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POST REMEDIAL ACTION REPORT

SELECTED AREAS OF

NEW BEDFORD
MUNICIPAL SEWER SYSTEM

CORNELL DUBILIER ELECTRONICS, INC.

NEW BEDFORD, MASSACHUSETTS

JANUARY, 1985

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SECTION 1 - INTRODUCTION

This report is being submitted pursuant to an USEPA Administrative Order (83-1047) dated September 30, 1983, as amended. The purpose of this report is to document the remedial activities described in the O'Brien & Gere Engineers, Inc. Report, "Remedial Action Plan, Selected Areas of New Bedford Municipal Sewer System" dated January 27, 1984, as amended. This report covers the activities to remove and dispose of PCB contaminated sediments from the following portions of the New Bedford Municipal Sewer System:

- The combined sewer line on East Rodney French Boulevard from Rodney Street to Cove Street;
- The storm drain line, including the crossover segments and the outfall on East Rodney French Boulevard from Rodney Street to manhole D-6.

The removal and disposal of the PCB contaminated sediments from the specified sewer lines was implemented between September 28, 1984 and November 7, 1984, in close conformance with the cleaning, decontamination and disposal methods outlined in the Remedial Action Plan. A plan of the sewer lines from which the PCB contaminated sediments were removed is shown on Figure 1.

This report describes the removal and disposal of the PCB contaminated sediments from the New Bedford Municipal Sewer System.

SECTION 2 - SEWER SYSTEM CLEANING

2.01 Introduction

The purpose of the sewer cleaning operation was to remove PCB contaminated sediments from the subject segments of the New Bedford Municipal Sewer System.

For each sewer segment designated for cleaning, decontamination and safety measures were implemented, the line was isolated, and the City of New Bedford was notified and given an opportunity to inspect the dewatered segment prior to the cleaning operation. After approval was granted, sewer cleaning was performed. A two-step cleaning operation utilizing mechanical buckets followed by a high pressure water cleaning system was initially used.

The structural condition of the sewer system did not make the use of bucket cleaning practical. Inspection of the dewatered sewer showed many cracks in the sewer. Bucket cleaning could have potentially aggravated the existing sewer conditions. Therefore, bucket cleaning was eliminated early in the cleaning operation, and only the high pressure cleaning method was used.

A detailed description of the sewer system cleaning process is offered in the following sections. Figure 2 and Table 3 provide a summary of the sewer system cleaning operations.

A summary of the contacts with the City of New Bedford and approval dates are as follows:

Line Segment	City of New Bedford Official Contacted	Date Contacted	Approval Date
CD-19 to CD-18	Manuel Camacho, Eng. Dept.	09/28/84	09/28/84
CD-18 to CD-17	Manuel Camacho, Eng. Dept.	10/02/84	10/03/84
CD-17 to CD-16*	Manuel Camacho, Eng. Dept.	10/12/84	10/12/84
CD-16 to CD-15 to CD-14	Manuel Camacho, Eng. Dept.	10/12/84	10/12/84
CD-14 to CD-13	Manuel Camacho, Eng. Dept.	10/15/84	10/15/84
CD-13 to CD-12**	Manuel Camacho, Eng. Dept.	10/15/84	10/16/84
CD-12 to CD-11	Manuel Camacho, Eng. Dept.	10/22/84	10/23/84
CD-11 to CD-10	Manuel Camacho, Eng. Dept.	10/22/84	10/23/84
CD-10 to CD-9	Bruce Duarte, D.P.W.	10/27/84	10/27/84
CD-9 to CD-8	Bruce Duarte, D.P.W.	10/27/84	10/27/84
CD-8 to CD-7	Bruce Duarte, D.P.W.	10/27/84	10/27/84
CD-7 to CD-6	Bruce Duarte, D.P.W.	10/27/84	10/27/84
D-6 to D-5			
D-5 to D-4			
D-4 to D-3	On 10/30/84, M. Camacho was		
D-3 to D-2	notified for an inspection of		
D-2 to D-1	the storm drain lines.		
Outfall @ D-3	Permission was granted to		
D-5 to David St.	proceed with the cleaning		
D-4 to CD-15	on all storm drain lines		
D-2 to CD-19	on this date.		
D-1 to Rodney St.			

* On 10/15/84, M. Camacho was informed of a possible collapse in the sewer line between CD-17 to CD-16, after the completion of cleaning the sewer segment. The broken section was subsequently repaired.

** On 10/23/84, M. Camacho was informed of a break in the sewer line between CD-13 to CD-12, after the completion of cleaning the sewer segment.

2.02 Sewer Segment Isolation

Each sewer segment was isolated prior to the start of the cleaning operations.

The first step in isolating a sewer section was the set up of a by-pass pumping operation to reroute the sewage flow around the line to be cleaned. A pump diverted the flow from the next manhole upstream of the segment of sewer to be isolated to the next downstream manhole of the line. Bypass pumping continued through the duration of the

cleaning operation. In some instances, additional bypass pumps had to be set up in order to intercept flows that could be introduced into the isolated line from nearby regulator chambers. Specifically, flows tributary to chambers between CD-10 to CD-9 and CD-14 to CD-13 required additional pumping.

Each sewer section to be cleaned was dewatered so that pneumatic plugs could be inserted into the lines entering the upstream manhole and in those lines leaving the downstream manhole. This operation was accomplished by bypass pumping the flow in the sewer to the next downstream manhole. Whenever possible, the plugging of lines was scheduled to coincide with low tide to help minimize the effect of seawater intrusion. Bypass pumping did not disturb the downstream sediment in the system because a normal flow situation was simulated by pumping. Bypass pumping also reduced the amount of sewage and seawater generated for processing at the project treatment system.

Prior to the cleaning of the storm drain lines, the sluice gate at the system outfall (CSO-17) had to be lowered to stop the inflow of seawater into the system. On October 30, 1984, the City of New Bedford's DPW provided a key for the sluice gate operator. The gate was reopened after cleaning each segment.

Once the liquid level in the line was sufficiently lowered, the plugs were inserted to isolate the line. The dewatering operation continued until the remaining liquid in the line was negligible. Excessive infiltration was often encountered in the sewer lines and prolonged the dewatering process.

Special bypass pumping operations were used to divert sewage flow from CD-17 to CD-16, into CD-15 to CD-14 after the suspected collapse

on October 13, 1984. This was necessary to prevent overflows from occurring, because the City had not repaired the sewer segment between CD-15 and CD-16.

2.03 Mechanical Cleaning

Mechanical buckets were utilized to remove much of the sediment from the sewer lines in segments CD-16-17, and CD-17-18. A high pressure water "jet" was then used to remove any remaining sediment.

Mechanical winches were set up at both the upstream and downstream manholes of the isolated sewer segment. A cable was run through the line to connect both winches. Following the manhole set up, the operator at the downstream manhole pulled the bucket through the sewer line as it scraped debris off the pipe wall. Once full, the operator at the upstream location reversed the winch to return the bucket to the downstream manhole. The bucket was then lifted to street level, where it was directly deposited into a 4'x6'x6' fiberglass tank mounted on the back of a pick-up truck. When the bucketing operation was complete, the sediment in the tank was transferred to the Vactor truck for disposal.

The bucket machines provided an effective means of removing large amounts of heavy sediment without introducing water into the sewer line. Bucketing operations were used in the lines between CD-18 to CD-17 and CD-17 to CD-16. The material removed from both of these lines was a heavy, oily sediment. During the televising of the segment from CD-17 to CD-16, many breaks and cracks were observed. It was obvious that the sewer system is very old and fragile. After the suspected collapse in this line, the structural integrity of the downstream

pipe segments was questioned. At this point, a decision to eliminate the bucketing operation was made because the risk of sewer collapses outweighted the benefits.

The use of high pressure water without bucket cleaning significantly reduced the time to clean a sewer segment; however, the trade off was having more water to treat. The bucketing operation alone took 9 hours for sewer segment CD-18 to CD-17 and 6.5 hours for sewer segment CD-17 to CD-16. The consistency of the sediment led to the long durations required to bucket clean.

The oily sediment coupled with high infiltration rates made the consistency of the bucketed sediment rather soupy. The bucket design is very efficient for non-flowing gritty sediments, but the soupy nature of the sediment allowed the sediment to flow out of the bucket. Therefore, the bucketing operation was inefficient and required more time than if the sediments were non-flowing in nature.

2.04 High Pressure Water Cleaning

The high pressure water cleaning system was used to dislodge and transport sediment, sand, gravel and rocks contained within the sewer lines. This cleaning method utilizes high pressure water to propel a jet nozzle upstream through a sewer line backflushing debris to the inlet manhole. The system is relatively easy to operate and cleans in a short period of time. The jet nozzle can also negotiate offsets and bends in the pipeline and also provides dewatering capabilities.

The high pressure water cleaning system used on this project consisted of a variable speed water pump, a water hose with a spray nozzle, a hose reel and a self-contained vacuum truck. The hose, spray

nozzle and a guide were lowered into the downstream manhole of the isolated segment of sewer line after the contamination and decontamination zones were constructed over both manholes.

The high pressure water generated by the water pump propelled the nozzle through the sewer line towards the upstream manhole. The water pump, contained on the vacuum truck, was capable of varying water pressure to as high as 2000 psi, and varying flow rates up to 60 gpm. A water pressure of 1400 psi was typically used during the cleaning operations and 500 psi for dewatering purposes.

A man stationed at the upstream manhole would indicate when the jet nozzle arrived. As the hose was pulled through the sewer, the high pressure water scoured the sidewalls, backflushing the debris into the inlet manhole. The solids and liquid entering the manhole were continuously removed through the use of a vacuum truck. The vacuum truck tank had the capacity to hold either 6 cubic yards of sediment, or 1500 gallons of liquid, or any combination of both.

The high pressure water cleaning operations were continued until the flushing water returning to the vacuum tube appeared clear and free of debris. At the conclusion of the high pressure water cleaning operation, equipment such as the jet nozzle, hose and guides were decontaminated. Televising of each sewer segment was performed to determine the efficiency of the cleaning operations. (See Section 6).

The amount of water used to complete the cleaning of each line is presented in Table 4. Most sewer line segments required substantial quantities of high pressure water for the hydraulic cleaning operation due to the adhesive nature of the sediment and grease deposits. Dewatering operations before and during the televising operations also

contributed significantly to the quantity of water used. Sewer line segments, particularly those between CD-11 to CD-10 and CD-8 to CD-7, had excessive amounts of infiltration due to the poor existing conditions of these lines.

SECTION 3 - SEDIMENT HANDLING AND DISPOSAL

3.01 Introduction

All sediments removed from the sewer system were transported via a self-contained vacuum truck to a temporary sediment containment area for later disposal. Upon completion of the cleaning operations, the sediments were transported to and disposed of at a hazardous waste facility approved by the EPA for the disposal of PCBs, in accordance with applicable state and federal requirements.

3.02 Solids Handling and Temporary Disposal

A 20 cubic yard rectangular bin was used for the temporary storage of sediment and was located on the northwest corner of the CDE parking facility. A double layer of 6 ml. thick polyethylene plastic was used to line the storage bin, making it watertight. Before the liner was installed, a thick bead of silicon caulking was placed along the door gasket to provide added protection. The container also included a heavy vinyl tarp which was used to cover the contents of the tank between sediment dumping operations. Polyethylene plastic was spread around the area surrounding the container as an added precaution.

A ramp and platform for the dumping operations were constructed of heavy wooden railroad ties and planks. The platform measured 4 feet by 12 feet by 36 inches in height. The ramp spanned 25 feet in length and provided a transition from ground level to the top of the platform. Once the truck backed on the ramp, it had enough clearance to overcome the height of the container, tilt the holding tank and dispose of the solids. The ramp and platform were secured with heavy

angle irons. The ramp and platform were built because there were no other means of positioning the solids container on a level lower than that of the approach used by the vacuum truck. The use of a loading dock or sunken area would have provided for an ideal dumping location but none was located on or near the CDE facility.

Once full, the liquid in the vacuum truck tank was discharged at the treatment system into the liquid storage tank. (See Section 5). The vacuum truck then transported the sediment to the temporary sediment container. The vacuum truck was backed onto the wooden ramp until the discharge end of the holding tank sat over the container. The tarp covering the sediment container was then removed. Another large vinyl tarp was used as a chute to help prevent any spillage or splashing of the material as it was dumped from the truck. One end of the tarp was wrapped and tied around the discharge end of the truck tank and the other end was placed in the sediment container. As the vacuum truck slowly tilted its tank to dispose of the solids, the sediment was guided along the tarp into the container. After all the solids were discharged from the vacuum truck, the tarp used as the chute was wiped down and stored in the solids container. The container was then recovered and the temporary disposal process was complete. Table 4 provides a summary of the dumping operations during the project.

3.03 Container Disposal

Late in the cleaning operations it was learned that SCA and CECOS landfills in Western New York and Ohio were not accepting any PCB wastes. Both facilities had previously indicated that they had the capacity to accept the anticipated volumes of PCB sediments. Both

facilities are reportedly awaiting permits from the EPA for the new landfill cells before they can accept PCB or any other wastes. After numerous conversations with SCA and CECOS, it appears that realistically they will not be accepting wastes until early 1985.

This creates some difficulty in removing PCB contaminated sediments generated on this project as they were originally scheduled to be disposed of at these locations. Alternative disposal sites are potentially available but they are in distant, remote locations (e.g. Emmelle, Alabama and Beatty, Nevada) and transportation costs would be more than double the projected shipping charges for the two roll-off boxes presently at Cornell Dubilier.

Because of these unforseen difficulties and the reasonable likelihood that SCA and/or the CECOS landfills will soon be authorized to again receive PCB wastes, it is recommended that the project deadline should be extended for disposal of the PCB contaminated sediments.

This also raises the issue of temporary storage of PCBs on-site at Cornell Dubilier pending shipment to an authorized facility. Because of the size of the roll-off boxes, it is not practical to move the two large containers into CDE's approved PCB storage area. Removal to an off-site approved PCB storage facility was investigated, but that facility advised that it was at capacity and was not accepting new wastes.

The safest and most efficient storage alternative at the present time is to leave the two containers in their present locations at the CDE site pending authorization of the CECOS or SCA to resume receipt of PCB wastes. The containers, in fact, are in segregated areas and have been secured to prevent any leaking or intrusion from the elements. Additionally, the roll-off boxes are monitored on a daily basis.

Because of these difficulties, the project deadline should be extended for disposing the PCB contaminated sediments. This also raises the issue of storing PCBs on-site at Cornell Dubilier.

One container is a 20 cubic yard roll-off box of steel construction typically used for storing and hauling demolition debris. The end gate has been sealed with a rubber gasket to make it watertight and leakproof. The box is lined with two layers of 6 mil polyethylene to prevent the contamination of the interior surface of the container. This box was used to contain the heavier, drier debris from the sewer cleaning operations.

The second container is a 30 cubic yard roll-off box. The end gate has been sealed with a silicone caulking material. This box is lined with a 60 mil vinyl liner because it contained the more fluid sludge-like material.

It should be noted that the material in both containers have been further solidified and stabilized using sawdust which absorbs both the aqueous and non-aqueous liquids.

Both roll-off boxes are covered with a plastic tarpaulin. The tarpaulins rest upon 2" x 4" studs placed every two feet, which provide added support in the event of rainwater ponding. After a rain event or snowfall, the tarps are brushed clean to remove any accumulated rain or snow.

Both boxes are located within the confines of the CDE facility which is secured by a chain link fence with two controlled access

points. One roll-off box is located behind a building and is only partially visible from the public streets. The second roll-off box is completely hidden from public view as it is located in a small court yard surrounded by buildings.

The containment of the PCB sediments in the roll-off boxes substantially meet the criteria for PCB storage in 40 CFR, Subpart D, Section 761.65 (b) (1) (i-v). The tarpaulins and steel walls keep the rain from reaching the PCB contaminated sediments. The vinyl liners act as the PCB container for the contaminated Sediments (40 CFR, Subpart D, Section 761.3 Definitions, "PCB Container"). The roll-off boxes fulfill the floor and curbing requirements. Finally, the roll-off boxes are at the approximate 100 year flood plain elevation. Based on the foregoing factors, it would appear to be most appropriate to extend the temporary storage period until the SCA or CECOS facilities reopen in early 1985.

SECTION 4 - DECONTAMINATION AND SAFETY PROTOCOLS

4.01 Introduction

Due to the nature of the materials removed from the sewer system and the area in which the materials were removed, specific decontamination procedures and safety protocols were necessary during the sewer cleaning operations. After the completion of each sewer line segment, equipment which came in contact with the PCB contaminated sediments were either decontaminated or disposed of. Final decontamination operations were performed after the sediment removal operations were complete. The following sections describe the decontamination and safety procedures.

4.02 Safety Protocols

From the outset of the cleaning operations, safety procedures were strictly enforced. Protective measures were taken at all times to contain all contaminated wastewater and sediment.

Personnel protection was an integral part of the safety procedures followed during the project. Those involved in the cleaning operations were required to wear tyvek coveralls and rubber, chemical protective boots and gloves. The gloves and boots were taped at both the cuffs and ankles. Hard hats were also mandatory.

Prior to the start of the cleaning operations at each line segment, a contamination zone was constructed over the upstream and downstream manholes. A 12-foot by 16-foot sheet of 6-ml. thick polyethylene plastic was placed directly over the center of the manhole and a hole was cut out of the plastic where the manhole was situated. Planks were

placed at the borders of the plastic to help hold it in place. This area provided ample working space and caught any wastewater or sediment that was removed from the sewer. A decontamination zone was set up adjacent to each contamination area and usually measured 12 feet square. It was divided into two areas of equal size, using plastic cones as boundaries. One half of the zone was used as a transition area from the contamination zone to the final decontamination area. All contaminated outer wear was deposited in designated plastic barrels in the transition area. The material in the barrels was later placed in plastic bags and disposed of in the solids container. The other half of the decontamination zone provided a dressing area.

Barricades and traffic cones were set up around the perimeter of the cleaning areas at both manholes to protect against vehicular and pedestrian traffic. A New Bedford Police Officer was brought on site for detail duty whenever the cleaning operations interfered with normal traffic flow. All of the trucks were equipped with overhead flashing lights for protection during the evening hours.

As the cleaning operations proceeded, personnel were required to decontaminate and discard their outer garments before leaving the cleaning area. Before any equipment was transported from the cleaning location, it was hosed with low pressure water, swabbed with kerosene, and allowed to drip dry. All the washwater was contained within the contamination area and directed into the manhole and pumped into the Vactor truck; the manhole was then cleared with the Vactor. When the sediment removal was complete, the contamination zones were carefully

disassembled. The plastic was folded from each corner to allow any remaining wastewater to flow into the manhole. The contamination zone was contained in a plastic bag for disposal into the solids tank.

The decontamination zones were also wrapped up, contained and disposed of, taking care to ensure that all the cleaning personnel were in fresh clothes, but were still wearing rubber gloves.

At the conclusion of each day's cleaning, all of the plastic bags containing contaminated material were disposed of in the solids container and all the vehicles were returned to the CDE parking facility. The parking area designated for the vehicles was in full view of the security quarters, which is manned 24 hours per day. The parking area was enclosed by a fence and entrance was only possible through an electronic gate accessible only by authorized persons.

4.03 Final Decontamination

All the equipment which came in contact with the PCB contaminated sediment was decontaminated or disposed of before leaving the project site.

The vehicles and equipment used in the sewer line cleaning operation were decontaminated on November 8 and 9, 1984. Polyethylene plastic contamination zones measuring approximately 12 feet by 20 feet, were constructed in the area where the vehicles were parked. The equipment to be decontaminated was placed on the cleaning area and washed down with low pressure water. After the wash, all the areas coming in contact with the contaminated material was swabbed with

kerosene and allowed to drip dry before being removed from the cleaning area. Smaller contamination zones were used to catch the wash water off the vehicles which required only a kerosene swabbing. The sewer line plugs, T.V. camera and winches, bucket winches, jet nozzle, hose and guides, pumps, and all other miscellaneous equipment were all decontaminated. After the decontamination operation was complete, the plastic used to collect the wash water and solvent was bagged and disposed of in the solids container. Other items like the planks and barrels were also deposited in the solids tank for disposal.

The equipment at the treatment system underwent a washdown with low pressure water and then a wipe down with petroleum ether. The vinyl liners in both the primary and secondary holding tanks were deposited into the solids container along with all the process piping. The sump pumps and tanks were thoroughly decontaminated. The vacuum filter was run through several cycles using clean water, then scrubbed with an abrasive cleanser, and swabbed with petroleum ether. All the remaining system accessories, including the vinyl tarps, were deposited into the solids container for disposal.

SECTION 5 - WASTEWATER TREATMENT

5.01 Introduction

The wastewater resulting from the cleaning operations contained significant concentrations of the PCB contaminated sediments. The chemical and physical properties of PCB's are such that the compound should be absorbed in the sediments which were removed from the sewer system. Therefore, any process which reduces the sediment concentration in the wastewater should also reduce the PCB concentration.

5.02 System Description

The wastewater treatment system consisted of a primary and secondary settling tank, a coagulation system and two filtering systems. (Figure 3 illustrates a schematic of the Wastewater Treatment System).

Wastewater from the vacuum truck utilized in the cleaning operation was discharged into the primary settling tank, which had a capacity of 6,000 gallons. The primary tank provided for settling of the settlable solids and provided flow and concentration equalization. The supernatant from the primary settling tank was pumped into a 6,000-gallon secondary settling tank for the further removal of suspended solids. The contents of the secondary tank were then pumped to the flocculation tank.

Prior to entering the flocculation tank, aluminum sulfate (alum) was introduced into the waste stream and mixed through the use of an in-line spiral mixer. Alum forms an insoluable gelatinous floc that settles through the wastewater, sweeping out the suspended material. A cationic polymer (magnifloc 581C) was also added into the system before

passing through an in-line coagulation coil. This polymer was selected because it is typically used for destabilization of colloidal clays and silts in the neutral pH range. To promote the required reaction between the chemicals, bicarbonate of soda was added periodically to the contents of both settling tanks to raise the pH of the wastewater to 7±.

The flow was then pumped into a flocculation tank which overflowed by gravity into a rotary drum vacuum filter unit. The function of this system was to reduce the water content of the solids still present in the wastewater and form a moist, easily handled, disposable cake. As the flow passed through the unit's trough, a cylindrical drum coated with a 2 inch layer of diatomaceous earth filter material slowly rotated in the bath. The drum, which was subject to an internal vacuum, drew the wastewater through the filter medium catching the suspended solids. As the drum rotated, the filter cake was gradually removed by an automatic scraper and disposed of in the solids container.

The vacuum filter system effluent then passed through a polishing cartridge filter which further removed any solids which may have passed through the treatment process. The flow was then routed into the CDE facility, where it was stored in a holding tank before passing through an activated carbon contactor. After passing through the carbon system, the treated effluent was discharged to the New Bedford Municipal Sewer System.

The original wastewater treatment system implemented at the outset of the project operated at a flow rate of approximately 5 gpm. It consisted of the same apparatus in the system described above, except that an inclined plate clarifier was used instead of the rotary vacuum filter.

The system was modified in the early stages of the clean-up operations because excessive amounts of liquid had to be used to remove the contaminated sediment from the sewers. Processing the additional wastewater at the design flow rate caused delays in the removal operations. To increase the treatment capacity of the system, the secondary settling tank and the vacuum filter system were added and the inclined plate clarifier was omitted. The use of the secondary tank provided additional storage capacity and alleviated the problem of pumping the wastewater directly from the primary settling tank. The addition of the vacuum filter system allowed the treatment system to operate at a flowrate of between 15-20 gpm.

SECTION 6 - POST SEWER CLEANING INSPECTION

6.01 Introduction

The effectiveness of the cleaning operations were verified by televising each sewer segment immediately following the cleaning operation conducted in that segment. All the television operations were recorded to provide a permanent record of the condition of the sewer lines.

6.02 T.V. Inspection

After the cleaning operations were completed, television inspection of the line was commenced. The televising van, carrying the recording equipment, was positioned beside the upstream manhole of the isolated segment of sewer line. The winches used to pull the T.V. camera through the pipeline were set up at the upstream and downstream manholes of the sewer segment. The cable at the downstream manhole was attached to the hydraulic jet and transported to the upstream manhole as the jet made its last pass up the line. Upon its arrival at the upstream manhole, the water pressure was turned off and the cables from both winches were connected to the camera. The camera was then positioned on the invert of the pipe facing downstream.

The camera was mounted on a skid and pulled down the line. A pre-set footage, usually 7 feet, was fixed to account for slack in the cable line. At this time, a picture of the sewer was visible on the television screen located in the T.V. van. A bulb attached to the camera gave off the light which reflected off the pipe wall illuminating the line. The smaller lines of the combined sewer system gave a clearer picture

than the larger pipe of the storm drain system because of the increased efficiency of the light reflection. A Beta-Max recorder taped the interior of the sewer line as it made its way toward the downstream manhole. Control of the camera winches was done from a control panel within the T.V. van. Audio attachments on the recorder allowed for the narration of the taping operation. Items such as infiltration, structural defects, and obstructions were indicated. A data entry on the television screen displayed the section of line being cleaned, the date, and gave a running total of the line footage. On October 31, 1984, a small fire in the recording equipment rendered the data display inoperable. The monitor operation was not affected; however, line footage had to be obtained from the winch after the display failed.

As the winches pulled the camera down the line, a close inspection of the line was made for any remaining sediment. The 5 o'clock position to 7 o'clock position was the most probable portion of the pipe that the contaminated sediments would remain. When sediment or grease was encountered in the line, the jet cleaner was brought back up the line towards the camera and used to flush the material towards the vacuum truck's suction tube at the downstream manhole. Dark stains on the pipe wall were generally observed during the taping operations. The stains remained after numerous passes with the high water pressure water cleaner and, as a result, were considered to be irremovable and permanent. Also, in some cases, the jet cleaner was used to dewater the line to make the bottom portion of the pipe visible. The camera would follow directly behind the jet nozzle to allow for a clear, uninterrupted path. When the camera reached the downstream manhole, the T.V. operation was complete. If the line contained no standing

sediment, it was considered acceptable and cleaning operations would continue to the next downstream line. As a final step, the camera and winches were disconnected and decontaminated. Also, all other equipment was decontaminated and the plastic decontamination zones were contained and disposed. A detail description of decontamination procedures is presented in Section 4.

6.03 Post Cleaning Testing

The effectiveness of the treatment operation was tested on October 23 and November 2, 1984. Samples were collected on the effluent of the temporary treatment system, before the CDE carbon filter, and on the effluent of the carbon system. The results of the analysis are as follows:

		Total PCB's (ppb)
10/23/84	Effluent of Treatment System	360
	Effluent of Carbon Filter	7.2
11/02/84	Effluent of Treatment System	100
	Effluent of Carbon Filter	0.4

TABLE 1

SEWER CLEANING SUMMARY

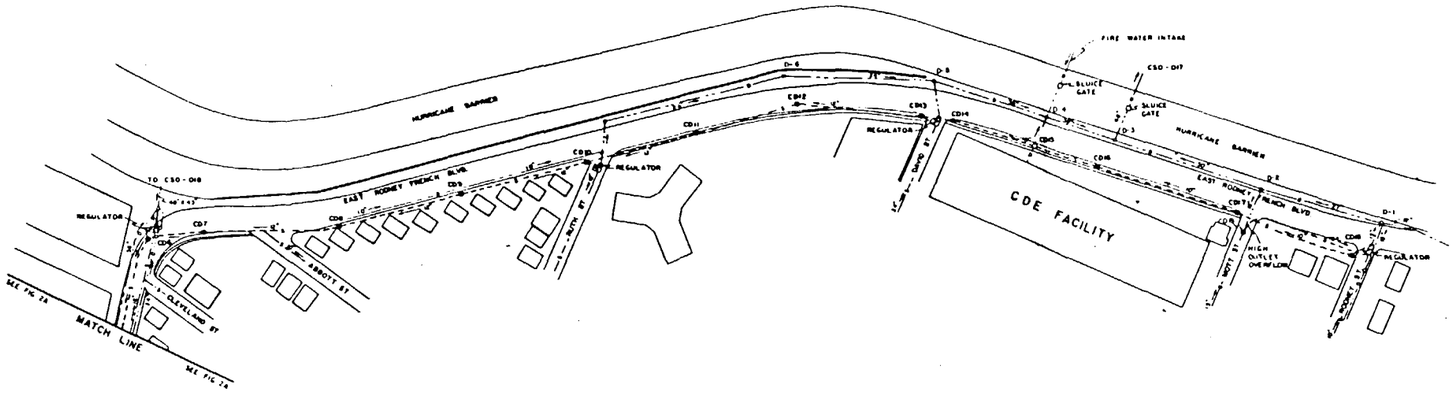
Sewer Line Segment	Date	Results	Comments
CD-19 to CD-18	Sept. 28, 1984	No Sediment	Visual inspection made
CD-18 to CD-17	Oct. 3, 1984	No Sediment	Heavy, oily sediment
CD-17 to CD-16	Oct. 13, 1984	No Sediment	Many cracks & breaks
CD-16 to CD-15 to CD-14	Oct. 15, 1984	No Sediment	No bucketing operation
CD-14 to CD-13	Oct. 16, 1984	No Sediment	Heavily oxidized cast iron repair
CD-13 to CD-12	Oct. 22, 1984	No Sediment	A break & excess infiltration
CD-12 to CD-11	Oct. 25, 1984	No Sediment	
CD-11 to CD-10	Oct. 26, 1984	No Sediment	Excess infiltration
CD-10 to CD-9	Oct. 27, 1984	No Sediment	
CD-9 to CD-8	Oct. 27, 1984	No Sediment	
CD-8 to CD-7	Oct. 28, 1984	No Sediment	Excess infiltration
CD-7 to CD-6	Oct. 30, 1984	No Sediment	Last of combined sewers
D-6 to D-5	Oct. 31, 1984	No Sediment	Excess infiltration
D-5 to D-4	Nov. 1, 1984	No Sediment	
D-4 to D-3	Nov. 7, 1984	No Sediment	
D-3 to D-2	Nov. 7, 1984	No Sediment	
D-2 to D-1	Nov. 2, 1984		
D-5 to David St.	Nov. 1, 1984	No Sediment	Excess infiltration
D-4 to CD-15	Nov. 1, 1984	No Sediment	Heavily oxidized cast iron line
D-2 to CD-19	Nov. 2, 1984	No Sediment	
D-1 to Rodney St.	Nov. 1, 1984	No Sediment	
Outfall @ D-3	Nov. 7, 1984	No Sediment	Visual inspection made

TABLE 2

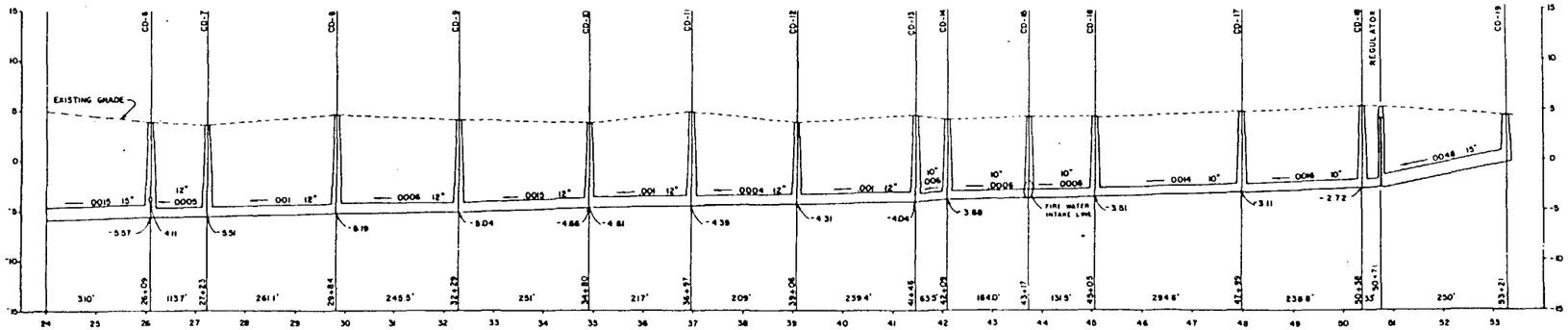
DISPOSAL SUMMARY

Date	Section of Sewer	Liquid Quantity Gallons	Solids Quantity Cubic yards
09/28/84	CD-19 to CD-18	1500	
10/03/84	CD-18 to CD-17	5300	
10/13/84	CD-17 to CD-16	3400	3.0
10/15/84	CD-16 to CD-15 to CD-14	3900	
10/16/84	CD-14 to CD-13	3500	
10/17/84			4.0
10/22/84	CD-13 to CD-12	5700	
10/23/84			2.5
10/25/84	CD-12 to CD-11	3200	
10/26/84	CD-11 to CD-10	7600	
10/27/84	CD-10 to CD-9	4600	4.0
10/27/84	CD-9 to CD-8	3600	
10/28/84	CD-8 to CD-7	12,800	
10/30/84	CD-7 to CD-6	1400	
10/31/84	D-6 to D-5	3600	
11/01/84	D-5 to David St.	300	
11/01/84	D-4 to CD-15	1200	
11/01/84	D-5 to D-4	4300	
11/01/84	D-1 to Rodney St.	500	
11/02/84	D-2 to CD-19	500	
11/02/84	D-2 to D-1	1000	
11/07/84	D-3 to D-2	1300	4.0
11/07/84	D-4 to D-3	4900	
11/07/84	Outfall @ D-3	1300	
11/08/84			.5
	TOTALS	75,400	18.0

FIGURE I.



PLAN



PROFILE

EAST RODNEY FRENCH BOULEVARD SEWER

LEGEND

- SANITARY SEWER AND MANHOLE
- STORM SEWER AND MANHOLE
- SANITARY SEWER SEGMENTS TO BE CLEANED
- CD16 — MANHOLE I.D. NUMBER
- CSO-017 — COMBINED SEWER OVERFLOW AND I.D. NUMBER

NOTES

1. SEWER LOCATIONS AND PLANIMETRIC FEATURES SHOWN IN THE PLAN VIEW ARE BASED ON MAPPING OBTAINED FROM THE CITY OF NEW BEDFORD.
2. ALL ELEVATIONS SHOWN IN PROFILE ARE BASED ON CITY OF NEW BEDFORD DATUM

EAST RODNEY FRENCH BLVD. SEWER

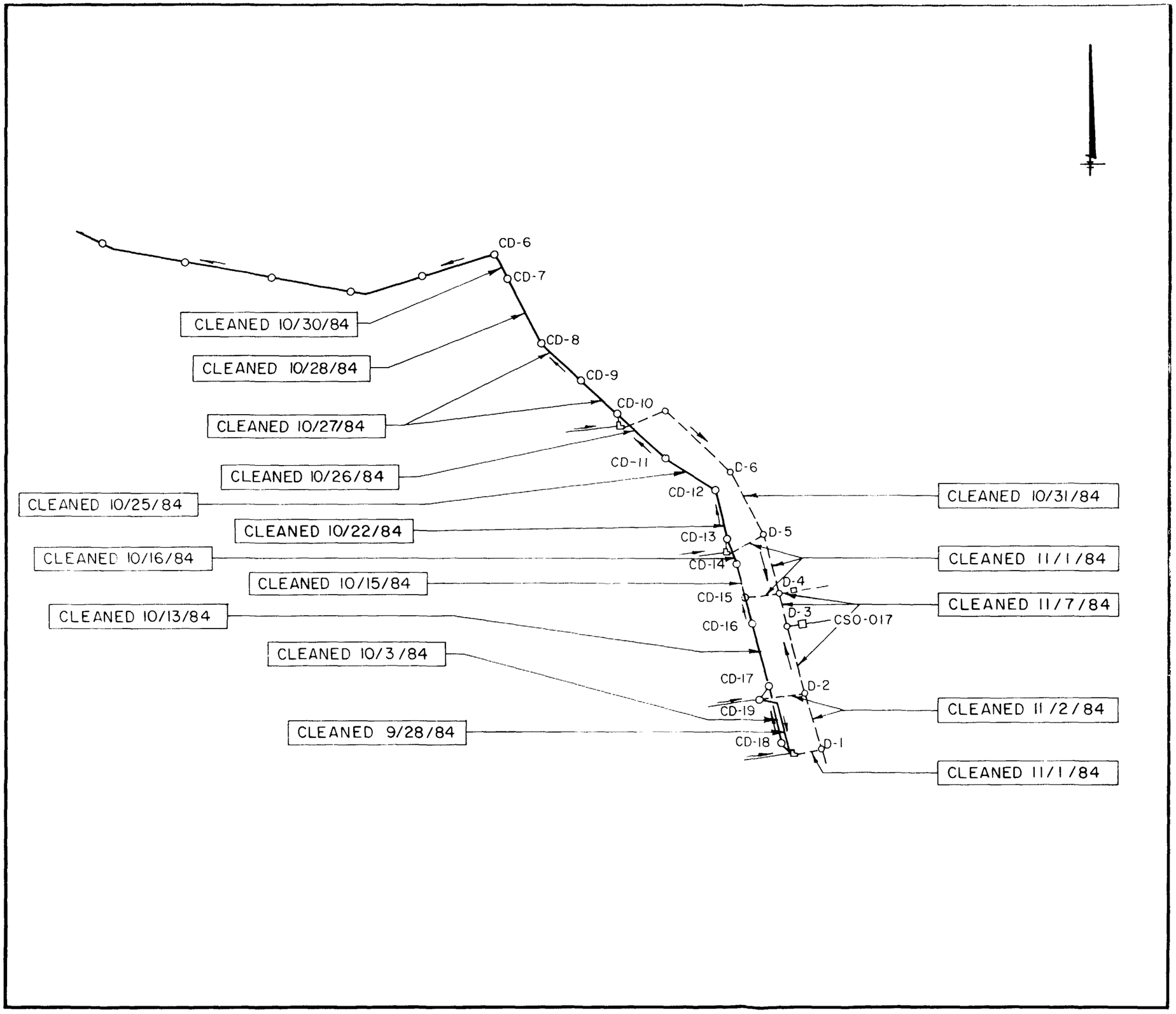
APPROX. SCALE :

HORIZ 100 0 100 200

VERT. 5 0 5 10

O'BRIEN & GERE

FIGURE 2



LEGEND

- SANITARY SEWER AND MANHOLE
- STORM SEWER AND MANHOLE
- REGULATOR
- SLUICE GATE
- CD-2 MANHOLE I.D. NUMBER
- CSO-17 COMBINED SEWER OVERFLOW & I.D. NUMBER

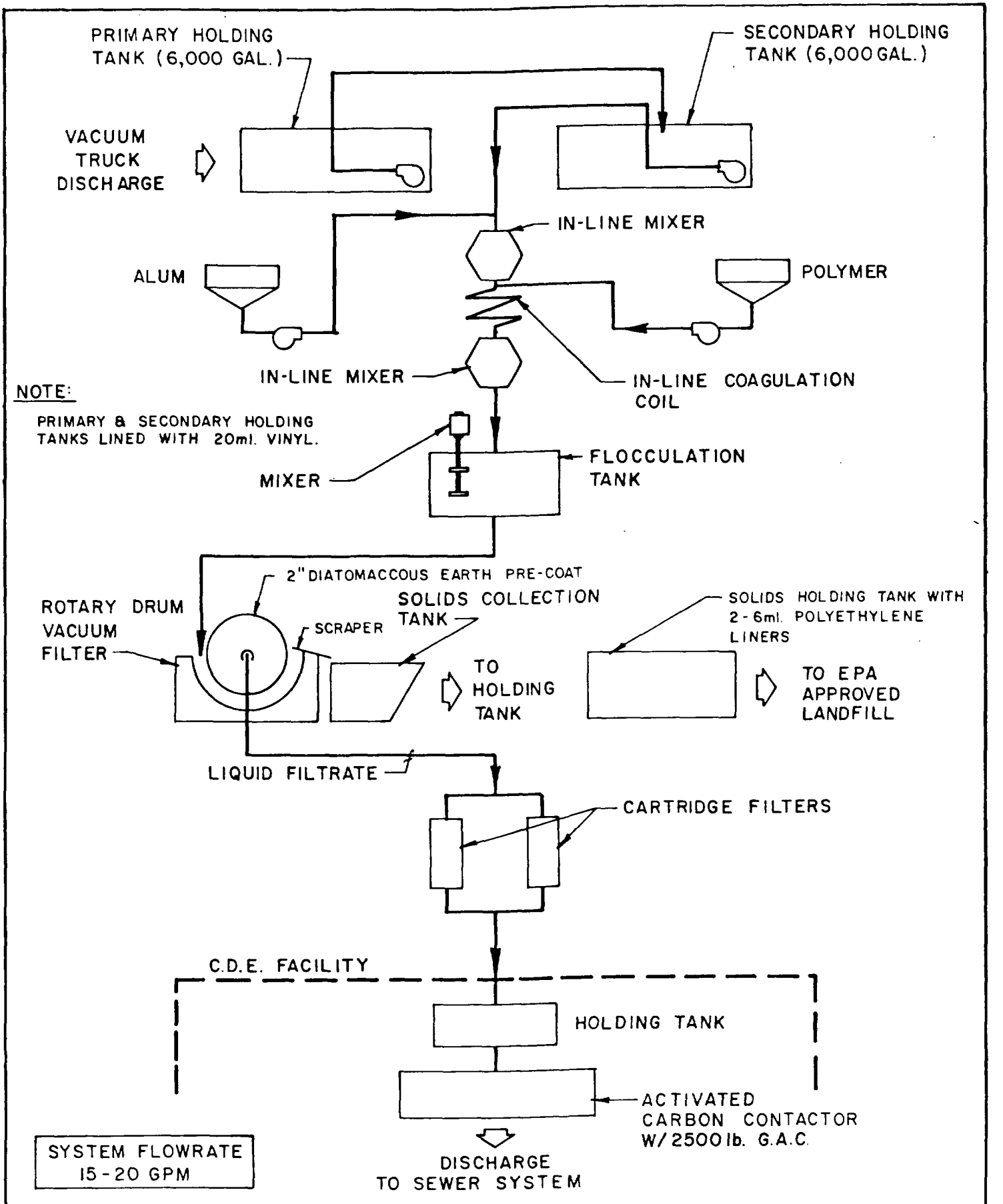
SPECIFIED SEGMENTS OF CITY OF NEW BEDFORD MUNICIPAL SEWER SYSTEM CLEANED

APPROX. SCALE : 1" = 400'

400 0 400

O'BRIEN & GERE ENGINEERS, INC.

FIGURE 3



WASTE WATER

TREATMENT SYSTEM SCHEMATIC