Bay of Plenty Regional Council
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COMPLIANCE/IMPACT MONITORING REPORT

CHEMICAL CLEANING LIMITED

PERMIT No. 2027

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CONTENTS

CONTENTS i

CHAPTER ONE: INTRODUCTION 2

1.1 BACKGROUND 2
1.2 PLANT PROCESS 2

1.2.1 General 2

1.3 THE PERMIT 4

CHAPTER TWO: METHODOLOGY 5

2.1 JULIAN DATES 5
2.2 MEDIAN PERMIT LIMITS 5
2.3 TREND DETECTION 5
2.4 SCOPE OF THIS REPORT 5

CHAPTER THREE 7

3.1 GENERAL DESCRIPTION OF THE EFFLUENT 7
3.2 COMPLIANCE WITH PERMIT CONDITIONS 10

3.2.1 Compliance with permit instantaneous limits 10

3.2.1.1 Effluent flow 10
3.2.1.2 Effluent pH 10
3.2.1.3 Effluent suspended solids 14
3.2.1.4 Effluent total phosphorus 14
3.2.1.5 Effluent COD 14
3.2.1.6 Effluent conductivity 14
3.2.1.7 Effluent dissolved solids 14
3.2.1.8 Effluent total nitrogen 14

3.2.2 Compliance with permit median limits 21

3.2.2.1 Suspended solids 21
3.2.2.2 Total phosphorus 21

3.3 THE NATURE OF THE DISCHARGE 24

3.3.1 Effluent suspended solids daily mass discharge . . . 24
3.3.2 Effluent total phosphorus daily mass discharge . . . 27
3.3.3 Effluent COD daily mass discharge 27
3.3.4 Effluent dissolved solids daily mass discharge 27
3.3.5 Effluent total nitrogen daily mass discharge 27
3.3.6 Comparison between years 30
3.3.7 Relationships between effluent parameters 30

CHAPTER FOUR 39

4.1 Compliance with permit instantaneous limits 39
4.2 Compliance with permit median limits 39
4.3 Overall compliance 39

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND

The Bay of Plenty Regional Water Board granted Chemical Cleaning Limited a right to discharge up to 300 m^3/day of stormwater and wastewater into Tauranga Harbour on 28 March 1988. This right has the same expiry date as that of the nearby discharge permit for the Bay of Plenty Fertiliser Company Limited, being 31 May 1992.

The right relates to the discharge of stormwater and wastewater arising from the activities associated with the importation, storage, formulation and distribution of bulk liquid industrial chemicals.

Following the granting of Water Right 1507 on 05 September 1984, Chemical Cleaning Limited installed a wastewater treatment plant which provided retention of all wastewater; batch treatment, if necessary, to achieve the pH standard set by the Water Right; and discharge of wastewater, in batch lots of 40 m^3, into the culvert which eventually discharges to Tauranga Harbour. Discharges were restricted, in so far as was possible, to the outgoing tide period.

This Technical Report provides an assessment of the present status of compliance of the Company with the existing discharge permit conditions imposed on WR2027.

1.2 PLANT PROCESS

1.2.1 General

Chemical Cleaning Limited is New Zealand's leading bulk liquid chemical importation, storage, and transport company. At their Mount Maunganui plant they receive, store, blend and distribute process and cleaning chemicals to the dairy, food, energy, metal finishing and pulpm and paper industries in particular.

They import caustic soda, caustic potash and nitric acid by tanker and various other acids, dtergents and sequestrants in drums and bags. They also purchase large quantities of locally manufactured sulphuric and hydrochloric acids, sodium hypochlorite and sanitisers. These are then distributed or blended for use as process or cleaning chemicals for their customers throughout the North Island. Distribution is by their fleet of tankers or via drums and 20 litre containers.

A significant portion of their discharge is from cooling water containing no contamination, and rainfall which may contain minimal chemical contamination but may entrain significant levels of suspended solids in the form of sediments. The remainder of the discharge arises from the washing of the tanker fleet and processing and storage vessels, which results mainly in sodium sulphate and water when neutralised by the treatment plant. The other materials mentioned in Water Right 2027 arise from the 'active agents' present in the blended products at low levels in comparison to the major constituents (ie caustic soda, sulphuric, nitric and phosphoric acids).

Table 1.1 provides a summary of the components of the treated wastewater, and their approximate concentrations with zero stormwater content.

Table 1.1 Components of treated wastewater and approximate concentrations with zero stormwater content (as at 22/07/91).

PARAMETER	Concentration (g/m3)	Frequency present in discharge
Sodium sulphate	42500	Daily
Sodium chloride	2000	Daily
Sodium nitrate	2500	Daily
Sodium phosphate	1000	Daily
Sodium gluconates (1)	1250	Daily
Sodium glucoheptonates (2)	1250	Occasional
Sodium phosphonates (3)	1250	Daily
Sodium salts of:		
EDTA (ethylenediaminetetraacetic acid)	250	Monthly on 1 day
NTA (nitrilotriacetic acid)	250	3 - 4 times per annum on 1 day
Sodium mercaptobenzothiazole	250	1 - 2 times per month on 1 day
Detergent:		
Nonyl phenol ethylene oxide type - non-ionic	250	Daily
DDBSA (dodecylbenzenesulphonic acid) - anionic	250	Daily
Sanitiser:		
QAC (quaternary ammonium compounds)	100	2 - 3 days per week

(1) gluconates are in alkaline products

(2) glucoheptonate is added to two products

(3) phosphonate is added to two acid and four caustic products.

1.3 THE PERMIT

The permit granted to Chemical Cleaning Limited (No. 2027) places a number of restrictions on the Company with respect to the discharge of effluent.

Firstly, Condition 2 states that the daily quantity of effluent discharged is not to exceed 300 m^3 and the rate of discharge shall not exceed 30.0 litres per second.

Secondly, Condition 3.2 requires the Company to ensure that effluent is discharged from the outfall only during the period between high tide and low tide at the outfall point except when the quantity of stormwater runoff exceeds the storage capacity of the treatment plant.

Additionally, Condition 6 places a number of conditions on effluent quality, being:

- the pH shall be within the range 6.0 - 9.0;
- the suspended solids concentration shall not exceed 800 g/m^3, nor shall the median concentration of not less than nine samples in a 65 day period exceed 400 g/m^3;
- the total phosphorus concentration shall not exceed 200 g/m^3, nor shall the median concentration of not less than nine samples in a 65 day period exceed 100 g/m^3;

with all of the above being measured from representative batches of effluent at weekly intervals (Condition 7).

Thirdly, Condition 7 requires the permit holder to furnish, at six monthly intervals, information on:

(a) the volume of effluent discharged each day and the time at which the batch discharge commenced;

(b) the pH of each batch discharged;

(c) the concentration and mass of the following effluent constituents obtained by analysis of a representative sample of effluent taken from one batch per week:

(i) suspended solids
(ii) total dissolved solids
(iii) total nitrogen
(iv) total phosphorus
(v) chemical oxygen demand.

CHAPTER TWO

METHODOLOGY

2.1 JULIAN DATES

Appendix 1 presents permit return data for the three-year period 01 April 1988 to 31 March 1991.

In order to undertake trend analyses and handle time-related data efficiently, dates have been translated into Julian dates. These are not true Julian dates, but convenient shortened versions. The 'Julian' dates reported here are calculated as the number of days since 30 December 1899. Julian dates are presented for all sampling occassions listed in Appendix 1.

The location of Chemical Cleaning Limited is shown in Figure 2.1.

2.2 MEDIAN PERMIT LIMITS

Compliance with the median limits placed on various parameters has been expressed as 'medians-for-the-period-ending' values (Appendix 2). As an example, the median total phosphorus concentration of 99 g/m^3 recorded for 01/06/88 (Appendix 2) is that median of the nine samples taken within a 65-day period prior to and including the 01/06/88.

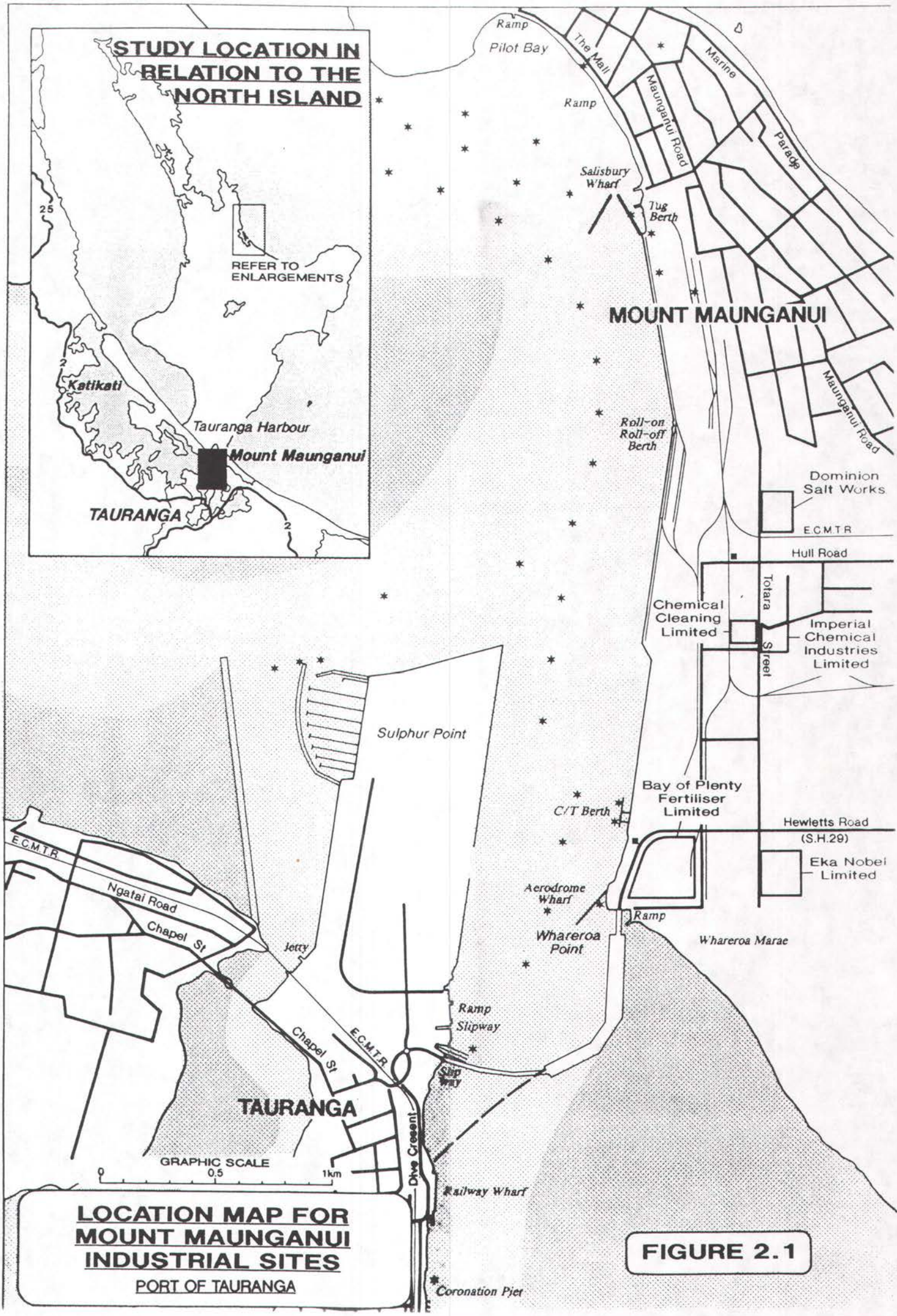
2.3 TREND DETECTION

A Lilliefors analysis showed that COD, suspended solids, total phosphorus, dissolved solids and total nitrogen daily mass discharge data were all non-normal.

Consequently, a non-parametric regression method was used to assess the significance of any temporal trends in effluent parameter mass discharges. Regression analysis was performed on ranked data.

2.4 SCOPE OF THIS REPORT

This report deals in detail with those returns data relating to post-01 June 1988.



LOCATION MAP FOR MOUNT MAUNGANUI INDUSTRIAL SITES

PORT OF TAURANGA

FIGURE 2.1

CHAPTER THREE

PERMIT COMPLIANCE

3.1 GENERAL DESCRIPTION OF THE EFFLUENT

Table 3.1 provides yearly summary statistics for various effluent parameters. The dataset commences 01 April 1988, and ends 31 March 1991 (allowing consideration of a full three year period).

Mean daily effluent flow has dropped from a mean of 74 m^3/day in 1988 and 1989, to 68 m^3/day in 1990, and further to 47 m^3/day in 1991 (a 36% reduction since 1988).

Effluent COD and total phosphorus mass discharges decreased substantially over this period, whereas dissolved solids and total nitrogen did not. Effluent suspended solids mass dicharges actually showed a significant increase in 1990. Effluent suspended solids mass dicharges during 1991 have been highly variable to date.

When maximum effluent concentrations discharged during each year are considered, there has been a marked and consistent reduction in maximum COD concentrations from a high of 4320 g/m^3 in 1988 to a low of 1030 g/m^3 for 1991 to date. On the other hand, dissolved solids concentrations have shown a consistent increase in maximum concentrations over the same period. Dissolved solids maximum concentrations increased from a low of 41,550 g/m^3 in 1988 to a high of 57,900 g/m^3 in 1991 to date. Annual maximums for suspended solids, total nitrogen and total phosphorus were all highly variable. The highest maximum suspended solids concentration was recorded in 1990 (2520 g/m^3). A particularly high total nitrogen maximum value of 2230 g/m^3 was recorded in 1989 (the highest value to date in 1991 is 670 g/m^3). Maximum total phosphorus levels are approximately the same to date in 1991 (948 g/m^3) as in 1988 (956 g/m^3). In 1990, however, maximum total phosphorus concentrations reached only 172 g/m^3.

Table 3.1 Descriptive statistics for the Chemical Cleaning Limited effluent discharge, from 1988 until the present.

1988
TOTAL OBSERVATIONS = 275

STATISTIC	Effluent flow (m3/day)	pH	COD (g/m3)	COD (kg/day)	Conductivity (millimhos)	Dissolved solids (g/m3)	Dissolved solids (kg/day)	Suspended solids (g/m3)	Suspended solids (kg/day)	Total nitrogen (g/m3)	Total nitrogen (kg/day)	Total phosphorus (g/m3)	Total phosphorus (kg/day)
N OF CASES	265.0	39.0	39.0	38.0	39.0	39.0	38.0	39.0	38.0	38.0	37.0	39.0	38.0
MEAN	74.3	7.4	581.4	59.5	10.1	9396.0	1031.9	235.9	25.2	85.8	9.0	191.7	18.4
MEDIAN	80.0	7.2	311.0	30.7	7.8	6900.0	820.7	145.0	16.2	35.0	4.3	93.0	9.1
MINIMUM	0.0	1.3	59.0	2.2	0.7	640.0	101.6	20.0	3.6	5.0	0.4	1.0	0.2
MAXIMUM	280.0	12.9	4320.0	345.6	36.6	41550.0	3324.0	1230.0	98.4	320.0	46.2	956.0	83.3
RANGE	280.0	11.6	4261.0	343.4	35.9	40910.0	3222.4	1210.0	94.8	315.0	45.8	955.0	83.1
STANDARD DEV	58.8	2.0	834.0	77.1	8.0	7846.0	862.7	237.6	24.6	99.7	12.0	253.6	24.1
VARIANCE	3385.4	4.0	695473.3	5950.4	64.8	61562400.0	744329.8	56459.4	602.6	9941.1	143.1	64326.4	578.6
STD. ERROR	3.6	0.3	133.5	12.5	1.3	1256.0	140.0	38.0	4.0	16.2	2.0	40.6	3.9
C.V.	0.8	0.3	1.4	1.3	0.8	0.8	0.8	1.0	1.0	1.2	1.3	1.3	1.3
SKEWNESS(G1)	0.7	0.5	3.0	2.3	1.7	2.2	1.2	2.4	1.6	1.2	1.8	1.6	1.6
KURTOSIS(G2)	0.2	2.7	9.7	5.1	2.9	5.8	0.8	6.8	1.7	0.1	2.4	1.6	1.4

1989
TOTAL OBSERVATIONS = 365

STATISTIC	Effluent flow (m3/day)	pH	COD (g/m3)	COD (kg/day)	Conductivity (millimhos)	Dissolved solids (g/m3)	Dissolved solids (kg/day)	Suspended solids (g/m3)	Suspended solids (kg/day)	Total nitrogen (g/m3)	Total nitrogen (kg/day)	Total phosphorus (g/m3)	Total phosphorus (kg/day)
N OF CASES	365.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	51.0	51.0	52.0	52.0
MEAN	74.1	7.1	408.8	37.6	7.4	6714.4	652.0	272.5	27.0	163.2	15.5	119.3	10.9
MEDIAN	65.0	7.1	246.0	20.6	5.1	4335.0	366.8	185.0	18.0	30.0	2.9	44.5	3.7
MINIMUM	0.0	5.8	5.0	0.0	0.6	480.0	0.0	30.0	0.0	10.0	0.0	4.0	0.0
MAXIMUM	395.0	9.9	2850.0	285.0	41.8	48900.0	6650.4	930.0	142.2	2230.0	303.3	810.0	67.4
RANGE	395.0	4.1	2845.0	285.0	41.2	48420.0	6650.4	900.0	142.2	2220.0	303.3	806.0	67.4
STANDARD DEV	62.3	0.8	470.9	47.4	7.5	8059.9	985.3	213.9	28.2	395.8	47.4	175.2	15.9
VARIANCE	3875.5	0.6	221731.8	2248.6	56.4	64961600.0	970838.2	45740.7	797.7	156693.8	2243.0	30706.5	253.4
STD. ERROR	3.3	0.1	65.3	6.6	1.0	1117.7	136.6	29.7	3.8	55.4	6.6	24.3	2.2
C.V.	0.8	0.1	1.2	1.3	1.0	1.2	1.5	0.8	1.0	2.4	3.1	1.5	1.5
SKEWNESS(G1)	1.5	1.3	3.2	3.1	2.8	3.5	4.6	1.5	2.2	3.8	5.0	2.1	1.8
KURTOSIS(G2)	3.8	2.8	12.6	12.6	8.6	14.0	24.7	1.6	5.4	14.7	26.1	4.0	2.5

Table 3.1 (Continued) Descriptive statistics for the Chemical Cleaning Limited effluent discharge, from 1988 until the present.

1990
TOTAL OBSERVATIONS = 365

STATISTIC	Effluent flow (m3/day)	pH	COD (g/m3)	COD (kg/day)	Conductivity (millimhos)	Dissolved solids (g/m3)	Dissolved solids (kg/day)	Suspended solids (g/m3)	Suspended solids (kg/day)	Total nitrogen (g/m3)	Total nitrogen (kg/day)	Total phosphorus (g/m3)	Total phosphorus (kg/day)
N OF CASES	365.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0
MEAN	67.7	7.0	442.1	36.2	7.0	6773.8	546.1	467.9	39.5	63.6	5.4	38.5	2.9
MEDIAN	65.0	6.7	310.0	24.1	6.2	5415.0	394.0	350.0	26.2	30.0	2.1	21.5	2.0
MINIMUM	0.0	5.7	30.0	3.8	1.2	780.0	75.0	100.0	6.3	10.0	0.5	4.0	0.3
MAXIMUM	432.0	12.9	1810.0	249.7	29.5	52040.0	3434.6	2520.0	172.6	310.0	37.2	172.0	17.5
RANGE	432.0	7.2	1780.0	245.9	28.3	51260.0	3359.6	2420.0	166.3	300.0	36.7	168.0	17.2
STANDARD DEV	57.5	1.1	393.0	40.0	4.8	7553.2	610.5	399.4	35.8	69.6	7.0	39.2	3.2
VARIANCE	3300.5	1.1	154432.7	1603.6	22.7	57051100.0	372734.7	159530.7	1278.3	4843.5	49.3	1535.2	10.4
STD. ERROR	3.0	0.1	54.5	5.6	0.7	1047.4	84.7	55.4	5.0	9.7	1.0	5.4	0.4
C.V.	0.9	0.2	0.9	1.1	0.7	1.1	1.1	0.9	0.9	1.1	1.3	1.0	1.1
SKEWNESS(G1)	2.1	3.6	1.8	3.4	2.5	4.5	3.5	2.9	1.9	1.6	2.4	1.8	3.1
KURTOSIS(G2)	8.8	16.9	2.9	14.3	8.8	23.6	13.4	11.6	3.7	2.2	6.7	2.7	10.7

1991
TOTAL OBSERVATIONS = 90

STATISTIC	Effluent flow (m3/day)	pH	COD (g/m3)	COD (kg/day)	Conductivity (millimhos)	Dissolved solids (g/m3)	Dissolved solids (kg/day)	Suspended solids (g/m3)	Suspended solids (kg/day)	Total nitrogen (g/m3)	Total nitrogen (kg/day)	Total phosphorus (g/m3)	Total phosphorus (kg/day)
N OF CASES	90.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
MEAN	46.7	7.5	568.5	31.4	8.7	11983.1	901.0	583.1	31.6	161.9	12.0	113.2	4.2
MEDIAN	34.0	7.1	520.0	20.8	7.9	7930.0	308.5	390.0	23.1	70.0	2.2	33.0	1.3
MINIMUM	0.0	6.3	140.0	0.0	4.9	3670.0	0.0	240.0	0.0	15.0	0.0	13.0	0.0
MAXIMUM	267.0	10.2	1030.0	111.4	17.1	57900.0	7411.2	1600.0	192.0	670.0	85.8	948.0	30.3
RANGE	267.0	3.9	890.0	111.4	12.2	54230.0	7411.2	1360.0	192.0	655.0	85.8	935.0	30.3
STANDARD DEV	44.5	1.2	304.2	32.0	3.4	14250.5	1974.3	453.2	49.1	229.5	24.2	253.2	8.1
VARIANCE	1984.4	1.5	92547.4	1021.2	11.5	203077000.0	3898041.0	205406.4	2412.9	52652.2	586.0	64094.2	65.1
STD. ERROR	4.7	0.3	84.4	8.9	0.9	3952.4	547.6	125.7	13.6	63.6	6.7	70.2	2.2
C.V.	1.0	0.2	0.5	1.0	0.4	1.2	2.2	0.8	1.6	1.4	2.0	2.2	1.9
SKEWNESS(G1)	1.8	1.0	0.2	1.4	1.2	2.8	3.1	1.6	3.0	1.5	2.4	3.1	2.9
KURTOSIS(G2)	5.7	-0.1	-1.5	1.0	0.9	6.8	7.7	0.9	7.3	0.6	4.9	7.7	6.9

3.2 COMPLIANCE WITH PERMIT CONDITIONS

3.2.1 Compliance with permit instantaneous limits

3.2.1.1 Effluent flow

Of the various effluent parameters limited by the discharge permit, effluent flow and pH are free of any requirement to meet a median limitation. Other effluent parameters controlled by the permit (suspended solids and total phosphorus) have both median and instantaneous limits placed on them. Other effluent parameters are required to be reported, but do not have limits placed upon them (total dissolved solids, total nitrogen and Chemical Oxygen Demand (COD)).

The instantaneous limits are discussed below.

Daily effluent flows are shown in Figure 3.1. The daily flow limitation was exceeded on eight occasions during the period April 1988 - March 1991 (0.7% of sampling occasions).

A limitation is also placed on the total monthly effluent discharge, which must not exceed 3,000 m^3/month. This permit limitation has not been breached during the period April 1988 - March 1991 (Figure 3.2).

3.2.1.2 Effluent pH

Figure 3.3 presents effluent pH compliance. The pH compliance limits of 6 and 9 have been breached on 18 occasions during the three year period to March 1991. A unique extremely acid discharge occured on 20 September 1988. Three caustic discharges in excess of 12 have occurred during the three year period considered (Figure 3.3).

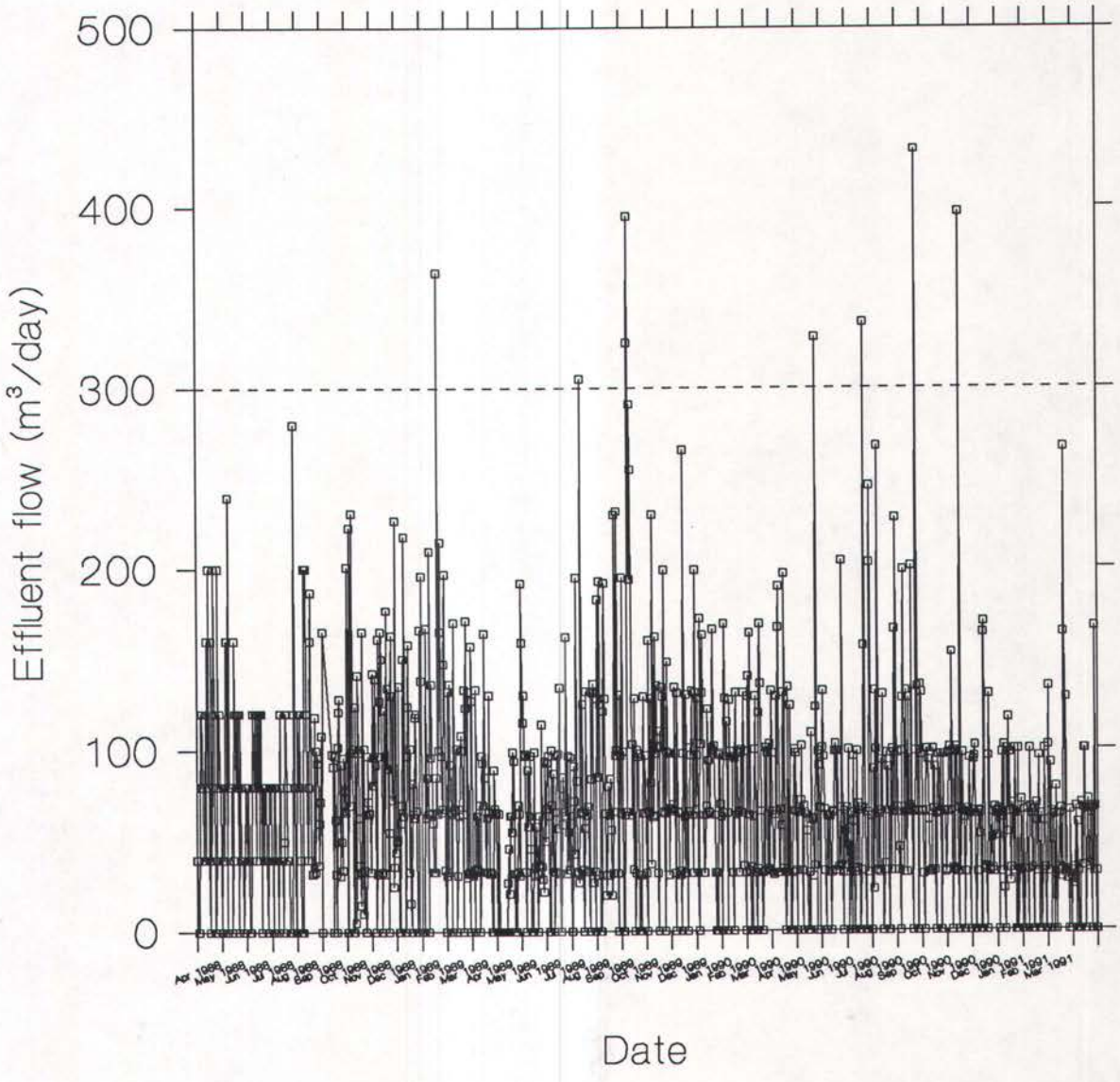


Figure 3.1 Chemical Cleaning Limited. Daily effluent flow compliance. The WR2027 consent limit of 300 m^3/day is shown.

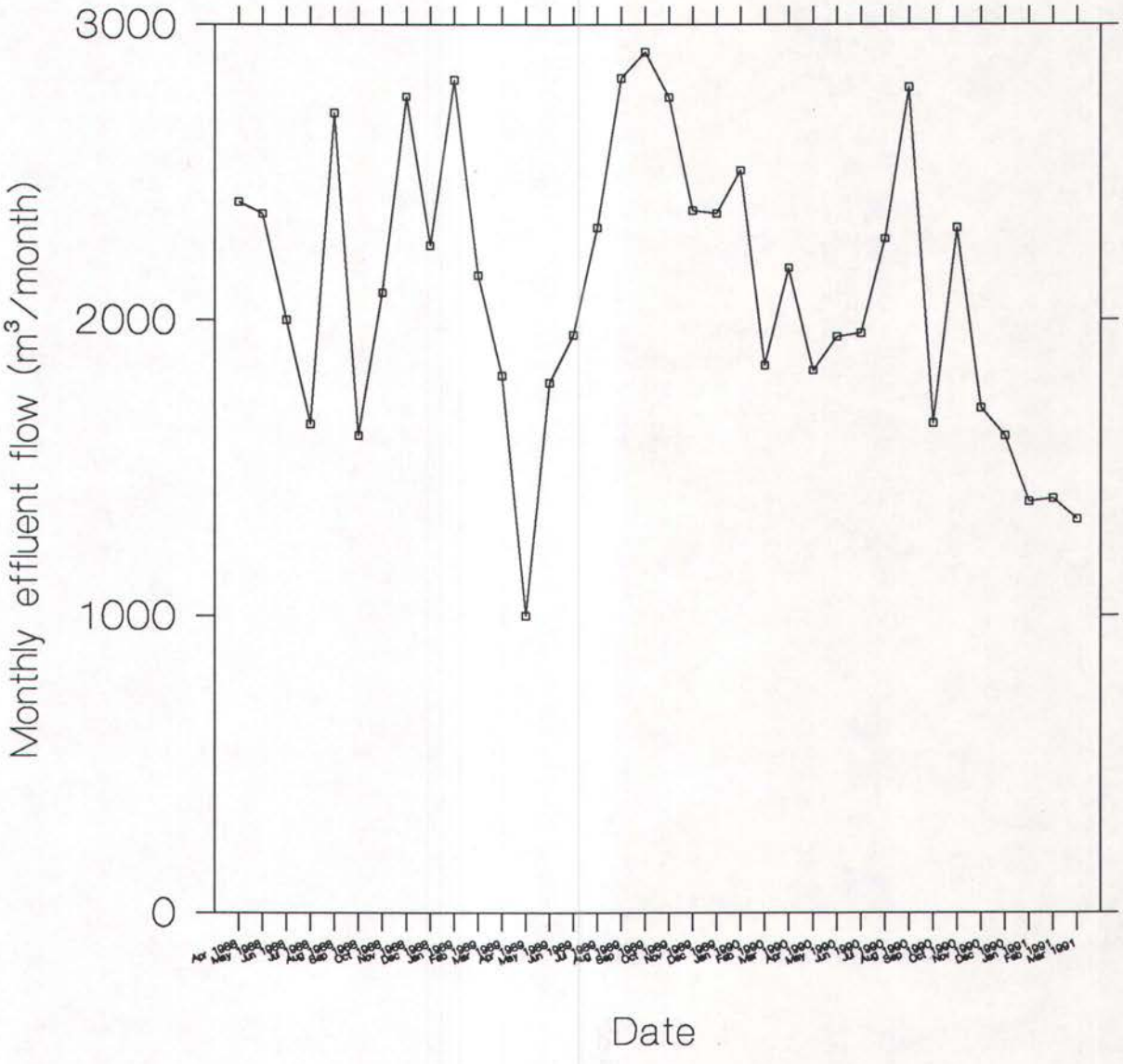


Figure 3.2 Chemical Cleaning Limited. Total monthly effluent flow compliance. The WR2027 consent limit of 3000 m^3/month is shown.

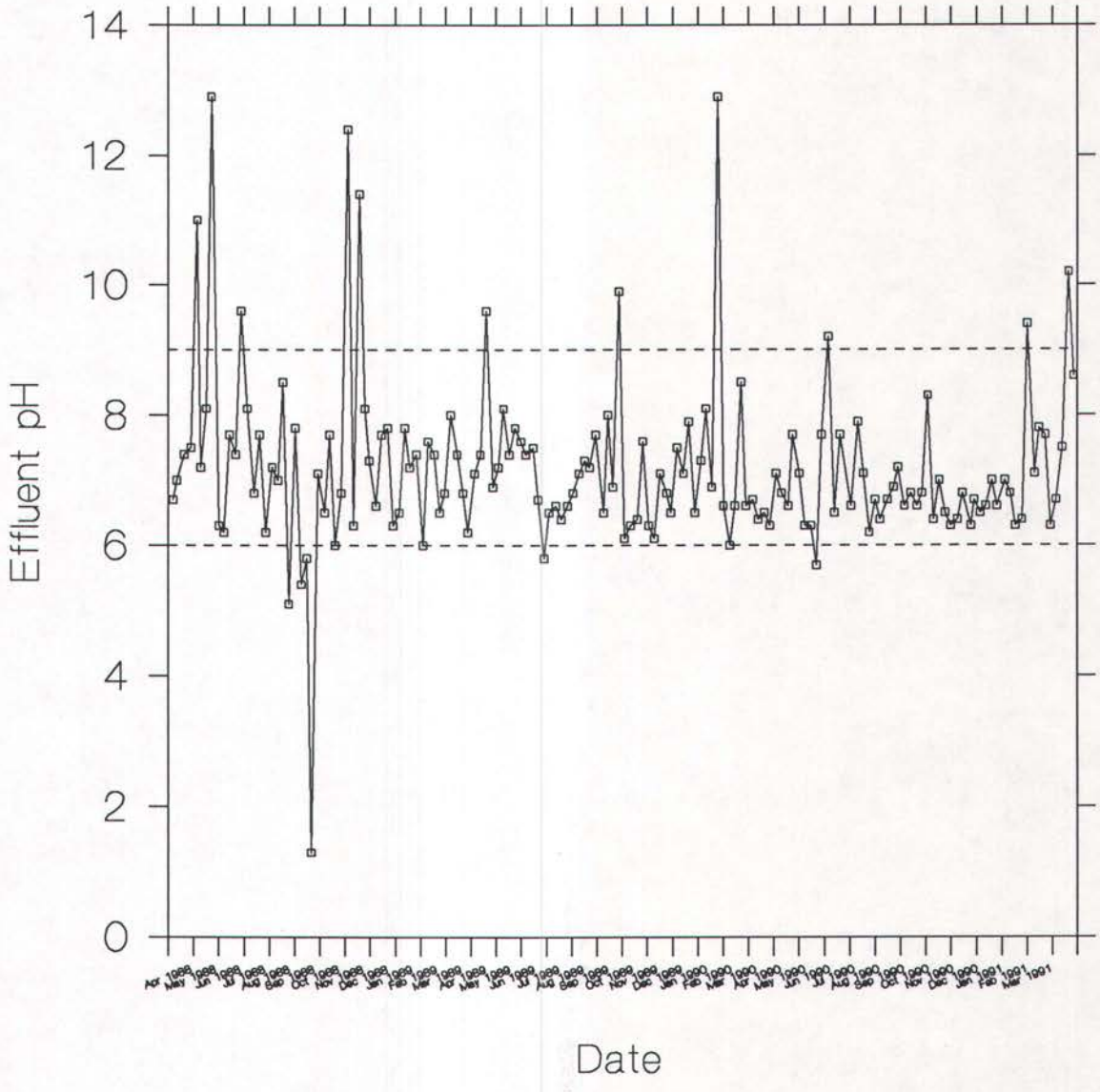


Figure 3.3 Chemical Cleaning Limited. Effluent pH compliance.
The WR2027 consent limits of 6.0 and 9.0 are shown.

3.2.1.3 Effluent suspended solids

Figure 3.4 presents effluent suspended solids. The effluent suspended solids limit (800 g/m^3) has been breached on 12 of 156 sampling occasions (8%) over the past three years. Non-compliance has increased both in frequency and degree over the past three years, with the instantaneous suspended solids limitation of 800 g/m^3 being exceeded by up to 215%, as on 17 July 1990 (Appendix 1).

3.2.1.4 Effluent total phosphorus

Figure 3.5 presents effluent total phosphorus. Compliance with the effluent total phosphorus limit (200 g/m^3) has improved from a pre-1990 figure in excess of 20% to approximately 1.5% of sampling occasions for the period commencing January 1990.

3.2.1.5 Effluent COD

Figure 3.6 presents effluent COD. Mean COD concentrations in 1991 are similar to those recorded in 1988 (Table 3.1).

3.2.1.6 Effluent conductivity

Figure 3.7 presents effluent conductivity. Effluent conductivities stabilised over the latter half of the three year period shown in Figure 3.7.

3.2.1.7 Effluent dissolved solids

Figure 3.8 presents effluent dissolved solids. Although effluent discharge volumes have dropped considerably since 1981, effluent dissolved solids concentrations have not shown a concommitant increase.

3.2.1.8 Effluent total nitrogen

Figure 3.9 presents effluent total nitrogen. Total nitrogen concentrations vary widely from year to year. In 1988, the mean effluent total nitrogen concentration was 86 g/m^3. In 1989, this doubled to 163 g/m^3. In 1990, this dropped by 60% to 64 g/m^3, while in 1991, mean effluent total nitrogen concentrations again increased to 162 g/m^3.

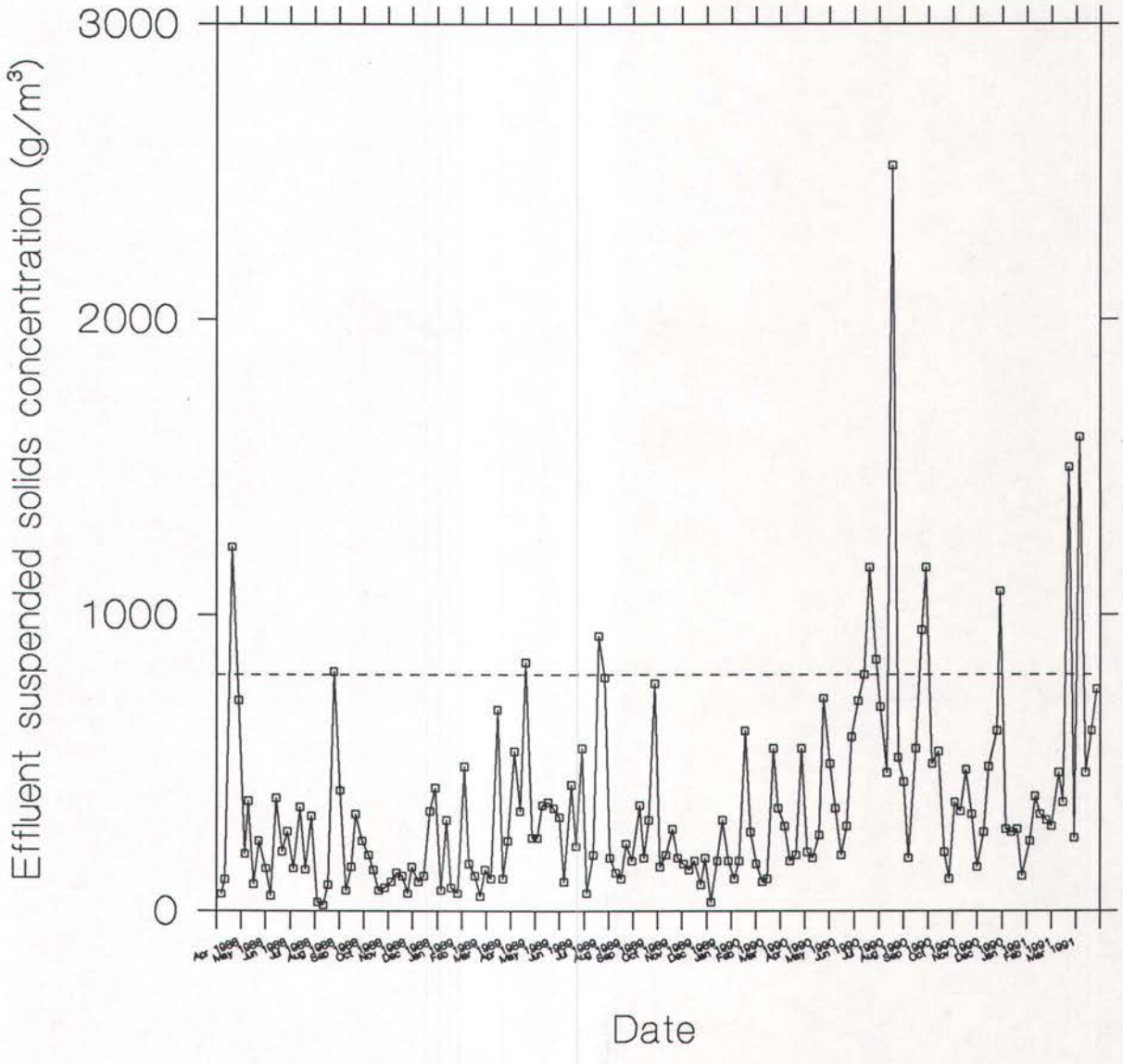


Figure 3.4 Chemical Cleaning Limited. Effluent suspended solids concentration. The WR2027 consent limit of 800 g/m³ is shown.

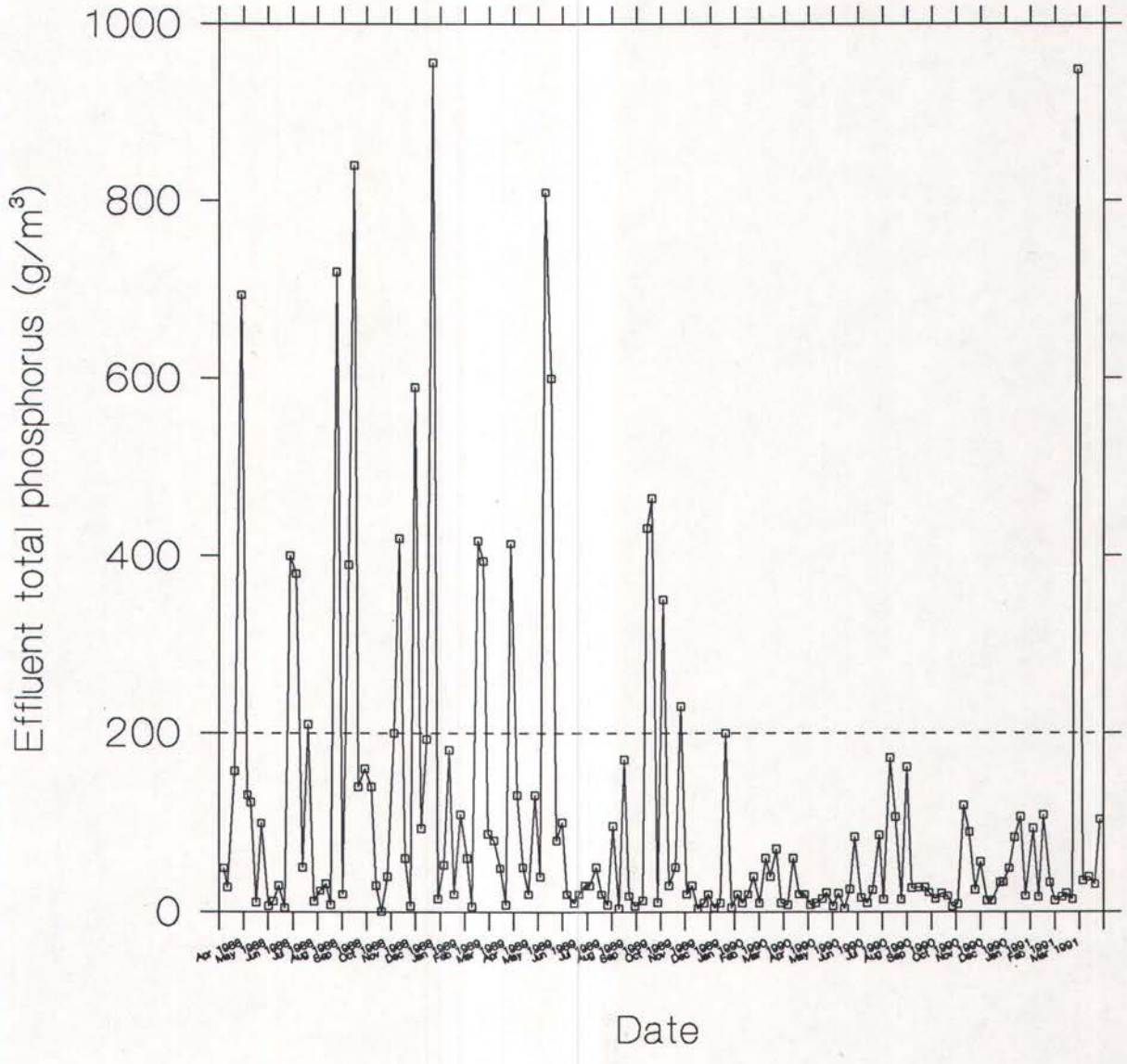


Figure 3.5 Chemical Cleaning Limited. Effluent total phosphorus compliance. The WR2027 consent limit of 200 g/m^3 is shown.

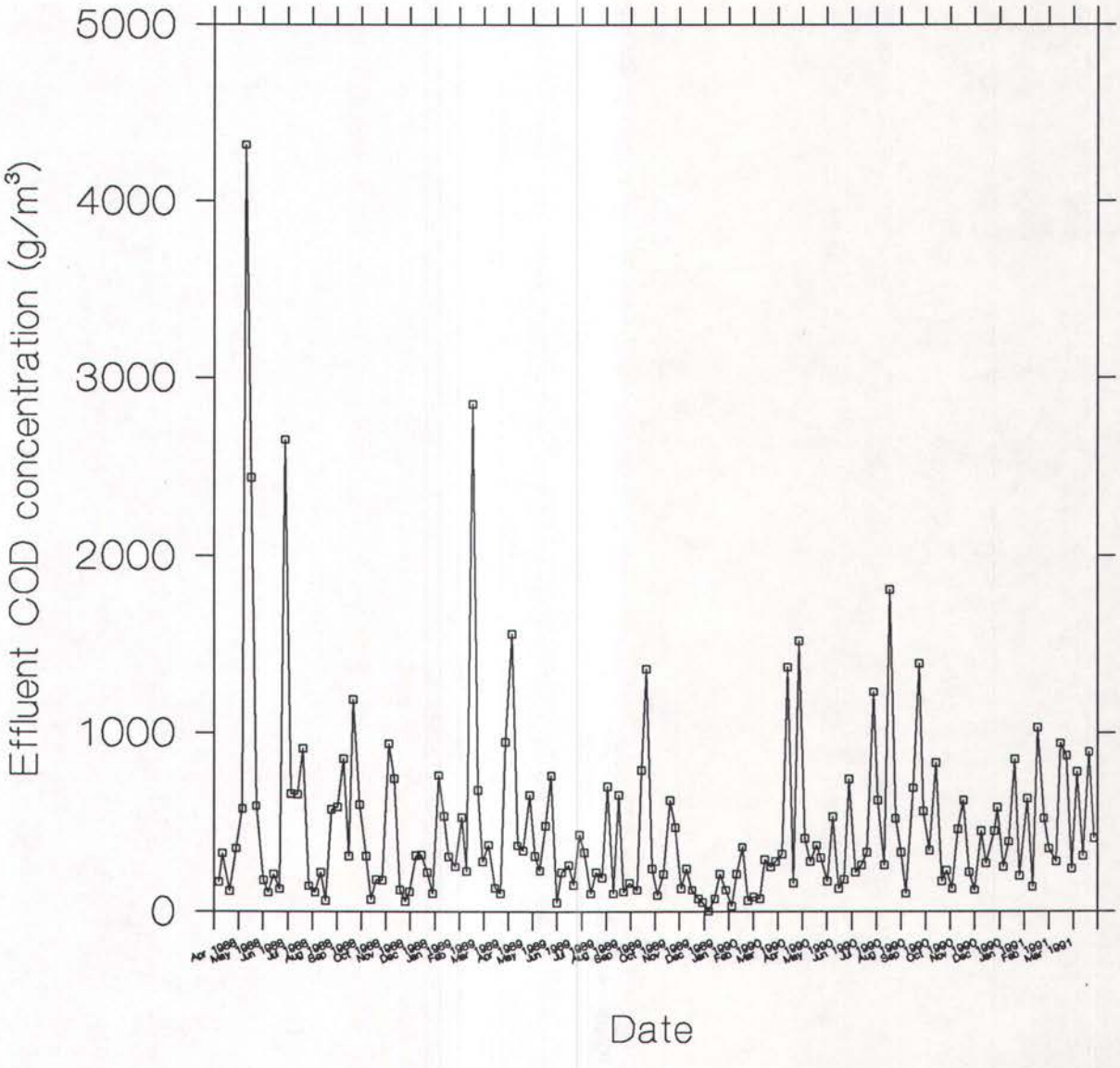


Figure 3.6 Chemical Cleaning Limited. Effluent COD concentration.

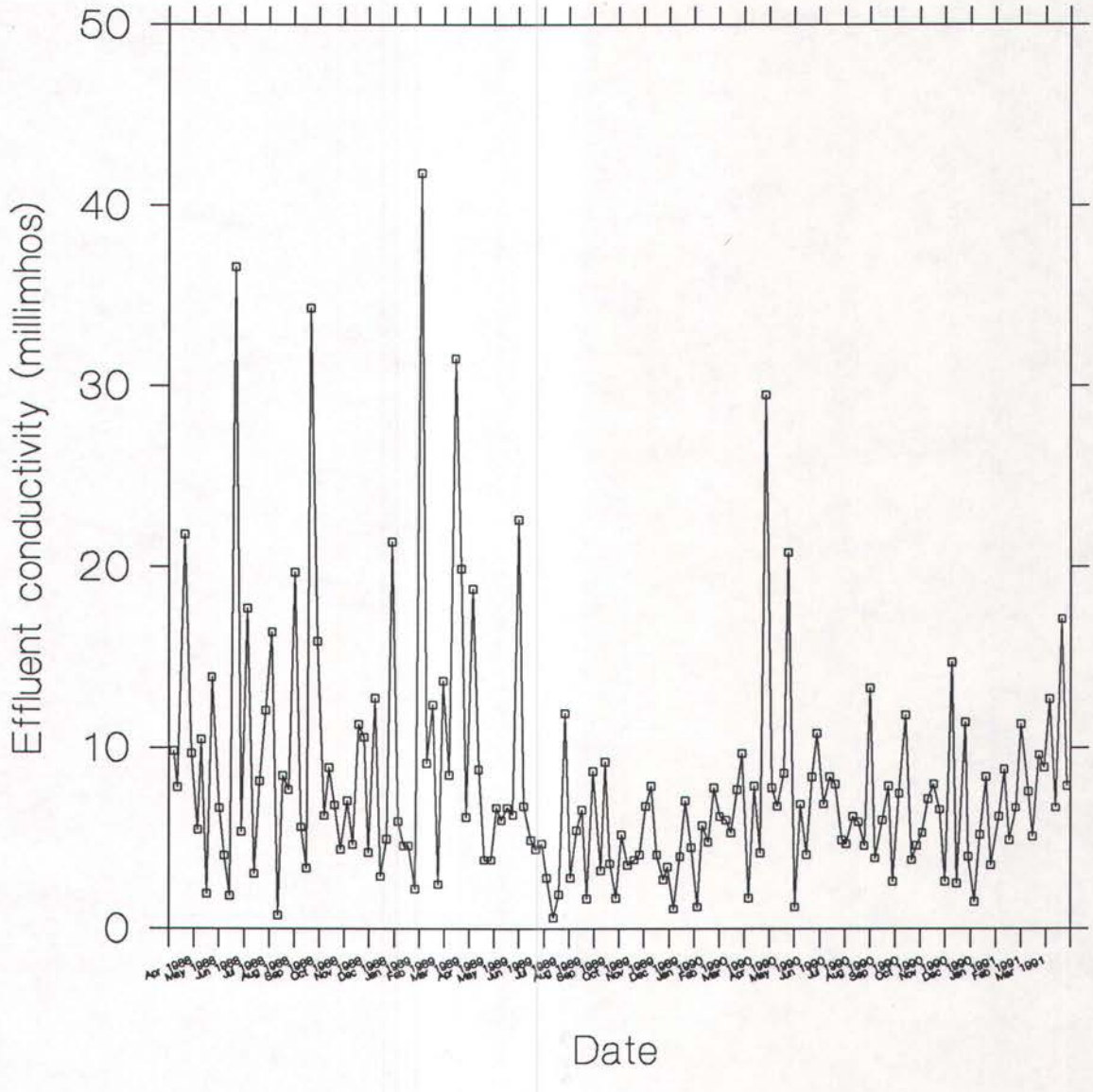


Figure 3.7 Chemical Cleaning Limited. Effluent conductivity.

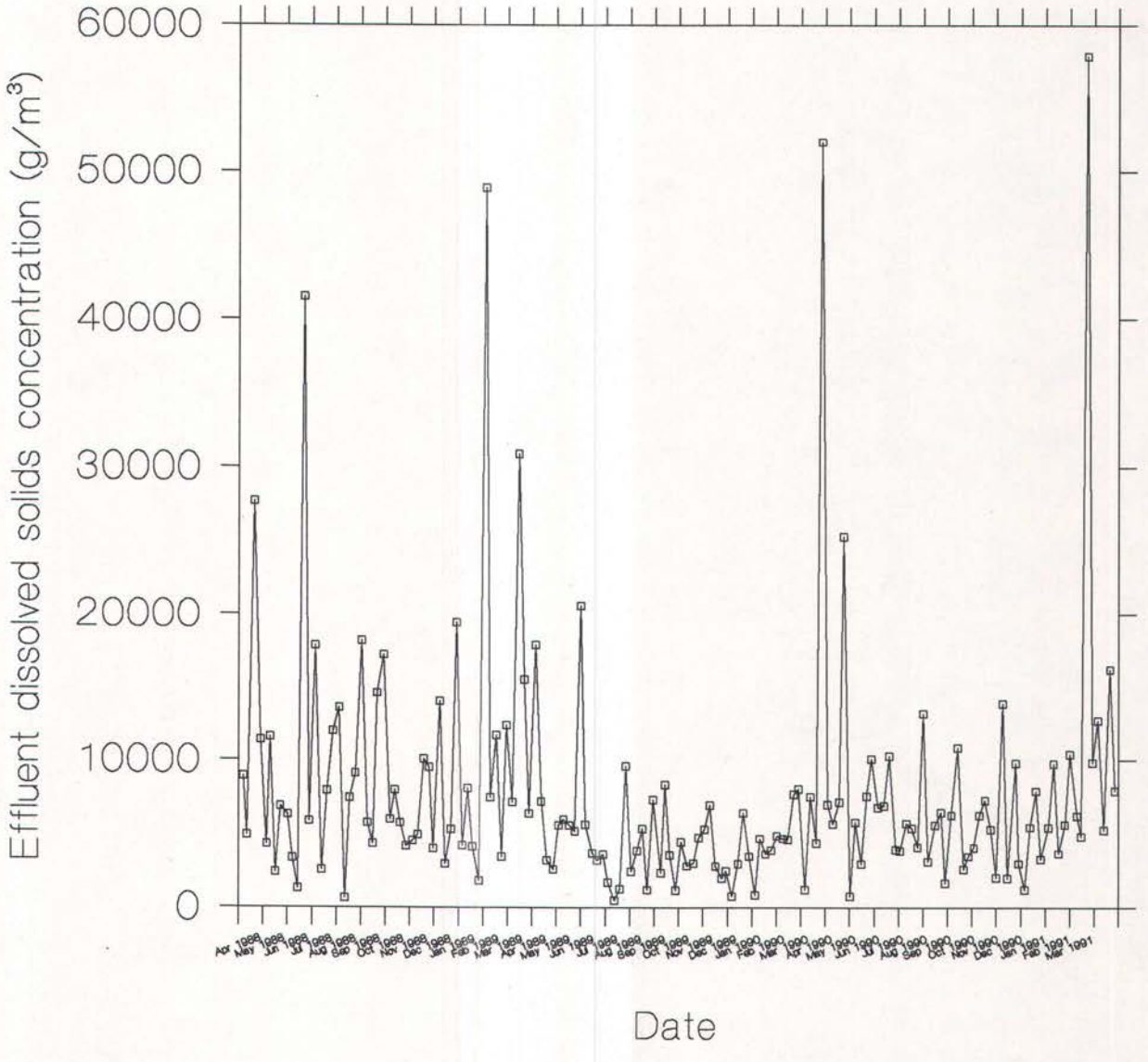


Figure 3.8 Chemical Cleaning Limited. Effluent dissolved solids concentration.

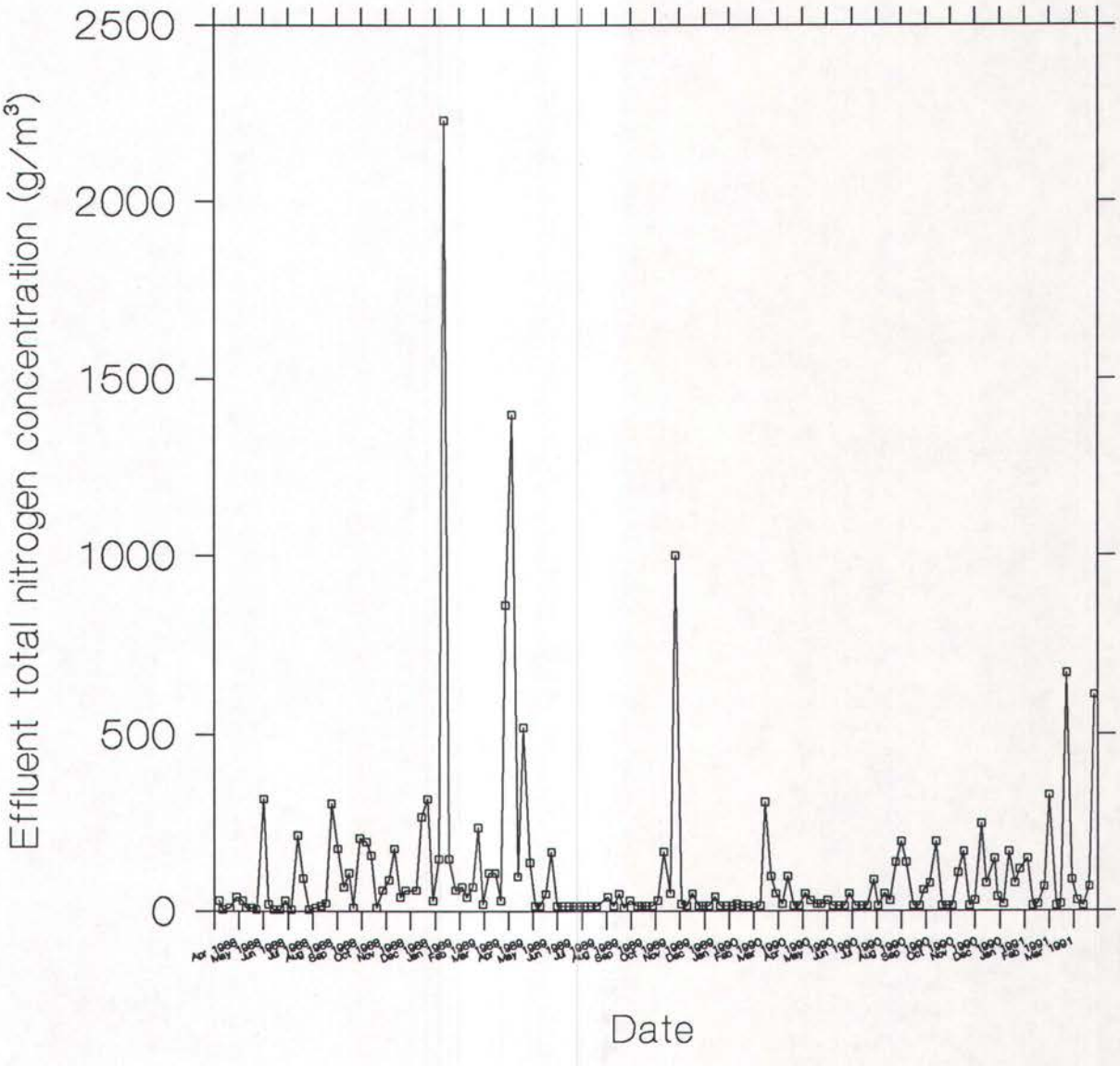


Figure 3.9 Chemical Cleaning Limited. Effluent total nitrogen concentration.

3.2.2 Compliance with permit median limits

3.2.2.1 Suspended solids

Figure 3.10 displays compliance with the effluent suspended solids concentration median permit limit of 400 g/m^3. The permit limit has been breached on 14% of sampling occasions over the three year period commencing April 1988. While non-compliance with the effluent suspended solids median permit limit was at its worst in 1990, decreased effluent flows have meant in practice that the overall mass discharge of suspended solids has reduced, and was actually at its lowest for the three year period in 1990 (Table 3.1).

3.2.2.2 Total phosphorus

Figure 3.11 displays compliance with the effluent total phosphorus concentration median permit limit of 100 g/m^3. The permit limit has been breached on 9% of sampling occasions over the three year period commencing April 1988. Non-compliance occurred exclusively in the period prior to mid-1989.

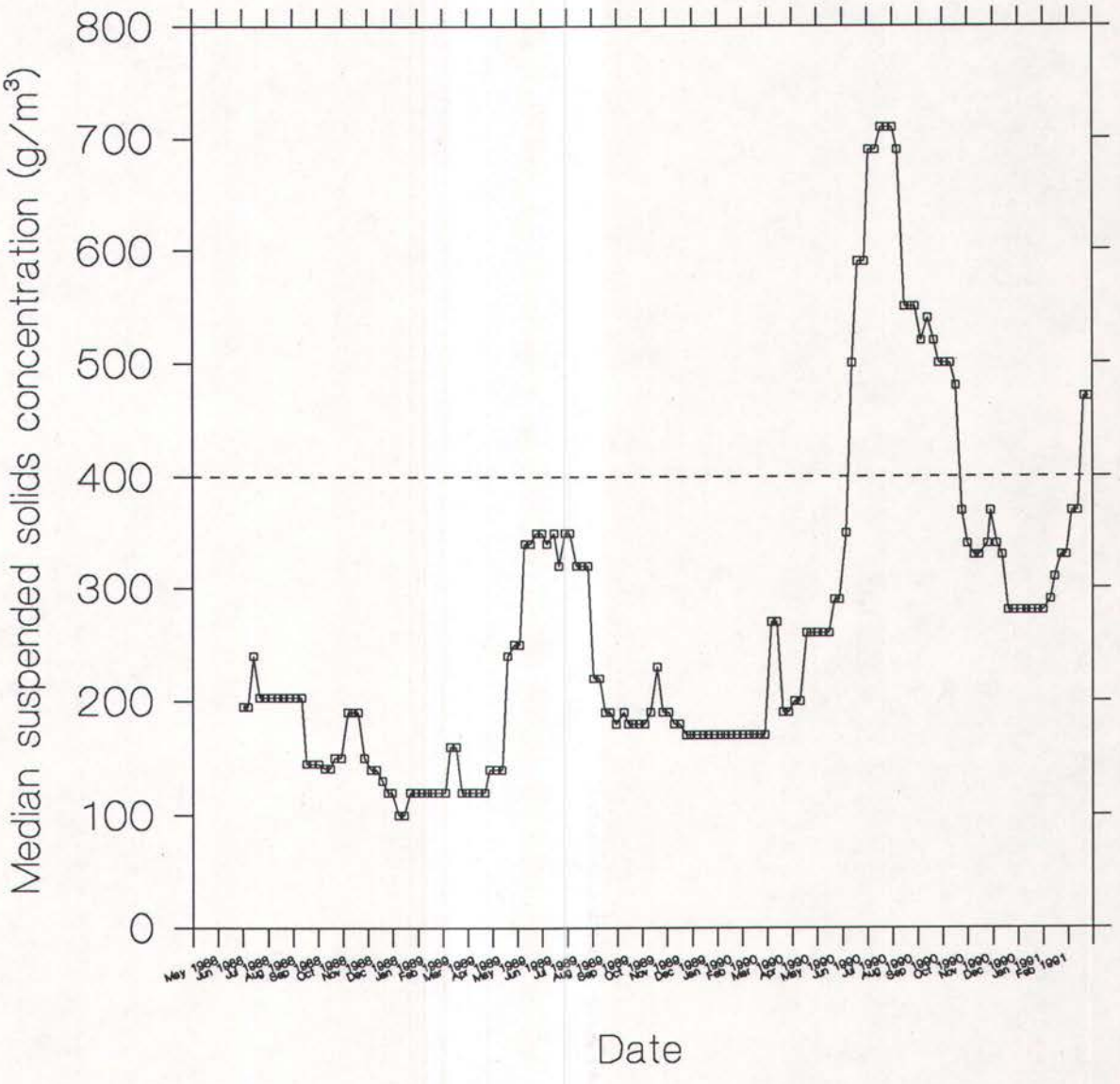


Figure 3.10 Chemical Cleaning Limited. Median effluent suspended solids compliance. The WR2027 consent limit of 400 g/m³ is shown.

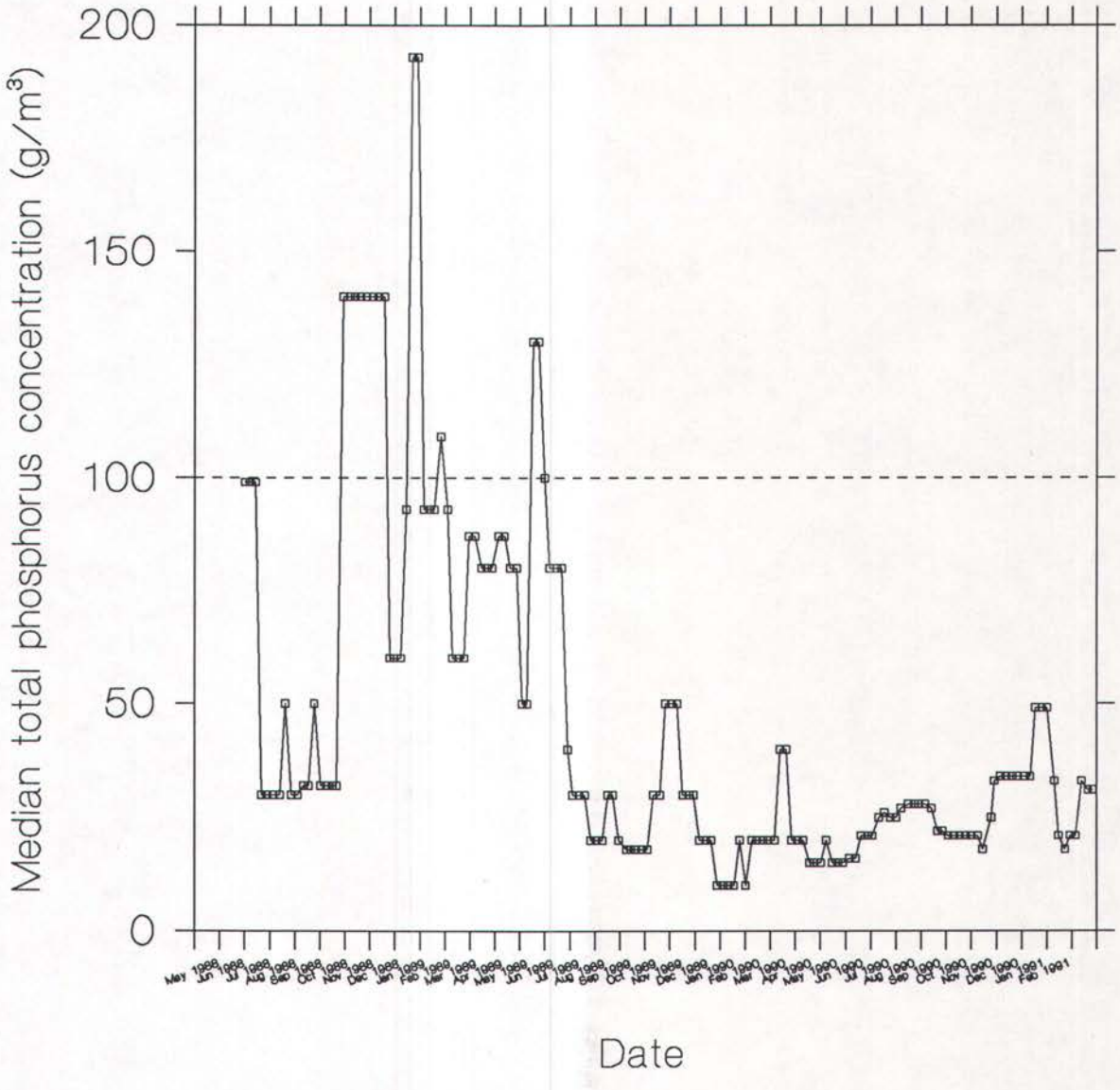


Figure 3.11 Chemical Cleaning Limited. Median effluent total phosphorus concentration compliance. The WR2027 consent limit of 100 g/m³ is shown.

3.3 THE NATURE OF THE DISCHARGE

3.3.1 Effluent suspended solids daily mass discharge

Figure 3.12 displays effluent suspended solids daily mass discharges. There has been a significant trend towards increased suspended solids mass discharge (P=0.028) over the three year period studied.

3.3.2 Effluent total phosphorus daily mass discharge

Figure 3.13 displays effluent total phosphorus daily mass discharges. There has been an extremely significant trend towards decreased total phosphorus mass discharge (P=0.000) over the three year period. Mean daily total phosphorus mass dicharges decreased from 18.4 kg/day in 1988 to 10.9 kg/day in 1989. This decreased further to 2.9 kg/day in 1990, and adjusted to a level of 4.2 kg/day to date for 1991 (Table 3.1). This represents a 78% reduction in mean daily total phosphorus mass discharge since 1988.

3.3.3 Effluent COD daily mass discharge

Figure 3.14 displays effluent COD daily mass discharges. The slight downward trend is not statistically significant.

3.3.4 Effluent dissolved solids daily mass discharge

Figure 3.15 displays effluent dissolved solids daily mass discharges. There has been a highly significant trend towards decreased dissolved solids mass discharge (P=0.001) over the three year period, although mean daily mass dicharges have risen during 1991 (Table 3.1).

3.3.5 Effluent total nitrogen daily mass discharge

Figure 3.16 displays effluent total nitrogen daily mass dicharges. There has been no significant trend in mass discharge over the three year period considered in this report (P=0.508). Total nitrogen mass dicharges have been highly variable, with some particularly high discharges occurring from time to time (eg 11 January 1989 - Appendix 1).

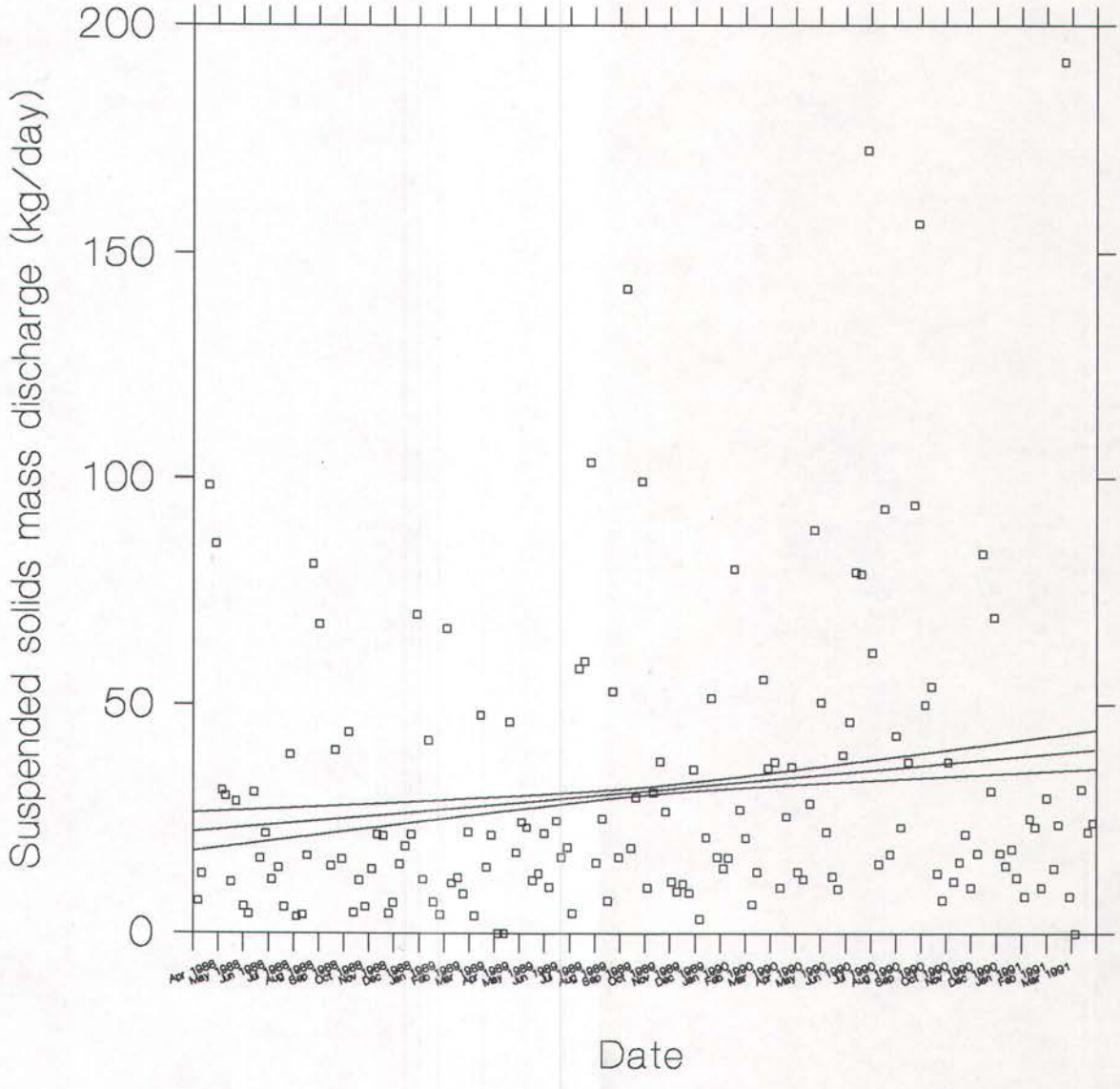


Figure 3.12 Chemical Cleaning Limited. Effluent suspended solids mass discharge. The 95% confidence interval about the regression is shown.

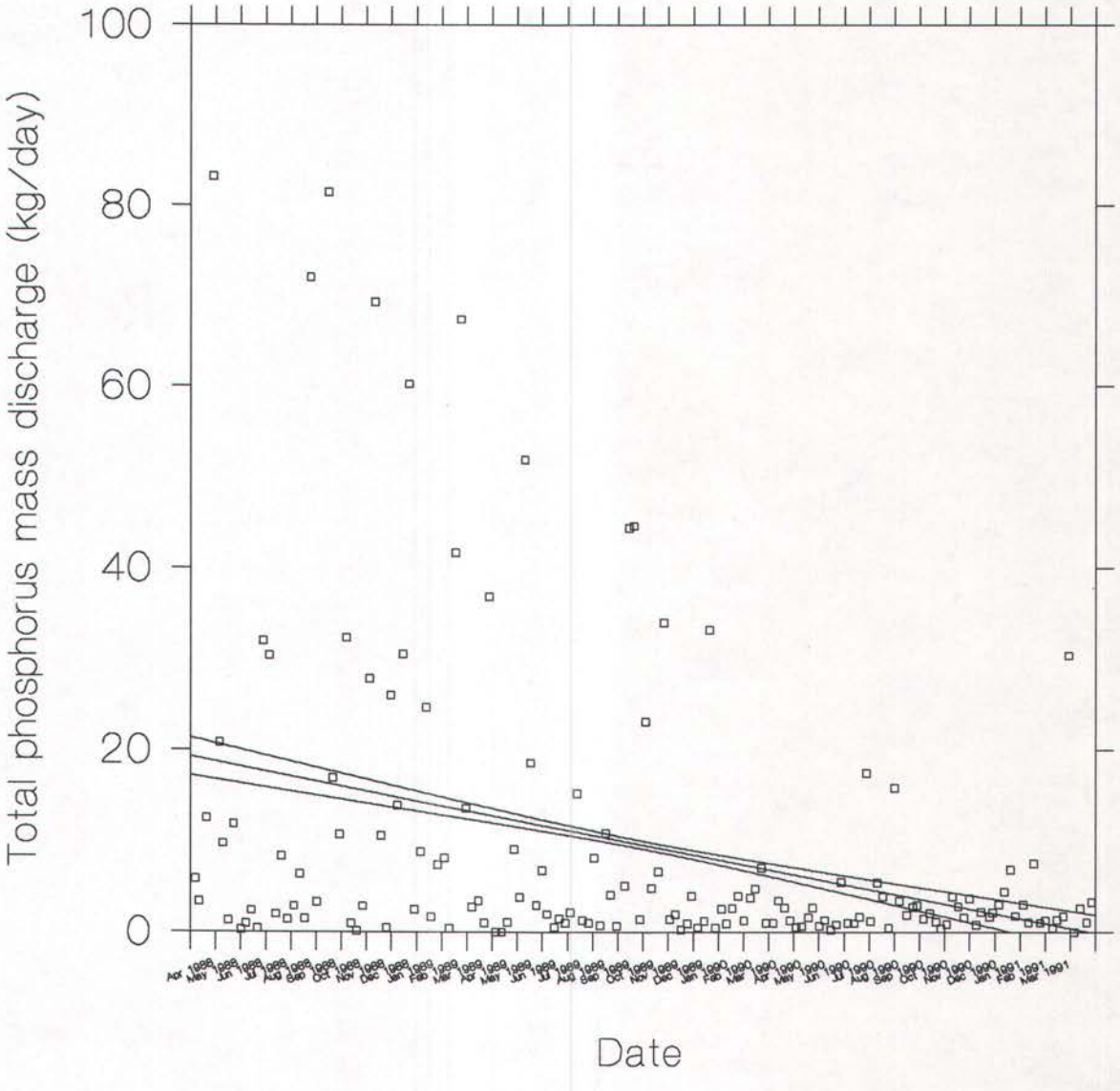


Figure 3.13 Chemical Cleaning Limited. Effluent total phosphorus mass discharge. The 95% confidence interval about the regression is shown.

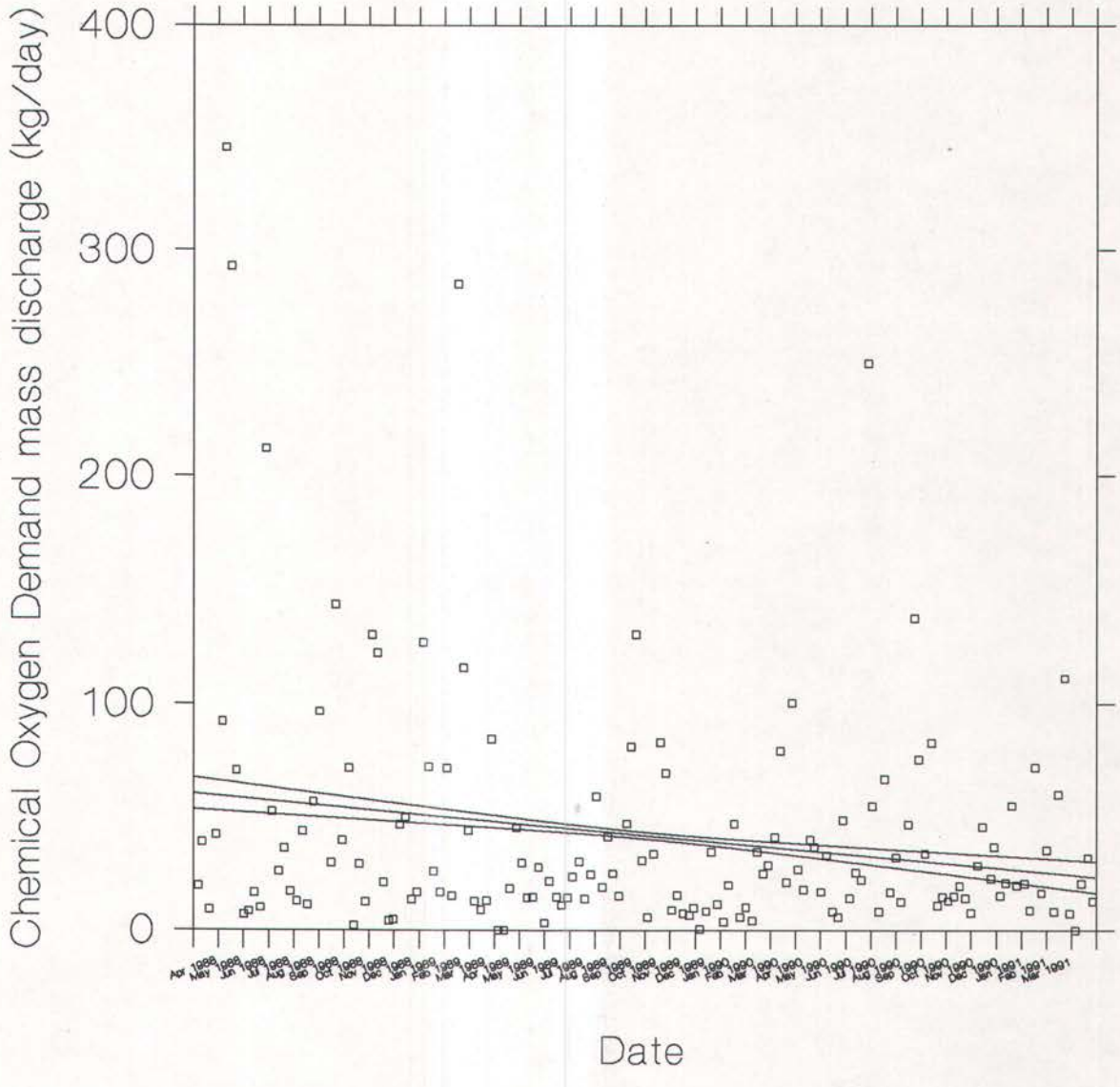


Figure 3.14 Chemical Cleaning Limited. Effluent COD mass discharge. The 95% confidence interval about the regression is shown.

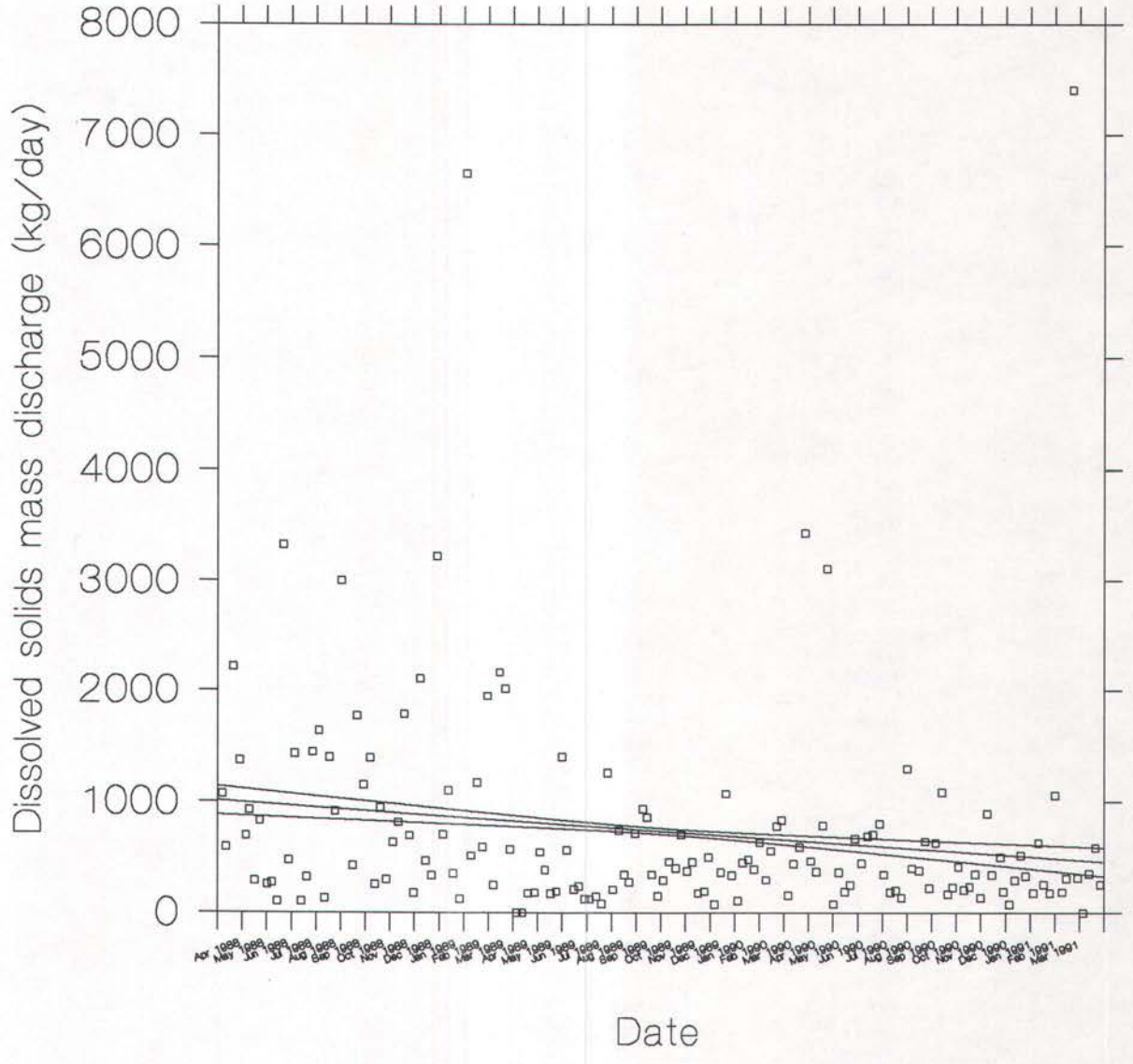


Figure 3.15 Chemical Cleaning Limited. Effluent dissolved solids mass discharge. The 95% confidence interval about the regression is shown.

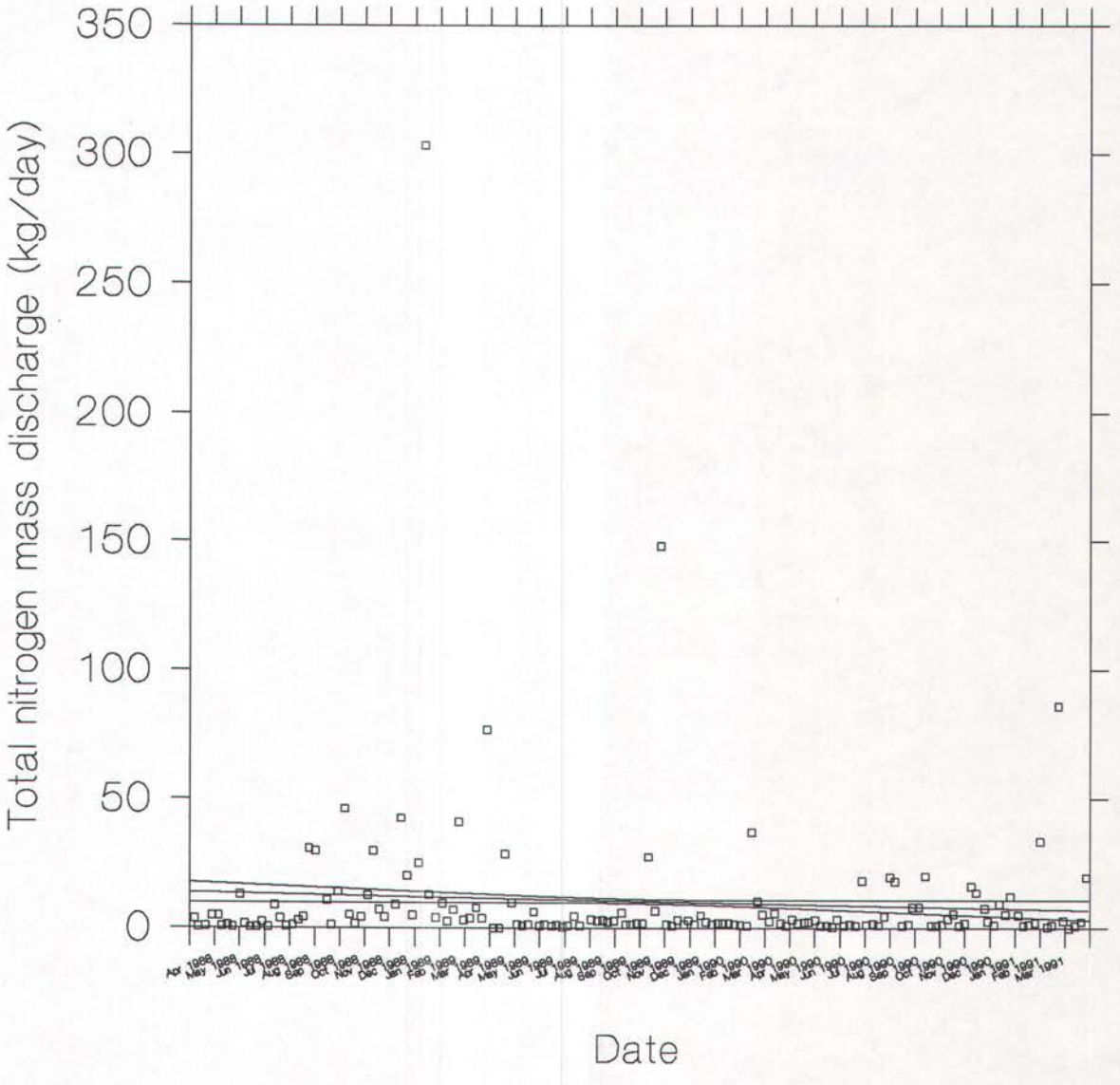


Figure 3.16 Chemical Cleaning Limited. Effluent total nitrogen mass discharge. The 95% confidence interval about the regression is shown.

3.3.6 Comparison between years

Figure 3.17 - 3.22 provide plots of mean daily flows and mass dicharges of COD, dissolved solids, suspended solids, total nitrogen and total phosphorus.

Effluent flow has shown a marked decrease over the past two years (Figure 3.17). Consequently, there has been an associated decrease in the mass dicharge of many effluent parameters.

COD mass discharge has dropped considerably since 1988 (Figure 3.18). Dissolved solids mass discharges initially dropped in 1989 and 1990, but then rose again in 1991 (Figure 3.19).

In contrast, suspended solids mass discharges have shown an increase, particularly for 1990, with mass discharges reducing slightly in 1991 (Figure 3.20).

Total nitrogen mass discharges have been highly variable, and the reduction in effluent flow does not appear to have had any effect on total nitrogen mass dicharges (Figure 3.21).

In contrast, total phosphorus mass discharges have shown a marked decline since 1988 (Figure 3.22).

3.3.7 Relationships between effluent parameters

Figure 3.23 provides a scatterplot of all effluent parameters, allowing ready assessment of the relationships between them.

The only strong relationship between effluent parameters is that between conductivity dissolved solids, indicating that an in-stream effluent conductivity probe would provide a good guide as to effluent dissolved solids content:

Raw data: $r = 0.83$, $P = 0.000$
Conductivity (Millimhos) = 3.026 + 0.001 Dissolved solids (g/m^3);

Ranked data: $r = 0.96$, $P + 0.000$
Conductivity rank = 3.077 + 0.961 Dissolved solids rank.

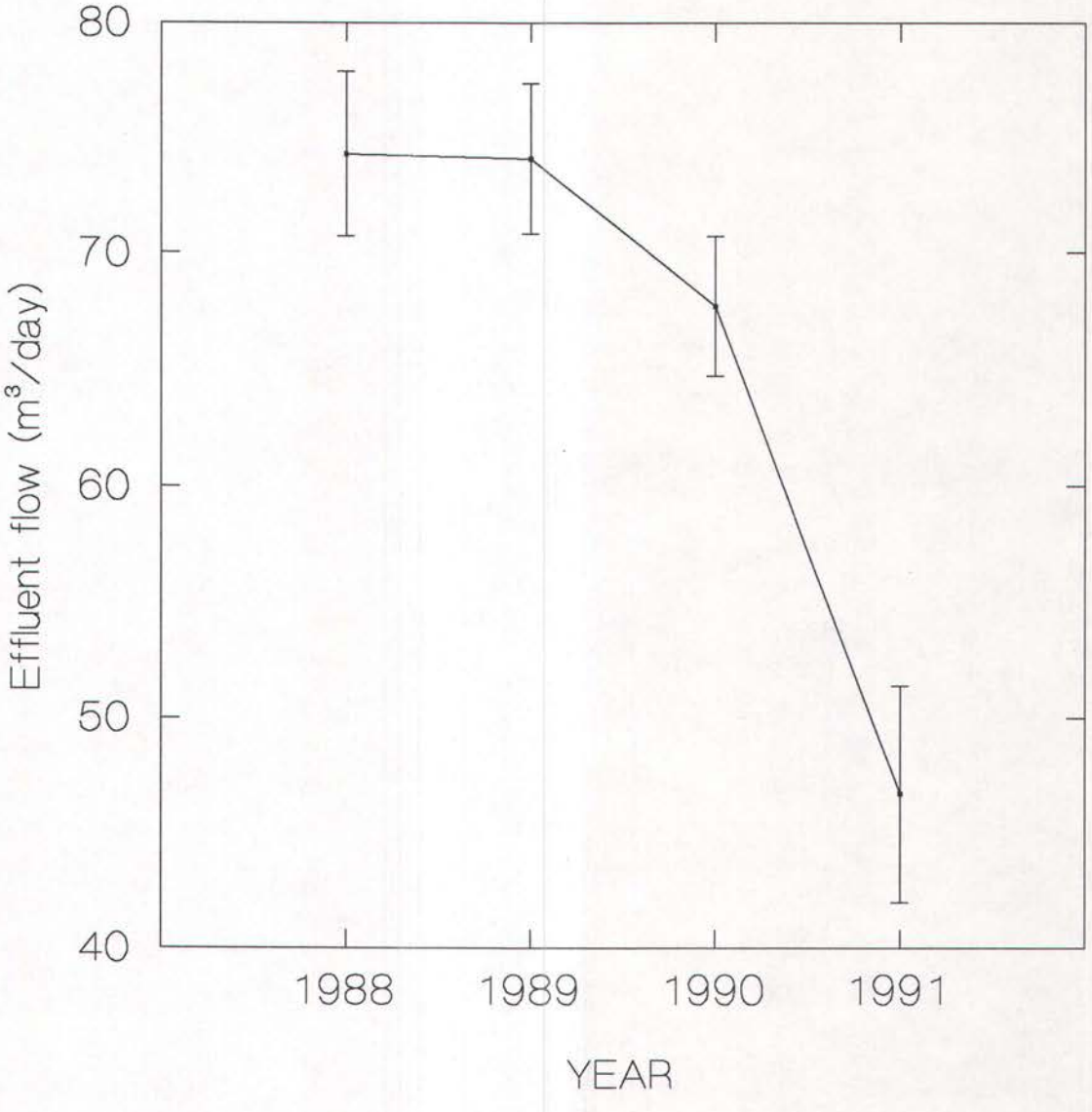


Figure 3.17 Chemical Cleaning Limited. Mean annual effluent flow. The standard error about each mean is shown.

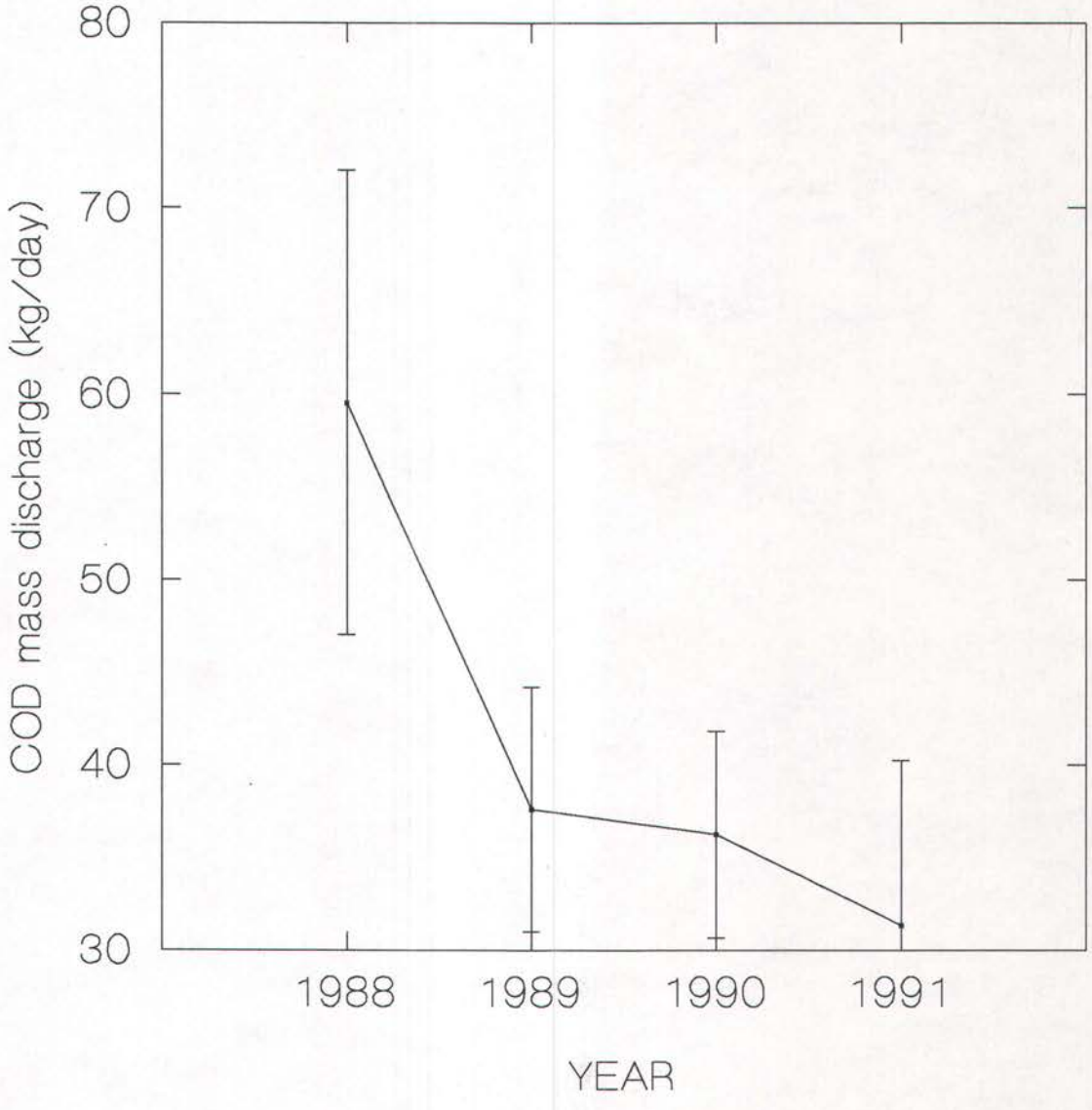


Figure 3.18 Chemical Cleaning Limited. Mean annual COD mass discharge. The standard error about each mean is shown.

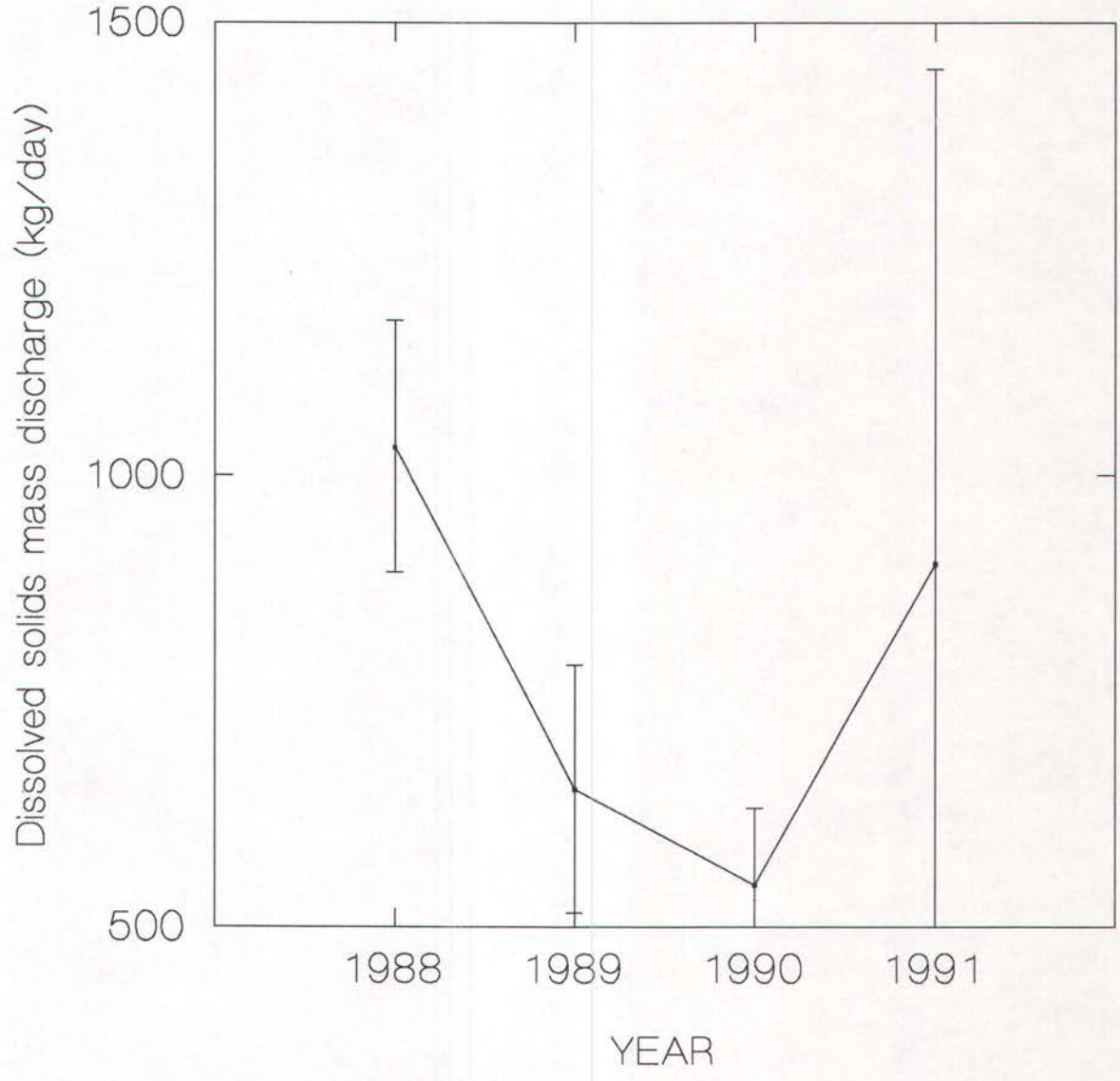


Figure 3.19 Chemical Cleaning Limited. Mean annual dissolved solids mass discharge. The standard error about each mean is shown.

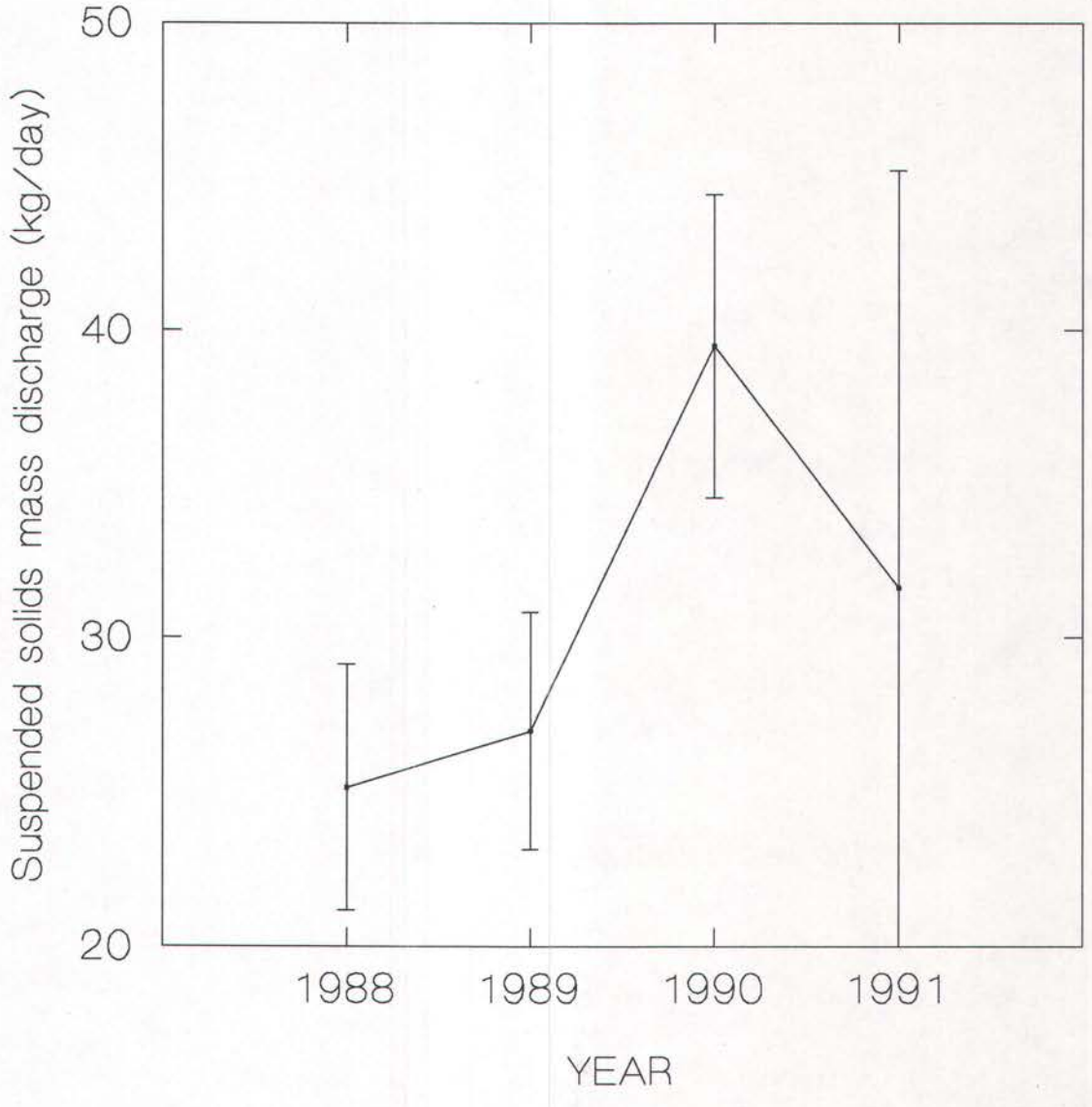


Figure 3.20 Chemical Cleaning Limited. Mean annual suspended solids mass discharge. The standard error about each mean is shown.

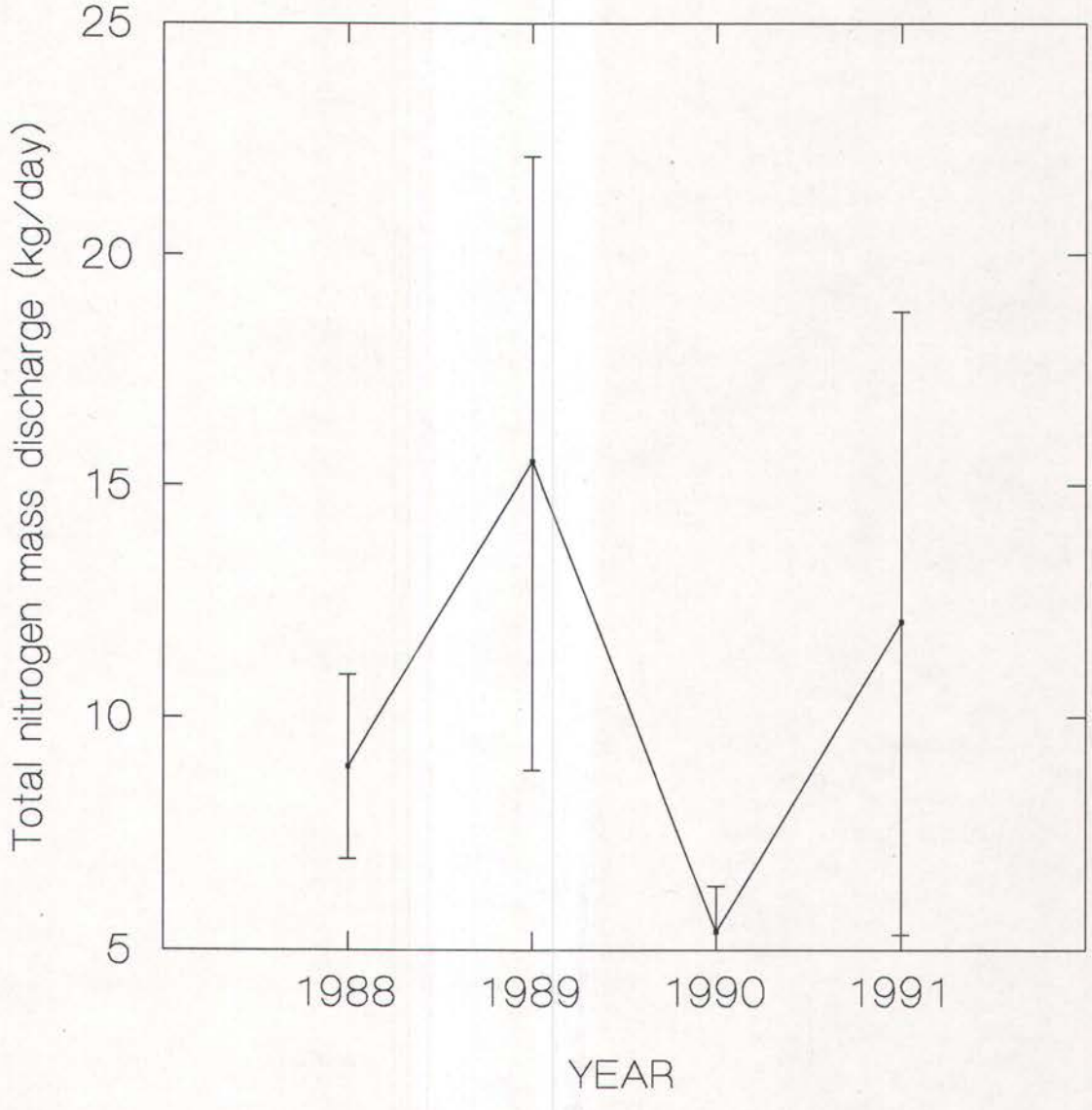


Figure 3.21 Chemical Cleaning Limited. Mean annual total nitrogen mass discharge. The standard error about each mean is shown.

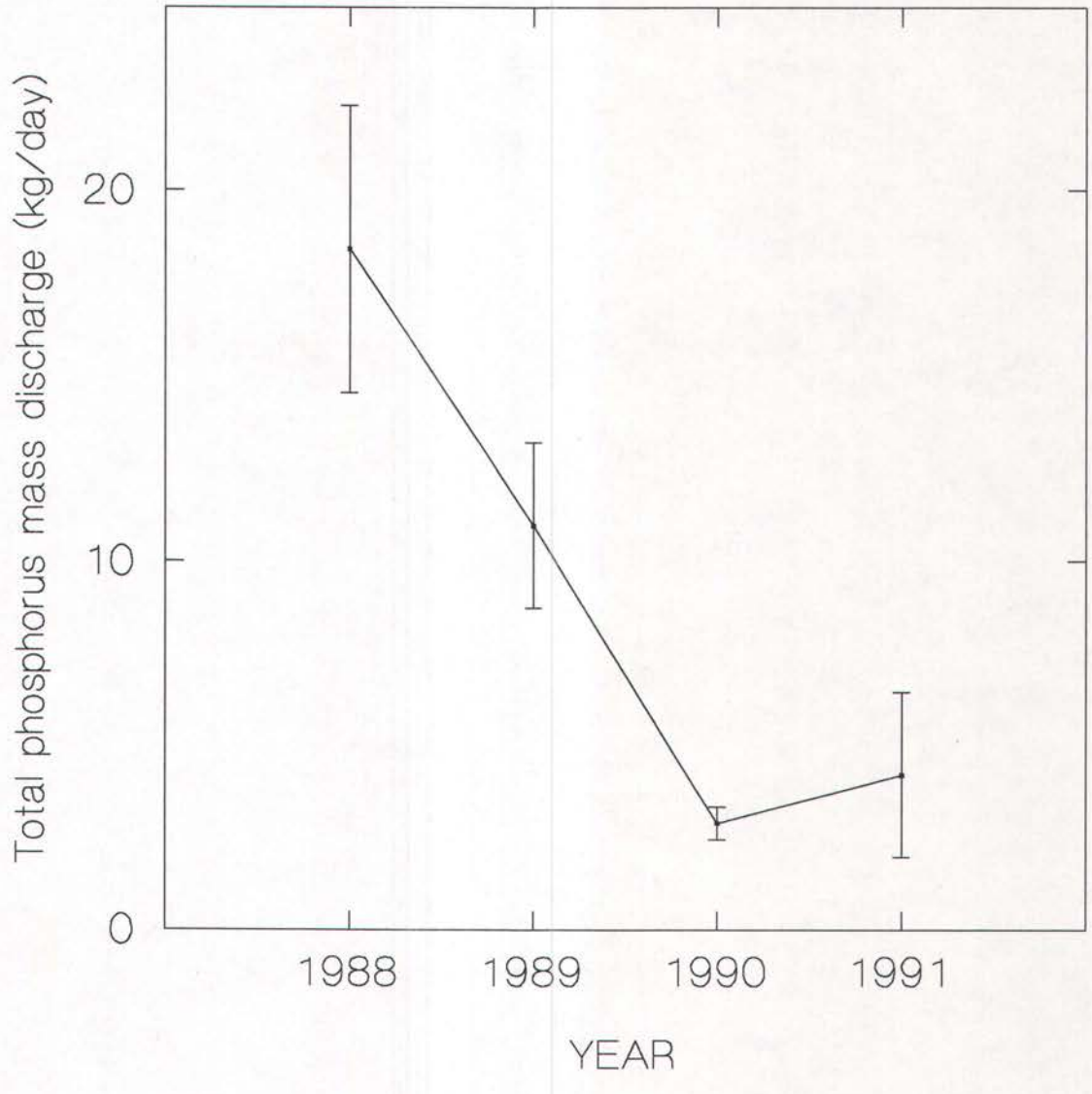


Figure 3.22 Chemical Cleaning Limited. Mean annual total phosphorus mass discharge. The standard error about each mean is shown.

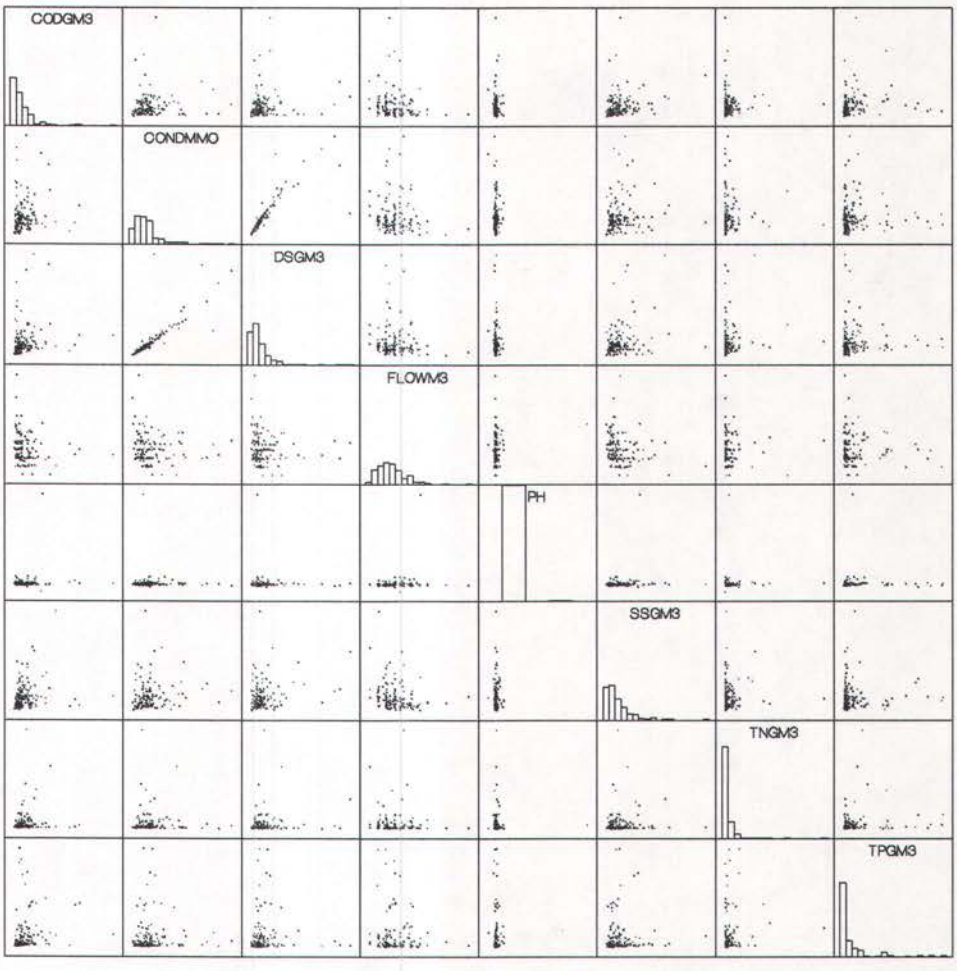


Figure 3.23 Chemical Cleaning Limited. Scatterplot matrix for all effluent parameters.

CHAPTER FOUR

DISCUSSION

4.1 Compliance with permit instantaneous limits

While there have been occasional breaches of the daily effluent flow limitation of 300 m^3/day, the monthly effluent discharge limitation of 3,000 m^3/month has not been breached during the three year period considered in this report.

The effluent pH limitations (6 - 9) have been breached on occasion. Compliance has improved over the past two years.

Effluent suspended solids concentrations have increased over the last year, with a marked increase in the frequency of non-compliance with the permit limitation of 800 g/m^3.

On the other hand, effluent total phosphorus concentrations have shown a dramatic decrease since the beginning of 1990, and with the exception of one excessive breach of the permit on 26 February 1991, compliance with the total phosphorus concentration permit limitation (200 g/m^3) has been excellent.

Effluent total nitrogen concentrations have fluctuated widely from year to year. Water Right 2027 places no limitation on total nitrogen discharge from Chemical Cleaning Limited.

4.2 Compliance with permit median limits

The median effluent suspended solids concentration limitation (400 g/m^3) was breached for a period of several months in mid - late 1990.

The median effluent total phosphorus concentration limitation (100 g/m^3) was breached on several occasions in late 1988 - early 1989, but compliance has improved markedly since mid-1989.

4.3 Overall compliance

Overall, Chemical Cleaning Limited has shown an excellent record with respect to maintenance of monitoring records, and has demonstrated a tendency towards constant upgrading of effluent quality.

APPENDICES

Appendix 1:
Consent return data

Appendix 2:
Compliance with consent median limits.

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APPENDIX 1: CHEMICAL CLEANING LIMITED - WR2027. CONSENT RETURN DATA.

Date	Julian Date	Flow (m3/day)	pH	Suspended solids (g/m3)	Dissolved Solids (g/m3)	Total phosphorus (g/m3)	Conductivity (millimhos)	COD (g/m3)	Total nitrogen (g/m3)
06/11/90	33183	66							
07/11/90	33184	64	6.4	270	13900	13	14.7	450	250
08/11/90	33185	53							
09/11/90	33186	65							
10/11/90	33187	0							
11/11/90	33188	0							
12/11/90	33189	164							
13/11/90	33190	170	6.8	490	2000	13	2.5	270	80
14/11/90	33191	35							
15/11/90	33192	34							
16/11/90	33193	33							
17/11/90	33194	0							
18/11/90	33195	96							
19/11/90	33196	130							
20/11/90	33197	32							
21/11/90	33198	33							
22/11/90	33199	65							
23/11/90	33200	51	6.3	610	9790	33	11.4	450	150
24/11/90	33201	34							
25/11/90	33202	32							
26/11/90	33203	68							
27/11/90	33204	64	6.7	1080	2980	34	4	580	40
28/11/90	33205	65							
29/11/90	33206	52							
30/11/90	33207	66							
01/12/90	33208	67							
02/12/90	33209	0							
03/12/90	33210	64							
04/12/90	33211	62	6.5	280	1210	49	1.5	250	20
05/12/90	33212	98							
06/12/90	33213	32							
07/12/90	33214	102							
08/12/90	33215	23							
09/12/90	33216	0							
10/12/90	33217	100							
11/12/90	33218	54	6.6	270	5450	83	5.2	390	170
12/12/90	33219	117							
13/12/90	33220	65							
14/12/90	33221	98							
15/12/90	33222	27							
16/12/90	33223	34							
17/12/90	33224	70							
18/12/90	33225	65	7	280	7920	106	8.4	850	80
19/12/90	33226	32							
20/12/90	33227	100							
21/12/90	33228	64							
22/12/90	33229	0							
23/12/90	33230	0							
24/12/90	33231	100	6.6	120	3280	18	3.5	200	120
25/12/90	33232	0							
26/12/90	33233	33							
27/12/90	33234	32							
28/12/90	33235	72							
29/12/90	33236	33							
30/12/90	33237	0							
31/12/90	33238	66							
01/01/91	33239	0							
02/01/91	33240	33							
03/01/91	33241	33	7	240	5430	93	6.2	630	150
04/01/91	33242	67							
05/01/91	33243	33							
06/01/91	33244	0							
07/01/91	33245	100							
08/01/91	33246	68							
09/01/91	33247	64	6.8	390	9760	17	8.8	140	15
10/01/91	33248	34							
11/01/91	33249	66							
12/01/91	33250	0							
13/01/91	33251	0							
14/01/91	33252	66							
15/01/91	33253	70	6.3	330	3670	108	4.9	1030	20
16/01/91	33254	60							
17/01/91	33255	32							

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APPENDIX 1: CHEMICAL CLEANING LIMITED - WR2027. CONSENT RETURN DATA.

Date	Julian Date	Flow (m3/day)	pH	Suspended solids (g/m3)	Dissolved Solids (g/m3)	Total phosphorus (g/m3)	Conductivity (millimhos)	COD (g/m3)	Total nitrogen (g/m3)
18/01/91	33256	96							
19/01/91	33257	0							
20/01/91	33258	0							
21/01/91	33259	64							
22/01/91	33260	0							
23/01/91	33261	32	6.4	310	5640	33	6.7	520	70
24/01/91	33262	60							
25/01/91	33263	100							
26/01/91	33264	34							
27/01/91	33265	0							
28/01/91	33266	0							
29/01/91	33267	102	9.4	290	10400	13	11.3	350	330
30/01/91	33268	134							
31/01/91	33269	32							
01/02/91	33270	92							
02/02/91	33271	65							
03/02/91	33272	0							
04/02/91	33273	64							
05/02/91	33274	63							
06/02/91	33275	0							
07/02/91	33276	30	7.1	470	6230	17	7.6	280	15
08/02/91	33277	79							
09/02/91	33278	0							
10/02/91	33279	32							
11/02/91	33280	34							
12/02/91	33281	64	7.8	370	4820	21	5.1	940	20
13/02/91	33282	34							
14/02/91	33283	67							
15/02/91	33284	29							
16/02/91	33285	33							
17/02/91	33286	164							
18/02/91	33287	267							
19/02/91	33288	33							
20/02/91	33289	128	7.7	1500	57900	14	9.6	870	670
21/02/91	33290	32							
22/02/91	33291	28							
23/02/91	33292	33							
24/02/91	33293	0							
25/02/91	33294	66							
26/02/91	33295	32	6.3	250	9830	948	8.9	240	90
27/02/91	33296	0							
28/02/91	33297	27							
01/03/91	33298	32							
02/03/91	33299	25							
03/03/91	33300	34							
04/03/91	33301	68							
05/03/91	33302	0	6.7	1600	12700	35	12.7	780	30
06/03/91	33303	59							
07/03/91	33304	0							
08/03/91	33305	32							
09/03/91	33306	0							
10/03/91	33307	0							
11/03/91	33308	70							
12/03/91	33309	67	7.5	470	5270	39	6.7	310	15
13/03/91	33310	35							
14/03/91	33311	100							
15/03/91	33312	100							
16/03/91	33313	0							
17/03/91	33314	0							
18/03/91	33315	66							
19/03/91	33316	72							
20/03/91	33317	36	10	610	16200	31	17.1	890	70
21/03/91	33318	34							
22/03/91	33319	66							
23/03/91	33320	64							
24/03/91	33321	0							
25/03/91	33322	67							
26/03/91	33323	32	8.6	750	7930	103	7.9	410	610
27/03/91	33324	167							
28/03/91	33325	68							
29/03/91	33326	0							
30/03/91	33327	32							
31/03/91	33328	0							

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APPENDIX 1: CHEMICAL CLEANING LIMITED - WR2027. CONSENT RETURN DATA.

Date	Julian Date	Flow (m3/day)	pH	Suspended solids (g/m3)	Dissolved Solids (g/m3)	Total phosphorus (g/m3)	Conductivity (millimhos)	COD (g/m3)	Total nitrogen (g/m3)
01/04/88	32234	40							
02/04/88	32235	40							
03/04/88	32236	0							
04/04/88	32237	0							
05/04/88	32238	120							
06/04/88	32239	80							
07/04/88	32240	120	6.7	58	8930	49	9.82	165	30
08/04/88	32241	80							
09/04/88	32242	40							
10/04/88	32243	40							
11/04/88	32244	120	7	107	4910	28	7.83	326	5
12/04/88	32245	40							
13/04/88	32246	160							
14/04/88	32247	80							
15/04/88	32248	200							
16/04/88	32249	40							
17/04/88	32250	0							
18/04/88	32251	160							
19/04/88	32252	40							
20/04/88	32253	80	7.4	1230	27690	157	21.8	114	10
21/04/88	32254	200							
22/04/88	32255	120							
23/04/88	32256	0							
24/04/88	32257	0							
25/04/88	32258	40							
26/04/88	32259	200							
27/04/88	32260	80							
28/04/88	32261	120	7.5	712	11390	694	9.69	353	40
29/04/88	32262	80							
30/04/88	32263	80							
01/05/88	32264	0							
02/05/88	32265	40							
03/05/88	32266	80							
04/05/88	32267	40							
05/05/88	32268	80							
06/05/88	32269	160	11	195	4310	130	5.47	575	30
07/05/88	32270	160							
08/05/88	32271	0							
09/05/88	32272	240							
10/05/88	32273	80	7.2	374	11570	122	10.46	4320	10
11/05/88	32274	80							
12/05/88	32275	80							
13/05/88	32276	80							
14/05/88	32277	0							
15/05/88	32278	40							
16/05/88	32279	160							
17/05/88	32280	120	8.1	92	2400	11	1.93	2440	10
18/05/88	32281	80							
19/05/88	32282	120							
20/05/88	32283	80							
21/05/88	32284	120							
22/05/88	32285	0							
23/05/88	32286	120	13	240	6900	99	13.9	589	5
24/05/88	32287	80							
25/05/88	32288	40							
26/05/88	32289	40							
27/05/88	32290	40							
28/05/88	32291	0							
29/05/88	32292	40							
30/05/88	32293	80							
31/05/88	32294	80							
01/06/88	32295	40	6.3	145	6330	7	6.68	175	320
02/06/88	32296	80							
03/06/88	32297	80							
04/06/88	32298	0							
05/06/88	32299	0							
06/06/88	32300	0							
07/06/88	32301	80	6.2	53	3380	12	4.05	107	20
08/06/88	32302	120							
09/06/88	32303	80							
10/06/88	32304	80							
11/06/88	32305	120							
12/06/88	32306	40							

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APPENDIX 1: CHEMICAL CLEANING LIMITED - WR2027. CONSENT RETURN DATA.

Date	Julian Date	Flow (m3/day)	pH	Suspended solids (g/m3)	Dissolved Solids (g/m3)	Total phosphorus (g/m3)	Conductivity (millimhos)	COD (g/m3)	Total nitrogen (g/m3)
13/06/88	32307	120							
14/06/88	32308	80	7.7	385	1290	30	1.82	211	5
15/06/88	32309	120							
16/06/88	32310	40							
17/06/88	32311	120							
18/06/88	32312	120							
19/06/88	32313	0							
20/06/88	32314	80							
21/06/88	32315	80	7.4	203	41550	5	36.6	127	6
22/06/88	32316	40							
23/06/88	32317	80							
24/06/88	32318	80							
25/06/88	32319	40							
26/06/88	32320	0							
27/06/88	32321	40							
28/06/88	32322	80	9.6	271	5870	400	5.38	2650	30
29/06/88	32323	80							
30/06/88	32324	80							
01/07/88	32325	40							
02/07/88	32326	40							
03/07/88	32327	0							
04/07/88	32328	80							
05/07/88	32329	80	8.1	145	17840	380	17.72	657	6
06/07/88	32330	40							
07/07/88	32331	40							
08/07/88	32332	40							
09/07/88	32333	0							
10/07/88	32334	80							
11/07/88	32335	120							
12/07/88	32336	40							
13/07/88	32337	40	6.8	355	2540	50	3.04	655	218
14/07/88	32338	40							
15/07/88	32339	0							
16/07/88	32340	50							
17/07/88	32341	120							
18/07/88	32342	120							
19/07/88	32343	80							
20/07/88	32344	40	7.7	141	7940	210	8.18	911	95
21/07/88	32345	40							
22/07/88	32346	40							
23/07/88	32347	0							
24/07/88	32348	0							
25/07/88	32349	0							
26/07/88	32350	0							
27/07/88	32351	120	6.2	325	11990	12	12.08	144	6
28/07/88	32352	280							
29/07/88	32353	80							
30/07/88	32354	0							
31/07/88	32355	0							
01/08/88	32356	120							
02/08/88	32357	80							
03/08/88	32358	80							
04/08/88	32359	120	7.2	30	13600	24	16.39	109	10
05/08/88	32360	40							
06/08/88	32361	0							
07/08/88	32362	0							
08/08/88	32363	0							
09/08/88	32364	200							
10/08/88	32365	200							
11/08/88	32366	200	7	20	640	32	0.735	220	15
12/08/88	32367	120							
13/08/88	32368	40							
14/08/88	32369	40							
15/08/88	32370	80							
16/08/88	32371	160							
17/08/88	32372	187	8.5	90	7450	8	8.46	61	23
18/08/88	32373	40							
19/08/88	32374	32							
20/08/88	32375	32							
21/08/88	32376	36							
22/08/88	32377	118							
23/08/88	32378	33							
24/08/88	32379	100	5.1	810	9130	720	7.71	570	307

I:\PC\QPRO\CONSENTS\CCL.WQ2

APPENDIX 1: CHEMICAL CLEANING LIMITED - WR2027. CONSENT RETURN DATA.

Date	Julian Date	Flow (m3/day)	pH	Suspended solids (g/m3)	Dissolved Solids (g/m3)	Total phosphorus (g/m3)	Conductivity (millimhos)	COD (g/m3)	Total nitrogen (g/m3)
25/08/88	32380	93							
26/08/88	32381	96							
27/08/88	32382	37							
28/08/88	32383	60							
29/08/88	32384	72							
30/08/88	32385	108							
31/08/88	32386	0							
01/09/88	32387	165	7.8	410	18200	20	19.7	585	180
02/09/88	32388								
03/09/88	32389								
04/09/88	32390								
05/09/88	32391								
06/09/88	32392								
07/09/88	32393								
08/09/88	32394		5.4	70	5750	390	5.62	855	69
09/09/88	32395								
10/09/88	32396								
11/09/88	32397								
12/09/88	32398	98							
13/09/88	32399	91							
14/09/88	32400	0							
15/09/88	32401	97	5.8	150	4330	840	3.33	310	110
16/09/88	32402	62							
17/09/88	32403	32							
18/09/88	32404	0							
19/09/88	32405	102							
20/09/88	32406	121	1.3	330	14600	140	34.3	1187	10
21/09/88	32407	128							
22/09/88	32408	31							
23/09/88	32409	92							
24/09/88	32410	50							
25/09/88	32411	34							
26/09/88	32412	96							
27/09/88	32413	78							
28/09/88	32414	67	7.1	240	17200	160	15.88	597	210
29/09/88	32415	66							
30/09/88	32416	201							
01/10/88	32417	0							
02/10/88	32418	0							
03/10/88	32419	223							
04/10/88	32420	70							
05/10/88	32421	99							
06/10/88	32422	231	6.5	190	6010	140	6.26	311	200
07/10/88	32423	101							
08/10/88	32424	0							
09/10/88	32425	0							
10/10/88	32426	124							
11/10/88	32427	5							
12/10/88	32428	32	7.7	140	7970	30	8.9	69	160
13/10/88	32429	141							
14/10/88	32430	99							
15/10/88	32431	63							
16/10/88	32432	37							
17/10/88	32433	15							
18/10/88	32434	33							
19/10/88	32435	165	6	70	5740	1	6.85	179	10
20/10/88	32436	10							
21/10/88	32437	101							
22/10/88	32438	34							
23/10/88	32439	0							
24/10/88	32440	0							
25/10/88	32441	97							
26/10/88	32442	72	6.8	80	4160	40	4.4	176	60
27/10/88	32443	65							
28/10/88	32444	66							
29/10/88	32445	33							
30/10/88	32446	33							
31/10/88	32447	142							
01/11/88	32448	96							
02/11/88	32449	81							
03/11/88	32450	139	12	100	4550	200	7.08	938	90
04/11/88	32451	92							
05/11/88	32452	0							

I:\PC\QPRO\CONSENTS\CCL.WQ2

APPENDIX 1: CHEMICAL CLEANING LIMITED - WR2027. CONSENT RETURN DATA.

Date	Julian Date	Flow (m3/day)	pH	Suspended solids (g/m3)	Dissolved Solids (g/m3)	Total phosphorus (g/m3)	Conductivity (millimhos)	COD (g/m3)	Total nitrogen (g/m3)
06/11/88	32453	32							
07/11/88	32454	161							
08/11/88	32455	97							
09/11/88	32456	127							
10/11/88	32457	165	6.3	130	4930	420	4.65	743	180
11/11/88	32458	150							
12/11/88	32459	0							
13/11/88	32460	33							
14/11/88	32461	122							
15/11/88	32462	97							
16/11/88	32463	32							
17/11/88	32464	177	11	120	10080	60	11.3	121	40
18/11/88	32465	90							
19/11/88	32466	134							
20/11/88	32467	0							
21/11/88	32468	55							
22/11/88	32469	130							
23/11/88	32470	163							
24/11/88	32471	73	8.1	60	9510	7	10.6	59	60
25/11/88	32472	130							
26/11/88	32473	25							
27/11/88	32474	36							
28/11/88	32475	227							
29/11/88	32476	44	7.3	150	4030	590	4.23	111	
30/11/88	32477	50							
01/12/88	32478	51							
02/12/88	32479	135							
03/12/88	32480	0							
04/12/88	32481	0							
05/12/88	32482	60							
06/12/88	32483	70							
07/12/88	32484	150	6.6	100	14040	93	12.76	313	60
08/12/88	32485	64							
09/12/88	32486	218							
10/12/88	32487	0							
11/12/88	32488	0							
12/12/88	32489	97							
13/12/88	32490	124							
14/12/88	32491	158	7.7	120	2950	193	2.89	317	270
15/12/88	32492	33							
16/12/88	32493	101							
17/12/88	32494	16							
18/12/88	32495	0							
19/12/88	32496	82							
20/12/88	32497	65							
21/12/88	32498	63	7.8	340	5320	956	4.96	220	320
22/12/88	32499	118							
23/12/88	32500	120							
24/12/88	32501	67							
25/12/88	32502	0							
26/12/88	32503	0							
27/12/88	32504	0							
28/12/88	32505	166	6.3	420	19420	15	21.4	103	30
29/12/88	32506	138							
30/12/88	32507	196							
31/12/88	32508	0							
01/01/89	32509	0							
02/01/89	32510	0							
03/01/89	32511	0							
04/01/89	32512	167	6.5	70	4210	53	5.94	761	150
05/01/89	32513	63							
06/01/89	32514	85							
07/01/89	32515	65							
08/01/89	32516	0							
09/01/89	32517	210							
10/01/89	32518	96							
11/01/89	32519	136	7.8	310	8100	181	4.6	532	2230
12/01/89	32520	66							
13/01/89	32521	60							
14/01/89	32522	33							
15/01/89	32523	33							
16/01/89	32524	33							
17/01/89	32525	85	7.2	80	4120	20	4.6	308	150

I:\PC\QPRO\CONSENTS\CCL.WQ2

APPENDIX 1: CHEMICAL CLEANING LIMITED - WR2027. CONSENT RETURN DATA.

Date	Julian Date	Flow (m3/day)	pH	Suspended solids (g/m3)	Dissolved Solids (g/m3)	Total phosphorus (g/m3)	Conductivity (millimhos)	COD (g/m3)	Total nitrogen (g/m3)
18/01/89	32526	65							
19/01/89	32527	364							
20/01/89	32528	100							
21/01/89	32529	165							
22/01/89	32530	215							
23/01/89	32531	97							
24/01/89	32532	66							
25/01/89	32533	68	7.4	60	1840	109	2.2	252	60
26/01/89	32534	147							
27/01/89	32535	197							
28/01/89	32536	34							
29/01/89	32537	0							
30/01/89	32538	31							
31/01/89	32539	132							
01/02/89	32540	33							
02/02/89	32541	136	6	490	48900	60	41.8	528	70
03/02/89	32542	92							
04/02/89	32543	66							
05/02/89	32544	0							
06/02/89	32545	65							
07/02/89	32546	170							
08/02/89	32547	68	7.6	160	7510	6	9.15	226	40
09/02/89	32548	67							
10/02/89	32549	101							
11/02/89	32550	0							
12/02/89	32551	31							
13/02/89	32552	68							
14/02/89	32553	64							
15/02/89	32554	100	7.4	120	11700	417	12.4	2850	70
16/02/89	32555	108							
17/02/89	32556	100							
18/02/89	32557	65							
19/02/89	32558	0							
20/02/89	32559	133							
21/02/89	32560	123							
22/02/89	32561	171	6.5	50	3440	394	2.45	679	240
23/02/89	32562	30							
24/02/89	32563	132							
25/02/89	32564	32							
26/02/89	32565	33							
27/02/89	32566	0							
28/02/89	32567	157	6.8	140	12400	87	13.7	282	20
01/03/89	32568	127							
02/03/89	32569	32							
03/03/89	32570	31							
04/03/89	32571	34							
05/03/89	32572	0							
06/03/89	32573	133							
07/03/89	32574	35	8	110	7160	80	8.51	373	110
08/03/89	32575	64							
09/03/89	32576	34							
10/03/89	32577	70							
11/03/89	32578	0							
12/03/89	32579	33							
13/03/89	32580	97							
14/03/89	32581	93							
15/03/89	32582	70	7.4	680	30900	49	31.5	131	110
16/03/89	32583	164							
17/03/89	32584	85							
18/03/89	32585	33							
19/03/89	32586	33							
20/03/89	32587	63							
21/03/89	32588	66							
22/03/89	32589	130	6.8	110	15500	8	19.9	102	30
23/03/89	32590	32							
24/03/89	32591	33							
25/03/89	32592	32							
26/03/89	32593	0							
27/03/89	32594	0							
28/03/89	32595	89	6.2	240	6400	414	6.17	949	860
29/03/89	32596	68							
30/03/89	32597	65							
31/03/89	32598	66							

I:\PC\QPRO\CONSENTS\CCL.WQ2

APPENDIX 1: CHEMICAL CLEANING LIMITED - WR2027. CONSENT RETURN DATA.

Date	Julian Date	Flow (m3/day)	pH	Suspended solids (g/m3)	Dissolved Solids (g/m3)	Total phosphorus (g/m3)	Conductivity (millimhos)	COD (g/m3)	Total nitrogen (g/m3)
01/04/89	32599	0							
02/04/89	32600	0							
03/04/89	32601	65							
04/04/89	32602	0							
05/04/89	32603	0	7.1	540	17900	130	18.8	1560	1400
06/04/89	32604	0							
07/04/89	32605	0							
08/04/89	32606	0							
09/04/89	32607	0							
10/04/89	32608	0							
11/04/89	32609	0							
12/04/89	32610	0	7.4	340	7200	50	8.8	370	100
13/04/89	32611	0							
14/04/89	32612	27							
15/04/89	32613	46							
16/04/89	32614	21							
17/04/89	32615	64							
18/04/89	32616	64							
19/04/89	32617	55	9.6	840	3200	20	3.8	340	520
20/04/89	32618	99							
21/04/89	32619	94							
22/04/89	32620	32							
23/04/89	32621	0							
24/04/89	32622	32							
25/04/89	32623	0							
26/04/89	32624	33							
27/04/89	32625	70	6.9	250	2600	130	3.8	650	140
28/04/89	32626	65							
29/04/89	32627	31							
30/04/89	32628	192							
01/05/89	32629	159							
02/05/89	32630	115							
03/05/89	32631	130							
04/05/89	32632	97	7.2	250	5600	40	6.7	310	15
05/05/89	32633	98							
06/05/89	32634	33							
07/05/89	32635	0							
08/05/89	32636	89							
09/05/89	32637	58							
10/05/89	32638	64	8.1	360	6000	810	6	230	15
11/05/89	32639	97							
12/05/89	32640	46							
13/05/89	32641	0							
14/05/89	32642	0							
15/05/89	32643	0							
16/05/89	32644	99							
17/05/89	32645	31	7.4	370	5600	600	6.7	480	50
18/05/89	32646	36							
19/05/89	32647	58							
20/05/89	32648	32							
21/05/89	32649	0							
22/05/89	32650	64							
23/05/89	32651	37							
24/05/89	32652	37	7.8	350	5200	80	6.3	760	170
25/05/89	32653	114							
26/05/89	32654	36							
27/05/89	32655	29							
28/05/89	32656	22							
29/05/89	32657	94							
30/05/89	32658	50							
31/05/89	32659	68	7.6	320	20600	100	22.6	50	15
01/06/89	32660	93							
02/06/89	32661	97							
03/06/89	32662	64							
04/06/89	32663	0							
05/06/89	32664	0							
06/06/89	32665	100	7.4	100	5640	20	6.8	220	15
07/06/89	32666	70							
08/06/89	32667	33							
09/06/89	32668	87							
10/06/89	32669	0							
11/06/89	32670	33							
12/06/89	32671	66							

I:\PC\QPRO\CONSENTS\CCL.WQ2

APPENDIX 1: CHEMICAL CLEANING LIMITED - WR2027. CONSENT RETURN DATA.

Date	Julian Date	Flow (m3/day)	pH	Suspended solids (g/m3)	Dissolved Solids (g/m3)	Total phosphorus (g/m3)	Conductivity (millimhos)	COD (g/m3)	Total nitrogen (g/m3)
13/06/89	32672	97							
14/06/89	32673	98							
15/06/89	32674	57	7.5	430	3680	10	4.9	260	15
16/06/89	32675	134							
17/06/89	32676	32							
18/06/89	32677	0							
19/06/89	32678	59							
20/06/89	32679	85							
21/06/89	32680	75	6.7	220	3200	20	4.4	150	15
22/06/89	32681	66							
23/06/89	32682	64							
24/06/89	32683	162							
25/06/89	32684	32							
26/06/89	32685	97							
27/06/89	32686	55							
28/06/89	32687	34	5.8	550	3620	30	4.7	430	15
29/06/89	32688	96							
30/06/89	32689	64							
01/07/89	32690	0							
02/07/89	32691	0							
03/07/89	32692	91							
04/07/89	32693	72	6.5	60	1700	30	2.8	330	15
05/07/89	32694	43							
06/07/89	32695	195							
07/07/89	32696	83							
08/07/89	32697	33							
09/07/89	32698	32							
10/07/89	32699	27							
11/07/89	32700	65							
12/07/89	32701	305	6.6	190	480	50	0.6	100	15
13/07/89	32702	66							
14/07/89	32703	125							
15/07/89	32704	34							
16/07/89	32705	0							
17/07/89	32706	57							
18/07/89	32707	132							
19/07/89	32708	64	6.4	930	1260	20	1.9	220	15
20/07/89	32709	64							
21/07/89	32710	69							
22/07/89	32711	33							
23/07/89	32712	0							
24/07/89	32713	132							
25/07/89	32714	84							
26/07/89	32715	131	6.6	790	9600	8	11.9	190	
27/07/89	32716	136							
28/07/89	32717	27							
29/07/89	32718	33							
30/07/89	32719	0							
31/07/89	32720	128							
01/08/89	32721	183							
02/08/89	32722	85	6.8	180	2450	96	2.8	700	40
03/08/89	32723	193							
04/08/89	32724	125							
05/08/89	32725	0							
06/08/89	32726	0							
07/08/89	32727	31							
08/08/89	32728	121							
09/08/89	32729	192	7.1	130	3860	4	5.45	100	15
10/08/89	32730	128							
11/08/89	32731	65							
12/08/89	32732	20							
13/08/89	32733	31							
14/08/89	32734	80							
15/08/89	32735	65							
16/08/89	32736	64	7.3	110	5340	170	6.59	650	50
17/08/89	32737	84							
18/08/89	32738	56							
19/08/89	32739	20							
20/08/89	32740	32							
21/08/89	32741	66							
22/08/89	32742	230	7.2	230	1200	18	1.66	110	10
23/08/89	32743	97							
24/08/89	32744	100							

I:\PC\QPRO\CONSENTS\CCL.WQ2

APPENDIX 1: CHEMICAL CLEANING LIMITED - WR2027. CONSENT RETURN DATA.

Date	Julian Date	Flow (m3/day)	pH	Suspended solids (g/m3)	Dissolved Solids (g/m3)	Total phosphorus (g/m3)	Conductivity (millimhos)	COD (g/m3)	Total nitrogen (g/m3)
25/08/89	32745	232							
26/08/89	32746	32							
27/08/89	32747	0							
28/08/89	32748	130							
29/08/89	32749	97	7.7	170	7340	7	8.7	160	30
30/08/89	32750	65							
31/08/89	32751	195							
01/09/89	32752	99							
02/09/89	32753	0							
03/09/89	32754	0							
04/09/89	32755	64							
05/09/89	32756	66							
06/09/89	32757	66							
07/09/89	32758	325							
08/09/89	32759	395	6.5	360	2370	13	3.2	120	15
09/09/89	32760	194							
10/09/89	32761	291							
11/09/89	32762	255							
12/09/89	32763	64							
13/09/89	32764	103	8	180	8340	431	9.2	790	15
14/09/89	32765	34							
15/09/89	32766	128							
16/09/89	32767	0							
17/09/89	32768	32							
18/09/89	32769	100							
19/09/89	32770	96	6.9	310	3580	465	3.6	1360	15
20/09/89	32771	98							
21/09/89	32772	0							
22/09/89	32773	0							
23/09/89	32774	31							
24/09/89	32775	0							
25/09/89	32776	65							
26/09/89	32777	129	9.9	770	1180	11	1.7	240	15
27/09/89	32778	65							
28/09/89	32779	97							
29/09/89	32780	65							
30/09/89	32781	32							
01/10/89	32782	0							
02/10/89	32783	160							
03/10/89	32784	66	6.1	150	4460	350	5.2	90	30
04/10/89	32785	128							
05/10/89	32786	82							
06/10/89	32787	37							
07/10/89	32788	230							
08/10/89	32789	63							
09/10/89	32790	64							
10/10/89	32791	162	6.3	190	2820	30	3.5	210	170
11/10/89	32792	98							
12/10/89	32793	135							
13/10/89	32794	101							
14/10/89	32795	32							
15/10/89	32796	0							
16/10/89	32797	110							
17/10/89	32798	102							
18/10/89	32799	134	6.4	280	3000	50	3.8	620	50
19/10/89	32800	129							
20/10/89	32801	66							
21/10/89	32802	199							
22/10/89	32803	65							
23/10/89	32804	0							
24/10/89	32805	99							
25/10/89	32806	148	7.6	180	4760	230	4.1	470	1000
26/10/89	32807	98							
27/10/89	32808	98							
28/10/89	32809	31							
29/10/89	32810	68							
30/10/89	32811	66							
31/10/89	32812	67							
01/11/89	32813	70	6.3	160	5320	20	6.8	130	20
02/11/89	32814	67							
03/11/89	32815	134							
04/11/89	32816	32							
05/11/89	32817	0							

I:\PC\QPRO\CONSENTS\CCL.WQ2

APPENDIX 1: CHEMICAL CLEANING LIMITED - WR2027. CONSENT RETURN DATA.

Date	Julian Date	Flow (m3/day)	pH	Suspended solids (g/m3)	Dissolved Solids (g/m3)	Total phosphorus (g/m3)	Conductivity (millimhos)	COD (g/m3)	Total nitrogen (g/m3)
06/11/89	32818	131							
07/11/89	32819	66							
08/11/89	32820	65	6.1	140	6960	30	7.9	240	15
09/11/89	32821	33							
10/11/89	32822	33							
11/11/89	32823	31							
12/11/89	32824	0							
13/11/89	32825	98							
14/11/89	32826	266							
15/11/89	32827	63	7.1	170	2790	4	4.1	120	50
16/11/89	32828	32							
17/11/89	32829	130							
18/11/89	32830	64							
19/11/89	32831	0							
20/11/89	32832	66							
21/11/89	32833	66							
22/11/89	32834	101							
23/11/89	32835	97	6.8	90	1980	10	2.7	70	15
24/11/89	32836	132							
25/11/89	32837	64							
26/11/89	32838	32							
27/11/89	32839	131							
28/11/89	32840	199	6.5	180	2490	20	3.4	50	15
29/11/89	32841	67							
30/11/89	32842	97							
01/12/89	32843	128							
02/12/89	32844	32							
03/12/89	32845	0							
04/12/89	32846	172							
05/12/89	32847	103	7.5	30	760	5	1.1	5	15
06/12/89	32848	131							
07/12/89	32849	163							
08/12/89	32850	64							
09/12/89	32851	32							
10/12/89	32852	32							
11/12/89	32853	64							
12/12/89	32854	69							
13/12/89	32855	122	7.1	170	2960	10	4	70	40
14/12/89	32856	94							
15/12/89	32857	66							
16/12/89	32858	65							
17/12/89	32859	100							
18/12/89	32860	101							
19/12/89	32861	166	7.9	310	6460	200	7.1	210	15
20/12/89	32862	99							
21/12/89	32863	102							
22/12/89	32864	64							
23/12/89	32865	32							
24/12/89	32866	0							
25/12/89	32867	32							
26/12/89	32868	0							
27/12/89	32869	97	6.5	170	3470	5	4.5	120	15
28/12/89	32870	98							
29/12/89	32871	70							
30/12/89	32872	63							
31/12/89	32873	0							
01/01/90	32874	65							
02/01/90	32875	169							
03/01/90	32876	128	7.3	110	840	20	1.2	30	15
04/01/90	32877	96							
05/01/90	32878	115							
06/01/90	32879	65							
07/01/90	32880	0							
08/01/90	32881	127							
09/01/90	32882	96	8.1	170	4680	10	5.7	210	20
10/01/90	32883	99							
11/01/90	32884	96							
12/01/90	32885	96							
13/01/90	32886	32							
14/01/90	32887	0							
15/01/90	32888	95							
16/01/90	32889	131	6.9	610	3630	20	4.8	360	15
17/01/90	32890	64							

I:\PC\QPRO\CONSENTS\CCL.WQ2

APPENDIX 1: CHEMICAL CLEANING LIMITED - WR2027. CONSENT RETURN DATA.

Date	Julian Date	Flow (m3/day)	pH	Suspended solids (g/m3)	Dissolved Solids (g/m3)	Total phosphorus (g/m3)	Conductivity (millimhos)	COD (g/m3)	Total nitrogen (g/m3)
18/01/90	32891	99							
19/01/90	32892	65							
20/01/90	32893	66							
21/01/90	32894	32							
22/01/90	32895	98							
23/01/90	32896	100	13	270	3900	40	7.8	60	15
24/01/90	32897	65							
25/01/90	32898	131							
26/01/90	32899	99							
27/01/90	32900	36							
28/01/90	32901	32							
29/01/90	32902	0							
30/01/90	32903	129	6.6	160	4880	10	6.2	80	10
31/01/90	32904	140							
01/02/90	32905	64							
02/02/90	32906	164							
03/02/90	32907	33							
04/02/90	32908	0							
05/02/90	32909	35							
06/02/90	32910	0							
07/02/90	32911	63	6	100	4680	60	6	70	15
08/02/90	32912	100							
09/02/90	32913	129							
10/02/90	32914	32							
11/02/90	32915	0							
12/02/90	32916	34							
13/02/90	32917	120	6.6	110	4620	40	5.3	290	310
14/02/90	32918	169							
15/02/90	32919	136							
16/02/90	32920	66							
17/02/90	32921	32							
18/02/90	32922	0							
19/02/90	32923	32							
20/02/90	32924	101	8.5	550	7690	70	7.7	250	100
21/02/90	32925	33							
22/02/90	32926	101							
23/02/90	32927	98							
24/02/90	32928	34							
25/02/90	32929	34							
26/02/90	32930	103	6.6	350	8060	10	9.7	280	50
27/02/90	32931	33							
28/02/90	32932	132							
01/03/90	32933	98							
02/03/90	32934	66							
03/03/90	32935	32							
04/03/90	32936	31							
05/03/90	32937	64							
06/03/90	32938	129	6.7	290	1220	8	1.7	320	20
07/03/90	32939	66							
08/03/90	32940	167							
09/03/90	32941	190							
10/03/90	32942	32							
11/03/90	32943	32							
12/03/90	32944	67							
13/03/90	32945	58	6.4	170	7540	60	7.9	1370	100
14/03/90	32946	131							
15/03/90	32947	34							
16/03/90	32948	197							
17/03/90	32949	32							
18/03/90	32950	0							
19/03/90	32951	32							
20/03/90	32952	134	6.5	190	4390	20	4.2	160	15
21/03/90	32953	32							
22/03/90	32954	32							
23/03/90	32955	124							
24/03/90	32956	0							
25/03/90	32957	0							
26/03/90	32958	32							
27/03/90	32959	66	6.3	550	52040	20	29.5	1520	15
28/03/90	32960	100							
29/03/90	32961	66							
30/03/90	32962	98							
31/03/90	32963	33							

I:\PC\QPRO\CONSENTS\CCL.WQ2

APPENDIX 1: CHEMICAL CLEANING LIMITED - WR2027. CONSENT RETURN DATA.

Date	Julian Date	Flow (m3/day)	pH	Suspended solids (g/m3)	Dissolved Solids (g/m3)	Total phosphorus (g/m3)	Conductivity (millimhos)	COD (g/m3)	Total nitrogen (g/m3)
01/04/90	32964	0							
02/04/90	32965	65							
03/04/90	32966	66	7.1	200	7010	8	7.8	410	50
04/04/90	32967	67							
05/04/90	32968	72							
06/04/90	32969	102							
07/04/90	32970	33							
08/04/90	32971	0							
09/04/90	32972	69							
10/04/90	32973	65	6.8	180	5670	10	6.8	280	30
11/04/90	32974	64							
12/04/90	32975	64							
13/04/90	32976	55							
14/04/90	32977	0							
15/04/90	32978	0							
16/04/90	32979	32							
17/04/90	32980	0							
18/04/90	32981	109	6.6	260	7180	15	8.6	370	20
19/04/90	32982	61							
20/04/90	32983	62							
21/04/90	32984	30							
22/04/90	32985	36							
23/04/90	32986	123	7.7	720	25300	22	20.8	300	20
24/04/90	32987	328							
25/04/90	32988	0							
26/04/90	32989	99							
27/04/90	32990	91							
28/04/90	32991	68							
29/04/90	32992	0							
30/04/90	32993	68							
01/05/90	32994	101	7.1	500	780	7	1.2	170	30
02/05/90	32995	132							
03/05/90	32996	96							
04/05/90	32997	67							
05/05/90	32998	33							
06/05/90	32999	0							
07/05/90	33000	64							
08/05/90	33001	63	6.3	350	5780	21	6.9	530	15
09/05/90	33002	32							
10/05/90	33003	63							
11/05/90	33004	63							
12/05/90	33005	0							
13/05/90	33006	32							
14/05/90	33007	66							
15/05/90	33008	65	6.3	190	2950	4	4.1	130	15
16/05/90	33009	99							
17/05/90	33010	103							
18/05/90	33011	99							
19/05/90	33012	33							
20/05/90	33013	99							
21/05/90	33014	35							
22/05/90	33015	33	5.7	290	7570	26	8.4	180	15
23/05/90	33016	68							
24/05/90	33017	36							
25/05/90	33018	204							
26/05/90	33019	32							
27/05/90	33020	0							
28/05/90	33021	66	7.7	590	10070	84	10.8	740	50
29/05/90	33022	55							
30/05/90	33023	36							
31/05/90	33024	68							
01/06/90	33025	32							
02/06/90	33026	100							
03/06/90	33027	0							
04/06/90	33028	32							
05/06/90	33029	65	9.2	710	6820	16	6.9	220	15
06/06/90	33030	0							
07/06/90	33031	60							
08/06/90	33032	96							
09/06/90	33033	0							
10/06/90	33034	0							
11/06/90	33035	32							
12/06/90	33036	99	6.5	800	6930	10	8.4	260	15

I:\PC\QPRO\CONSENTS\CCL.WQ2

APPENDIX 1: CHEMICAL CLEANING LIMITED - WR2027. CONSENT RETURN DATA.

Date	Julian Date	Flow (m3/day)	pH	Suspended solids (g/m3)	Dissolved Solids (g/m3)	Total phosphorus (g/m3)	Conductivity (millimhos)	COD (g/m3)	Total nitrogen (g/m3)
13/06/90	33037	34							
14/06/90	33038	70							
15/06/90	33039	66							
16/06/90	33040	0							
17/06/90	33041	0							
18/06/90	33042	33							
19/06/90	33043	68	7.7	1160	10300	25	8	330	15
20/06/90	33044	157							
21/06/90	33045	336							
22/06/90	33046	67							
23/06/90	33047	0							
24/06/90	33048	0							
25/06/90	33049	65							
26/06/90	33050	32							
27/06/90	33051	203	7.2	850	3930	86	4.9	1230	90
28/06/90	33052	246							
29/06/90	33053	63							
30/06/90	33054	0							
01/07/90	33055	0							
02/07/90	33056	89	6.6	690	3860	14	4.7	620	15
03/07/90	33057	23							
04/07/90	33058	132							
05/07/90	33059	100							
06/07/90	33060	33							
07/07/90	33061	268							
08/07/90	33062	33							
09/07/90	33063	64							
10/07/90	33064	32	7.9	470	5710	172	6.2	260	50
11/07/90	33065	94							
12/07/90	33066	66							
13/07/90	33067	130							
14/07/90	33068	0							
15/07/90	33069	0							
16/07/90	33070	33							
17/07/90	33071	37	7.1	2520	5380	106	5.9	1810	30
18/07/90	33072	98							
19/07/90	33073	66							
20/07/90	33074	90							
21/07/90	33075	0							
22/07/90	33076	0							
23/07/90	33077	98							
24/07/90	33078	33	6.2	520	4080	14	4.6	520	140
25/07/90	33079	100							
26/07/90	33080	65							
27/07/90	33081	166							
28/07/90	33082	33							
29/07/90	33083	228							
30/07/90	33084	65							
31/07/90	33085	98	6.7	440	13200	162	13.3	330	200
01/08/90	33086	68							
02/08/90	33087	33							
03/08/90	33088	46							
04/08/90	33089	0							
05/08/90	33090	99							
06/08/90	33091	128	6.4	180	3110	27	3.9	100	140
07/08/90	33092	199							
08/08/90	33093	32							
09/08/90	33094	68							
10/08/90	33095	132							
11/08/90	33096	65							
12/08/90	33097	32							
13/08/90	33098	128							
14/08/90	33099	66							
15/08/90	33100	68	6.7	550	5580	28	6	690	15
16/08/90	33101	69							
17/08/90	33102	201							
18/08/90	33103	65							
19/08/90	33104	0							
20/08/90	33105	65							
21/08/90	33106	66							
22/08/90	33107	99	6.9	950	6470	28	7.9	1390	15
23/08/90	33108	432							
24/08/90	33109	134							

I:\PC\QPRO\CONSENTS\CCL.WQ2

APPENDIX 1: CHEMICAL CLEANING LIMITED - WR2027. CONSENT RETURN DATA.

Date	Julian Date	Flow (m3/day)	pH	Suspended solids (g/m3)	Dissolved Solids (g/m3)	Total phosphorus (g/m3)	Conductivity (millimhos)	COD (g/m3)	Total nitrogen (g/m3)
25/08/90	33110	0							
26/08/90	33111	0							
27/08/90	33112	135	7.2	1160	1650	22	2.6	560	60
28/08/90	33113	97							
29/08/90	33114	131							
30/08/90	33115	66							
31/08/90	33116	65							
01/09/90	33117	31							
02/09/90	33118	0							
03/09/90	33119	66							
04/09/90	33120	100	6.6	500	6290	15	7.5	340	80
05/09/90	33121	100							
06/09/90	33122	94							
07/09/90	33123	61							
08/09/90	33124	32							
09/09/90	33125	32							
10/09/90	33126	32							
11/09/90	33127	33							
12/09/90	33128	100	6.8	540	10860	21	11.8	830	200
13/09/90	33129	67							
14/09/90	33130	90							
15/09/90	33131	33							
16/09/90	33132	0							
17/09/90	33133	64							
18/09/90	33134	97							
19/09/90	33135	65	6.6	200	2590	18	3.8	170	15
20/09/90	33136	65							
21/09/90	33137	97							
22/09/90	33138	0							
23/09/90	33139	0							
24/09/90	33140	97							
25/09/90	33141	65	6.8	110	3470	6	4.6	230	15
26/09/90	33142	65							
27/09/90	33143	66							
28/09/90	33144	32							
29/09/90	33145	33							
30/09/90	33146	65							
01/10/90	33147	98							
02/10/90	33148	101	8.3	370	4070	9	5.3	130	15
03/10/90	33149	98							
04/10/90	33150	66							
05/10/90	33151	153							
06/10/90	33152	0							
07/10/90	33153	34							
08/10/90	33154	99							
09/10/90	33155	33	6.4	340	6290	119	7.2	460	110
10/10/90	33156	98							
11/10/90	33157	101							
12/10/90	33158	67							
13/10/90	33159	32							
14/10/90	33160	0							
15/10/90	33161	397							
16/10/90	33162	32	7	480	7290	89	8	620	170
17/10/90	33163	66							
18/10/90	33164	98							
19/10/90	33165	65							
20/10/90	33166	62							
21/10/90	33167	0							
22/10/90	33168	32							
23/10/90	33169	65	6.5	330	5320	25	6.6	220	15
24/10/90	33170	67							
25/10/90	33171	65							
26/10/90	33172	95							
27/10/90	33173	64							
28/10/90	33174	0							
29/10/90	33175	64							
30/10/90	33176	66	6.3	150	2030	56	2.6	120	30
31/10/90	33177	94							
01/11/90	33178	96							
02/11/90	33179	102							
03/11/90	33180	0							
04/11/90	33181	0							
05/11/90	33182	32							

APPENDIX 2: CHEMICAL CLEANING LIMITED - WR2027. COMPLIANCE WITH THE CONSENT MEDIAN LIMITS OF 400 G/M3 FOR SS, AND 100 G/M3 FOR TP.

DATE	Median Total Phosphorus (g/m3)	Percentage Exceedence	Median Suspended solids (g/m3)	Percentage Exceedence	Days Elapsed
01/06/88	99	0	195	0	55
07/06/88	99	0	195	0	57
14/06/88	99	0	240	0	55
21/06/88	30	0	203	0	54
28/06/88	30	0	203	0	53
05/07/88	30	0	203	0	56
13/07/88	30	0	203	0	57
20/07/88	50	0	203	0	58
27/07/88	30	0	203	0	56
04/08/88	30	0	203	0	58
11/08/88	32	0	203	0	58
17/08/88	32	0	145	0	57
24/08/88	50	0	145	0	57
01/09/88	32	0	145	0	58
08/09/88	32	0	141	0	57
15/09/88	32	0	141	0	57
20/09/88	32	0	150	0	55
28/09/88	140	40	150	0	55
06/10/88	140	40	190	0	56
12/10/88	140	40	190	0	56
19/10/88	140	40	190	0	56
26/10/88	140	40	150	0	55
03/11/88	140	40	140	0	56
10/11/88	140	40	140	0	56
17/11/88	140	40	130	0	58
24/11/88	60	0	120	0	57
29/11/88	60	0	120	0	54
07/12/88	60	0	100	0	56
14/12/88	93	0	100	0	56
21/12/88	193	93	120	0	56
28/12/88	193	93	120	0	55
04/01/89	93	0	120	0	55
11/01/89	93	0	120	0	55
17/01/89	93	0	120	0	54
25/01/89	109	9	120	0	57
02/02/89	93	0	120	0	57
08/02/89	60	0	160	0	56
15/02/89	60	0	160	0	56
22/02/89	60	0	120	0	56
28/02/89	87	0	120	0	55
07/03/89	87	0	120	0	55
15/03/89	80	0	120	0	57

APPENDIX 2: CHEMICAL CLEANING LIMITED - WR2027. COMPLIANCE WITH THE CONSENT MEDIAN LIMITS OF 400 G/M3 FOR SS, AND 100 G/M3 FOR TP.

DATE	Median Total Phosphorus (g/m3)	Percentage Exceedence	Median Suspended solids (g/m3)	Percentage Exceedence	Days Elapsed
22/03/89	80	0	120	0	56
28/03/89	80	0	140	0	54
05/04/89	87	0	140	0	56
12/04/89	87	0	140	0	56
19/04/89	80	0	240	0	56
27/04/89	80	0	250	0	58
04/05/89	50	0	250	0	58
10/05/89	50	0	340	0	56
17/05/89	130	30	340	0	56
24/05/89	130	30	350	0	57
31/05/89	100	0	350	0	56
06/06/89	80	0	340	0	55
15/06/89	80	0	350	0	57
21/06/89	80	0	320	0	55
28/06/89	40	0	350	0	55
04/07/89	30	0	350	0	55
12/07/89	30	0	320	0	56
19/07/89	30	0	320	0	56
26/07/89	20	0	320	0	56
02/08/89	20	0	220	0	57
09/08/89	20	0	220	0	55
16/08/89	30	0	190	0	56
22/08/89	30	0	190	0	55
29/08/89	20	0	180	0	56
08/09/89	18	0	190	0	58
13/09/89	18	0	180	0	56
19/09/89	18	0	180	0	55
26/09/89	18	0	180	0	55
03/10/89	18	0	180	0	55
10/10/89	30	0	190	0	55
18/10/89	30	0	230	0	57
25/10/89	50	0	190	0	57
01/11/89	50	0	190	0	54
08/11/89	50	0	180	0	56
15/11/89	30	0	180	0	57
23/11/89	30	0	170	0	58
28/11/89	30	0	170	0	56
05/12/89	20	0	170	0	56
13/12/89	20	0	170	0	56
19/12/89	20	0	170	0	55
27/12/89	10	0	170	0	56
03/01/90	10	0	170	0	56

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DATE	Median Total Phosphorus (g/m3)	Percentage Exceedence	Median Suspended solids (g/m3)	Percentage Exceedence	Days Elapsed
09/01/90	10	0	170	0	55
16/01/90	10	0	170	0	54
23/01/90	20	0	170	0	56
30/01/90	10	0	170	0	56
07/02/90	20	0	170	0	56
13/02/90	20	0	170	0	56
20/02/90	20	0	170	0	55
26/02/90	20	0	170	0	54
06/03/90	20	0	270	0	56
13/03/90	40	0	270	0	56
20/03/90	40	0	190	0	56
27/03/90	20	0	190	0	56
03/04/90	20	0	200	0	55
10/04/90	20	0	200	0	56
18/04/90	15	0	260	0	57
23/04/90	15	0	260	0	56
01/05/90	15	0	260	0	56
08/05/90	20	0	260	0	56
15/05/90	15	0	260	0	56
22/05/90	15	0	290	0	56
28/05/90	15	0	290	0	55
05/06/90	16	0	350	0	56
12/06/90	16	0	500	25	55
19/06/90	21	0	590	47.5	57
27/06/90	21	0	590	47.5	57
02/07/90	21	0	690	72.5	55
10/07/90	25	0	690	72.5	56
17/07/90	26	0	710	77.5	56
24/07/90	25	0	710	77.5	57
31/07/90	25	0	710	77.5	56
06/08/90	27	0	690	72.5	55
15/08/90	28	0	550	37.5	57
22/08/90	28	0	550	37.5	56
27/08/90	28	0	550	37.5	56
04/09/90	28	0	520	30	56
12/09/90	27	0	540	35	57
19/09/90	22	0	520	30	57
25/09/90	22	0	500	25	56
02/10/90	21	0	500	25	57
09/10/90	21	0	500	25	55
16/10/90	21	0	480	20	55
23/10/90	21	0	370	0	57

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DATE	Median Total Phosphorus (g/m3)	Percentage Exceedence	Median Suspended solids (g/m3)	Percentage Exceedence	Days Elapsed
30/10/90	21	0	340	0	56
07/11/90	21	0	330	0	56
13/11/90	18	0	330	0	55
23/11/90	25	0	340	0	59
27/11/90	33	0	370	0	56
04/12/90	34	0	340	0	56
11/12/90	34	0	330	0	56
18/12/90	34	0	280	0	56
24/12/90	34	0	280	0	55
03/01/91	34	0	280	0	57
09/01/91	34	0	280	0	57
15/01/91	49	0	280	0	53
23/01/91	49	0	280	0	57
29/01/91	49	0	280	0	56
07/02/91	33	0	290	0	58
12/02/91	21	0	310	0	56
20/02/91	18	0	330	0	58
26/02/91	21	0	330	0	54
05/03/91	21	0	370	0	55
12/03/91	33	0	370	0	56
20/03/91	31	0	470	17.5	56
26/03/91	31	0	470	17.5	56