TECHNICAL REPORT

INVESTIGATION OF THE CITY OF SANTA BARBARA SEWAGE TREATMENT FACILITIES

Surveillance and Analysis Division

United States Environmental Protection Agency

Region IX

San Francisco, CA 94111

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I. Introduction

A. Statement of Problem

At the request of the California State Water Resources Control Board, the Environmental Protection Agency (EPA) provided technical assistance to evaluate the sewage treatment plant at the City of Santa Barbara. Because of the overloaded condition of this plant, the city had been under a sewer connection ban for some time. Concern has been focused on the Santa Barbara STP because of the recent lifting of the connection ban by the Central Coast Regional Water Quality Control Board.

B. Purpose of Investigation

The objectives of this investigation were: 1) to evaluate the performance of this facility; 2) to evaluate the physical structure of the plant and recommend needed interim improvements, and 3) to evaluate the operation of the treatment processes and recommend needed changes.

C. Acknowledgements

The principal investigator for this investigation was Daryl G. DeRuiter, Sanitary Engineer, Surveillance & Analysis Division (S&A). He was assisted in the field by Robert C. Tauer, Chemist, and Gary D. Thompson, Physical Science Aide, also of S&A.

A special word of appreciation is extended to Alfred E. Clancy, Sanitation Superintendent and James E. Tulk, Plant Supervisor of the City of Santa Barbara STP for their complete cooperation and assistance in conducting the survey.

II. Procedures

A. Physical Description of Plant

The Santa Barbara STP is a conventional primary treatment system (design flow: 8 MGD) with two sedimentation tanks and a two-stage digester as the principal components. (See Appendix for schematic of plant.) Raw sewage is collected and transported via a separate sewer system and enters the plant through a 42-inch gravity line. A certain portion of the raw sewage passes through a barminutor with the excess channeled through a bar screen with 1-inch openings. The screened sewage enters a wet well from which it is pumped by a series of single-speed pumps through an 18-inch force main to the primary clarifiers. The sizes of the four raw sewage pumps are: one 25-hp (1600 gpm), two 50-hp (3200 gpm), and one 75-hp (5000 gpm). These pumps switch on and off automatically by a level sensing device located in the wet well.

The primary clarifiers are eighty feet in diameter with a twelve foot sidewall depth and have a twelve-to-one slope to the sludge cone in the center. A single overflow weir is located along the outer perimeter of the clarifier. Each of the clarifiers is equipped with a scum baffle and scum collection box. Sludge is mechanically scraped to the sludge cone. A 45-foot diameter baffle extends to a depth of approximately nine feet. Air diffusers were initially installed within these baffles and the units were operated as combined aerator-clarifiers, but this practice has been discontinued.

At design flow of eight MGD (four MGD to each clarifier), the surface overflow rate is 870 gallons per feet per day, the weir overflow rate is 16,650 gallons per square foot per day and the detention time is 2.80 hours. Figure 9 shows the relationship between the surface and the weir overflow rates vs flow. It is important to note that the zone enclosed by the baffle plate is quite turbulent and should for all practical purposes be neglected in computing the surface overflow rate. Figure 9 also shows the effect of neglecting this zone.

Clarifier sludge is pumped to the digesters through an eight-inch line with a Venturi meter by two centrifigal pumps with a screw feed mechanism which also serves to cut rags and other materials which escape the bar screen. Each pump is driven by a five-horsepower variable speed motor with a 75-gallon-per-minute capacity.

Each digester has a diameter of sixty-five feet and a 28-foot sidewall depth which yields a volume 93,000 cubic feet. Mixing capability by means of gas recirculation is being added to the primary digester. Both digesters have heating and recirculation capabilities, although only one of the digesters can be heated and recirculated at a time. Sludge drying beds are available on the plant site, but the capacity is quite restricted due to limited available land area.

An 18-inch diameter centrifuge with a rated capacity of 500 pounds per hour is located near clarifier number 2, but this unit has not been used for the past three years because it has failed to operate efficiently and odors from this process were responsible for many complaints.

Chlorine is added to the clarifier effluent at the upstream end of a Parshall flume, which was the only functioning meter at the plant at the time of the investigation. The effluent from the Parshall flume passes through a small "mixing" chamber prior to discharge to the outfall. The chlorinator capacity is 4000 pounds per day (both liquid and gaseous chlorine are used) and is manually operated.

The chlorinated effluent is discharged to the Santa Barbara Channel through a 42-inch reinforced concrete pipe to a point 3430 feet from shore at a depth of 42 feet. A 300 foot corregated metal pipe diffuser with 6-inch diameter portholes placed on successive alternate sides was added in 1963.

The present auxiliary power supply consists of a 110-hp Fairbank Morse 2-cycle diesel engine which is connected only to the number 4 pump (75-hp, 500 gpm capacity).

B. Investigation

The EPA conducted a three-day sampling survey on February 6-8, 1973. Plant influent and effluent samples were collected hourly from 3:30 am through 2:30 pm (peak flow conditions). Primary sludge samples were drawn during scheduled sludge removal from the clarifier during both work shifts (8:00 am to midnight). Digester supernatant samples were collected during the early evening hours while it was returned to the headworks and clarifier effluent samples were collected after the digester supernatant had reached the effluent.

Emphasis was placed upon a performance determination of the two principal components--the primary clarifiers and the digesters. The efficiency of the clarifiers was determined by a comparison of the influent and effluent samples. Each clarifier was sampled for individual efficiency; the parameters used in this evaluation were settleable and suspended solids. Because of the limited number of BOD samples that could be analyzed in the field, an attempt was made at correlating BOD with total organic carbon (TOC).

Primary sludges were sampled for total and volatile solids content for two purposes. Total solids data was to give an indication of the effectiveness of the sludge pumping program and volatile solids data was collected as a measure of digester loading.

Total and volatile solids data were collected on the digester influent (primary sludge), digester sludge withdrawn, and supernatant in order to perform a mass balance analysis of volatile solids reduction in the clarifiers.

TOC, BOD, suspended solids and settleable solids analyses were performed on the digester supernatant to determine if the return of this supernatant to the headworks had any degrading effect on the final effluent quality.

Other information was gathered by observation of equipment and operational control methods, inspection of plant records, and discussions with plant personnel.

III. Findings and Discussion

A. Operation and Maintenance

Personnel associated with the operation and maintenance of the Santa Barbara sewage treatment facilities are identified as follows:

Number	Title	Duties
1	Sanitation Supt.	Organization and supervision of all city sanitation facilities.
1	Plant Supervisor	Supervision of sewage treatment plant.
5	Operators	Routine operation & maintenance of sewage treatment plant.
1	Maintenance Man III)	Repair sewer lines
2	Maintenance Men I)	
1	Maintenance Man III)	Hauls digester sludge to disposal area.
3	Maintenance Men I	Temporary workers on the Public Employee Program (assigned duties as needed).
1	Sewer Maintenance Foreman)	Maintenance of pump stations; rodding, sealing, and cleaning of sewer lines; trouble-shooting
6	Sewer Maintenance Crewmen)	

Routine maintenance work is performed only during the main shift (8:00 am to 4:00 pm) as detailed in the schedule in Table I. One operator is assigned to the night shift (4:00 pm to midnight) with principal duties limited to pumping sludge from the clarifiers and to return digester supernatant after the plant flow has receded.

The bar screen is raked two or three times during peak flows and occasionally as needed. The raw sewage pumps operate automatically except when an operator washes down the wet well and manually turns on extra pumps to lower the water level in the wet well.

Dow A-23 anionic polymer is added daily from 6:00 am until 1:30 pm at a dose rate of 0.5 ppm to the headworks and 0.25 ppm in each raw sewage force main just ahead of the clarifiers. Plans are being made to add aluminum sulfate to the headworks and Dow A-23 anionic polymer just ahead of the clarifiers. A dried bacterial culture manufactured by BIO-CON is also added to the wet well for biodegradation of grease.

Primary sludge is pumped to the digester hourly during the two shifts. The pumps are manually operated and pumping is terminated when the sludge consistency becomes watery as visually determined. The scum boxes are pumped to the digester three times daily.

Digester sludge is presently being hauled by tank truck to a private land disposal area. The quantity disposed of generally depends upon when the tank truck can operate (since it cannot spread the sludge during muddy conditions) and how many loads can be hauled in one day. Digester supernatant is returned to the headworks during the evening (generally around 8:00 pm when the plant flows have diminished), and the quantity depends upon how much will have to be returned to lower the digester lid to a specified level.

At the time of the survey, anhydrous ammonia was added to the secondary digester from 8:00 am until midnight for pH control. The dosage rate during the survey was 227 pounds NH_3 per day (average over a 6-day period).

Chlorine dosage rates are manually controlled and are rarely changed. The dosage is set at 20-25 ppm at the design flow rate of eight MGD. Chlorine residuals have recently been determined only once every week or two at a point one quarter mile from the plant (approximately fifteen minutes detention); the values have been in the range of 0.75 ppm. The chlorine residual sampling location is being moved to a manhole situated on the plant site. Thus, essentially no detention time will be provided before residuals are determined.

The grounds at the Santa Barbara STP were generally in an unkempt condition: materials and equipment were haphazardly lying about, buildings and equipment were in need of painting and repair, grounds were ungroomed, and cleaning practices were minimal. Extra funds would be necessary for any work requiring major equipment or outside services, but much routine maintenance could be done to improve the appearance and condition of the facilities at this plant.

B. Monitoring

The waste discharge requirements and the monitoring and reporting requirements adopted for the Santa Barbara plant by the Central Coast Regional Water Quality Control Board are attached. Weekly reports are submitted voluntarily by the plant and monthly summaries are sent to the Regional Board as required. These reports contain only data relating to plant effluent and receiving waters; data pertaining to plant operation are noticeably absent. Some data, as listed in Table II, are collected to assist the operator in operational control of the plant. However, these data have not been collected frequently enough to provide the operator with sufficient information for consistent control. No laboratory testing was performed by plant personnel during this investigation.

C. Physical Considerations

Influent flow is greatly affected by heavy rains. The capacity of the raw sewage pumps is 18.7 MGD and the influent flow occasionally exceeds this capacity. During these occasions, the raw sewage overflows the wet well and backs up in the sewer to points 1000-1500 feet away from the plant. These extreme flows can be attributed to excessive infiltration and low areas of Santa Barbara which are flooded during heavy rains when the ground is relatively saturated with water. These are an estimated 75-100 manholes in these low areas and approximately 1/2 to 3/4 of these manholes are flooded during wet weather conditions.

Some of the sewer lines in the older parts of Santa Barbara were constructed fifty to sixty years ago. There are some 500 trouble spots at present in this area which include an estimated 100-125 miles of sewer lines. One foreman and two repair crews of three men each are responsible for maintenance of the sewer lines and pump stations.

Surges that were noticeable in the overflow of the final clarifiers occur when the larger raw sewage pumps kick in. Variable speed pumps are important factors in eliminating such surges.

It was also observed that the effluent flow from clarifier number 2 was significantly greater than flow from clarifier number 1. This could be a result of several factors: 1) unequal settling of the clarifiers, 2) weir plates out of adjustment, or 3) partially restricted flow in the influent line to clarifier number 1. Whatever the cause, this problem can be corrected by adjusting the elevation of the weir plates. In addition to this, the weirs in each clarifier have several low spots where overflow rates are high and high spots where there is no overflow at all. The results of such a situation are obvious: the low spots with high overflow rates were discharging more solids than the higher spots with less overflow.

Sludge pumping from the clarifiers to the digesters was found to be a continuous problem for the operator. An attempt was made to composite the sludge from each clarifier during each pump cycle which ranged in time from two minutes to eighteen minutes per clarifier. Some of the problems encountered were:

1. It was extremely difficult to start moving sludge with a consistency of five or six per cent with the centrifugal pumps. Quite often it was necessary to force flushing water back through the line leading from the sludge cone in the clarifier to the pumps in order to clean out the sludge line and assist pumping. This flushing water had the effect of diluting the sludge so that its true consistency in the clarifier was unknown. It also resulted in an unnecessarily high volume of flow being sent to the digesters, thus reducing the detention time in the digesters.

2. Since no sludge is pumped out of the clarifiers between midnight and 8:00 am, the accumulation of sludge during these hours can be substantial. The accumulation of sludge is undesirable not only from the viewpoint of poor operation, but makes the first sludge pumping cycle in the morning extremely difficult.

3. Sludge flow was not metered. Attempting to measure the sludge flow by recording the time of pumping for each cycle was inaccurate because the actual flow rate will vary greatly depending upon the sludge consistency. Erratic sludge flow and variable speed pumps added to this problem. The displacement of the digester lid due to each pump cycle was measured, but this method also lacked accuracy.

4. The sludge sampling lines were 90-degree connections into the sludge lines. It was difficult to get thick sludge through these small sample lines. Solids frequently clogged in the valve on the sample line.

5. Sludge and scum are pumped through the same lines. There was no clear separation of sludge flow and scum flow.

6. There appeared to be much fluctuation in the quantity and consistency of sludge from each clarifier from one pump cycle to the next.

At the time of the survey (February 6-8, 1973) the primary sludge line leading from the clarifiers to the digesters was plugged with sand and grit and a temporary six-inch line had been installed for use while the permanent line was being cleaned.

In September 1971 the secondary digester was taken out of service for cleaning because sludge could not be pumped into the digester properly. While removing the digester contents, the workers found that much of the piping had collapsed and that mounds of sand and grit had accumulated to depths up to fifteen feet. After this material was completely removed, new piping (sludge lines, recirculation lines, and gas lines) was installed and the corbels on the digester cover were rebuilt and reinforced. The operation was completed in October 1972.

On October 13, 1972 the primary digester was taken out of service for cleaning. The floating cover was removed during the emptying process and was repaired, painted, and re-roofed. New valves were installed on all lines entering the digester. The interior sections of all recirculating pipes and the supernatant return line were replaced because they had collapsed. Gas mixing was added by means of six "shearfuser" type cylinders near the center of the tank on the floor. A 420,000 BTU steam generator and two Dorr-Oliver spiral heat exchangers have been acquired to provide heat to each digester.

Due to the facts that the primary digester was out of service and that no sludge was withdrawn from the secondary digester during the survey period, an attempt to evaluate the performance of the digesters was impractical.

The calculations on digester loading (see Appendix) give an estimate of expected digester efficiency under proper operation. If primary sludge with four per cent solids is pumped to the digester, the resulting detention time is 49.5 days. In heated digesters ($t \sim 95^{o}F$), this detention period will reduce the volatile solids content by approximately 64 per cent. Assuming digester sludge is withdrawn at an eight per cent solids content, the volume of the primary sludge is reduced by approximately 74.5 per cent.

However, if sludge of lower solids content is pumped to the digesters, then a greater volume of water is sent to the digesters (assuming the same quantity of solids is pumped to the digesters) and the detention time is reduced. Thus the volatile matter reduction and the volume reduction will also diminish.

D. Data Evaluation (See data tabulations in Appendix).

Average TOC removal (during the hours of 8:30 am through 2:30 pm) for the three days was 21.1 per cent and the average suspended solids removal for this period was 58.8 per cent. Considering the high rate of flow (and subsequent high overflow rates in the clarifiers) received by the plant at the time of sampling, the removal efficiency with respect to suspended solids was surprisingly high. The suspended solids efficiency of these clarifiers is comparable to that of primary plants with much lower overflow rates.

TOC removals (assume BOD will follow similar patterns) are slightly higher in clarifier number 1 as compared to clarifier number 2, but do not correlate to fluctuations in the flow rate. The low per cent removals when compared to the relatively high suspended solids removal indicate that much of the TOC is in the dissolved state.

Slightly better removal of suspended solids was also achieved in clarifier number 1, except during the afternoon of February 8 when the operator was having difficulty pumping sludge out of clarifier number 1. Again, no strict correlation between suspended solids removal and flow rate was evident. The effluent settleable solids were generally quite high, especially during the later morning hours of February 7 and 8. This data is distinctly responsive to variations in flow rates.

Of the forty-eight suspended solids samples from the clarifiers (see data in Appendix) 27 per cent exceeded the maximum limit of 100 mg/l (see attached requirements), 70 per cent exceeded 75 mg/l, and 93 per cent exceeded 50 mg/l. Of the forty-two settleable solids samples from the clarifiers, 42 per cent exceeded the maximum limit of 1.0 ml/l and 83 per cent exceeded 0.3 ml/l. Thus, the plant was violating the solids requirements most of the time during the investigation.

A close examination of the settleable solids test in the Imhoff cone revealed the presence of a fibrous material which inhibited the compaction of the sludge in the bottom of the cone. This hindering effect may be due to an electrostatic charge on the fibers or some other physical phenomenon. This same effect may take place in the clarifier sludge as well as in the Imhoff cone. One obvious effect of this fiber is that it will yield settleable solids results that are higher than would result without the presence of such fiber.

The Sanitation Superintendant indicated that he believes the source of this fibrous material is the Mission Linen Supply Company on Montecito Street which deals in laundry and renting of uniforms, linens, towels, etc. Santa Barbara STP personnel indicated that an analysis of the Mission effluent revealed a settleable solids content of 11 ml/l/hr.

Table III contains data which indicates the effect of the digester supernatant return on the raw sewage concentrations with respect to TOC and suspended solids and the subsequent performance of the primary clarifiers during the time of supernatant return. The extremely high TOC and suspended solids concentrations in the digester supernatant has the effect of doubling the influent concentrations. With per cent removals comparable to those without supernatant return, the effluent quality is also approximately twice the normal values.

Because the sludge pumps are incapable of pumping concentrated sludge to the digesters without the aid of flushing water, an unnecessarily high volume of diluted sludge is sent to the digesters. Thus, a greater volume of digester supernatant must be returned to the headworks at the end of the day. Due to reduced efficiency of the digesters and a greater volume of supernatant return, a greater quantity of suspended solids and TOC is returned to the headworks. This increase in supernatant return volume and concentration is reflected by increased concentrations of suspended solids and TOC in the final effluent. The greater the reduction in sludge flow that can be achieved, the less effect the supernatant return will have on effluent quality with respect to suspended solids and TOC.

IV. Conclusions and Recommendations

A. Conclusions

The primary clarifiers at this facility are hydraulically overloaded during the peak flows which occur from approximately 8:00 am until 10:00 pm. It was found during this investigation that the waste discharge requirements concerning settleable and suspended solids were violated most of the time during the hours of sampling. The improvements recommended as a result of this investigation will enhance the performance of this facility. However, there is insufficient data to determine whether or not these improvements will result in compliance with waste discharge requirements.

The most significant problems confronting the plant are summarized below.

1. Sand and grit, which also reflect high infiltration rates, have given the plant a history of problems such as plugging the primary sludge line, accumulating in the digester, causing excessive wear on pump impellers, and impeding the pumping of clarifier sludge.

2. The existing centrifigal sludge pumps are incapable of moving concentrated sludges or sludges that have a significant sand and grit content. If sludge is not pumped frequently and is allowed to accumulate in the clarifier, the clarifier effluent will eventually reflect a higher solids content.

3. Clarifier number 2 receives a significantly higher rate of flow than does clarifier number 1. In addition, the weirs are not level in either clarifier, resulting in short-circuiting at several points around the periphery of the clarifiers. Elimination of these deficiences should improve the performance of these units.

4. There is an apparent deficiency of men and equipment available to repair and maintain the sewer system properly. Excessive wet weather flows due to infiltration and flooded manholes result in high overflow rates in the primary clarifiers. These high overflow rates have an adverse effect on removal efficiency of settleable solids and a probable adverse effect

on suspended solids and BOD removal as well, although the limited duration of this investigation was insufficient to confirm this conclusion.

B. Recommendations

The following four recommended improvements to the Santa Barbara STP are deemed necessary to effect improved performance of this facility:

1. Grit removal facilities should be constructed to insure against further problems associated with sand and grit. Because of the major cost involved, it is advised that these facilities be installed such that they may be used in conjunction with the secondary treatment system proposed for the City of Santa Barbara.

2. Positive displacement pumps should be acquired immediately to replace the existing centrifugal sludge pumps. These positive displacement pumps could later be installed into the proposed secondary treatment facility.

3. The weir plates on the primary clarifiers should be leveled to equalize the flow to each clarifier and to eliminate short-circuiting due to low areas on the weirs.

4. Greater emphasis should be placed on sewer maintenance to reduce high flows resulting from infiltration and flooded manholes during wet-weather conditions. Reduced flows should improve treatment efficiency and will also provide a cost benefit in the construction of the proposed secondary system since lower flows will require smaller treatment units.

Several additional steps which would assist in upgrading and provide more reliable operation of the plant should be considered:

1. Consideration should be given to 24-hour operation which will provide for overnight pumping of sludge and quicker response to emergency situations.

2. A more complete and systematic monitoring program should be incorporated for efficiency determination and operational control. Certain analyses such as volatile acids and volatile solids are critical for reliable digester operation. It is recommended that the Regional Board require such operational control data to be included in the monthly reports.

3. A means of measuring all main streams of flow is essential for optimum operational control. The Santa Barbara STP has a definite need for more complete metering.

4. Frequent monitoring of chlorine demand should be practiced for more efficient and reliable chlorination of the final effluent.

5. An industrial waste survey program and pre-treatment requirements wherever necessary would be advantageous to insure against harmful materials entering the plant.

6. Scum collected from the clarifiers should be hauled to a land disposal site along with digester sludge to prevent clogging of the sludge line and accumulation in the digesters.

7. Testing should be performed to determine the optimum types and dosage rates of polymers for coagulation and sedimentation.

8. Variable speed raw sewage pumps should be considered to eliminate the surges that occur when the larger pumps kick in.

9. The present auxiliary pumping capacity is insufficient to handle influent flows during the peak hours of the day. Additional capacity should be provided.

In addition, general housekeeping practices should be instituted to clean up the facility. As observed, the grounds and equipment were in a run-down state. A routine cleaning, maintenance and painting program to improve the appearance would be in order.

TABLE I

MAINTENANCE SCHEDULE

UNIT	FREQUENCY OF REPAIR	DESCRIPTION
Barminutor	Yearly	Send unit to manufacturer for complete repair (have and extra unit for interim use)
	Daily	Check for greasing
	After each Flooding	Drain and replace oil
Motors	Semi-Annually	greasing
Raw Sewage Pumps	Yearly (after wet season)	Rebuild (replace shaft, bearings, packing assembly, wear rings, and seal rings) - have duplicates for all pumps.
	As required	Packing
Sludge Pumps	As required	Rebuild (have 2 standby pumps, and 1 standby motor)
	As required	Packing
Clarifier Assembly	Weekly	Greasing

TABLE II

MONITORING SCHEDULE

LOCATION	PARAMETER	FREQUENCY	REMARKS
I. Influent	pH	1/day	10:00 A.M.
	Temperature	4/day	
	Suspended Solids	1/week	Eight-hour composite (eight samples at one-hour intervals during 8:00 A.M. to 4:00 P.M. shift)
	Settleable Solids	1/day	10:00 A.M.
II. Final Effluent	pH	1/day	10:00 A.M.
	Suspended Solids	1/week	Eight-hour composite (eight samples at one-hour intervals during 8:00 A.M. to 4:00 P.M. shift)
	Settleable Solids	1/day	10:00 A.M.
	Chlorine Residual	2/day	10:00 A.M. and 2:00 P.M.
III. Digesters	pH	1/day	
	Temperature	Constant Control	
	Volatile acids	1/week	
	Total Solids	1/day & as needed	Performed on supernatant, recirculated flow, and effluent sludge
	Volatile Solids	As needed	Performed on sludge & recirculated flow
IV. Primary Sludge	No analyses performed at present (expect to begin pH, total solids, and volatile solids in future)		

TABLE III

EFFECT OF DIGESTER SUPERNATANT RETURN

ON EFFLUENT QUALITY

	TOTAL ORGANIC CARBON			SUSPENDED SOLIDS		
DATE	Feb. 6	Feb.7	Feb. 8	Feb.6	Feb.7	Feb.8
Time of Digester Supernatant Return	1800-2000	1813-1941	1808-2004	1800-2000	1813-1941	1808-2004
Raw Sewage Conc. (mg/l.)	111	106	134	239	206	203
Raw Sewage Flow (MGD)	12.92	10.38	9.20	12.92	10.38	9.20
Dig. Sup. Conc. (mg/l.)	3550	3450	4700	9600	1500	4500
Dig. Sup. Flow (MGD)	0.38	0.315	0.40	0.38	0.315	0.40
Combined Raw Sewage & Dig. Sup. Conc. (mg/l.)	209	218.5	323.5	506	244	382
Clarifier No. 1 Effl. Conc. (mg/l.)	180	180	180	150	140	140
% Removal in Clarifier No. 1	13.9	17.6	44.4	70.3	42.6	63.3
Clarifier No. 2 Effl. Conc. (mg/l.)	190	180	220	140	150	130
% Removal in Clarifier No. 2	9.1	17.6	32.0	72.3	38.5	66.0

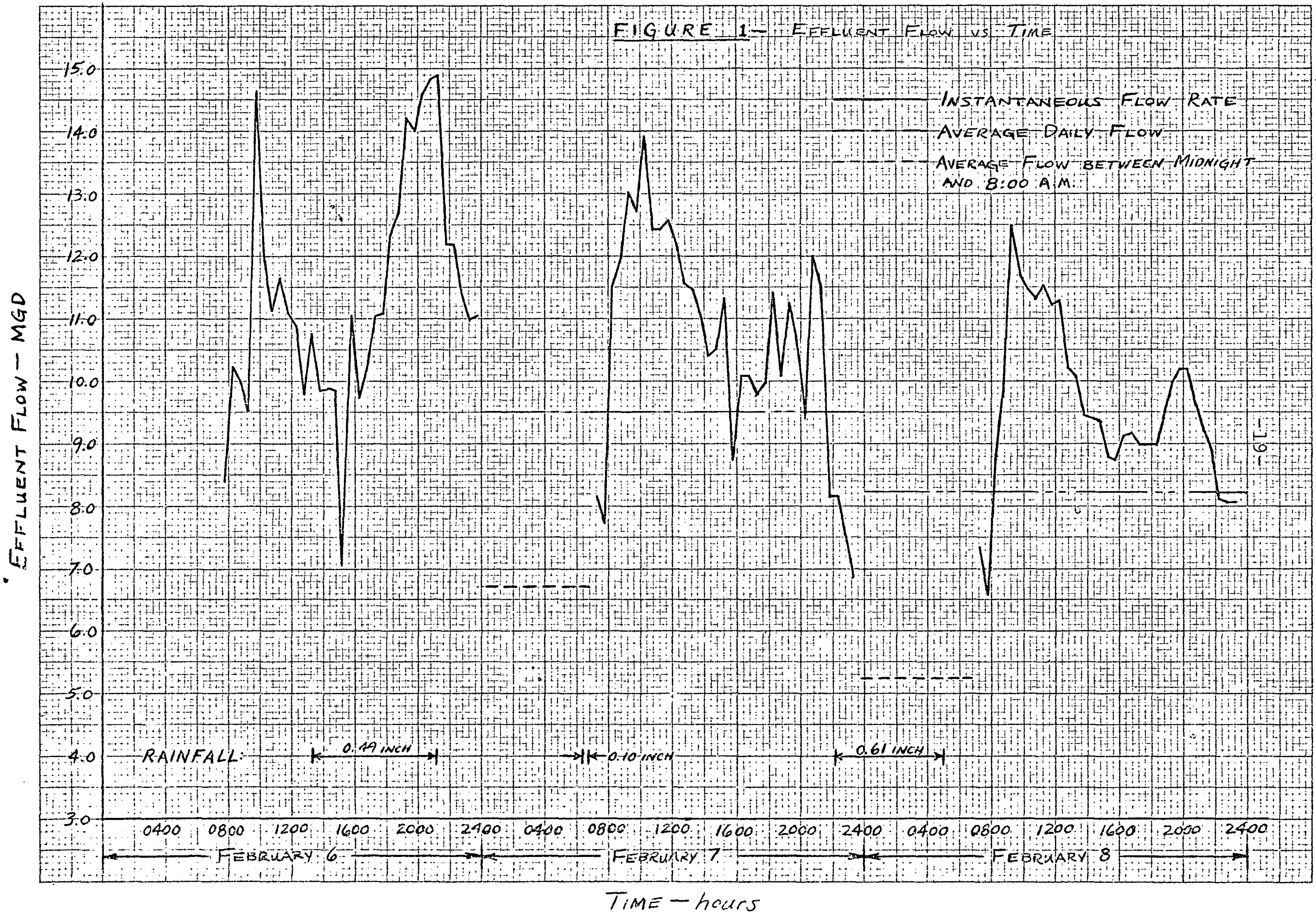


FIGURE 1 — EFFLUENT FLOW VS TIME
INSTANTANEOUS FLOW RATE
AVERAGE DAILY FLOW
AVERAGE FLOW BETWEEN MIDNIGHT AND 8:00 A.M.
EFFLUENT FLOW — MGD
15.0
14.0
13.0
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
RAINFALL:
0.49 INCH
0.10 INCH
0.61 INCH
0400 0800 1200 1600 2000 2400 0400 0800 1200 1600 2000 2400 0400 0800 1200 1600 2000 2400
FEBRUARY 6
FEBRUARY 7
FEBRUARY 8
TIME — hours

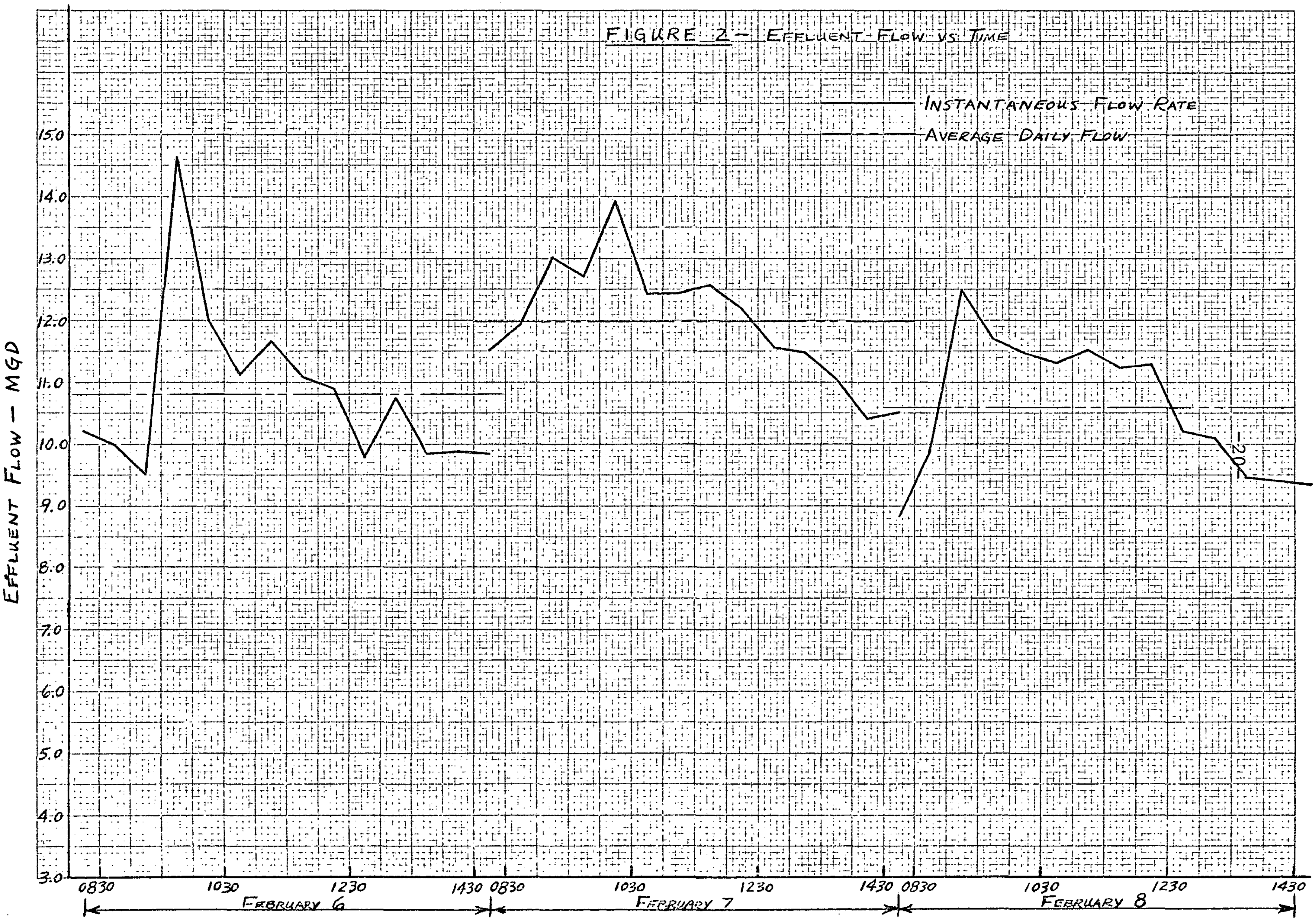


FIGURE 2 — EFFLUENT FLOW VS TIME

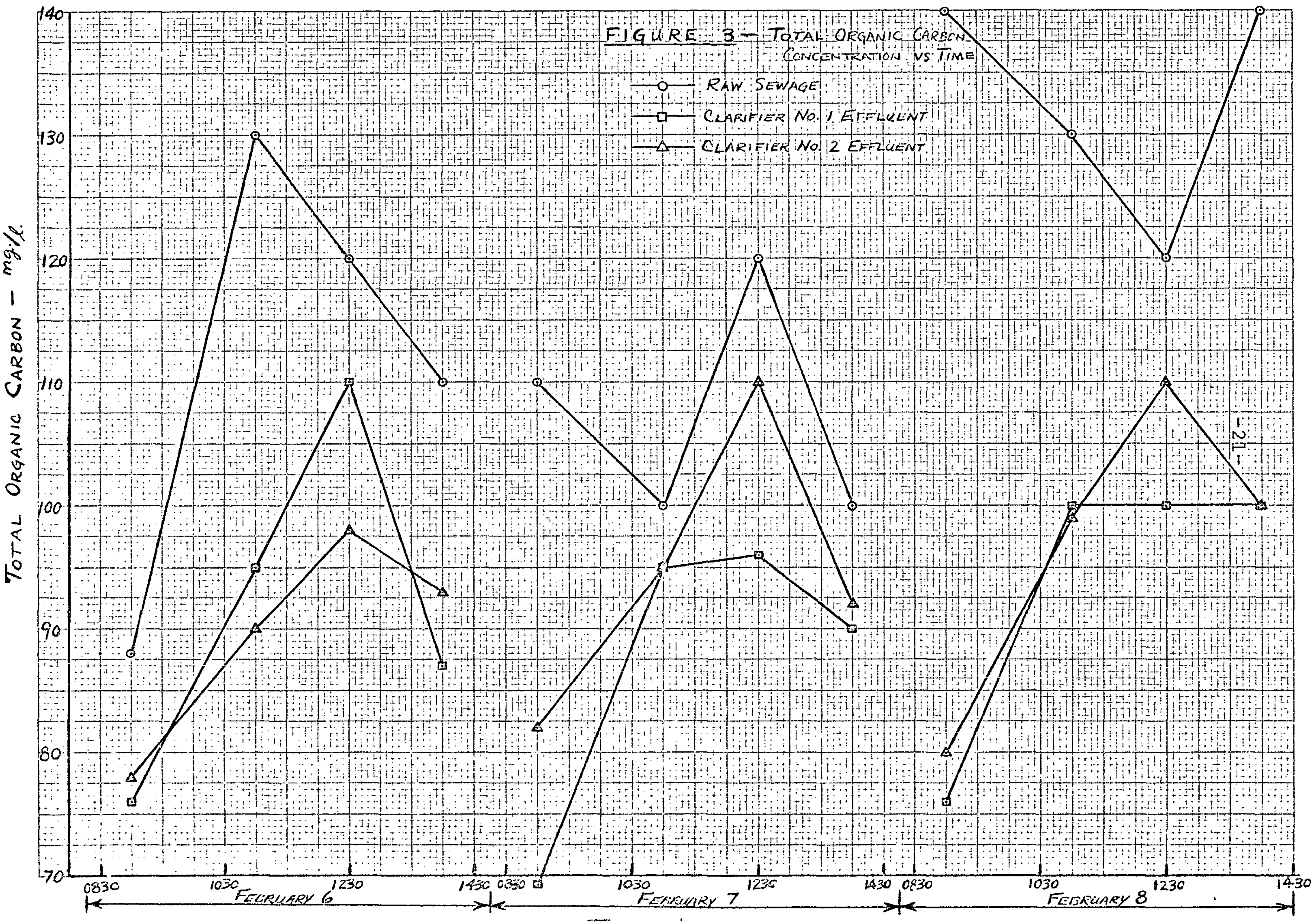
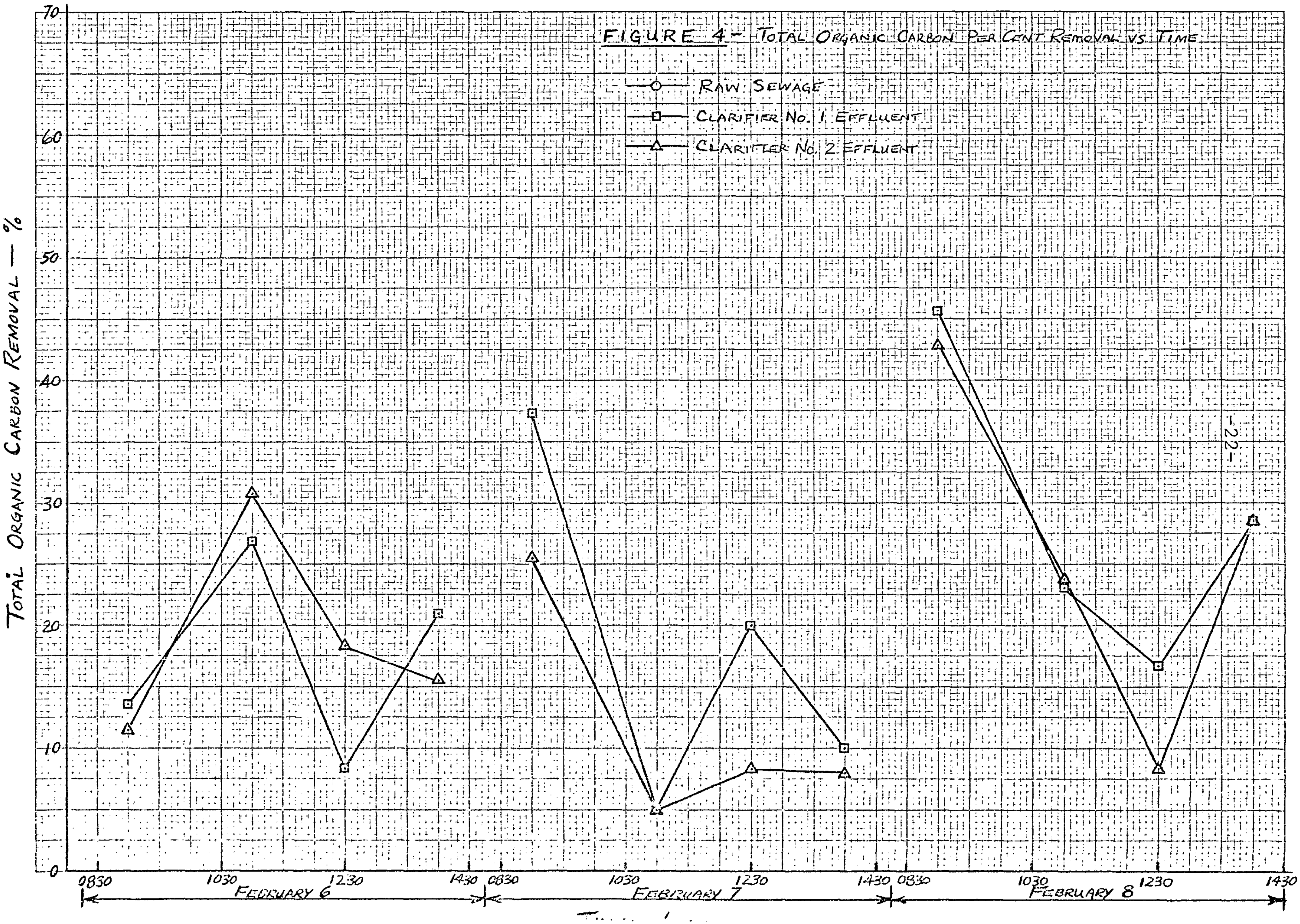


FIGURE 3 — TOTAL ORGANIC CARBON CONCENTRATION VS TIME
RAW SEWAGE
CLARIFIER NO. 1 EFFLUENT
CLARIFIER NO. 2 EFFLUENT
TOTAL ORGANIC CARBON — mg/l.
140
130
120
110
100
90
80
70
0830
1030
1230
1430
FEBRUARY 6
FEBRUARY 7
FEBRUARY 8

FIGURE 4 - TOTAL ORGANIC CARBON PER CENT REMOVAL VS TIME



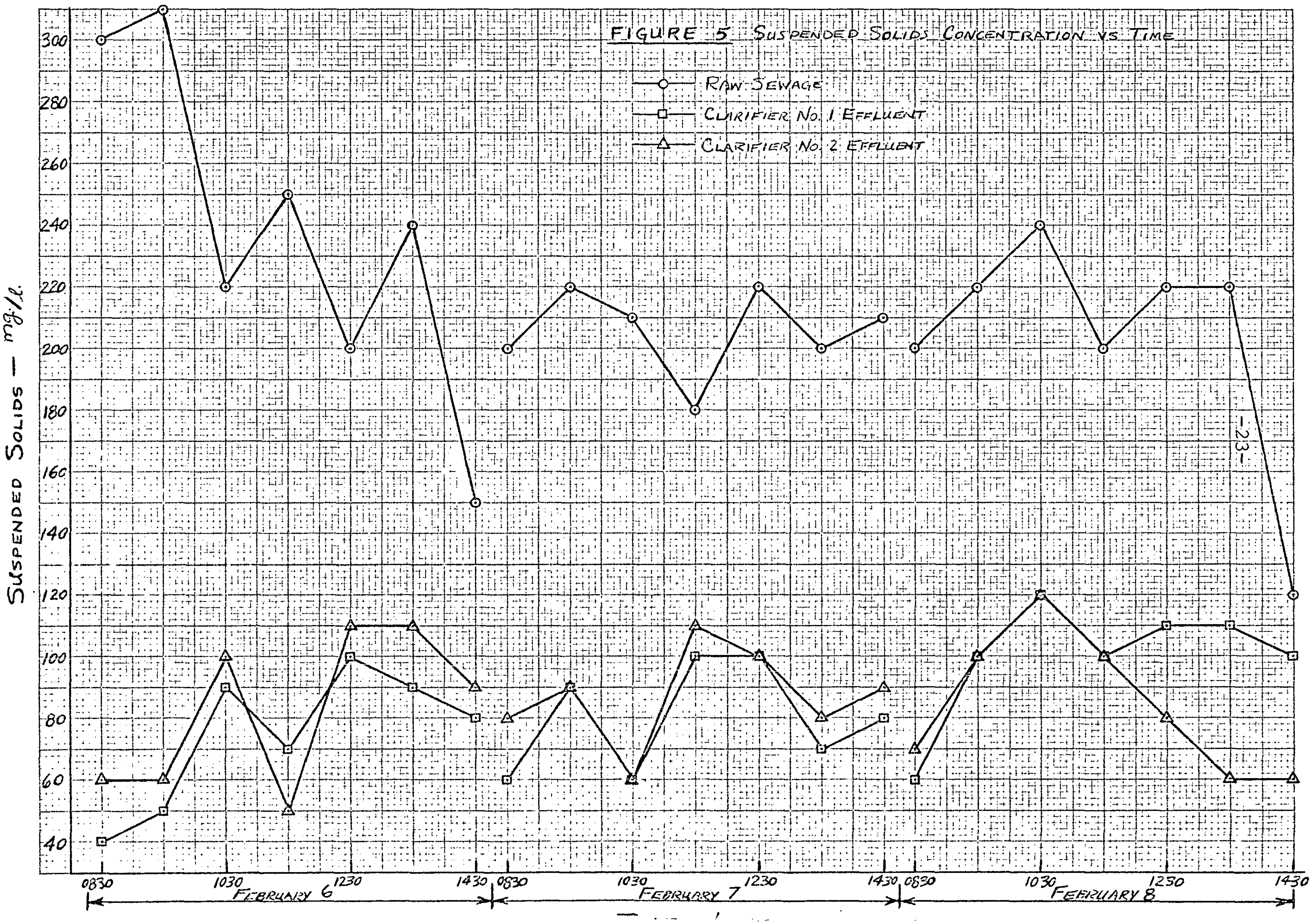


FIGURE 5 SUSPENDED SOLIDS CONCENTRATION VS TIME
RAW SEWAGE
CLARIFIER NO. 1 EFFLUENT
CLARIFIER NO. 2 EFFLUENT
SUSPENDED SOLIDS — mg/l
300
280
260
240
220
200
180
160
140
120
100
80
60
40
0830
1030
1230
1430
FEBRUARY 6
FEBRUARY 7
FEBRUARY 8

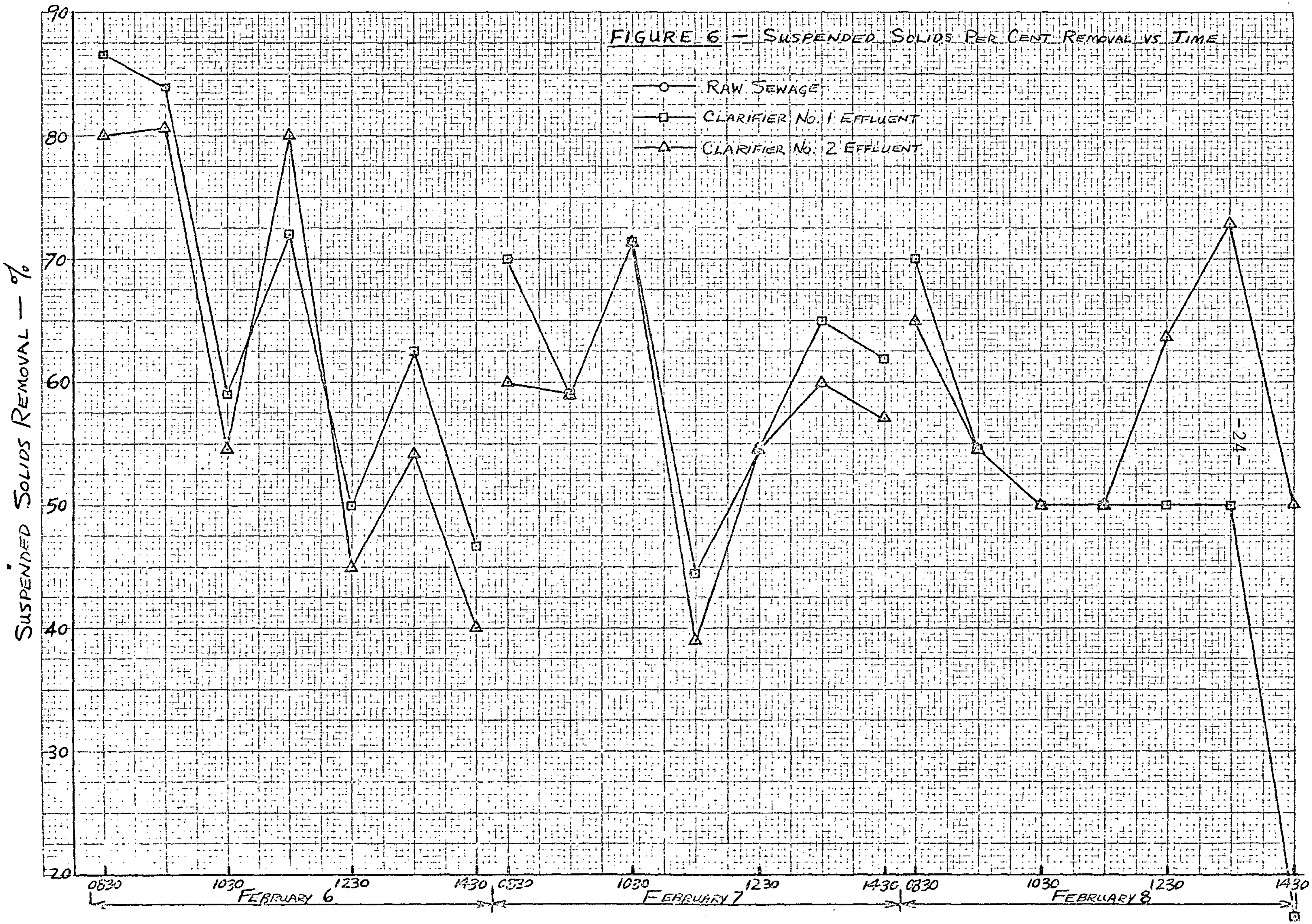


FIGURE 6 — SUSPENDED SOLIDS PER CENT REMOVAL VS TIME
RAW SEWAGE
CLARIFIER NO. 1 EFFLUENT
CLARIFIER NO. 2 EFFLUENT
SUSPENDED SOLIDS REMOVAL — %
90
80
70
60
50
40
30
20
0830
1030
1230
1430
0830
1030
1230
1430
0830
1030
1230
1430
FEBRUARY 6
FEBRUARY 7
FEBRUARY 8

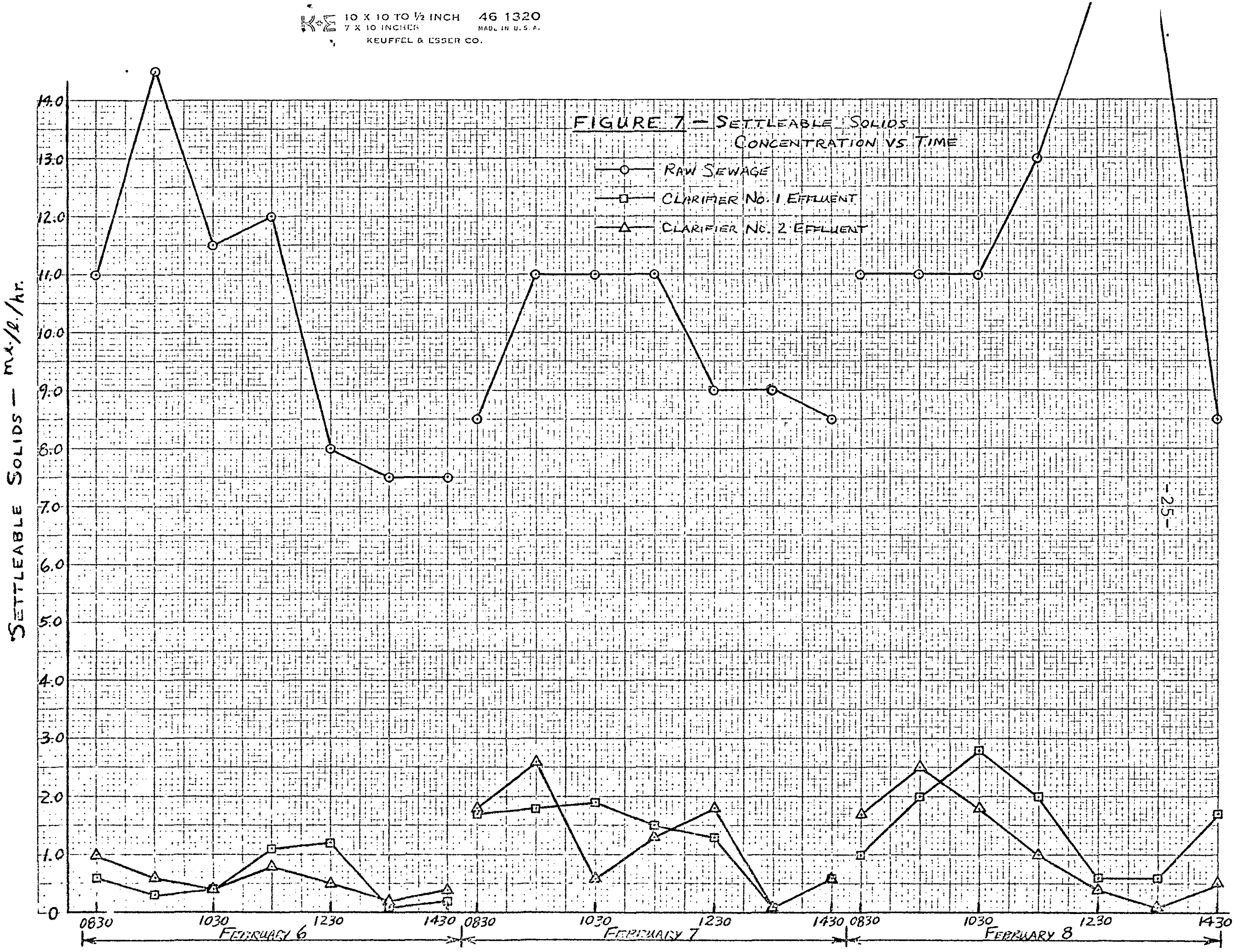


FIGURE 7 — SETTLEABLE SOLIDS
CONCENTRATION VS TIME
RAW SEWAGE
CLARIFIER No. 1 EFFLUENT
CLARIFIER No. 2 EFFLUENT
SETTLEABLE SOLIDS — ml./l./hr.
14.0
13.0
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0
0830
1030
1230
1430
0830
1030
1230
1430
0830
1030
1230
1430
FEBRUARY 6
FEBRUARY 7
FEBRUARY 8

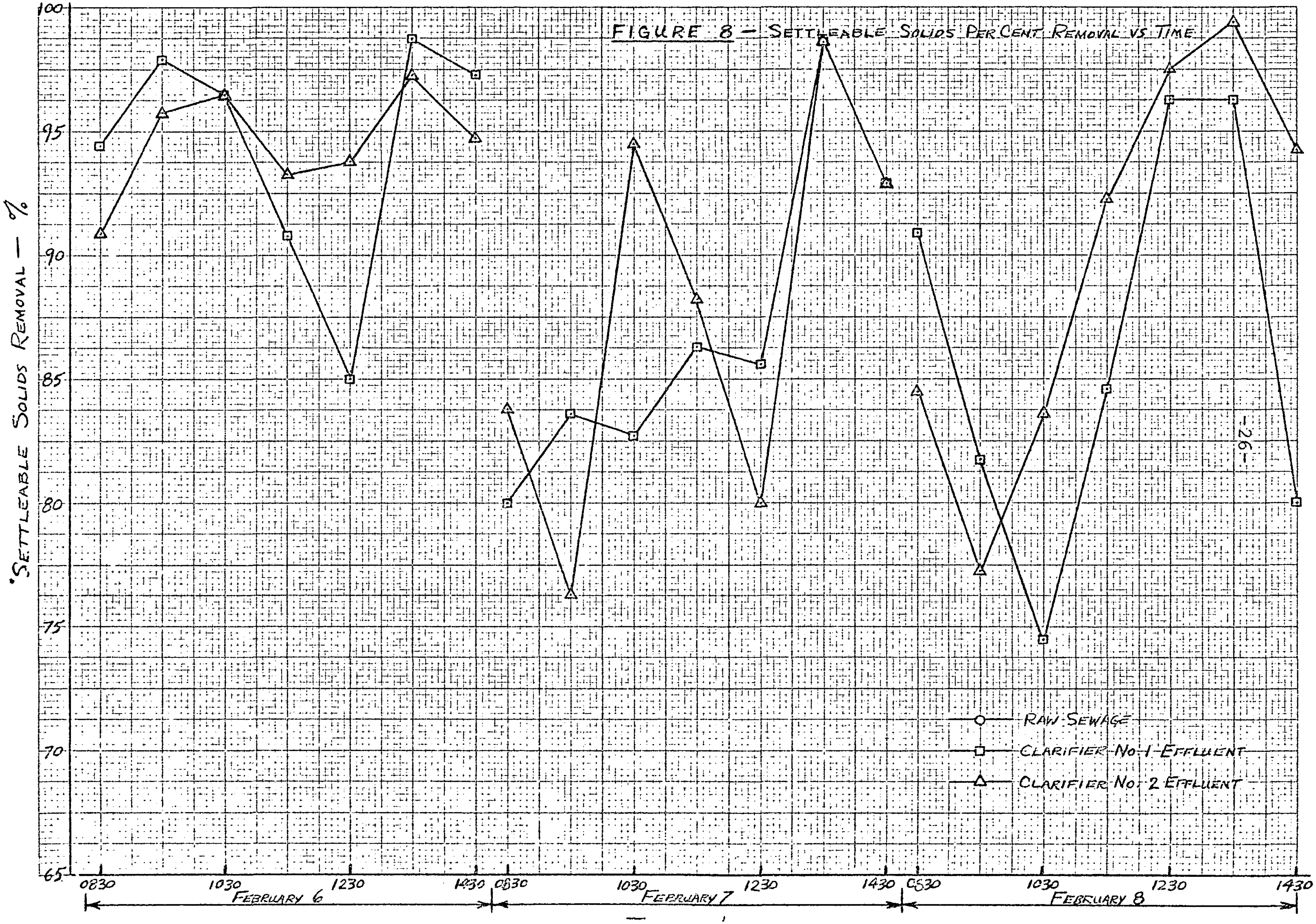


FIGURE 8 – SETTLEABLE SOLIDS PER CENT REMOVAL VS TIME
SETTLEABLE SOLIDS REMOVAL – %
100
95
90
85
80
75
70
65
0830
1030
1230
1430
FEBRUARY 6
FEBRUARY 7
FEBRUARY 8
RAW SEWAGE
CLARIFIER NO. 1 EFFLUENT
CLARIFIER NO. 2 EFFLUENT

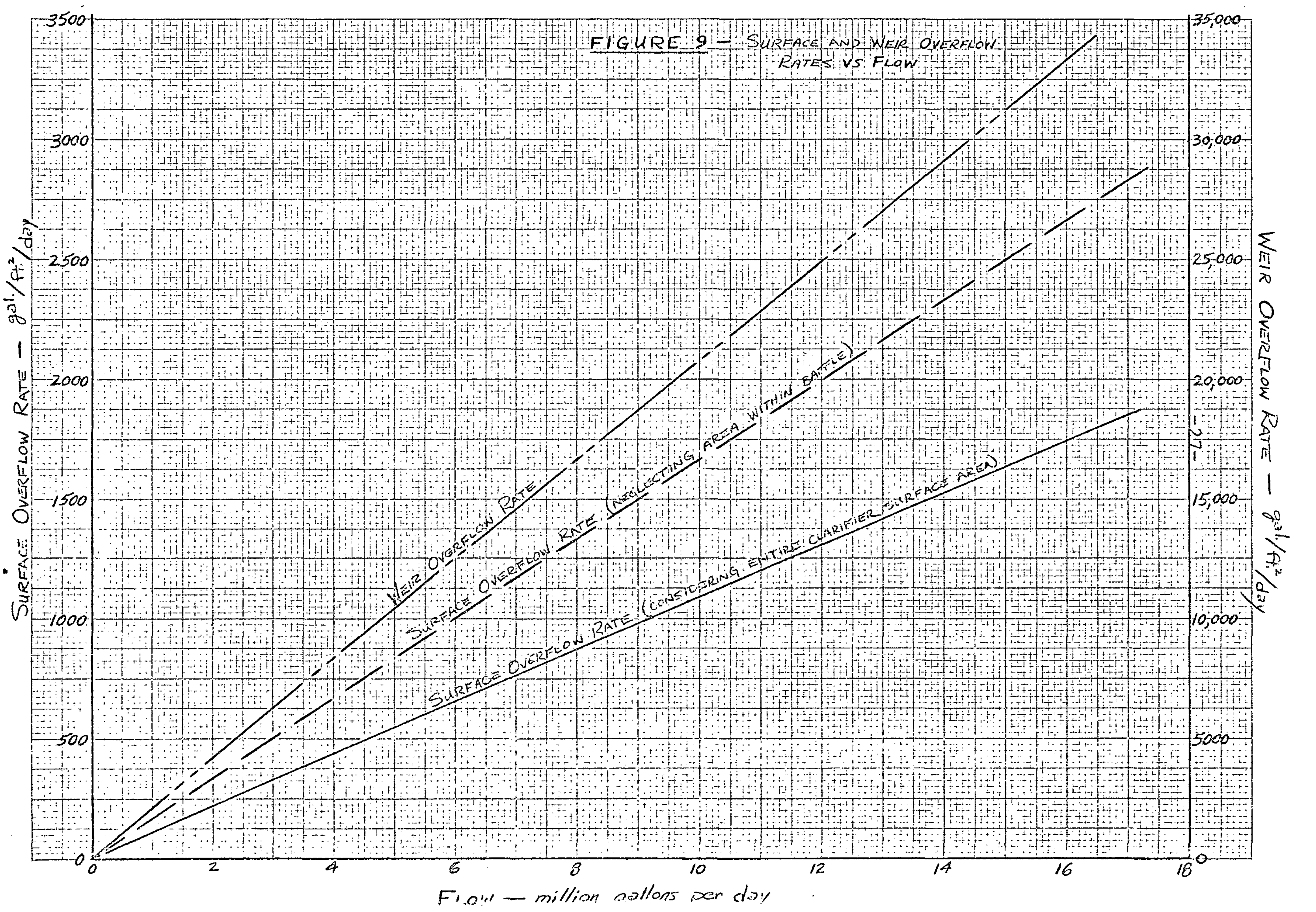


FIGURE 9 — SURFACE AND WEIR OVERFLOW RATES VS FLOW
WEIR OVERFLOW RATE
SURFACE OVERFLOW RATE (NEGLECTING AREA WITHIN BAFFLE)
SURFACE OVERFLOW RATE (CONSIDERING ENTIRE CLARIFIER SURFACE AREA)
SURFACE OVERFLOW RATE — gal./ft.²/day
WEIR OVERFLOW RATE — gal./ft.²/day
FLOW — million gallons per day
0
500
1000
1500
2000
2500
3000
3500
5000
10,000
15,000
20,000
25,000
30,000
35,000
2
4
6
8
10
12
14
16
18

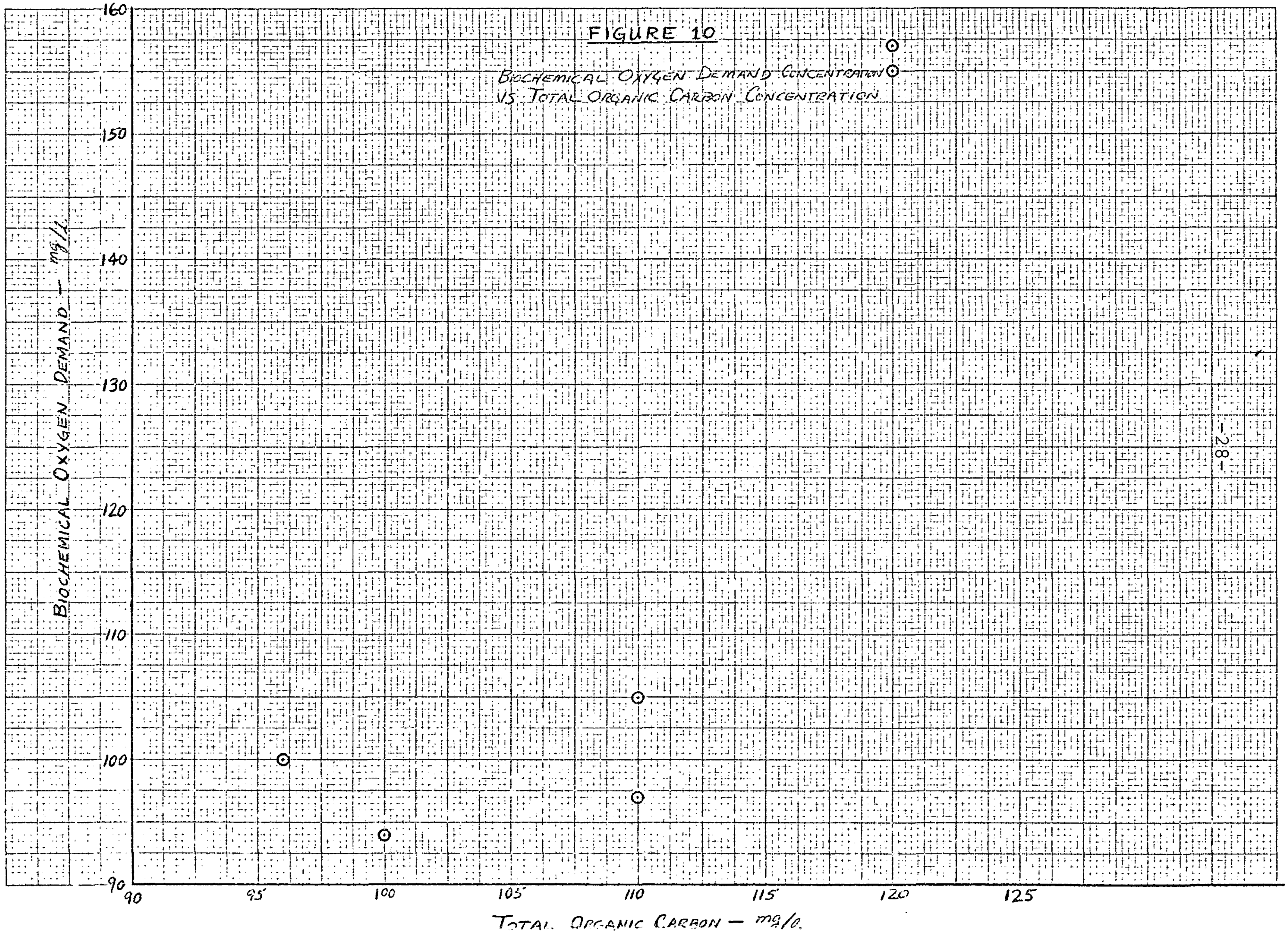
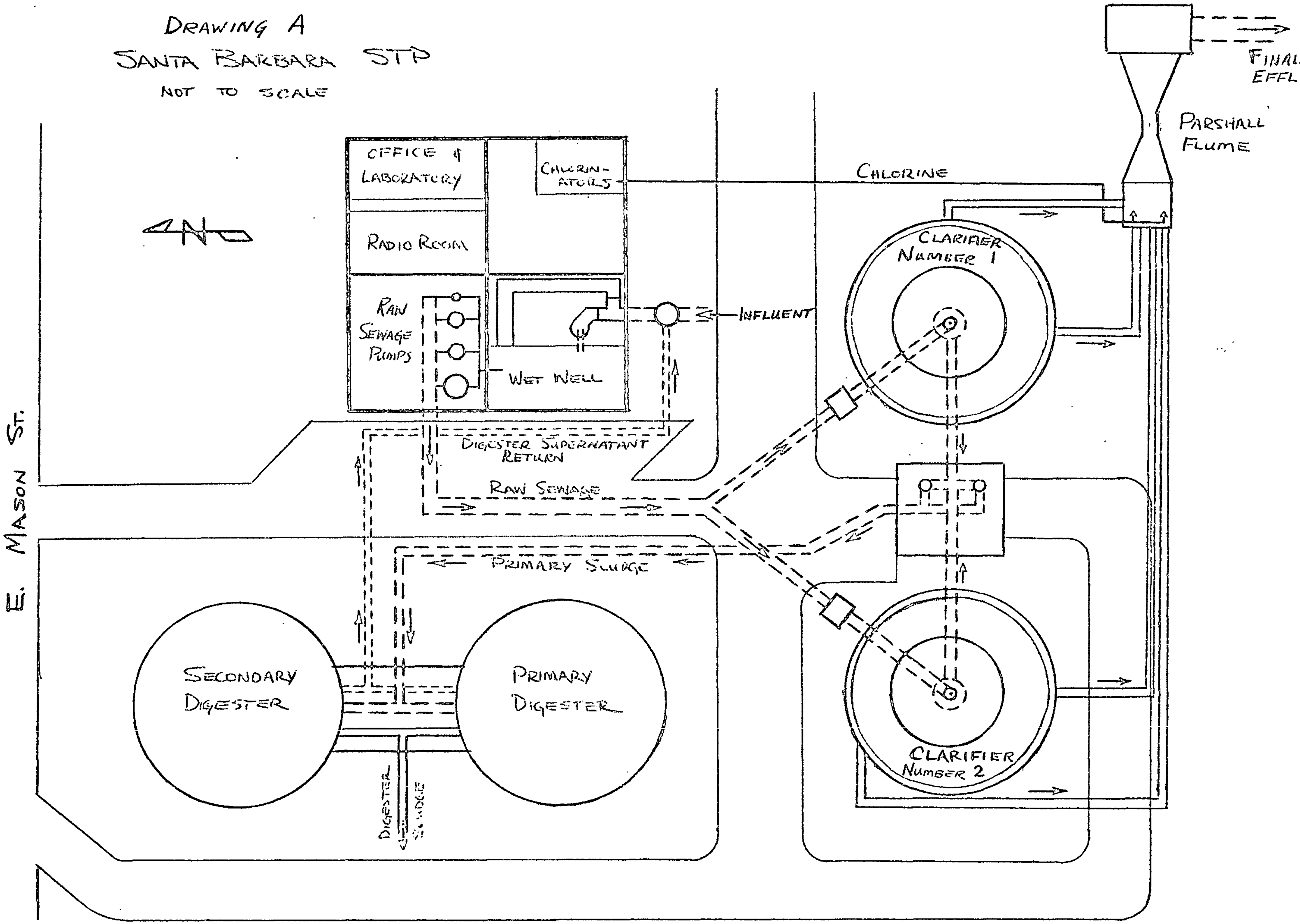


FIGURE 10
BIOCHEMICAL OXYGEN DEMAND CONCENTRATION
VS TOTAL ORGANIC CARBON CONCENTRATION
BIOCHEMICAL OXYGEN DEMAND — mg/l
160
150
140
130
120
110
100
90
90
95
100
105
110
115
120
125
TOTAL ORGANIC CARBON — mg/l

APPENDIX

DRAWING A
SANTA BARBARA STP
NOT TO SCALE



DIGESTER LOADING CALCULATIONS

AVERAGE DAILY FLOW (FEB 6 - FEB. 8, 1973)	8.86 MG
AVERAGE SUSPENDED SOLIDS CONCENTRATION IN RAW SEWAGE (FEB. 6 - FEB 8, 1973)	216 mg/l
AVERAGE SUSPENDED SOLIDS PER CENT REMOVAL (FEB. 6 - FEB 8, 1973)	58.8 %
EXPECTED AVERAGE PRIMARY SLUDGE CONCENTRATION	4 %

1. SLUDGE PRODUCED:

$$0.588 \times 216 \text{ mg/l} = 127 \text{ mg/l removed}$$

$$8.86 \times 10^6 \text{ gal/day} \times 127 \text{ mg/l} \times 3.785 \text{ l/gal} \times \text{lb}/0.4536 \times 10^6 \text{ mg}$$

$$= 9480 \text{ lb. dry solids per day}$$

2. COMPUTATION OF DETENTION TIME IN DIGESTERS:

Assume 75 % volatile matter in suspended solids

Assume specific gravity of mineral solids = 2.50

Assume specific gravity of organic solids = 1.20

SPECIFIC GRAVITY OF DRY SLUDGE:

$$\frac{1}{Sp. Gr.} = \frac{0.75}{1.20} + \frac{0.25}{2.50} = 0.725$$

$$Sp. Gr. = \frac{1}{0.725} = 1.38$$

$$\text{Volume of Dry Solids} = \frac{9480 \text{ lb/day} \times 7.48 \text{ gal/ft}^3}{1.38 \times 62.4 \text{ lb/ft}^3} = 824 \text{ gal. dry solids/day}$$

SPECIFIC GRAVITY OF WET SLUDGE:

$$\frac{1}{Sp. Gr.} = \frac{0.96}{1.00} + \frac{0.04}{1.38} = 0.989$$

$$Sp. Gr. = \frac{1}{0.989} = 1.011$$

DIGESTER LOADING
CALCULATIONS

x = total weight of wet sludge

$0.04\,x = 9480$ lb.

$x = \frac{9480}{0.04} = 237{,}000$ lb. wet sludge/day

Volume of Wet Sludge $= \frac{237{,}000 \text{ lb/day}}{1.011 \times 62.4 \text{ lb/ft}^3} = 3760 \text{ ft}^3\text{/day}$

Volume of Each Digester = $93{,}000 \text{ ft}^3$

DETENTION TIME $= \frac{2 \text{ digesters} \times 93{,}000 \text{ ft}^3\text{/digester}}{3760 \text{ ft}^3 \text{ sludge/day}} = 49.5$ days

Volatile Matter Reduction ≅ 64%

Figure 6-3, page 83 in UNIT PROCESSES OF SANITARY ENGINEERING, 1963, by Linvil G. Rich

3. COMPUTATION OF VOLUME REDUCTION IN DIGESTERS

Sp. Gr. (undigested solids) $= \frac{1}{(0.75/1.20) + (0.25/2.50)} = 1.38$

Sp. Gr. (digested solids) $= \frac{1}{\frac{(0.27/0.52)}{1.20} + \frac{(0.25/0.52)}{2.50}} = 1.60$

INITIAL VOLUME OF WET SLUDGE = 3760 ft^3

Assume Digester Sludge withdrawn contains 8% Solids:

FINAL VOLUME OF WET SLUDGE $= \frac{4930 \text{ lb.}}{1.60 \times 62.4 \text{ lb/ft}^3} + \frac{4930 \text{ lb} \times (1-0.08)}{0.08 \times 62.4 \text{ lb/ft}^3} = 958 \text{ ft}^3$

VOLUME REDUCTION $= \frac{3760 - 958}{3760} \times 100 = 74.5\ \%$

SUSPENDED SOLIDS REMOVAL

		Clarifier No. 1			Clarifier No. 2		
	Influent	Effluent	Removed	% Removal	Effluent	Removed	% Removal
February 6							
8:30 A.M.	300	40	260	86.6	60	240	80.0
9:30	310	50	260	83.9	60	250	80.7
10:30	220	90	130	59.1	100	120	54.6
11:30	250	70	180	72.0	50	200	80.0
12:30 P.M.	200	100	100	50.0	110	90	45.0
1:30	240	90	150	62.5	110	130	54.2
2:30	150	80	70	46.7	90	60	40.0
				AVG. = 65.8			AVG. = 62.1
February 7							
8:30 A.M.	200	60	140	70.0	80	120	60.0
9:30	220	90	130	59.1	90	130	59.1
10:30	210	60	150	71.4	60	150	71.4
11:30	180	100	80	44.4	110	70	38.9
12:30 P.M.	220	100	120	54.6	100	120	54.6
1:30	200	70	130	65.0	80	120	60.0
2:30	210	80	130	61.9	90	120	57.1
				AVG. = 60.9			AVG. = 57.3
February 8							
8:30 A.M.	200	60	140	70.0	70	130	65.0
9:30	220	100	120	54.6	100	120	54.6
10:30	240	120	120	50.0	120	120	50.0
11:30	200	100	100	50.0	100	100	50.0
12:30 P.M.	220	110	110	50.0	80	140	63.7
1:30	220	110	110	50.0	60	160	72.8
2:30	120	100	20	16.7	60	60	50.0
				AVG. = 48.8			AVG. = 58.0

Raw Sewage Data

	TOC (mg/l.)	BOD (mg/l)	Suspended Solids (mg/l.)	Settleable Solids (ml/l/hr)
February 6				
8:30 A.M.	88		300	11.0
9:30			310	14.5
10:30	130		220	11.5
11:30			250	12.0
12:30 P.M.	120		200	8.0
1:30	110		240	7.5
2:30			150	7.5
February 7				
8:30 A.M.	110		200	8.5
9:30			220	11.0
10:30	100		210	11.0
11:30			180	11.0
12:30 P.M.	120	157	220	9.0
1:30	100		200	7.0
2:30			210	8.5
February 8				
8:30 A.M.	140		200	11.0
9:30			220	11.0
10:30	130		240	11.0
11:30			200	13.0
12:30 P.M.	120	155	220	16.0
1:30	140		220	16.0
2:30			120	8.5

Clarifier No. 1 Effluent Data

	TOC (mg/l.)	BOD (mg/l.)	Suspended Solids (mg/l.)	Settleable Solids (ml/l/hr)
February 6				
8:30	76		40	0.6
9:30			50	0.3
10:30	95		90	0.4
11:30			70	1.1
12:30	110		100	1.2
1:30	87		90	<0.1
2:30			80	0.2
7:16	180		150	
February 7				
8:30	69		60	1.7
9:30			90	1.8
10:30	95		60	1.9
11:30			100	1.5
12:30	96	100	100	1.3
1:30	90		70	0.1
2:30			80	0.6
7:28	180		140	
February 8				
8:30	76		60	1.0
9:30			100	2.0
10:30	100		120	2.8
11:30			100	2.0
12:30	100	94	110	0.6
1:30	100		110	0.6
2:30			100	1.7
9:42	180		140	

△

Clarifier No. 2 Effluent Data

	TOC (mg/l.)	BOD (mg/l.)	Suspended Solids (mg/l.)	Settleable Solids (ml/l/hr)
February 6				
8:30 A.M.	78		60	1.0
9:30			60	0.6
10:30	90		100	0.4
11:30			50	0.8
12:30 P.M.	98		110	0.5
1:30	93		110	0.2
2:30			90	0.4
7:19	190		140	
February 7				
8:30 A.M.	82		80	1.8
9:30			90	2.6
10:30	95		60	0.6
11:30			110	1.3
12:30 P.M.	110	105	100	1.8
1:30	92		80	<0.1
2:30			90	0.6
7:31	180		150	
February 8				
8:30 A.M.	80		70	1.7
9:30			100	2.5
10:30	99		120	1.8
11:30			100	1.0
12:30 P.M.	110	97	80	0.4
1:30	100		60	<0.1
2:30			60	0.5
9:44	220		130	

Primary Sludge Data

	Clarifier No. 1 Total Solids (% by weight)	Clarifier No. 1 Volatile Solids (% fraction)		Clarifier No. 2 Total Solids (% by weight)	Clarifier No. 2 Volatile Solids (% fraction)
February 7					
12:50 P.M.	2.9	75	12:58 P.M.	1.8	70
1:44	4.5	75	2:11	3.9	71
3:39	1.5	70	3:44	4.0	72
4:55	5.0	73	4:47	4.1	71
5:56	3.4	72	5:53	1.8	69
7:10	3.3	71	7:04	3.0	69
8:16	2.0	71	8:06	1.6	68
February 8					
8:27 A.M.	4.5	71	8:33 A.M.	3.2	72
9:46	3.2	72	9:50	5.1	71
10:49	3.1	71	10:53	1.4	69
11:45	1.5	70	11:54	3.9	70
12:57 P.M.	4.7	73	1:02 P.M.	3.8	71
1:43	2.7	73	2:06	2.8	72
3:23	2.5	72	3:28	3.7	70
4:49	2.0	71	4:45	2.5	71
5:54	3.4	72	5:49	5.4	71
7:40	3.3	71	7:37	5.8	68
8:46	4.7	73	8:43	3.3	71
9:52	2.1	70	9:49	1.4	70
11:23	3.9	74	11:16	1.4	69
Composites	(Clar. No. 1 & Clar. No. 2):				
February 6	4.5	77			
February 7	3.1	75			
February 8	2.8	74			

Digester Supernatant Return Data

	TOC (mg/l.)	BOD (mg/l.)	Suspended Solids (mg/l.)	Settleable Solids (ml/l/hr.)	Total Solids (% by weight)	Volatile Solids (% fraction
February 6						
	3550	>1900	9600	10.0	0.49	57
February 7						
6:13-7:41 P.M.	3450	>1900	1500	9.5	0.48	57
February 8						
6:08-8:04 P.M.	4700		4500		0.66	61

TOC Removal

	Influent	Clarifier No. 1 Effluent	Clarifier No. 1 Removed	Clarifier No. 1 % Removal	Clarifier No. 2 Effluent	Clarifier No. 2 Removed	Clarifier No. 2 % Removal
February 6							
8:30 A.M. – 9:30	88	76	12	13.6	78	10	11.4
10:30 – 11:30	130	95	35	26.9	90	40	30.8
12:30 P.M.	120	110	10	8.3	98	22	18.3
1:30 – 2:30	110	87	23	20.9	93	17	15.5
				AVG. = 18.7			AVG. = 19.1
February 7							
8:30 A.M. – 9:30	110	69	41	37.3	82	28	25.5
10:30 – 11:30	100	95	5	5.0	95	5	5.0
12:30 P.M.	120	96	24	20.0	110	10	8.3
1:30 – 2:30	100	90	10	10.0	92	8	8.0
				AVG. = 17.8			AVG. = 12.2
February 8							
8:30 A.M. – 9:30	140	76	64	45.7	80	60	42.8
10:30 – 11:30	130	100	30	23.1	99	31	23.8
12:30 P.M.	120	100	20	16.7	110	10	8.3
1:30 – 2:30	140	100	40	28.6	100	40	28.6
				AVG. = 30.2			AVG. = 28.4

SETTLEABLE SOLIDS REMOVAL

		Clarifier No. 1			Clarifier No. 2		
	Influent	Effluent	Removed	% Removal	Effluent	Removed	% Removal
February 6							
8:30 A.M.	11.0	0.6	10.4	94.4	1.0	10.0	90.9
9:30	14.5	0.3	14.2	97.9	0.6	13.9	95.8
10:30	11.5	0.4	11.1	96.5	0.4	11.1	96.5
11:30	12.0	1.1	10.9	90.8	0.8	11.2	93.3
12:30 P.M.	8.0	1.2	6.8	85.0	0.5	7.5	93.8
1:30	7.5	<0.1	7.4	98.7	0.2	7.3	97.3
2:30	7.5	0.2	7.3	97.3	0.4	7.1	94.7
				AVG. = 94.3			AVG. = 94.(
February 7							
8:30 A.M.	8.5	1.7	6.8	80.0	1.8	6.7	83.8
9:30	11.0	1.8	9.2	83.6	2.6	8.4	76.3
10:30	11.0	1.9	9.1	82.7	0.6	10.4	94.5
11:30	11.0	1.5	9.5	86.3	1.3	9.7	88.2
12:30 P.M.	9.0	1.3	7.7	85.6	1.8	7.2	80.0
1:30	7.0	0.1	6.9	98.6	<0.1	6.9	98.6
2:30	8.5	0.6	7.9	92.9	0.6	7.9	92.9
				AVG. = 87.2			AVG. = 87.8
February 8							
8:30 A.M.	11.0	1.0	10.0	90.9	1.7	9.3	84.5
9:30	11.0	2.0	9.0	81.8	2.5	8.5	77.3
10:30	11.0	2.8	8.2	74.5	1.8	9.2	83.6
11:30	13.0	2.0	11.0	84.6	1.0	12.0	92.3
12:30 P.M.	16.0	0.6	15.4	96.3	0.4	15.6	97.5
1:30	16.0	0.6	15.4	96.3	<0.1	15.9	99.4
2:30	8.5	1.7	6.8	80.0	0.5	8.0	94.2
				AVG. = 86.4			AVG. = 89.9

RECEIVED
E.P.A. REGION IX
JAN 19 11 31 AM '73

The Resources Agency of California
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL COAST REGION
2238 Broad Street
San Luis Obispo, California

ORDER NO. 72-24

Adopted May 12, 1972

WASTE DISCHARGE REQUIREMENTS
FOR
CITY OF SANTA BARBARA

The California Regional Water Quality Control Board, Central Coast Region, finds:

1. The City of Santa Barbara proposes expansion of its sewage treatment facilities located north of Stearn's Wharf between Highway 101 and the Pacific Ocean from a present capacity of 8.0 MGD to provide capacity for 16.0 MGD from a design population of 140,000 persons.

2. Following treatment, sewage will be discharged to the Pacific Ocean through a submarine outfall terminating in approximately 100 feet of water. Treated sewage is presently discharged to the ocean through a 3,200 foot ocean outfall located east of Stearn's Wharf.

3. The Board adopted an Interim Water Quality Control Plan for the Central Coastal Basin on June 10, 1971.

4. The beneficial uses of the coastal waters in the vicinity of the discharge are:

   a. Scenic attractiveness and aesthetic enjoyment.
   b. Marine habitat for sustenance and propogation of fish, aquatic and wild life.
   c. Fishing.
   d. Industrial water supply.
   e. Boating, shipping and navigation.
   f. Scientific study.
   g. General beach recreation, including swimming and other water contact activities.

5. The discharge has been subject to waste discharge requirements adopted October 1, 1957, October 9, 1970, and March 10, 1972.

6. The Board has notified the discharger and interested agencies and persons of its intent to revise waste discharge requirements for the discharge.

7. The Board, in a public hearing on May 12, 1972, heard and considered testimony and correspondence relating to these requirements.

IT IS HEREBY ORDERED, the City of Santa Barbara shall comply with the following:

A. Discharge Specifications

1. a. Prior to January 1, 1974, the effluent shall not exceed 0.3 milliliters per liter (ml/l) settleable solids in 80% of samples analyzed. In addition, no single sample shall exceed 1.0 ml/l settleable solids.

   b. Effective January 1, 1974, the effluent shall not exceed 0.1 ml/l settleable solids in 50% of samples analyzed nor 0.2 ml/l in 10% of samples analyzed. In addition, no single sample shall exceed 1.0 ml/l settleable solids.

2. The effluent shall not exceed 50 mg/l suspended solids in more than 50% of samples analyzed nor 75 mg/l in more than 10% of samples analyzed. No single sample shall exceed 100 mg/l.

3. No raw or digested sludge, supernatant liquor, or untreated sewage may be discharged to the receiving waters.

4. There shall be no visible floating or suspended solids, oil, or other petroleum wastes of sewage origin in the receiving waters at any time as a result of the discharge.

5. The discharge shall be controlled so that sludge banks or bottom deposits are not formed. There shall be no change in the organic content of the ocean bottom directly attributable to the discharge.

6. The discharge shall not have a pH less than 6.5 nor greater than 8.5.

7. The discharge shall not cause the dissolved oxygen of the receiving waters to be depressed below 7.0 mg/l.

8. The receiving waters shall not have a coliform MPN (most probable number) greater than 1000 per 100 ml as a result of the discharge, provided that not more than 20% of the samples at any sampling station, in any 30 day period, exceed 1000 per 100 ml and Orovided further that no single sample taken within 48 hours exceeds 10,000 per 100 ml.

9. The discharge shall not cause discoloration of the receiving waters at any point.

10. The discharge shall not adversely effect the diversity or abundance of aquatic life.

11. The discharge shall not cause a pollution.

12. Neither the treatment nor the discharge shall cause a nuisance.

13. a. The maximum daily dry weather volume shall not exceed 8.0 million gallons.

    b. Upon completion of the proposed new treatment facilities, the maximum daily dry weather volume shall not exceed 16.0 million gallons.

14. The discharge shall not contain concentrations of substances which are toxic or otherwise detrimental to human, animal, plant, bird, fish or other aquatic life.

15. The light transmittance of the ocean waters shall not be reduced as a result of the discharge to less than 75% of that naturally occurring.

16. The total summation of individual pesticides in the discharge shall not be greater than 1.0 microgram/liter.

B. Provisions

1. The waste discharge requirements for the City of Santa Barbara Adopted on October 1, 1957 and October 9, 1970 are hereby rescinded.

2. Discharge specifications 2, 9, and 15 are effective upon completion of the city's sewage treatment plant expansion or by January 1, 1974, whichever occurs earlier. The remaining discharge specifications are effective immediately.

3. The discharger shall comply with the "Monitoring and Reporting Program" and "General Provisions for Monitoring and Reporting" as specified by the Executive Officer.

4. The pre-design survey and reporting program transmitted to the City of Santa Barbara on January 18, 1972 shall be completed.

5. Final plans and specifications for the planned plant expansion shall be submitted prior to May 1, 1972, or in accordance with a deferred time schedule established by the State Water Resources Control Board.

I, KENNETH R. JONES, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an order adopted by the California Regional Water Quality Control Board, Central Coast Region, on March 10, 1972 and revised on May 12, 1972.

Executive Officer

Order No. 72-24

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL COAST REGION

MONITORING AND REPORTING PROGRAM
FOR
CITY OF SANTA BARBARA

*****

EFFLUENT MONITORING

All effluent samples shall be collected in the manner and frequency specified. Composite samples may be taken by a proportional sampling device approved by the Executive Officer or by grab samples composited in proportion to the flow. In compositing grab samples, the sampling interval shall not exceed one hour. The following shall constitute the effluent monitoring program:

Constituent	Units	Type of Sample	Sampling Frequency
Effluent Settleable Solids	Ml/l	Grab	Daily
Raw sewage " "	Ml/l	"	"
Effluent Suspended Solids	Mg/l	8-hr composite	Weekly
Raw sewage " "	Mg/l	" "	"
Chlorine Residual	Mg/l	Grab	Twice-daily
Toxicity Bioassay	96 hr TLm	8-hr composite	Semi-annually
Grease	Mg/l	Grab	Monthly
pH	units	"	Daily
TDS	Mg/l	"	Semi-annually
Chloride	Mg/l	"	" "
Sodium	Mg/l	"	" "
Nitrate	Mg/l	"	" "
Maximum Daily Flow	MGD	---	Daily
Average Daily Flow	MGD	---	Daily
Coliform Organisms	MPN/100 ml.	Grab	Weekly at sewage effluent manhole

RECEIVING WATER MONITORING

Receiving water monitoring shall be conducted at the following locations and at the prescribed frequency:

Station	Sample Point
SB15	Ocean surf opposite Bird Refuge
SB1	Ocean Surf at foot of Sycamore Canyon
S 9	Ocean Surf west of pavillion
SB2	Ocean Surf opposite restrooms - Palm Park
SB7	Ocean Surf at end of Santa Barbara Street

Station	Sample Point
SB6	Ocean surf east of pier
SB11	Ocean surf on pier - right hand side
SB5	Ocean surf opposite Veterans' Memorial Building
SB3	Ocean surf small boat landing area
SB13	Ocean surf end of breakwater
SB2	Ocean surf at Yacht Club
SB1	Ocean surf at Leadbetter Beach
A	City dredge discharge
C	Ocean 100 yards off breakwater
D	Ocean above outfall diffusers
E	Ocean 100 yards off East Beach bathhouse
F	Ocean 200 yards in line with targets

Bacteriological samples shall be collected of waters along the shore in the vicinity of the discharge and offshore in receiving waters at least weekly to determine most probable number (MPN) coliform organisms.

REPORTING

Monthly monitoring reports shall be submitted to the regional board by the 15th day of the following month of the effluent and beach coliform data. In reporting the monitoring data, the discharger shall arrange the data in tabular form so the date, the constituents, and the concentrations are readily discernible. The data shall be summarized to demonstrate compliance with waste discharge requirements.

In each monthly report the discharger shall include the quantity of and ultimate disposal location of sludge.

For every item where the requirements are not met, the discharger shall submit a statement of the actions undertaken or proposed which will bring the discharge into full compliance with requirements at the earliest time and submit a timetable for correction.

By January 30 of each year, the discharger shall submit an annual report to the regional board. The report shall contain both tabular and graphical summaries of the monitoring data obtained during the previous year. In addition, the discharger shall discuss the compliance record and the corrective actions taken or planned which may be needed to bring the discharge into full compliance with the waste discharge requirements.

The discharger shall file a written report within 90 days after the average dry-weather flow for any month that equals or exceeds 75% of the design capacity of the waste treatment or disposal facilities. The report shall contain a schedule for studies, design, and other steps needed to provide additional capacity or limit the flow below the design capacity prior to the time when the waste flow rate equals the capacity of the present units.

ORDERED BY Kenneth R. Jones
Executive Officer

May 12, 1972
Date

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL COAST REGION

GENERAL MONITORING AND REPORTING PROVISIONS

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GENERAL PROVISIONS FOR SAMPLING AND ANALYSIS

Unless otherwise noted, all sampling, sample preservation, and analyses shall be conducted in accordance with the current edition of "Standard Methods for the Examination of Water and Waste Water" or approved by the Executive Officer.

All analyses shall be performed in a laboratory certified to perform such analyses by the California State Department of Public Health or a laboratory approved by the Executive Officer.

All samples shall be representative of the waste discharge under the conditions of peak load.

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