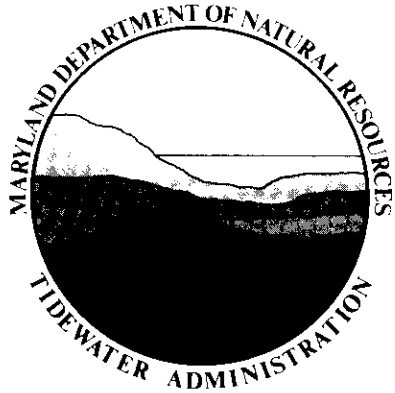
PPER-CEIR-7

PPRP

POWER PLANT CUMULATIVE ENVIRONMENTAL IMPACT REPORT FOR MARYLAND

1991

POWER PLANT AND ENVIRONMENTAL REVIEW



As Secretary of the Maryland Department of Natural Resources, I am convinced that public support of DNR's mission is essential if we are to restore the State's once bountiful natural resources, especially the Chesapeake Bay, to the level which earned the title "America in Miniature." The information in this publication is designed to increase your understanding of our program and of Maryland's natural resources.

Torrey C. Brown, M.D.

ABSTRACT

The Power Plant Cumulative Environmental Impact Report for Maryland (CEIR) is issued biennially as required by the Maryland Power Plant Research Act in Section 3-304 of the Natural Resources Article in the Annotated Code of Maryland. The objective of this CEIR is to summarize the information available on the actual and potential environmental impacts of power plants on Maryland's natural and human environment. Topic areas addressed in this edition are those considered necessary by the Maryland Power Plant and Environmental Review Division to understand potential environmental impacts.

Understanding the environmental impacts requires an understanding of the following two subjects:

- the sources of these impacts, namely the generating facilities that produce electric power in the State, and
- the receptors of these impacts, namely air, surface water, ground water, and terrestrial resources.

Chapters in this report describe the effects of power generation on each of these environmental media. Additional chapters discuss the impacts from nuclear power generation (Chapter 5) and acid deposition (Chapter 8) on each environmental medium. In addition, Chapter 2 (The Outlook for Electric Power Supply and Demand in Maryland) presents an overview of the electric facility industry in Maryland and a description of utility plans for meeting anticipated growth in demand over the next 15 years. Chapter 9, a new chapter for the CEIR, discusses some of the changes in the utility operating environment that may affect current power generation.

TABLE OF CONVERSIONS

1 inch = 2.54 cm
1 acre = 4,047 m^2
1 foot = 0.305 m
1 lb = 0.454 kg
1 st. mile = 1,609 m
1 Btu = 252 calories
1 cu ft = 28.3 liter = 28.3 x 10^{-3} m^3
1 gallon - 0.134 cu ft = 3.785 x 10^{-3} m^3
1 cfs = 449 gpm = 28.3 x 10^{-3} m^3/sec
10^6 gpm = 2.233 x 10^3 cfs = 63 m^3/sec
1 acre = 0.4 hectare
1 acre foot = 4.36 x 10^4 cu ft = 1.23 x 10^2 m^3
1 hectare = 10^4 m^2 = 2.47 acres
1 barrel of oil = 42 gallons

Concentration:

1 ppb by weight in water = 1 g/m^3

1 ppm by volume in air = $\frac{0.0224}{\text{gram mol. weight}}$ x concentration in $\mu g/m^3$

Gram molecular weight:

O_2 = 32; O_3 = 48; SO_2 = 64; NO = 30; NO_2 = 46; CO = 28

Approximate heating values:

Coal = 12,500 Btu/lb
Oil = 148,000 Btu/gallon
Gas = 1,000 Btu/cu ft

A coal burning plant operating at full capacity burns about 10 tons of coal per day per MW of capacity and requires about 900 gpm = 2 cfs = 0.057 m^3/sec of once-through cooling water (heated by 10°F) per MW.

LIST OF ACRONYMS

AES	Applied Energy Services
AFBC	Atmospheric fluidized bed combustion
ALARA	As low as reasonably achievable
AMA	Maryland Air Management Administration
ANSP	Academy of Natural Sciences of Philadelphia
APS	Allegheny Power System
AQCR	Air Quality Control Region
AQRV	Air Quality Related Value
BACT	Best Available Control Technology
BG&E	Baltimore Gas & Electric Company
BRESCO	Baltimore Refuse Energy Systems Company
Btu	British thermal unit
CAA	Clean Air Act
CBRM	Chesapeake Bay Research and Monitoring Division
CCNPP	Calvert Cliffs Nuclear Power Plant
CEIR	Cumulative Environmental Impact Report
CFCs	Chlorofluorocarbons
CFR	Code of Federal Regulations
COMAR	Code of Maryland Regulations
CPCN	Certificate of Public Convenience and Necessity
CT	Combustion turbine
DHMH	Maryland Department of Health and Mental Hygiene
DNR	Maryland Department of Natural Resources
DO	Dissolved oxygen
DOE	U.S. Department of Energy
DP&L	Delmarva Power & Light Company
DSM	Demand-side management
ECAR	East Central Area Reliability Agreement
EPA	U.S. Environmental Protection Agency
EPRI	Electric Power Research Institute
ESP	Electrostatic precipitator
EUM	Energy use management
FBC	Fluidized bed combustion
FDA	U.S. Food and Drug Administration
FERC	Federal Energy Regulatory Commission
FGD	Flue gas desulfurization
FWS	U.S. Fish and Wildlife Service
GCC	Gasified coal combustion
IGCC	Integrated gasification combined cycle
IOU	Investor-owned utility
IPP	Independent power producer
ISFSI	Independent Spent Fuel Storage Installation
LAER	Lowest Achievable Emission Rate
LLW	Low level wastes
MAAC	Mid-Atlantic Area Council
MACT	Maximum Achievable Control Technology
MDC	Minimum detectable concentration

MDE	Maryland Department of the Environment
MGS	Maryland Geological Survey
MP	Monongahela Power Company
NAAQS	National Ambient Air Quality Standards
NAPAP	National Acid Precipitation Assessment Program
NDDN	National Dry Deposition Network
NERC	North American Electric Reliability Council
NESHAPs	National Emissions Standards for Hazardous Air Pollutants
NMHC	Non-methane hydrocarbons
NPDES	National Pollutant Discharge Elimination System
NSINA	New Source Impacting on a Non-attainment Area
NSPS	New Source Performance Standard
NSR	New Source Review
NUG	Non-utility generation
ODEC	Old Dominion Electric Cooperative
PAHs	Polynuclear aromatic hydrocarbons
PBAPS	Peach Bottom Atomic Power Station
PCBs	Polychlorinated biphenyls
PE	Potomac Edison Company
PECO	Philadelphia Electric Company
PEPCO	Potomac Electric Power Company
Penelec	Pennsylvania Electric Company
PJM	Pennsylvania-New Jersey-Maryland Interconnection
PM10	Particulate matter < 10 micrometers in diameter
POTW	Publicly owned treatment works
PP&L	Pennsylvania Power & Light Company
PPER	Power Plant and Environmental Review Division
PPRP	Power Plant Research Program
PPSP	Power Plant Siting Program
PSC	Maryland Public Service Commission
PSD	Prevention of Significant Deterioration
PSI	Public Service Company of Indiana
PUHCA	Public Utility Holding Company Act
PURPA	Public Utility Regulatory Policies Act
QF	Qualifying facility
REA	U.S. Rural Electrification Administration
RIS	Representative important species
SAV	Submerged aquatic vegetation
SCR	Selective catalytic reduction
SMECO	Southern Maryland Electric Cooperative
TAPs	Toxic air pollutants
T-BACT	Best Available Control Technology for Toxics
TLD	Thermoluminescence dosimetry
TMINS	Three Mile Island Nuclear Station
TSP	Total suspended particulates
USGS	United States Geological Survey
USNRC	United States Nuclear Regulatory Commission
VOCs	Volatile organic compounds

WEPCO	Wisconsin Electric Power Company
WPP	West Penn Power Company
WRA	Water Resources Administration

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