	425	13.14	20.51
10/1/01 17:00	425	9.05	25.17	10/1/01 17:00	425	16.28	22.78
10/1/01 19:00	425	8.06	22.92	10/1/01 19:00	425	14.92	20.36
10/1/01 21:00	425	7.83	26.04	10/1/01 21:00	425	15.14	19.95
10/1/01 23:00	660	5.33	16.41	10/1/01 23:00	660	12.11	19.27
10/2/01 1:00	670	5.10	23.59	10/2/01 1:00	670	8.79	14.67
10/2/01 3:00	670	6.72	29.84	10/2/01 3:00	670	10.74	17.45
10/2/01 5:00	670	6.12	22.51	10/2/01 5:00	670	11.49	19.25
10/2/01 7:00	540	4.33	19.72	10/2/01 7:00	540	9.45	15.98
10/2/01 9:00	205	8.21	36.02	10/2/01 9:00	205	7.49	12.09
10/2/01 11:00	205	20.39	45.38	10/2/01 11:00	205	11.16	16.03
10/2/01 13:00	208	15.60	38.30	10/2/01 13:00	208	20.88	25.39
10/2/01 15:00	205	11.72	39.32	10/2/01 15:00	205	20.41	26.18
10/2/01 17:00	205	15.29	37.14	10/2/01 17:00	205	20.48	27.89

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AI-6 (Continued)

DATA COLLECTED FOR SOUTHWEST PLANT IN 2001 AMMONIA STUDY
SEPTEMBER 17 THROUGH OCTOBER 15, 2001

	SWRAW				SWPREF		
Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)	Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)
10/2/01 19:00	660	8.13	20.27	10/2/01 19:00	660	16.16	24.51
10/2/01 21:00	660	6.62	14.92	10/2/01 21:00	660	10.32	17.40
10/2/01 23:00	660	6.63	16.18	10/2/01 23:00	660	8.25	15.75
10/3/01 1:00	660	6.42	16.86	10/3/01 1:00	660	9.55	16.22
10/3/01 3:00	660	5.21	17.70	10/3/01 3:00	660	7.39	11.86
10/3/01 5:00	660	8.27	33.58	10/3/01 5:00	660	8.16	13.22
10/3/01 7:00	675	14.35	39.07	10/3/01 7:00	675	15.50	21.00
10/3/01 9:00	535	8.93	29.89	10/3/01 9:00	535	19.22	22.97
10/3/01 11:00	420	11.71	33.11	10/3/01 11:00	420	15.94	19.21
10/3/01 13:00	420	12.53	36.31	10/3/01 13:00	420	16.47	20.86
10/3/01 15:00	460	7.94	32.64	10/3/01 15:00	460	17.69	22.60
10/3/01 17:00	460	8.09	39.79	10/3/01 17:00	460	14.75	19.29
10/3/01 19:00	335	8.69	29.06	10/3/01 19:00	335	16.46	19.94
10/3/01 21:00	335	14.60	39.77	10/3/01 21:00	335	15.25	19.74
10/3/01 23:00	455	10.39	49.26	10/3/01 23:00	455	17.97	23.61
10/4/01 1:00	675	9.77	30.67	10/4/01 1:00	675	16.28	20.89
10/4/01 3:00	675	9.40	26.31	10/4/01 3:00	675	13.85	18.98
10/4/01 5:00	573	9.55	47.39	10/4/01 5:00	573	12.84	17.73
10/4/01 7:00	200	10.38	42.75	10/4/01 7:00	200	12.70	15.88
10/4/01 9:00	210	12.76	41.93	10/4/01 9:00	210	13.54	18.59
10/4/01 11:00	210	12.48	34.26	10/4/01 11:00	210	17.37	22.28
10/4/01 13:00	435	8.70	39.39	10/4/01 13:00	435	15.25	19.83
10/4/01 15:00	210	12.56	39.00	10/4/01 15:00	210	17.22	21.23
10/4/01 17:00	670	14.92	39.48	10/4/01 17:00	670	21.26	25.91
10/4/01 19:00	900	5.28	32.71	10/4/01 19:00	900	11.58	18.65
10/4/01 21:00	900	4.34	24.21	10/4/01 21:00	900	7.30	12.01
10/4/01 23:00	900	3.86	17.11	10/4/01 23:00	900	5.66	8.88
10/5/01 1:00	900	4.34	13.92	10/5/01 1:00	900	5.51	8.34
10/5/01 3:00	900	4.57	11.96	10/5/01 3:00	900	5.72	8.66
10/5/01 5:00	900	5.21	14.06	10/5/01 5:00	900	8.10	10.79
10/5/01 7:00	753	3.68	9.61	10/5/01 7:00	753	5.76	8.81

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AI-6 (Continued)

DATA COLLECTED FOR SOUTHWEST PLANT IN 2001 AMMONIA STUDY
SEPTEMBER 17 THROUGH OCTOBER 15, 2001

	SWRAW				SWPREF		
Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)	Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)
10/5/01 9:00	635	3.64	12.34	10/5/01 9:00	635	4.89	8.15
10/5/01 11:00	535	5.22	17.07	10/5/01 11:00	535	6.75	9.71
10/5/01 13:00	435	5.66	25.78	10/5/01 13:00	435	7.39	11.33
10/5/01 15:00	450	6.07	19.71	10/5/01 15:00	450	8.40	13.90
10/5/01 17:00	450	5.45	19.93	10/5/01 17:00	450	7.37	13.15
10/5/01 19:00	455	7.56	42.69	10/5/01 19:00	455	7.80	13.65
10/5/01 21:00	460	8.12	27.86	10/5/01 21:00	460	10.52	15.25
10/5/01 23:00	460	8.70	29.72	10/5/01 23:00	460	14.85	18.73
10/6/01 1:00	460	7.21	22.85	10/6/01 1:00	460	11.46	16.14
10/6/01 3:00	460	8.43	26.94	10/6/01 3:00	460	9.87	14.11
10/6/01 5:00	460	8.44	28.45	10/6/01 5:00	460	10.85	16.16
10/6/01 7:00	570	5.75	22.11	10/6/01 7:00	570	9.76	14.88
10/6/01 9:00	710	5.37	23.37	10/6/01 9:00	710	6.64	10.15
10/6/01 11:00	710	4.17	19.29	10/6/01 11:00	710	6.20	10.40
10/6/01 13:00	710	3.81	16.94	10/6/01 13:00	710	5.58	10.52
10/6/01 15:00	685	3.28	15.93	10/6/01 15:00	685	4.85	10.13
10/6/01 17:00	685	4.31	19.98	10/6/01 17:00	685	6.48	10.80
10/6/01 19:00	685	2.98	16.26	10/6/01 19:00	685	5.38	9.31
10/6/01 21:00	685	2.26	17.89	10/6/01 21:00	685	3.44	8.54
10/6/01 23:00	685	2.83	17.47	10/6/01 23:00	685	3.08	7.47
10/7/01 1:00	685	2.83	15.24	10/7/01 1:00	685	4.00	7.79
10/7/01 3:00	685	2.40	13.67	10/7/01 3:00	685	4.14	7.27
10/7/01 5:00	685	3.04	18.09	10/7/01 5:00	685	4.17	8.14
10/7/01 7:00	690	5.93	16.93	10/7/01 7:00	690	7.73	10.97
10/7/01 9:00	688	4.27	20.65	10/7/01 9:00	688	7.94	12.80
10/7/01 11:00	690	3.45	18.91	10/7/01 11:00	690	7.03	10.64
10/7/01 13:00	690	3.43	19.31	10/7/01 13:00	690	6.28	9.69
10/7/01 15:00	685	4.86	28.63	10/7/01 15:00	685	6.86	9.41
10/7/01 17:00	685	7.46	45.33	10/7/01 17:00	685	7.59	10.61
10/7/01 19:00	685	4.64	18.82	10/7/01 19:00	685	6.30	9.60
10/7/01 21:00	685	3.57	16.55	10/7/01 21:00	685	6.69	10.69
10/7/01 23:00	710	5.31	19.39	10/7/01 23:00	710	7.17	11.74

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AI-6 (Continued)

DATA COLLECTED FOR SOUTHWEST PLANT IN 2001 AMMONIA STUDY
SEPTEMBER 17 THROUGH OCTOBER 15, 2001

	SWRAW				SWPREF		
Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)	Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)
10/8/01 1:00	710	5.08	22.51	10/8/01 1:00	710	7.36	11.66
10/8/01 3:00	710	4.99	20.61	10/8/01 3:00	710	7.65	10.43
10/8/01 5:00	710	4.91	20.68	10/8/01 5:00	710	7.60	11.61
10/8/01 7:00	563	5.17	24.27	10/8/01 7:00	563	7.52	10.12
10/8/01 9:00	210	10.58	34.40	10/8/01 9:00	210	7.41	8.93
10/8/01 11:00	210	16.81	46.37	10/8/01 11:00	210	10.90	14.56
10/8/01 13:00	210	18.93	44.10	10/8/01 13:00	210	18.48	25.34
10/8/01 15:00	215	17.00	48.24	10/8/01 15:00	215	20.15	28.29
10/8/01 17:00	215	16.44	45.31	10/8/01 17:00	215	19.55	26.19
10/8/01 19:00	685	7.25	25.33	10/8/01 19:00	685	13.77	22.84
10/8/01 21:00	690	5.60	16.95	10/8/01 21:00	690	8.39	12.83
10/8/01 23:00	680	7.69	18.37	10/8/01 23:00	680	8.95	14.46
10/9/01 1:00	680	8.12	17.56	10/9/01 1:00	680	13.60	18.29
10/9/01 3:00	680	9.95	52.75	10/9/01 3:00	680	9.77	17.89
10/9/01 5:00	563	9.37	20.92	10/9/01 5:00	563	13.49	19.35
10/9/01 7:00	440	7.78	18.01	10/9/01 7:00	440	12.72	18.33
10/9/01 9:00	200	15.52	34.51	10/9/01 9:00	200	12.48	15.30
10/9/01 11:00	200	14.15	32.06	10/9/01 11:00	200	18.65	21.10
10/9/01 13:00	200	16.20	33.81	10/9/01 13:00	200	19.52	23.24
10/9/01 15:00	220	18.85	62.49	10/9/01 15:00	220	17.92	23.01
10/9/01 17:00	220	16.14	64.03	10/9/01 17:00	220	19.45	26.62
10/9/01 19:00	720	9.57	21.17	10/9/01 19:00	720	3.87	20.39
10/9/01 21:00	720	6.80	16.29	10/9/01 21:00	720	12.18	18.40
10/9/01 23:00	685	6.04	15.17	10/9/01 23:00	685	9.21	15.13
10/10/01 1:00	685	6.00	16.01	10/10/01 1:00	685	8.54	14.86
10/10/01 3:00	685	6.79	17.31	10/10/01 3:00	685	9.20	14.18
10/10/01 5:00	685	5.11	17.13	10/10/01 5:00	685	8.22	13.23
10/10/01 7:00	695	5.10	21.89	10/10/01 7:00	695	6.81	11.65
10/10/01 9:00	215	9.98	38.22	10/10/01 9:00	215	6.77	10.97
10/10/01 11:00	215	14.50	42.99	10/10/01 11:00	215	9.10	12.38
10/10/01 13:00	218	14.91	43.42	10/10/01 13:00	218	15.28	19.43
10/10/01 15:00	220	15.24	42.41	10/10/01 15:00	220	18.69	22.06

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AI-6 (Continued)

DATA COLLECTED FOR SOUTHWEST PLANT IN 2001 AMMONIA STUDY
SEPTEMBER 17 THROUGH OCTOBER 15, 2001

	SWRAW				SWPREF		
Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)	Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)
10/10/01 17:00	220	10.39	39.42	10/10/01 17:00	220	19.30	24.18
10/10/01 19:00	325	13.31	34.91	10/10/01 19:00	325	18.90	23.93
10/10/01 21:00	430	8.29	35.21	10/10/01 21:00	430	15.11	19.54
10/10/01 23:00	565	5.81	20.15	10/10/01 23:00	565	8.99	14.98
10/11/01 1:00	700	6.07	17.77	10/11/01 1:00	700	8.56	13.06
10/11/01 3:00	700	7.51	19.70	10/11/01 3:00	700	10.08	15.51
10/11/01 5:00	700	7.69	23.75	10/11/01 5:00	700	10.76	16.66
10/11/01 7:00	680	6.91	19.23	10/11/01 7:00	680	9.45	14.88
10/11/01 9:00	440	15.86	31.46	10/11/01 9:00	440	10.70	16.18
10/11/01 11:00	440	9.30	36.05	10/11/01 11:00	440	16.16	22.67
10/11/01 13:00	435	9.19	20.02	10/11/01 13:00	435	10.39	18.29
10/11/01 15:00	420	9.06	18.20	10/11/01 15:00	420	10.72	18.52
10/11/01 17:00	540	7.87	22.65	10/11/01 17:00	540	11.08	15.88
10/11/01 19:00	660	5.86	15.35	10/11/01 19:00	660	9.37	13.50
10/11/01 21:00	660	6.91	19.09	10/11/01 21:00	660	9.16	12.59
10/11/01 23:00	660	5.70	15.63	10/11/01 23:00	660	8.28	12.15
10/12/01 1:00	660	6.48	13.28	10/12/01 1:00	660	7.99	15.62
10/12/01 3:00	660	5.35	12.77	10/12/01 3:00	660	8.37	14.21
10/12/01 5:00	660	2.78	11.44	10/12/01 5:00	660	5.50	8.60
10/12/01 7:00	908	2.11	9.30	10/12/01 7:00	908	4.10	6.32
10/12/01 9:00	905	2.57	10.74	10/12/01 9:00	905	3.14	13.95
10/12/01 11:00	645	3.66	21.80	10/12/01 11:00	645	5.00	7.62
10/12/01 13:00	655	4.09	25.01	10/12/01 13:00	655	6.75	9.73
10/12/01 15:00	450	3.73	29.44	10/12/01 15:00	450	5.42	8.62
10/12/01 17:00	570	4.13	29.35	10/12/01 17:00	570	5.90	9.65
10/12/01 19:00	690	5.80	28.72	10/12/01 19:00	690	8.05	13.04
10/12/01 21:00	690	4.06	24.78	10/12/01 21:00	690	8.14	12.97
10/12/01 23:00	690	3.46	16.52	10/12/01 23:00	690	5.95	10.79
10/13/01 1:00	690	3.27	8.76	10/13/01 1:00	690	5.39	8.78
10/13/01 3:00	690	3.32	11.31	10/13/01 3:00	690	4.92	9.91
10/13/01 5:00	690	4.24	17.89	10/13/01 5:00	690	5.31	9.56

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AI-6 (Continued)

DATA COLLECTED FOR SOUTHWEST PLANT IN 2001 AMMONIA STUDY
SEPTEMBER 17 THROUGH OCTOBER 15, 2001

	SWRAW				SWPREF		
Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)	Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)
10/13/01 7:00	715	4.53	10.72	10/13/01 7:00	715	6.31	11.52
10/13/01 9:00	695	4.86	17.59	10/13/01 9:00	695	5.80	8.12
10/13/01 11:00	635	7.18	18.24	10/13/01 11:00	635	8.35	12.33
10/13/01 13:00	680	7.84	17.04	10/13/01 13:00	680	11.04	13.12
10/13/01 15:00	918	5.64	13.04	10/13/01 15:00	918	10.32	13.62
10/13/01 17:00	925	3.68	12.01	10/13/01 17:00	925	5.45	9.29
10/13/01 19:00	925	2.18	9.43	10/13/01 19:00	925	3.93	6.71
10/13/01 21:00	925	1.62	10.87	10/13/01 21:00	925	4.21	4.70
10/13/01 23:00	920	1.85	10.18	10/13/01 23:00	920	3.40	5.51
10/14/01 1:00	920	1.69	8.59	10/14/01 1:00	920	3.51	10.63
10/14/01 3:00	920	1.17	7.63	10/14/01 3:00	920	2.37	5.14
10/14/01 5:00	920	0.72	8.39	10/14/01 5:00	920	1.35	4.41
10/14/01 7:00	940	1.01	7.48	10/14/01 7:00	940	1.32	3.33
10/14/01 9:00	940	1.90	9.73	10/14/01 9:00	940	2.54	4.24
10/14/01 11:00	940	2.49	30.22	10/14/01 11:00	940	3.12	6.16
10/14/01 13:00	940	2.79	14.43	10/14/01 13:00	940	3.93	7.34
10/14/01 15:00	915	2.52	9.24	10/14/01 15:00	915	3.83	6.69
10/14/01 17:00	915	5.72	41.55	10/14/01 17:00	915	3.66	7.94
10/14/01 19:00	915	2.62	40.56	10/14/01 19:00	915	3.78	6.91
10/14/01 21:00	915	3.51	25.83	10/14/01 21:00	915	5.10	8.16
10/14/01 23:00	788	4.26	9.44	10/14/01 23:00	788	5.11	7.96
10/15/01 1:00	645	MS	MS	10/15/01 1:00	645	MS	MS
10/15/01 3:00	645	MS	MS	10/15/01 3:00	645	MS	MS
10/15/01 5:00	645	MS	MS	10/15/01 5:00	645	MS	MS
10/15/01 7:00	665	MS	MS	10/15/01 7:00	665	MS	MS
10/15/01 9:00	670	MS	MS				

Note: NS = not sampled. MS = missing sample.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AI-7

DATA COLLECTED FOR WEST SIDE PLANT IN 2001 AMMONIA STUDY
SEPTEMBER 17 THROUGH OCTOBER 15, 2001

	WSRAW				WSIMEF		
Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)	Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)
9/17/01 0:00	240	NS	NS	9/17/01 1:00	240	NS	NS
9/17/01 2:00	293	NS	NS	9/17/01 3:00	345	NS	NS
9/17/01 4:00	345	NS	NS	9/17/01 5:00	345	NS	NS
9/17/01 6:00	338	NS	NS	9/17/01 7:00	283	NS	NS
9/17/01 8:00	235	NS	NS	9/17/01 9:00	235	11.76	21.00
9/17/01 10:00	235	8.06	21.47	9/17/01 11:00	235	11.61	21.33
9/17/01 12:00	238	9.75	22.76	9/17/01 13:00	240	10.72	20.56
9/17/01 14:00	235	13.22	30.39	9/17/01 15:00	230	9.38	19.88
9/17/01 16:00	230	14.01	30.52	9/17/01 17:00	230	9.43	16.93
9/17/01 18:00	230	13.65	27.51	9/17/01 19:00	230	9.48	17.81
9/17/01 20:00	230	12.00	25.28	9/17/01 21:00	230	9.70	18.71
9/17/01 22:00	230	12.34	27.95	9/17/01 23:00	240	11.52	20.78
9/18/01 0:00	240	9.78	25.36	9/18/01 1:00	240	13.23	25.44
9/18/01 2:00	240	7.31	19.99	9/18/01 3:00	240	12.97	24.42
9/18/01 4:00	240	6.37	19.68	9/18/01 5:00	240	12.66	23.97
9/18/01 6:00	225	6.66	20.46	9/18/01 7:00	210	11.98	23.51
9/18/01 8:00	210	7.55	20.54	9/18/01 9:00	220	7.80	17.08
9/18/01 10:00	235	7.03	17.90	9/18/01 11:00	240	8.24	17.34
9/18/01 12:00	240	8.18	21.12	9/18/01 13:00	240	7.91	16.76
9/18/01 14:00	238	11.18	24.60	9/18/01 15:00	235	8.34	18.77
9/18/01 16:00	235	12.98	28.46	9/18/01 17:00	235	9.85	19.67
9/18/01 18:00	235	12.03	26.58	9/18/01 19:00	235	11.02	21.50
9/18/01 20:00	235	10.81	26.69	9/18/01 21:00	235	11.47	21.35
9/18/01 22:00	235	11.76	27.40	9/18/01 23:00	235	11.39	21.50
9/19/01 0:00	235	6.86	23.73	9/19/01 1:00	235	11.38	21.39
9/19/01 2:00	235	2.31	12.53	9/19/01 3:00	235	8.63	17.55
9/19/01 4:00	235	1.23	9.06	9/19/01 5:00	235	6.10	12.64
9/19/01 6:00	225	0.94	6.01	9/19/01 7:00	215	4.68	9.50
9/19/01 8:00	215	1.03	5.16	9/19/01 9:00	215	3.33	6.69
9/19/01 10:00	330	2.06	3.93	9/19/01 11:00	463	3.47	7.59
9/19/01 12:00	480	3.27	7.22	9/19/01 13:00	478	3.38	6.55
9/19/01 14:00	473	5.14	14.40	9/19/01 15:00	470	4.14	8.84

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AI-7 (Continued)

DATA COLLECTED FOR WEST SIDE PLANT IN 2001 AMMONIA STUDY
SEPTEMBER 17 THROUGH OCTOBER 15, 2001

	WSRAW				WSIMEF		
Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)	Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)
9/19/01 16:00	460	5.94	15.11	9/19/01 17:00	445	5.25	11.03
9/19/01 18:00	440	5.35	14.96	9/19/01 19:00	440	5.62	10.30
9/19/01 20:00	393	5.44	14.58	9/19/01 21:00	345	5.57	13.81
9/19/01 22:00	345	5.39	13.10	9/19/01 23:00	350	5.66	14.93
9/20/01 0:00	350	4.87	11.98	9/20/01 1:00	350	5.65	14.25
9/20/01 2:00	350	4.71	13.86	9/20/01 3:00	350	5.74	13.67
9/20/01 4:00	350	4.97	12.74	9/20/01 5:00	350	5.43	11.49
9/20/01 6:00	360	4.05	8.74	9/20/01 7:00	370	5.38	9.90
9/20/01 8:00	370	4.27	10.28	9/20/01 9:00	363	5.47	11.13
9/20/01 10:00	355	5.36	14.32	9/20/01 11:00	345	5.66	11.71
9/20/01 12:00	335	7.78	17.79	9/20/01 13:00	273	6.08	12.53
9/20/01 14:00	200	8.79	21.63	9/20/01 15:00	200	7.20	14.18
9/20/01 16:00	273	9.82	21.95	9/20/01 17:00	335	8.51	16.07
9/20/01 18:00	335	8.20	21.54	9/20/01 19:00	335	9.49	17.33
9/20/01 20:00	330	7.79	18.66	9/20/01 21:00	325	9.58	17.48
9/20/01 22:00	325	9.07	19.93	9/20/01 23:00	375	8.69	17.09
9/21/01 0:00	410	4.24	10.95	9/21/01 1:00	410	6.21	12.11
9/21/01 2:00	410	2.99	9.95	9/21/01 3:00	410	5.14	11.36
9/21/01 4:00	410	2.27	8.70	9/21/01 5:00	410	9.40	18.96
9/21/01 6:00	305	1.79	7.59	9/21/01 7:00	200	4.34	9.31
9/21/01 8:00	200	1.34	6.37	9/21/01 9:00	200	4.87	7.92
9/21/01 10:00	200	2.02	7.80	9/21/01 11:00	200	4.56	8.42
9/21/01 12:00	200	3.96	9.75	9/21/01 13:00	203	4.10	7.05
9/21/01 14:00	203	6.03	13.85	9/21/01 15:00	200	5.08	10.44
9/21/01 16:00	295	6.95	16.23	9/21/01 17:00	390	6.17	11.75
9/21/01 18:00	390	6.47	16.15	9/21/01 19:00	390	6.63	13.74
9/21/01 20:00	390	6.57	14.72	9/21/01 21:00	390	4.39	12.34
9/21/01 22:00	390	6.71	16.48	9/21/01 23:00	405	7.14	14.72
9/22/01 0:00	405	5.56	15.24	9/22/01 1:00	405	6.92	15.10
9/22/01 2:00	405	5.89	15.61	9/22/01 3:00	405	6.52	15.05
9/22/01 4:00	405	4.03	15.26	9/22/01 5:00	405	6.03	14.49

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AI-7 (Continued)

DATA COLLECTED FOR WEST SIDE PLANT IN 2001 AMMONIA STUDY
SEPTEMBER 17 THROUGH OCTOBER 15, 2001

	WSRAW				WSIMEF		
Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)	Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)
9/22/01 6:00	373	4.77	15.76	9/22/01 7:00	340	5.43	13.44
9/22/01 8:00	340	4.66	14.74	9/22/01 9:00	340	5.92	10.47
9/22/01 10:00	340	5.88	14.16	9/22/01 11:00	293	5.65	9.91
9/22/01 12:00	245	6.91	13.87	9/22/01 13:00	245	6.20	10.44
9/22/01 14:00	265	8.29	17.79	9/22/01 15:00	285	6.57	12.20
9/22/01 16:00	285	9.06	17.08	9/22/01 17:00	285	7.33	12.74
9/22/01 18:00	285	8.46	18.13	9/22/01 19:00	285	7.67	14.34
9/22/01 20:00	285	7.17	16.10	9/22/01 21:00	285	7.67	14.19
9/22/01 22:00	285	6.99	15.47	9/22/01 23:00	285	7.19	13.63
9/23/01 0:00	285	6.95	14.26	9/23/01 1:00	285	7.54	14.06
9/23/01 2:00	285	7.63	16.66	9/23/01 3:00	285	7.42	14.18
9/23/01 4:00	285	7.37	16.41	9/23/01 5:00	285	7.69	14.27
9/23/01 6:00	288	7.01	15.93	9/23/01 7:00	290	7.60	15.14
9/23/01 8:00	290	6.67	15.39	9/23/01 9:00	290	6.90	10.94
9/23/01 10:00	290	6.17	14.42	9/23/01 11:00	235	6.76	10.20
9/23/01 12:00	180	5.96	12.17	9/23/01 13:00	180	6.66	10.59
9/23/01 14:00	180	4.73	11.72	9/23/01 15:00	180	6.74	11.46
9/23/01 16:00	180	3.38	10.17	9/23/01 17:00	180	5.94	8.42
9/23/01 18:00	180	1.59	5.83	9/23/01 19:00	180	7.18	10.83
9/23/01 20:00	180	1.60	5.31	9/23/01 21:00	180	5.46	8.56
9/23/01 22:00	180	1.76	5.49	9/23/01 23:00	180	3.77	6.62
9/24/01 0:00	180	2.57	7.41	9/24/01 1:00	180	3.39	5.54
9/24/01 2:00	278	3.57	6.78	9/24/01 3:00	375	3.50	5.79
9/24/01 4:00	375	3.79	8.24	9/24/01 5:00	375	4.21	9.07
9/24/01 6:00	378	3.72	8.79	9/24/01 7:00	380	4.74	9.06
9/24/01 8:00	380	4.18	8.59	9/24/01 9:00	380	4.63	9.25
9/24/01 10:00	380	5.02	10.72	9/24/01 11:00	380	4.76	9.63
9/24/01 12:00	380	6.11	12.66	9/24/01 13:00	380	5.03	10.69
9/24/01 14:00	375	7.09	14.87	9/24/01 15:00	370	6.01	12.55
9/24/01 16:00	370	7.00	15.56	9/24/01 17:00	370	6.67	13.11
9/24/01 18:00	370	7.21	15.55	9/24/01 19:00	370	6.87	12.81
9/24/01 20:00	370	7.08	17.66	9/24/01 21:00	370	7.07	14.18

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AI-7 (Continued)

DATA COLLECTED FOR WEST SIDE PLANT IN 2001 AMMONIA STUDY
SEPTEMBER 17 THROUGH OCTOBER 15, 2001

	WSRAW				WSIMEF		
Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)	Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)
9/24/01 22:00	370	6.82	17.09	9/24/01 23:00	370	7.21	14.77
9/25/01 0:00	370	5.61	14.52	9/25/01 1:00	370	6.90	13.00
9/25/01 2:00	370	4.82	13.18	9/25/01 3:00	370	6.45	13.31
9/25/01 4:00	370	4.00	11.99	9/25/01 5:00	370	5.84	12.30
9/25/01 6:00	355	3.79	10.85	9/25/01 7:00	340	5.22	11.57
9/25/01 8:00	340	3.99	13.78	9/25/01 9:00	303	5.14	9.78
9/25/01 10:00	265	4.60	12.13	9/25/01 11:00	265	5.38	11.11
9/25/01 12:00	265	6.29	16.67	9/25/01 13:00	265	5.15	11.58
9/25/01 14:00	265	8.82	20.97	9/25/01 15:00	265	5.75	14.36
9/25/01 16:00	265	10.45	22.34	9/25/01 17:00	265	7.28	14.76
9/25/01 18:00	265	10.22	20.99	9/25/01 19:00	265	8.70	17.10
9/25/01 20:00	265	8.82	20.81	9/25/01 21:00	265	9.09	16.16
9/25/01 22:00	265	9.06	19.55	9/25/01 23:00	265	8.79	15.97
9/26/01 0:00	265	7.97	18.84	9/26/01 1:00	265	8.73	16.32
9/26/01 2:00	265	7.12	15.29	9/26/01 3:00	265	8.40	15.78
9/26/01 4:00	265	6.46	17.26	9/26/01 5:00	265	7.77	15.90
9/26/01 6:00	258	6.65	16.20	9/26/01 7:00	250	7.45	15.34
9/26/01 8:00	250	6.19	16.65	9/26/01 9:00	250	6.70	14.04
9/26/01 10:00	250	5.80	14.71	9/26/01 11:00	250	6.56	14.33
9/26/01 12:00	250	7.02	16.96	9/26/01 13:00	250	6.46	13.57
9/26/01 14:00	258	9.23	21.36	9/26/01 15:00	267	7.03	14.27
9/26/01 16:00	267	10.91	24.72	9/26/01 17:00	265	8.09	16.47
9/26/01 18:00	265	10.25	18.67	9/26/01 19:00	265	9.39	18.74
9/26/01 20:00	265	10.10	24.31	9/26/01 21:00	265	9.88	19.84
9/26/01 22:00	265	9.92	23.05	9/26/01 23:00	245	9.88	19.88
9/27/01 0:00	245	8.30	21.01	9/27/01 1:00	245	9.94	18.36
9/27/01 2:00	245	7.81	17.80	9/27/01 3:00	245	9.34	21.12
9/27/01 4:00	245	8.88	17.89	9/27/01 5:00	245	9.25	18.13
9/27/01 6:00	250	7.11	16.44	9/27/01 7:00	255	9.11	17.96
9/27/01 8:00	255	7.71	17.59	9/27/01 9:00	255	7.41	17.89
9/27/01 10:00	255	6.21	17.64	9/27/01 11:00	255	7.11	17.68

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AI-7 (Continued)

DATA COLLECTED FOR WEST SIDE PLANT IN 2001 AMMONIA STUDY
SEPTEMBER 17 THROUGH OCTOBER 15, 2001

	WSRAW				WSIMEF		
Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)	Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)
9/27/01 12:00	255	6.83	18.63	9/27/01 13:00	255	6.77	16.40
9/27/01 14:00	268	9.20	23.70	9/27/01 15:00	280	6.88	16.34
9/27/01 16:00	280	10.90	27.73	9/27/01 17:00	280	8.12	19.20
9/27/01 18:00	280	9.52	25.13	9/27/01 19:00	280	9.32	21.10
9/27/01 20:00	280	8.81	24.26	9/27/01 21:00	280	9.58	23.17
9/27/01 22:00	280	10.10	27.07	9/27/01 23:00	280	9.04	21.92
9/28/01 0:00	280	9.98	24.08	9/28/01 1:00	280	9.52	23.49
9/28/01 2:00	280	8.14	20.93	9/28/01 3:00	280	9.60	22.78
9/28/01 4:00	280	7.25	20.38	9/28/01 5:00	280	8.89	20.52
9/28/01 6:00	258	7.02	18.60	9/28/01 7:00	235	8.26	19.18
9/28/01 8:00	235	7.27	18.42	9/28/01 9:00	235	7.94	17.39
9/28/01 10:00	235	7.25	18.37	9/28/01 11:00	235	8.37	17.43
9/28/01 12:00	235	8.72	20.98	9/28/01 13:00	235	8.06	16.78
9/28/01 14:00	255	11.08	26.14	9/28/01 15:00	275	8.25	16.89
9/28/01 16:00	275	12.76	27.69	9/28/01 17:00	275	9.60	19.77
9/28/01 18:00	275	10.35	22.51	9/28/01 19:00	333	10.79	22.32
9/28/01 20:00	390	10.50	20.94	9/28/01 21:00	390	10.61	21.03
9/28/01 22:00	390	10.98	22.32	9/28/01 23:00	390	10.41	20.30
9/29/01 0:00	390	10.28	19.49	9/29/01 1:00	390	10.43	20.84
9/29/01 2:00	390	9.53	19.81	9/29/01 3:00	390	9.95	18.81
9/29/01 4:00	390	9.07	19.09	9/29/01 5:00	390	9.48	16.75
9/29/01 6:00	390	8.19	18.98	9/29/01 7:00	390	9.15	15.09
9/29/01 8:00	390	7.11	19.29	9/29/01 9:00	390	8.86	20.50
9/29/01 10:00	390	6.28	19.87	9/29/01 11:00	390	8.88	19.11
9/29/01 12:00	390	7.22	19.73	9/29/01 13:00	390	8.19	16.96
9/29/01 14:00	388	9.85	21.90	9/29/01 15:00	385	8.35	15.99
9/29/01 16:00	385	8.90	21.11	9/29/01 17:00	385	9.08	19.28
9/29/01 18:00	385	8.66	21.44	9/29/01 19:00	385	9.08	19.84
9/29/01 20:00	385	8.47	20.94	9/29/01 21:00	385	9.12	19.70
9/29/01 22:00	385	8.97	22.05	9/29/01 23:00	385	8.74	19.73
9/30/01 0:00	385	8.39	20.84	9/30/01 1:00	385	8.85	18.70

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AI-7 (Continued)

DATA COLLECTED FOR WEST SIDE PLANT IN 2001 AMMONIA STUDY
SEPTEMBER 17 THROUGH OCTOBER 15, 2001

	WSRAW				WSIMEF		
Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)	Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)
9/30/01 2:00	385	7.99	19.95	9/30/01 3:00	385	8.40	20.11
9/30/01 4:00	385	7.48	18.16	9/30/01 5:00	385	8.07	17.50
9/30/01 6:00	375	7.34	17.74	9/30/01 7:00	365	7.94	15.47
9/30/01 8:00	365	6.81	17.10	9/30/01 9:00	365	9.33	15.86
9/30/01 10:00	365	11.87	19.40	9/30/01 11:00	365	10.14	15.29
9/30/01 12:00	365	11.36	22.84	9/30/01 13:00	365	11.10	17.98
9/30/01 14:00	375	9.94	24.69	9/30/01 15:00	385	10.72	19.82
9/30/01 16:00	385	10.31	25.23	9/30/01 17:00	385	9.95	21.24
9/30/01 18:00	385	10.94	22.74	9/30/01 19:00	385	10.47	21.77
9/30/01 20:00	385	10.73	21.18	9/30/01 21:00	385	10.58	20.75
9/30/01 22:00	385	10.26	22.08	9/30/01 23:00	385	10.49	21.19
10/1/01 0:00	385	10.03	22.44	10/1/01 1:00	385	10.23	21.68
10/1/01 2:00	385	9.20	18.79	10/1/01 3:00	385	10.18	21.23
10/1/01 4:00	385	7.54	18.97	10/1/01 5:00	385	9.01	19.87
10/1/01 6:00	385	12.20	21.62	10/1/01 7:00	385	10.58	20.26
10/1/01 8:00	385	14.05	17.28	10/1/01 9:00	325	9.09	17.46
10/1/01 10:00	265	7.59	19.71	10/1/01 11:00	238	8.06	15.66
10/1/01 12:00	210	9.82	19.81	10/1/01 13:00	210	8.26	16.42
10/1/01 14:00	215	12.57	24.19	10/1/01 15:00	220	8.92	17.36
10/1/01 16:00	220	13.81	27.86	10/1/01 17:00	220	10.55	20.18
10/1/01 18:00	220	12.75	26.15	10/1/01 19:00	220	11.67	21.84
10/1/01 20:00	220	12.37	24.95	10/1/01 21:00	220	12.10	23.41
10/1/01 22:00	220	11.36	22.93	10/1/01 23:00	278	11.98	22.85
10/2/01 0:00	345	9.64	21.38	10/2/01 1:00	345	11.59	22.59
10/2/01 2:00	345	8.30	17.82	10/2/01 3:00	345	10.16	19.82
10/2/01 4:00	345	7.82	17.43	10/2/01 5:00	345	9.14	18.14
10/2/01 6:00	340	7.14	15.40	10/2/01 7:00	335	8.42	17.65
10/2/01 8:00	335	7.23	15.10	10/2/01 9:00	335	7.17	15.86
10/2/01 10:00	335	7.48	19.53	10/2/01 11:00	335	7.13	15.34
10/2/01 12:00	273	9.57	20.48	10/2/01 13:00	210	7.64	18.81
10/2/01 14:00	208	12.10	27.03	10/2/01 15:00	205	8.32	18.31
10/2/01 16:00	205	13.20	29.15	10/2/01 17:00	205	9.66	20.24

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AI-7 (Continued)

DATA COLLECTED FOR WEST SIDE PLANT IN 2001 AMMONIA STUDY
SEPTEMBER 17 THROUGH OCTOBER 15, 2001

	WSRAW				WSIMEF		
Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)	Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)
10/2/01 18:00	208	12.34	26.20	10/2/01 19:00	210	10.81	22.19
10/2/01 20:00	210	11.59	26.99	10/2/01 21:00	210	11.06	22.29
10/2/01 22:00	210	11.79	24.78	10/2/01 23:00	215	11.10	23.48
10/3/01 0:00	215	11.08	23.32	10/3/01 1:00	215	10.75	22.64
10/3/01 2:00	215	9.51	21.32	10/3/01 3:00	215	10.94	22.83
10/3/01 4:00	215	9.15	20.90	10/3/01 5:00	215	10.39	21.62
10/3/01 6:00	225	8.67	18.34	10/3/01 7:00	235	9.81	21.21
10/3/01 8:00	235	8.69	20.09	10/3/01 9:00	233	9.32	19.16
10/3/01 10:00	230	8.12	19.36	10/3/01 11:00	230	9.27	18.87
10/3/01 12:00	230	9.60	21.73	10/3/01 13:00	230	9.40	18.86
10/3/01 14:00	230	12.35	26.86	10/3/01 15:00	230	9.57	19.34
10/3/01 16:00	230	13.90	30.29	10/3/01 17:00	230	10.69	22.19
10/3/01 18:00	230	13.18	28.39	10/3/01 19:00	230	11.66	21.96
10/3/01 20:00	230	12.41	28.23	10/3/01 21:00	230	12.49	23.48
10/3/01 22:00	230	12.26	26.62	10/3/01 23:00	195	12.42	25.59
10/4/01 0:00	200	10.63	23.11	10/4/01 1:00	205	12.44	23.34
10/4/01 2:00	205	9.61	21.03	10/4/01 3:00	205	11.93	23.24
10/4/01 4:00	205	8.74	19.14	10/4/01 5:00	205	10.97	21.85
10/4/01 6:00	205	7.63	15.92	10/4/01 7:00	205	9.96	20.35
10/4/01 8:00	205	8.23	17.62	10/4/01 9:00	215	8.87	17.72
10/4/01 10:00	225	8.17	20.26	10/4/01 11:00	225	8.52	17.01
10/4/01 12:00	225	8.71	23.20	10/4/01 13:00	275	8.41	17.03
10/4/01 14:00	330	11.81	28.71	10/4/01 15:00	335	9.25	18.16
10/4/01 16:00	335	12.98	30.87	10/4/01 17:00	258	10.77	22.29
10/4/01 18:00	180	7.81	25.17	10/4/01 19:00	180	12.37	26.79
10/4/01 20:00	180	3.61	17.01	10/4/01 21:00	180	11.23	24.03
10/4/01 22:00	180	2.13	9.46	10/4/01 23:00	180	10.24	19.59
10/5/01 0:00	180	1.63	6.08	10/5/01 1:00	180	7.94	15.73
10/5/01 2:00	180	1.17	4.28	10/5/01 3:00	180	6.27	12.55
10/5/01 4:00	180	1.13	5.06	10/5/01 5:00	180	4.01	9.77
10/5/01 6:00	200	1.09	5.41	10/5/01 7:00	328	2.85	7.58

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AI-7 (Continued)

DATA COLLECTED FOR WEST SIDE PLANT IN 2001 AMMONIA STUDY
SEPTEMBER 17 THROUGH OCTOBER 15, 2001

	WSRAW				WSIMEF		
Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)	Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)
10/5/01 8:00	405	1.33	5.51	10/5/01 9:00	375	2.46	5.60
10/5/01 10:00	375	3.00	6.59	10/5/01 11:00	375	2.41	5.32
10/5/01 12:00	315	5.10	11.40	10/5/01 13:00	255	2.82	6.68
10/5/01 14:00	270	7.04	15.87	10/5/01 15:00	285	3.78	9.29
10/5/01 16:00	285	7.20	16.71	10/5/01 17:00	345	5.01	12.37
10/5/01 18:00	410	5.13	15.55	10/5/01 19:00	418	5.30	13.68
10/5/01 20:00	420	4.97	14.59	10/5/01 21:00	420	4.42	12.78
10/5/01 22:00	420	5.60	13.92	10/5/01 23:00	420	4.63	13.72
10/6/01 0:00	420	5.09	13.02	10/6/01 1:00	420	4.91	13.67
10/6/01 2:00	420	4.91	13.20	10/6/01 3:00	420	4.62	13.07
10/6/01 4:00	420	4.50	13.78	10/6/01 5:00	390	4.62	12.79
10/6/01 6:00	345	3.87	11.94	10/6/01 7:00	330	4.55	12.12
10/6/01 8:00	358	3.70	11.09	10/6/01 9:00	385	4.48	10.97
10/6/01 10:00	385	4.31	12.23	10/6/01 11:00	385	4.33	10.48
10/6/01 12:00	385	5.16	13.99	10/6/01 13:00	385	4.50	11.14
10/6/01 14:00	388	6.74	17.67	10/6/01 15:00	390	5.11	12.36
10/6/01 16:00	390	7.43	16.99	10/6/01 17:00	390	6.07	14.74
10/6/01 18:00	390	6.65	16.87	10/6/01 19:00	390	6.63	15.72
10/6/01 20:00	390	5.83	15.18	10/6/01 21:00	390	6.20	15.02
10/6/01 22:00	390	5.80	14.96	10/6/01 23:00	390	5.62	15.90
10/7/01 0:00	390	6.35	17.34	10/7/01 1:00	390	5.71	14.59
10/7/01 2:00	390	6.58	16.47	10/7/01 3:00	390	6.05	15.95
10/7/01 4:00	390	6.08	14.80	10/7/01 5:00	390	6.13	14.93
10/7/01 6:00	385	5.53	13.54	10/7/01 7:00	380	6.06	14.74
10/7/01 8:00	380	5.54	13.90	10/7/01 9:00	378	5.98	11.84
10/7/01 10:00	378	6.58	12.36	10/7/01 11:00	380	5.93	11.73
10/7/01 12:00	380	8.83	16.15	10/7/01 13:00	380	6.90	12.29
10/7/01 14:00	378	9.68	18.75	10/7/01 15:00	375	8.09	13.85
10/7/01 16:00	375	9.79	17.49	10/7/01 17:00	375	8.83	15.59
10/7/01 18:00	375	9.58	17.89	10/7/01 19:00	375	9.03	15.89
10/7/01 20:00	375	9.36	19.33	10/7/01 21:00	375	8.90	16.10
10/7/01 22:00	375	7.85	22.34	10/7/01 23:00	385	8.82	18.88

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AI-7 (Continued)

DATA COLLECTED FOR WEST SIDE PLANT IN 2001 AMMONIA STUDY
SEPTEMBER 17 THROUGH OCTOBER 15, 2001

	WSRAW				WSIMEF		
Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)	Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)
10/8/01 0:00	385	8.00	15.98	10/8/01 1:00	385	8.26	19.98
10/8/01 2:00	385	7.41	15.61	10/8/01 3:00	385	7.82	17.06
10/8/01 4:00	385	7.22	14.93	10/8/01 5:00	385	7.26	14.41
10/8/01 6:00	383	7.05	14.79	10/8/01 7:00	380	6.99	14.46
10/8/01 8:00	380	6.68	15.40	10/8/01 9:00	380	6.46	12.38
10/8/01 10:00	313	6.60	16.21	10/8/01 11:00	245	6.48	12.91
10/8/01 12:00	245	7.91	18.08	10/8/01 13:00	245	6.51	13.13
10/8/01 14:00	253	9.95	20.95	10/8/01 15:00	260	7.08	13.09
10/8/01 16:00	260	11.09	21.18	10/8/01 17:00	260	8.40	14.56
10/8/01 18:00	260	10.28	23.39	10/8/01 19:00	323	9.40	20.44
10/8/01 20:00	385	9.33	19.93	10/8/01 21:00	385	9.24	20.18
10/8/01 22:00	385	10.75	18.69	10/8/01 23:00	375	9.22	20.85
10/9/01 0:00	375	8.89	18.03	10/9/01 1:00	375	9.46	20.12
10/9/01 2:00	375	7.65	15.47	10/9/01 3:00	375	8.23	17.75
10/9/01 4:00	375	7.13	15.88	10/9/01 5:00	375	7.57	14.47
10/9/01 6:00	373	7.09	16.05	10/9/01 7:00	370	7.20	12.83
10/9/01 8:00	310	7.19	16.70	10/9/01 9:00	250	6.79	15.90
10/9/01 10:00	250	6.76	18.29	10/9/01 11:00	250	6.90	15.90
10/9/01 12:00	250	8.09	19.52	10/9/01 13:00	250	6.91	15.30
10/9/01 14:00	240	10.92	26.62	10/9/01 15:00	230	7.29	16.85
10/9/01 16:00	230	10.40	24.89	10/9/01 17:00	230	8.58	18.90
10/9/01 18:00	230	10.51	25.88	10/9/01 19:00	290	9.06	20.78
10/9/01 20:00	350	9.06	24.13	10/9/01 21:00	350	9.52	20.45
10/9/01 22:00	350	9.22	22.82	10/9/01 23:00	355	8.68	20.15
10/10/01 0:00	355	8.74	20.92	10/10/01 1:00	355	8.70	20.61
10/10/01 2:00	355	8.38	20.43	10/10/01 3:00	355	8.51	19.66
10/10/01 4:00	355	6.96	16.35	10/10/01 5:00	355	7.78	19.30
10/10/01 6:00	350	6.37	15.56	10/10/01 7:00	345	7.02	17.73
10/10/01 8:00	345	6.43	18.56	10/10/01 9:00	345	6.53	14.12
10/10/01 10:00	345	6.99	19.19	10/10/01 11:00	345	6.50	13.80
10/10/01 12:00	345	8.69	19.07	10/10/01 13:00	285	6.89	14.98
10/10/01 14:00	228	10.55	24.16	10/10/01 15:00	230	7.71	15.53

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AI-7 (Continued)

DATA COLLECTED FOR WEST SIDE PLANT IN 2001 AMMONIA STUDY
SEPTEMBER 17 THROUGH OCTOBER 15, 2001

	WSRAW				WSIMEF		
Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)	Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)
10/10/01 16:00	290	10.40	25.71	10/10/01 17:00	350	8.69	18.26
10/10/01 18:00	350	10.02	25.11	10/10/01 19:00	350	9.53	18.83
10/10/01 20:00	350	10.04	22.60	10/10/01 21:00	350	9.64	17.40
10/10/01 22:00	350	10.94	22.35	10/10/01 23:00	355	9.81	18.00
10/11/01 0:00	355	9.16	22.78	10/11/01 1:00	355	9.94	19.71
10/11/01 2:00	355	7.64	19.91	10/11/01 3:00	355	8.82	19.26
10/11/01 4:00	355	6.88	17.21	10/11/01 5:00	355	7.81	15.28
10/11/01 6:00	340	8.18	19.19	10/11/01 7:00	325	7.40	16.24
10/11/01 8:00	283	7.33	19.01	10/11/01 9:00	240	8.16	13.05
10/11/01 10:00	240	6.61	16.42	10/11/01 11:00	240	7.77	13.11
10/11/01 12:00	233	8.26	18.30	10/11/01 13:00	225	7.45	14.30
10/11/01 14:00	238	11.00	21.64	10/11/01 15:00	250	7.82	14.79
10/11/01 16:00	250	12.67	25.03	10/11/01 17:00	250	9.50	17.45
10/11/01 18:00	250	12.19	21.90	10/11/01 19:00	250	11.45	22.19
10/11/01 20:00	250	11.10	20.50	10/11/01 21:00	250	11.51	17.05
10/11/01 22:00	250	11.60	22.78	10/11/01 23:00	250	10.89	16.27
10/12/01 0:00	250	10.99	22.44	10/12/01 1:00	250	10.96	16.56
10/12/01 2:00	335	8.36	18.19	10/12/01 3:00	420	10.75	16.98
10/12/01 4:00	420	3.41	15.46	10/12/01 5:00	420	8.63	15.08
10/12/01 6:00	295	1.37	9.22	10/12/01 7:00	173	6.14	12.51
10/12/01 8:00	175	1.10	8.87	10/12/01 9:00	175	5.27	8.94
10/12/01 10:00	310	2.14	4.03	10/12/01 11:00	400	3.64	5.76
10/12/01 12:00	355	3.01	5.00	10/12/01 13:00	355	3.15	4.60
10/12/01 14:00	373	4.60	16.05	10/12/01 15:00	390	4.27	6.61
10/12/01 16:00	390	6.19	13.98	10/12/01 17:00	390	4.61	8.00
10/12/01 18:00	390	6.09	13.29	10/12/01 19:00	390	4.97	10.54
10/12/01 20:00	390	5.55	12.02	10/12/01 21:00	390	4.87	10.93
10/12/01 22:00	390	6.16	10.89	10/12/01 23:00	390	5.00	11.08
10/13/01 0:00	390	5.33	9.43	10/13/01 1:00	390	5.25	12.44
10/13/01 2:00	390	4.92	9.77	10/13/01 3:00	390	4.85	11.55
10/13/01 4:00	390	4.57	9.51	10/13/01 5:00	390	4.67	11.55

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AI-7 (Continued)

DATA COLLECTED FOR WEST SIDE PLANT IN 2001 AMMONIA STUDY
SEPTEMBER 17 THROUGH OCTOBER 15, 2001

	WSRAW				WSIMEF		
Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)	Date & Time	Flow (MGD)	NH_3-N (mg/L)	TKN (mg/L)
10/13/01 6:00	378	3.93	9.88	10/13/01 7:00	365	4.40	10.98
10/13/01 8:00	365	3.73	8.43	10/13/01 9:00	358	4.50	8.79
10/13/01 10:00	343	5.17	12.27	10/13/01 11:00	330	4.52	8.79
10/13/01 12:00	335	6.07	13.98	10/13/01 13:00	345	5.53	10.74
10/13/01 14:00	260	4.97	11.29	10/13/01 15:00	170	5.37	11.05
10/13/01 16:00	165	2.81	7.81	10/13/01 17:00	165	4.03	8.06
10/13/01 18:00	165	1.45	4.97	10/13/01 19:00	165	2.33	5.13
10/13/01 20:00	165	0.87	3.78	10/13/01 21:00	165	1.46	3.92
10/13/01 22:00	165	0.88	3.73	10/13/01 23:00	170	1.22	3.23
10/14/01 0:00	170	0.80	3.56	10/14/01 1:00	170	1.31	3.71
10/14/01 2:00	170	0.73	3.22	10/14/01 3:00	170	1.29	3.37
10/14/01 4:00	170	0.72	2.70	10/14/01 5:00	170	1.53	4.62
10/14/01 6:00	155	0.77	2.98	10/14/01 7:00	140	2.11	5.36
10/14/01 8:00	140	0.98	3.66	10/14/01 9:00	140	2.64	6.24
10/14/01 10:00	140	1.81	3.83	10/14/01 11:00	140	3.23	6.84
10/14/01 12:00	140	2.56	6.76	10/14/01 13:00	140	3.40	6.91
10/14/01 14:00	158	3.41	8.21	10/14/01 15:00	175	3.47	6.59
10/14/01 16:00	175	3.72	9.69	10/14/01 17:00	175	3.86	6.57
10/14/01 18:00	175	3.29	8.08	10/14/01 19:00	175	3.62	7.81
10/14/01 20:00	175	3.02	7.28	10/14/01 21:00	175	3.16	7.71
10/14/01 22:00	175	3.08	7.10	10/14/01 23:00	308	3.08	8.31
10/15/01 0:00	380	3.29	6.71	10/15/01 1:00	335	3.07	8.01
10/15/01 2:00	335	3.43	6.85	10/15/01 3:00	335	3.23	8.07
10/15/01 4:00	335	3.09	6.86	10/15/01 5:00	335	2.88	7.46
10/15/01 6:00	338	2.78	6.72	10/15/01 7:00	350	3.41	7.91
10/15/01 8:00	360	2.81	8.43				

Note: NS = not sampled.