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ENVIRONMENTAL SUMMARY
FOR CALENDAR YEAR 1978

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

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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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INTRODUCTION

Air and water quality in the Kansas City Plant environment were monitored and results are reported for calendar year 1978. Routine environmental surveillance programs are designed to demonstrate compliance with various regulatory standards, including the National Pollutant Discharge Elimination System (NPDES) permit¹ as issued by the U. S. Environmental Protection Agency. The Kansas City Plant does not have any on-site waste disposal activities, and environmental considerations are limited to assuring that 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 powerhouses 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 powerhouses have a total of seven stacks, 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 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)² during 1978.

Stack emission testing of the powerhouses demonstrated that airborne powerhouse pollutant discharges are only significant when fuel oil rather than natural gas is consumed. Natural gas is the primary fuel for the powerhouses but gas curtailments imposed by the local utility require the use of the alternate fuel oil. Existing Kansas City, Missouri, air pollution control regulations³ for both particulate matter discharges and sulfur dioxide fence-line concentrations have been evaluated and are being met. More frequent gas curtailments are a national trend. As a result, greater quantities of fuel oil, which increases pollutant discharges, are being used. Air pollution control measures, however, are being budgeted as appropriate to assure regulatory compliance.

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 NPDES permit authorizing this discharge requires routine sampling, analysis, and reporting of total dissolved solids, pH, temperature, and flow. In addition, the storm sewer outfall effluent monitoring program includes parameters identified in State of Missouri effluent regulations

and guidelines.^{4, 5} The NPDES permit is based on Missouri water quality standards⁶ 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. All outfall concentrations are compared to intake water quality (plus a 10 percent increase allowed by the permit) and Missouri effluent guidelines. The results of stream monitoring have indicated that discharges to Indian Creek and Blue River have no adverse effect on the pollutant levels in the streams.

Plant effluents discharging to the city sanitary sewer have been determined to be within applicable city regulations⁷ and Missouri effluent guidelines⁶ 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 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) was continued into 1978 to assess plant contributions to regional air pollutant levels. Monitored pollutant levels have historically been within ambient air standards. Hydrocarbon concentration levels exceeding ambient air standards have been recorded 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, pollutant concentration 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.

The only air pollutant effluent standard which applies to Kansas City operations, and to which comparison can be made, is a local regulation for maximum allowable emission of particulate matter from the steam generating powerhouses. Powerhouse pollutant discharges were evaluated on the basis of stack emissions testing conducted by Burns & McDonnell in 1978.⁸ The average plant emission rate from the powerhouses was 0.044 kilogram per million BTU input as compared to a standard based on 0.108 kilogram per million BTU input. Total particulate emissions from the boilers were 76,800 kilograms (169,000 pounds) or 41 percent of the applicable standard for calendar year 1978.

The Kansas City, Missouri, standard that limits visible emissions from the powerhouse also has been evaluated. Photoelectric monitors that measure opacity in the powerhouse stacks are used to alert operating personnel to an out-of-standard condition. The most significant adverse effect resulting from powerhouse operations has been the temporary upset conditions during the necessary changeover of fuels. These upsets, which can sometimes result in significant visible emissions, are reported to local regulatory officials as required by local 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.⁹ 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 1978; however, the monitoring of lagoon operations has been expanded since the completion of the second wastewater lagoon.

The effluent monitoring programs for the four outfall discharges to the receiving streams and the sanitary discharge 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 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 many effluent characteristics approximating the limitation. The outfall concentrations reported as 100 percent of the standard are examples of the stringency of the limitations. The reported parameters are all within Missouri Effluent Guidelines.⁵ Isolated incidents have occurred in which the total dissolved solids (TDS) concentrations discharged to surface waters have 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. 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 conversion to a non-PCB material in the processing systems which used PCBs. The presence of PCBs in plant effluents at the nominal one-part-per-billion concentration (the residual contamination of on-site

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

facilities and PCB usage in electrical equipment) has been documented to the EPA.¹⁰

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, officials also have monitored the combined discharges. Table 3 summarizes the municipal discharges during 1978 and compares them with applicable standards.

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

Figure 2. Water Monitoring Sites at the Kansas City Plant

Table 2. CY1978 Storm Sewer Outfall Monitoring Data

Parameter	Concentration*		Percent of Standard	Total Estimated Quantity Released During 1978 kg (lb)
	Combined Outfall Average	Standard**		
pH (Units)	8.6	6.5-9.0	Within Standard	---
Temperature (°F)	70	90 (max)	Within Standard	---
Total Dissolved Solids	381	488 (max)	78	1,615,135 (3,553,297)
Aluminum	0.12	0.25	46	492 (1,082)
Arsenic	<0.001	<0.001	100***	4 (9)
Barium	0.05	0.05	100†	199 (438)
Beryllium	<0.001	<0.001	100***	4 (9)
Boron	0.17	0.24	70	720 (1,585)
Cadmium	0.002	0.003	66	8 (18)
Chromium	0.01	0.04	25	40 (88)
Copper	0.018	0.011	100†	76 (168)
Cyanide	0.01	0.01	100***	47 (102)
Iron	0.17	0.6	28	704 (1,548)
Lead	0.019	0.03	63	80 (177)
Mercury	0.0005	0.0005	100	2 (4)
Nickel	0.016	0.02	80	68 (149)
Selenium	<0.001	<0.001	100***	4 (9)
Silver	0.002	0.006	33	8 (18)

Table 2 Continued. CY1978 Storm Sewer Outfall Monitoring Data

Parameter	Concentration*		Percent of Standard	Total Estimated Quantity Released During 1978 kg (lb)
	Combined Outfall Average	Standard**		
Zinc	0.045	0.27	17	191 (420)
BOD	1.6	20††	8	6,782 (14,922)
COD	17	100††	17	71,642 (157,613)
Ammonia	0.5	0.6††	83	2,162 (4,756)
Oil and Grease	1.7	4	42	7,037 (15,481)
PCBs	0.0005	<0.0001***	100***	0.2 (0.4)

*Concentration in mg/L except as noted

**NPDES Permit limitations based on intake water quality except as noted

***Both outfall and limiting standard concentrations are at the minimum detection level used in monitoring program

†Missouri Effluent Guideline is 1.0 mg/L

††Missouri Effluent Guideline

Table 3. CY1978 Sanitary Sewer Outfall Monitoring Data

Parameter	Concentration*		Percent of Standard	Total Estimated Quantity Released During 1978 kg (lb)
	Combined Outfall Average	Standard**		
pH (Units)	7.5	6.0-10.0***	Within Standard	---
Temperature (°F)	70	150*** (max)	Within Standard	---
BOD, 5 day	112	300***	37	256,401 (564,082)
Chlorinated Hydrocarbons**	0.013	Restricted***	---	30 (66)
Cyanides	0.01	2***	0.5	23 (50)
Phenols	0.09	10***	0.9	207 (455)
Soluble Oils	10.1	100***	10	25,043 (55,094)
Suspended Solids	48	400**	12	110,280 (242,616)
Boron	0.21	1.0†	21	483 (1,061)
Cadmium	0.002	2.0†	0.1	5 (10)
Chromium	0.043	10†	0.4	99 (217)
Copper	0.100	2.0†	5	230 (505)
Iron	0.58	15†	3.8	1,333 (2,932)
Lead	0.025	0.1†	25	57 (126)
Nickel	0.020	3.0†	0.6	460 (1,011)
Zinc	0.149	2.0†	7	342 (753)

*Concentration in mg/L except as noted

**Value includes PCBs at <0.0005 mg/L

***Kansas City Pollution Code for Commercial and Industrial Wastes

†Missouri Effluent Guidelines for Municipal Control of Industrial Wastes

REFERENCES

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

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

³City of Kansas City, Missouri, Air Pollution Control Code, June 9, 1972.

⁴State of Missouri Clean Water Commission, Effluent Regulations, May, 1974.

⁵State of Missouri Clean Water Commission, Effluent Guidelines, November, 1971.

⁶State of Missouri Clean Water Commission, Water Quality Standards, December, 1977.

⁷City of Kansas City, Missouri, Pollution Code for Commercial and Industrial Waste, Abridged, 1973.

⁸Burns & McDonnell Engineers Inc., Stack Emissions Test Report, July, 1978.

⁹APHA-A WWA-WPCF, Standard Methods for the Examination of Water and Wastewater, 14th Edition, 1975.

¹⁰EPA Survey: PCB Usage of Federal Facilities. Bendix Kansas City Report Submitted in April, 1976.

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