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**Environmental Summary for  
Calendar Year 1979**

U. S. Department of Energy  
Kansas City Plant  
Kansas City, Missouri

Published March 1980

Prepared for the United States Department of Energy  
Under Contract Number DE-AC04-76-DP00613.



**Kansas City  
Division**

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## FOREWORD

This report has been prepared by the Industrial Ecology Section of the Environmental Protection Department at the Kansas City Division of The Bendix Corporation. All environmental monitoring, including analyses and data management, is administered by the Industrial Ecology Section. This report summarizes the significant information resulting from the environmental and effluent monitoring programs at the Kansas City facility.

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A prime contractor with the United States  
Department of Energy under Contract Number  
DE-AC04-76-DP00613

## INTRODUCTION

Air and water quality in the Kansas City Plant environment were monitored and results are reported for calendar year 1979. Routine environmental surveillance programs are designed to demonstrate compliance with various regulatory standards, including the National Pollutant Discharge Elimination System (NPDES) permit<sup>1</sup> as issued by the U. S. Environmental Protection Agency. The Kansas City Plant does not have any on-site waste disposal, and environmental considerations are limited to assuring that off-site waste disposal practices meet all applicable regulatory requirements.

The Kansas City Plant is part of a Federal Complex in Kansas City, Missouri. The facility occupies approximately 122 acres of a 300-acre Federal Complex (Figure 1). The complex is 12 miles south of downtown Kansas City and is situated in a small river valley surrounded by low hills. The Blue River (a tributary of the Missouri River) flows from south to north along the eastern edge of the complex. Indian Creek flows from west to east along the south side of the complex and merges with the Blue River.

Prevailing winds are from the southwest, providing good ventilation for the site. The area is subject to early morning temperature inversions, especially in the fall months. However, the air mixing depth normally allows for adequate dispersion of any air discharges.

The area around the facility is primarily residential with occasional light industry, giving the facility predominance in the immediate community.

The offices and manufacturing areas are essentially under one roof with additional outbuildings for support operations. Two boilerhouses are situated to the east and west of the main building and supply steam for space heating and cooling to the entire Federal Complex. The boilerhouses have a total of seven boilers, of which only four discharge to the atmosphere during normal operations. There are multiple discharge points to the atmosphere on the roof of the main building. Four storm sewer outfalls discharge to the surrounding surface water streams (Blue River and Indian Creek), and industrial wastewater and sanitary effluents discharge to the Kansas City, Missouri, sanitary sewer system.

Non-nuclear weapon component manufacturing involves metals and plastics machining, plastics fabrication, plating, and electrical and mechanical assembly. No radioactive materials are machined or processed.

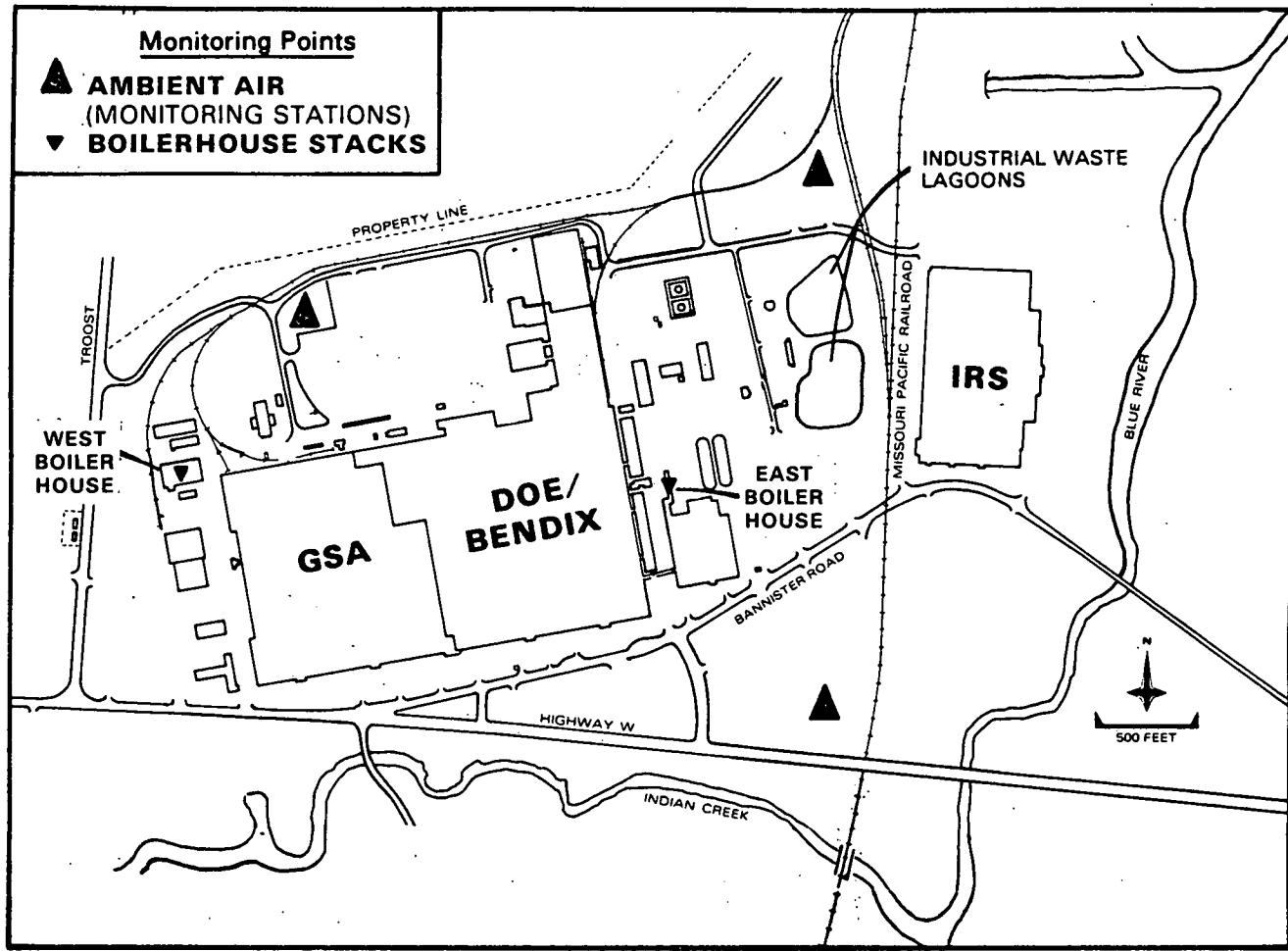


Figure 1. Air Monitoring Sites at the Kansas City Plant

## SUMMARY

Environmental monitoring for significant non-radioactive pollutants was conducted to allow evaluation of effluent effects on the environs of the Federal Complex. The monitoring data were compared to appropriate standards and guidelines. Ambient air and surface water analyses have shown no discernible effects on the environment from plant discharges. The National Pollutant Discharge Elimination System permit issued by the Environmental Protection Agency requires effluent monitoring of wastewater discharges entering Indian Creek and Blue River. Abatement activity and discharge monitoring reports have been routinely submitted to EPA as required by the permit.

### AIR

Ambient air monitoring at the three monitoring stations, located as shown in Figure 1, has indicated a negligible environmental impact on regional air quality from the operations of the Kansas City Plant. There were no activities subject to the National Emission Standards for Hazardous Air Pollutants (NESHAP)<sup>2</sup> during 1979.

The primary sources of air pollution emissions from the Kansas City Plant are the two boilerhouse operations. Stack emission testing of the boilerhouses has demonstrated that air-borne pollutant discharges are only significant when fuel oil rather than natural gas is consumed. Natural gas is the primary fuel for the boilerhouses but gas curtailments imposed by the local utility require the use of the alternate fuel oil. Existing Kansas City, Missouri, air pollution control regulations<sup>3</sup> for particulate matter discharges and Missouri State regulations<sup>4</sup> for sulfur dioxide emissions and volatile organic compounds have been evaluated and are being met. More frequent gas curtailments are forecast as a national trend. As a result, the use of greater quantities of fuel oil, which increases pollutant discharges, is anticipated. Although air pollution control measures had been budgeted to assure regulatory compliance with increasing fuel oil burning, emission testing of the boilerhouses resulted in the cancellation, in 1979, of the need for this project.

No radioactive air pollutant releases are associated with the Kansas City Plant operations.

### WATER

Contributions of non-radioactive pollutants to the water environment are determined by monitoring the four outfalls discharging

effluents to the surface waters. The storm sewer outfall effluent monitoring program includes parameters identified in State of Missouri effluent regulations and guidelines<sup>5,6</sup> in addition to routine sampling, analyses, and reporting of total dissolved solids, pH, temperature, and flow required by the NPDES permit authorizing this discharge. The NPDES permit is based on Missouri water quality standards<sup>7</sup> which limit effluents entering surface waters to storm water runoff and unpolluted cooling waters. Permit limitations are based on intake water quality, which is drinking water as supplied by Kansas City, Missouri, plus a 10 percent variance.

All outfall concentrations have been determined to be within the Missouri effluent guidelines and within NPDES permitted conditions (intake water quality plus a 10 percent variance) except as noted in the tables. In these instances, the National Interim Primary Drinking Water Regulations<sup>9</sup> limiting value is presented to give a perspective to the absolute value. It has been our experience that the fluctuations in some of these parameters that exceed the permit limitation are primarily attributable to ground water infiltration and surface water runoff.

The results of stream monitoring have indicated that discharges to Indian Creek and Blue River have no adverse effect on the quality of the receiving streams.

Plant effluents discharging to the city sanitary sewer have been determined to be within applicable city regulations<sup>8</sup> and Missouri effluent guidelines<sup>6</sup> for industrial discharges to municipal sewer systems. The sanitary sewer effluent includes both sanitary and industrial discharges. A routine report of monitored pollutant levels in the effluent is provided to the Kansas City, Missouri, Division of Industrial Waste Control on a quarterly basis. Industrial effluents from the wastewater lagoon system before they enter the sanitary sewer also are monitored.

No operations result in radioactive releases from the Kansas City Plant.

## MONITORING DATA AND EVALUATION

### AIR

The program for monitoring ambient air at the site perimeter (Figure 1) to assess plant contributions to regional air pollutant levels has shown that monitored pollutant levels are within federal ambient air standards. Total hydrocarbon concentration levels exceeding ambient air standards, however, have been recorded only during periods of heavy automobile traffic. Significant levels of the oxides of nitrogen and carbon monoxide also have been recorded during these periods. In addition, oxides of nitrogen levels also are affected by train traffic just east of the facility. Plant contributions affecting pollutant levels are significant only during periods of air stagnation. Communications with local regulatory officials has been maintained in conjunction with the continued monitoring program. Local regulatory agency representatives have remained receptive to the possible future incorporation of the three on-site ambient air monitoring stations into the Kansas City, Missouri, automated air pollutant monitoring telemetry system.

Several air pollutant effluent standards apply to Kansas City operations at the present time. The particulate standard, which is enforced by local agencies, regulates maximum allowable emissions of particulate matter from the boilerhouses. Another boilerhouse emission, regulated by the state agencies, is sulfur dioxide. Boilerhouse pollutant discharges were evaluated on the basis of stack emissions testing conducted by Burns & McDonnell in 1978.<sup>10</sup> The average plant particulate emission rate from the boilerhouses was 0.048 kilogram per million BTU input as compared to a standard of 0.108 kilogram per million BTU input. Total particulate emissions from the boilers as calculated from the total BTU annual input were 83,300 kilograms (183,000 pounds) or 44 percent of the applicable standard for calendar year 1979. Sulfur dioxide emissions were 0.27 kilogram per million BTU (0.59 pounds) compared to the standard of 3.6 kilogram per million BTU input. Total sulfur dioxide emissions, 7 percent of the standard, were 433,800 kilograms (954,500 pounds).

The Kansas City, Missouri standard limiting visible emissions from the boilerhouse also has been evaluated. Photoelectric monitors that measure opacity are installed in the boilerhouse stacks to alert operating personnel to an out-of-standard condition. The most significant adverse effect resulting from boilerhouse operations has been the temporary upset conditions during the necessary changeover of fuels and the upsets from boiler maintenance and adjusting. These upsets, which can sometimes result in significant short-term visible emissions, are reported to local regulatory officials as required by local regulations.

The State of Missouri also has recently promulgated air pollutant effluent regulations concerned with Volatile Organic Compound (VOC) emissions.<sup>4</sup> The primary impact to Bendix Kansas City comes from the degreasing operations regulation. Instead of prescribing emission limits, it designates equipment design requirements and operating procedures. Degreaser equipment surveys at the Kansas City Plant have shown that all operating equipment in CY1979 complied with these regulations.

In summary, air monitoring has revealed that normal operations have a negligible effect on air quality in the surrounding area.

#### WATER

Environmental and effluent monitoring was conducted for comparison to water quality and discharge criteria within the Kansas City Plant area. Environmental monitoring has indicated no significant adverse impact resulting from operations. Table 1 summarizes the environmental programs underway to assess environmental impact and to determine compliance status. The water-monitoring program was conducted in accordance with the EPA Manual of Methods for Chemical Analysis of Water and Wastes (1974) and Standard Methods for the Examination of Water and Wastewater.<sup>11</sup> Sampling and analytical work was performed by Langston Laboratories, Inc., which maintains a quality assurance program with EPA cognizance. Figure 2 shows the locations of the water monitoring sites at the Kansas City Plant. Routine ground water sampling around the lagoons was not conducted during 1979.

The effluent monitoring programs for the four outfall discharges to the receiving streams and the sanitary discharge to the city sewer system provide data for comparison to applicable regulations. The results of these effluent stream analyses are presented in Tables 2 and 3 and are compared to appropriate standards and guidelines. These data summarize the effluent monitoring program at the facility and reflect a negligible environmental impact.

Table 2 provides a comparison to the NPDES effluent limitations as the most restrictive standard, except as noted. NPDES limitations, based on plant intake (drinking) water concentration plus a 10-percent variation, result in some effluent characteristics approximating or exceeding the limitation. The outfall concentrations reported as 100 percent of the standard are examples of the stringency of the limitations. All the reported parameters are within Missouri Effluent Guidelines<sup>6</sup> and all of the parameters reported as exceeding the permit limitations are also within applicable Federal Drinking Water standards.<sup>9,14</sup>

Isolated incidents have occurred in which the total dissolved solids (TDS) concentrations discharged to surface waters have

Table 1. Bendix Kansas City Monitoring Program

Monitoring Program	Requirement
Outfalls to Blue River and Indian Creek	To assure effluents discharging to surface waters via four plant outfalls meet NPDES permit requirements and Missouri Effluent Guidelines
Lagoon Discharge	To provide visible data relating to discharge of industrial wastewater to the sanitary sewer
Sanitary Discharge	To assure effluent, which includes discharge from industrial wastewater lagoon, meets Kansas City ordinance for sanitary and industrial wastes
Stream Monitoring	To assess impact of effluents on surface waters
Intake Water	To provide baseline water quality data for NPDES permit

been above the NPDES permit limit, although the combined annual average is within acceptable limits. These exceptions have been noted in the quarterly permit reports to the EPA which specifically requires reporting of the parameters: pH, flow, temperature and TDS. The environmental impact of plant wastewater discharges to the surface waters is not discernible when compared to the water quality of Blue River and Indian Creek. Water quality of these streams varies considerably as a result of upstream discharges from publicly-owned treatment plants and urban runoff.

Monitoring for polychlorinated biphenyls (PCBs) in the storm and sanitary sewer outfalls has continued following the initial 1974 conversion to a non-PCB material in the processing systems which used PCBs. In 1979, these systems were completely converted to non-PCB systems as required by federal regulations.<sup>12</sup> The presence of PCBs in plant effluents at a less than one-part-per-billion concentration (the residual contamination of on-site facilities) has been documented to the EPA.<sup>13</sup>

Discharges from the industrial wastewater lagoons are routinely monitored before entry into the Kansas City, Missouri, sanitary sewer. The combined industrial wastewater and sanitary sewer discharge also is monitored and compared to applicable standards for discharges to the municipal system. Kansas City, Missouri,

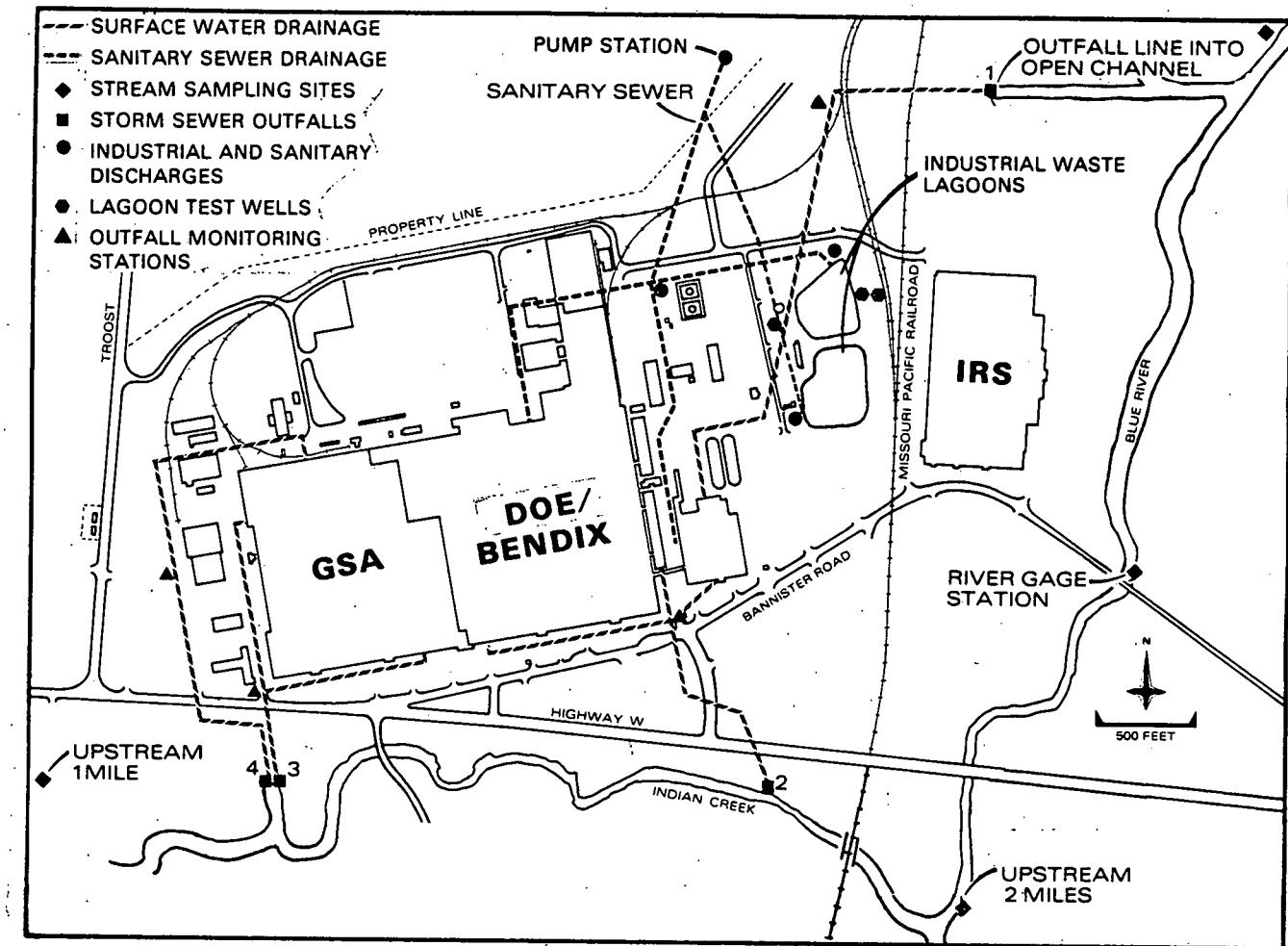


Figure 2. Water Monitoring Sites at the Kansas City Plant

officials also have monitored the combined discharges and require quarterly reporting of selected pollutant concentrations and flow. Table 3 summarizes the municipal discharges during 1979 and compares them to applicable standards.

Wastewater handling capabilities continue to be upgraded to assure environmental protection. Both federal and pending local pretreatment regulations require continuing evaluation for possible additional control of industrial discharges. Present plant operations do not result in any known adverse environmental impact.

Table 2. CY1979 Storm Sewer Outfall Monitoring Data

Parameter	Concentration (mg/L)			Total Estimated Quantity Released During 1979 kg (lb)
	Combined Outfall Average	Standard (Intake Drinking Water Quality Plus 10 Percent)	Percent of Standard	
pH (Units)	8.7	6.5-9.0	Within Standard	---
Temperature (°F)	61.0	90 (max)	Within Standard	---
Total Dissolved Solids	395.0	509 (max)	78	1,603,700 (3,528,139)
Aluminum	0.11	0.043	100*	446 (983)
Arsenic	<0.001	<0.001**	Within Standard	4 (9)
Barium	0.04	0.025	100†	163 (357)
Beryllium	<0.001	<0.001**	Within Standard	4 (9)
Boron	0.19	0.42	45	771 (1,697)
Cadmium	0.004	0.011	36	16 (36)
Chromium	<0.01	<0.01**	Within Standard	41 (89)
Copper	0.013	0.018	72	53 (116)
Cyanide	0.008	<0.01**	Within Standard	41 (90)
Iron	0.125	0.087	100††	528 (1,162)
Lead	<0.01	<0.01**	Within Standard	40 (89)
Mercury	<0.0005	<0.0005**	Within Standard	2 (4)
Nickel	<0.01	0.02	Within Standard	40 (89)
Selenium	<0.001	<0.001**	Within Standard	4 (9)
Silver	0.001	0.002	50	4 (9)

Table 2 Continued. CY1979 Storm Sewer Outfall Monitoring Data

Parameter	Concentration (mg/L)			Total Estimated Quantity Released During 1979 kg (lb)
	Combined Outfall Average	Standard (Intake Drinking Water Quality Plus 10 Percent)	Percent of Standard	
Zinc	0.023	0.032	72	93 (205)
BOD	2.4	20+++	12	9,744 (21,436)
COD	14.0	100+++	14	69,020 (151,844)
Ammonia	0.6	0.6+++	100*	2,030 (4,466)
Oil and Grease	3.1	4.4	71	6,902 (15,184)
PCBs	0.0005	<0.0001**	100*	2 (4.4)

\*No Drinking Water Standard (Primary or Secondary) or Missouri Effluent Guideline established

\*\*Limiting standard concentrations are at the minimum detection level used in monitoring program

†Primary Drinking Water Standard is 1.0

††Secondary Drinking Water Standard is 0.3<sup>1/4</sup>, No primary drinking water standard established

+++Missouri Effluent Guideline

## REFERENCES

<sup>1</sup>EPA Permit Number MO-0004863, Authorization to Discharge Under the National Pollutant Discharge Elimination System, February 26, 1974.

<sup>2</sup>EPA, Code of Federal Regulations, "National Emission Standards for Hazardous Air Pollutants," Federal Register, Volume 38, Number 66, April 6, 1973.

<sup>3</sup>City of Kansas City, Missouri, Air Pollution Control Code, June 9, 1972.

<sup>4</sup>State of Missouri Air Conservation Commission, "Air Quality Standards and Air Pollution Control Regulations for the Kansas City Metropolitan Area," 10CSR10-2, June 1, 1979.

<sup>5</sup>State of Missouri Clean Water Commission, Effluent Regulations, May, 1974.

<sup>6</sup>State of Missouri Clean Water Commission, Effluent Guidelines, November, 1971.

<sup>7</sup>State of Missouri Clean Water Commission, Water Quality Standards, December, 1977.

<sup>8</sup>City of Kansas City, Missouri, Pollution Code for Commercial and Industrial Waste, Abridged, 1973.

<sup>9</sup>EPA, Code of Federal Regulations, "National Interim Drinking Water Regulations," 40CFR141.

<sup>10</sup>Burns & McDonnell Engineers Inc., Stack Emissions Test Report, July, 1978.

<sup>11</sup>APHA-A WWA-WPCF, Standard Methods for the Examination of Water and Wastewater, 14th Edition, 1975.

<sup>12</sup>EPA, Code of Federal Regulations, "Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions," Federal Register Volume 44, Number 106, May 31, 1979.

<sup>13</sup>EPA Survey: PCB Usage at Federal Facilities. Bendix Kansas City Report Submitted in April, 1976.

<sup>14</sup>EPA, Code of Federal Regulations, "National Secondary Drinking Water Regulations," 40CFR Part 143, Federal Register, Volume 44, Number 140, July 19, 1979.

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