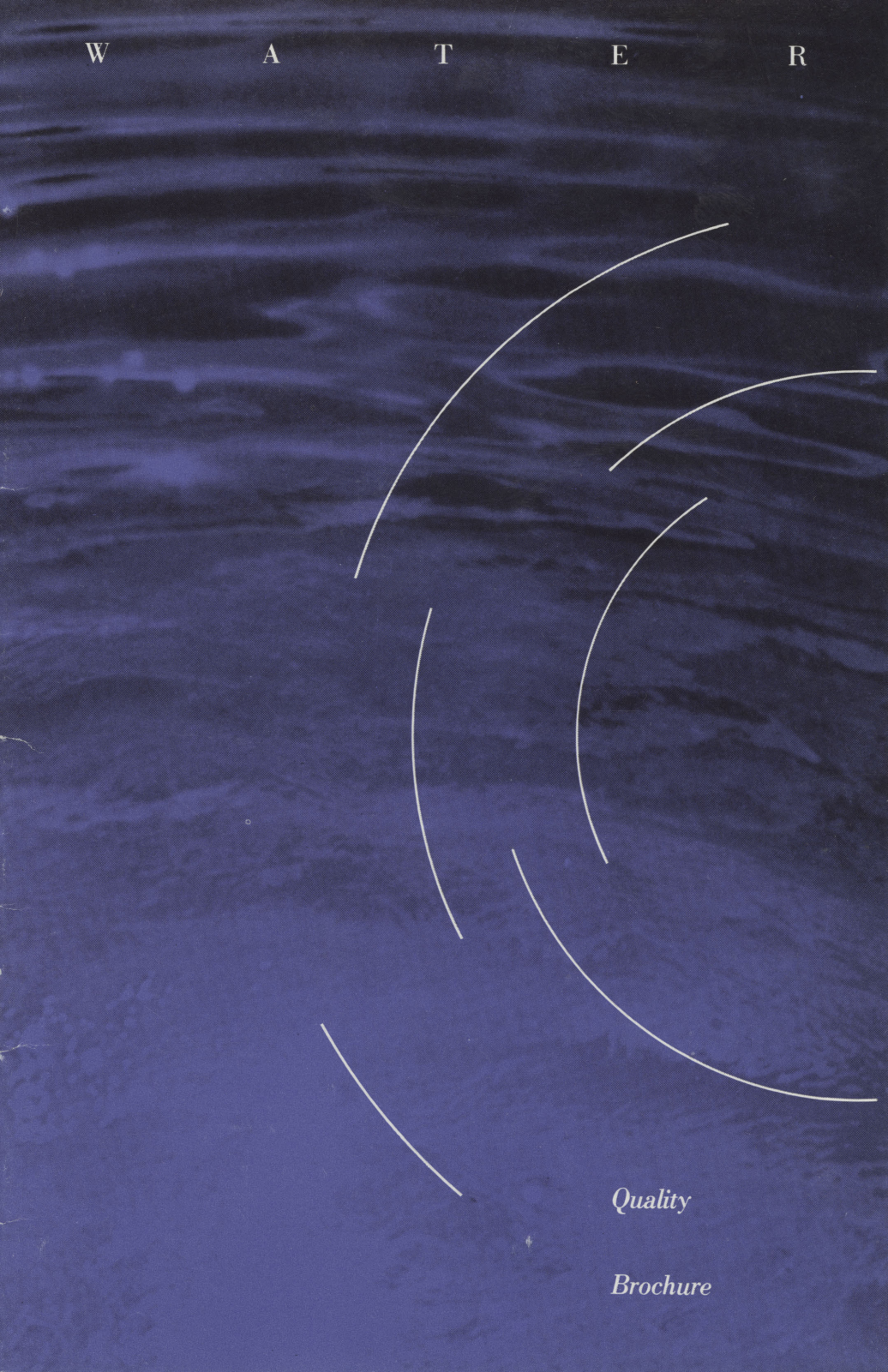
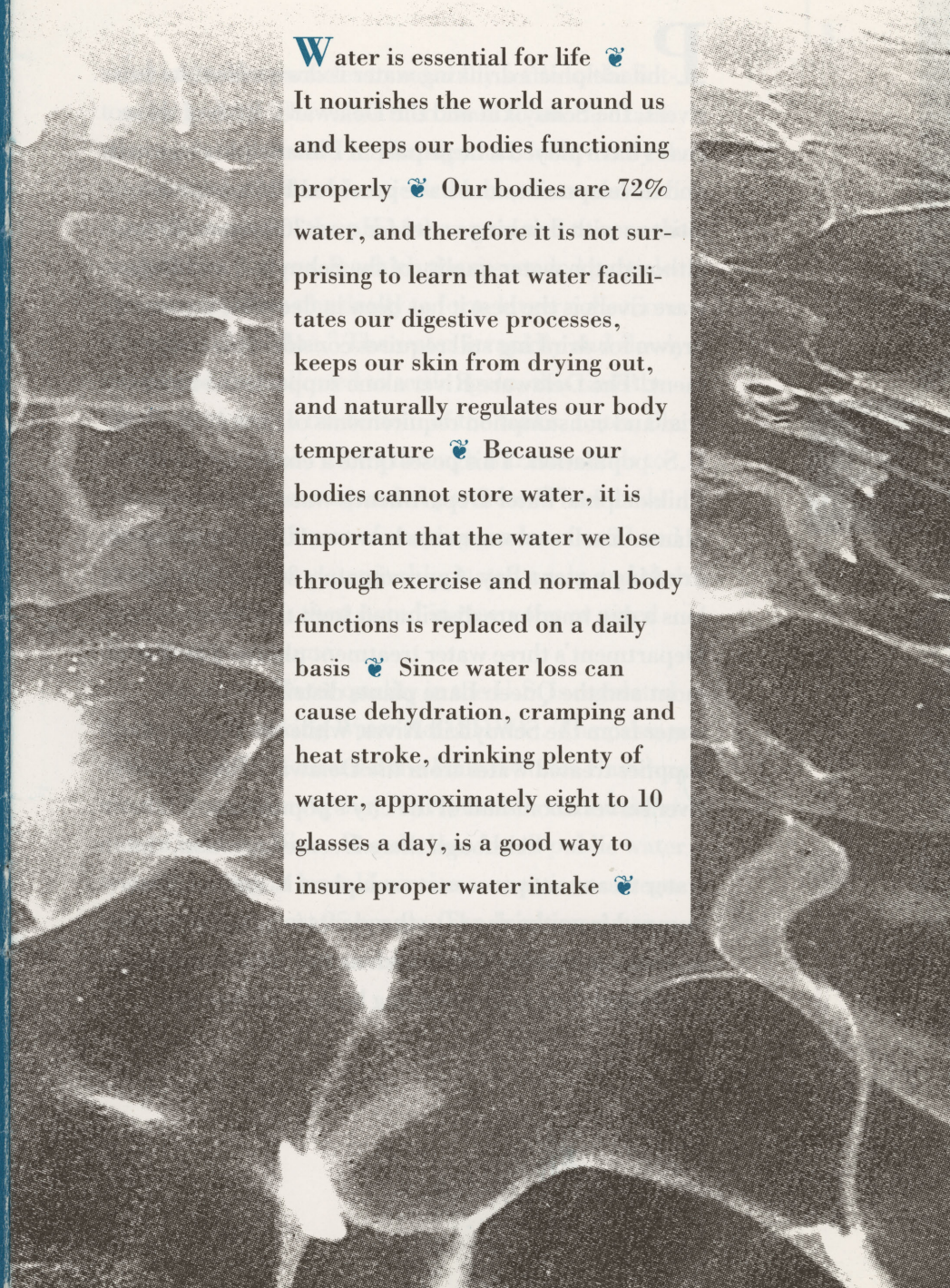

W A T E R
Quality
Brochure



Water is essential for life ❦ It nourishes the world around us and keeps our bodies functioning properly ❦ Our bodies are 72% water, and therefore it is not surprising to learn that water facilitates our digestive processes, keeps our skin from drying out, and naturally regulates our body temperature ❦ Because our bodies cannot store water, it is important that the water we lose through exercise and normal body functions is replaced on a daily basis ❦ Since water loss can cause dehydration, cramping and heat stroke, drinking plenty of water, approximately eight to 10 glasses a day, is a good way to insure proper water intake ❦

Philadelphia's drinking water is drawn from its two rivers, the Schuylkill and the Delaware. Both of these rivers have played a large part in Philadelphia's growth and development, and have provided Philadelphia's citizens with drinking water for over 300 years. Today, although the water quality of the Schuylkill and Delaware rivers is the best it has been in decades, the water drawn for drinking still requires considerable treatment. The Delaware River alone supports the industrial and consumption requirements of over 10% of the U.S. population. This poses quite a challenge for the Philadelphia Water Department's water treatment plants. Each customer uses between 80 - 100 gallons of drinking water a day. Approximately 360 million gallons a day (mgd) are distributed from the Water Department's three water treatment plants. The Belmont and the Queen Lane plants distribute treated water from the Schuylkill River, while the Baxter plant supplies treated water from the Delaware River. Each river serves about half of the city's population.

Although there is some variation, the water treatment process at each plant is similar. Water pumped from the rivers to the plants is initially screened to remove debris such as tree branches and leaves and then held in settling basins to allow silt,

sand and other particles to naturally settle to the bottom by gravity. The water then flows to another tank where it is chlorinated for disinfection, followed by the introduction of other chemicals such as lime and ferric chloride to control the pH of the water and to spur the coagulation process, in which the suspended particles in water combine physically to form larger collections of solids called "floc." The water is rapidly and slowly mixed and then allowed to settle again, this time the "floc" dropping to the bottom of the tanks. Later, the water, free of "floc," flows through filtration beds to remove the smaller suspended particles. These beds consist of several layers of varying grades of sand and gravel. Finally the water is chlorinated again and then ammoniated. It is then stored in reservoirs or piped directly to your home.

Water quality in the U.S. is regulated by the Safe Drinking Water Act (SDWA). The passage of this act in 1974 directed the United States Environmental Protection Agency (EPA) to issue national Primary Drinking Water Regulations for all public water systems having at least 15 service connections or regularly serving at least 25 people. The drinking water regulations of the Act are of two types: primary and

secondary. Primary standards are aimed to control substances that can pose a threat to health when present in certain quantities in water. Primary standards are enforceable. In June 1988, the EPA finalized Maximum Contaminant Levels (MCLs) for eight volatile organic chemicals, bringing the number of primary standards to 32.

Secondary standards serve as guidelines in settings levels for aesthetic considerations such as taste and odor. Secondary standards are recommended levels only and are not enforceable. The EPA has established 12 secondary standards.

In June of 1986, amendments were passed to the SDWA. These amendments are the most significant changes in the history of the public water supply field. They require the EPA to establish MCLs for 83 additional substances by 1991. *Philadelphia's drinking water currently meets or is better than all physical, chemical, radiological and bacterial water quality standards established by the EPA.*

The Philadelphia Water Department is required by the U.S. EPA to notify its customers that it is monitoring unregulated contaminants which may be in Philadelphia's drinking water. The Water Department has prepared this booklet, which is available to the public upon request by calling the Department's Customer Information number, 592-6300. This booklet includes chemical analysis of regulated and unregulated compounds under the Safe Drinking Water Act.

The following tables outline Philadelphia's water quality data for 1988. As shown on these tables, the regulated elements are present in concentrations considerably lower than the maximum contaminant levels allowed by the SDWA. The Water Department also monitors a number of other substances to give us a better picture of the overall water quality. In addition, the Department continues to explore other non-traditional means of analyzing water quality. One of these is the Taste and Odor team, which tastes and smells water samples ranging from raw river samples (which the team only smells) to treated drinking water. The panel works to insure that the finished product is safe and pleasant tasting.

The Water Department's customers are frequently interested in certain water quality issues. Some of these include:

CHLORINE Chlorine is used in the water treatment process as a disinfectant. Chlorine was introduced into Philadelphia's water treatment process in 1913, and ended periodic epidemics of cholera and typhoid which had plagued Philadelphia for two centuries.

When "free" or pure chlorine is present in water for a period of time, it chemically reacts with natural organic compounds in water to produce trihalomethanes (THMs), which may be carcinogenic to humans. Philadelphia has adjusted its treatment process by allowing free chlorine to mix with water for only the minimum amount of time needed to insure complete pathogen kill. Chlorine is then ammoniated, resulting in a disinfecting product which does not produce THMs, thereby significantly reducing the THM concentration in drinking water.

CLOUDY WATER Aeration is taking place when water flowing from your tap into your glass appears cloudy. This temporary condition is a result of dissolved air being released from the water and being temporarily suspended in the water in your glass.

FLUORIDE Philadelphia's City Health Code has required the Water Department to add fluoride to its treated water since 1954. Approximately 1 milligram per liter (mg/l) [or 1 part per million (ppm)] of fluoride is added, which is the amount recommended by the American Dental Association to provide maximum dental protection.

HARDNESS Hardness defines the quantity of minerals such as calcium and magnesium in a gallon of water. These minerals react with soap to form insoluble precipitate and can affect common household chores such as cooking and washing. Philadelphia's water is considered "medium" hard. Hardness also affects other water qualities such as corrosivity, with soft water being the most corrosive.

LEAD Lead concentration in water has become a much talked about concern because of its associated health effects, particularly on young children and the elderly. Lead does not occur naturally in our water supply, nor is it a result of Philadelphia's water treatment process. In Philadelphia, lead concentration in water is primarily a result of the use of lead service connections prior to the 1950's to connect residential services to the City's water mains in the street, or most recently, solders containing lead used to join copper

piping for home plumbing. Water allowed to stand unused in piping containing lead materials for a period of time, e.g., overnight, can cause dissolving or "leaching" of lead into your drinking water.

Philadelphia banned the use of lead service pipes in 1981 and solders containing lead in January of 1986. As a precaution, lead can be eliminated from your drinking water by flushing your tap before using the water for drinking or cooking simply by allowing the water to run for approximately two to three minutes. For copies of the Water Department's lead brochure, call 592-6300.

SODIUM Sodium occurs naturally in water and can also be present as a byproduct of the water treatment process. Its concentration is usually of interest to people who must strictly monitor their salt intake for health reasons. As shown on the table, sodium levels vary throughout Philadelphia depending upon the water source.

TEMPERATURE The temperatures of both the Schuylkill and Delaware rivers vary seasonally from approximately 33°F to 85°F.

Regulated Parameters

Parameter	MCL*	SMCL**	MDL***	Baxter Effluent	Queen Lane Effluent	Belmont Effluent
INORGANIC						
Chloride		250.	NA	46	84	68
Fluoride	4.0	2.0	0.2	0.97	1.00	1.00
Nitrate as Nitrogen	10.0		1.0	1.33	2.76	2.37
pH, units		6.5-8.5	NA	8.38	7.20	7.09
Sulfate		250.	NA	25	61	62
METALS						
Arsenic	0.05		0.005	ND	ND	ND
Barium	1.0		0.1	ND	ND	ND
Cadmium	0.010		0.001	ND	ND	ND
Chromium	0.05		0.005	ND	ND	ND
Copper		1.0	0.1	ND	ND	ND
Iron		0.3	0.05	ND	0.05	ND
Lead	0.05		0.005	ND	ND	ND
Manganese		0.05	0.05	ND	ND	ND
Mercury	0.002		0.0002	ND	ND	ND
Selenium	0.01		0.001	ND	ND	ND
Silver	0.05		0.005	ND	ND	ND
Sodium	****		NA	13.3	33.5	23.5
Zinc		5.0	0.50	ND	ND	ND
ORGANIC						
Endrin	0.0002		0.00005	ND	ND	ND
Lindane	0.004		0.0004	ND	ND	ND
Methoxychlor	0.1		0.01	ND	ND	ND
2, 4-D	0.1		0.01	ND	ND	ND
2,4,5-TP Silvex	0.01		0.001	ND	ND	ND
Toxaphene	0.005		0.0005	ND	ND	ND
Benzene	0.005		0.0005	ND	ND	ND
Carbon Tetrachloride	0.005		0.0005	ND	ND	ND
p-Dichlorobenzene	0.075		0.0005	ND	ND	ND
1,2-Dichloroethane	0.005		0.0005	ND	ND	ND
1,1-Dichloroethylene	0.007		0.0005	ND	ND	ND
1,1,1-Trichloroethane	0.2		0.0005	ND	ND	ND
Trichloroethylene (TCE)	0.005		0.0005	ND	ND	ND

Index of abbreviations and measurements on last page

Parameter	MCL*	SMCL**	MDL***	Baxter Effluent	Queen Lane Effluent	Belmont Effluent
PHYSICAL/SENSORY						
Turbidity, NTU	1		0.1	0.24	0.35	0.24
RADIOLOGICAL						
Gross Alpha, pCi/1	15		NA	<0.8	2.2	<0.9
Radium 226 & 228, pCi/1	5		NA	NA	NA	NA
Gross Beta, pCi/1 [1]	50		NA	2.5	4.0	3.9
Strontium 90, pCi/1 [1]	8		NA	<1.37	<1.57	<2.14
Tritium, pCi/1 [1]	20,000		NA	<60	<60	<60

Non-Regulated Parameters

Parameter	MDL***	Baxter Effluent	Queen Lane Effluent	Belmont Effluent
INORGANIC				
Alkalinity as Calcium Carbonate	NA	47	67	60
Ammonia as Nitrogen	0.03	0.17	0.33	0.18
Hardness as Calcium Carbonate	NA	94	136	123
Nitrite as Nitrogen	0.02	ND	ND	ND
ortho Phosphate as Phosphorus	0.02	ND	0.05	0.05
METALS				
Aluminum	0.01	0.15	0.02	0.01
Beryllium	0.00025	ND	ND	ND
Calcium	NA	27	31	30
Magnesium	NA	6	13	11
Nickel	0.01	ND	ND	ND
Potassium	0.1	1.7	3.0	2.8
ORGANIC				
Bromobenzene	0.0003	ND	ND	ND
Bromomethane	0.001	ND	ND	ND
Chlorobenzene	0.0003	ND	ND	ND
Chloroethane	0.001	ND	ND	ND
2-Chloroethylvinylether	0.0003	ND	ND	ND
Chloromethane	0.001	ND	ND	ND
o-Chlorotoluene	0.0003	ND	ND	ND
p-Chlorotuluene	0.0003	ND	ND	ND
Cumene	0.0003	ND	ND	ND
Dibromomethane	0.001	ND	ND	ND
m-Dichlorobenzene	0.0003	ND	ND	ND
o-Dichlorobenzene	0.0003	ND	ND	ND
1,1-Dichloroethane	0.0003	ND	ND	ND
c 1,2-Dichloroethylene	0.001	ND	ND	ND
t 1,2-Dichloroethylene	0.0003	ND	ND	ND
Dichloroiodomethane	0.0003	0.0009	0.0005	ND
1,2-Dichloropropane	0.0003	0.0003	ND	ND
1,3-Dichloropropane	0.001	ND	ND	ND
2,2-Dichloropropane	0.0003	ND	ND	ND
1,1-Dichloropropene	0.001	ND	ND	ND
c 1,3-Dichloropropene	0.001	ND	ND	ND
t 1,3-Dichloropropene	0.001	ND	ND	ND
Ethyl Benzene	0.0003	0.0003	ND	ND
Methylene Chloride	0.0003	ND	ND	ND
Styrene	0.0003	ND	ND	ND
1,1,1,2-Tetrachloroethane	0.001	ND	ND	ND
1,1,2,2-Tetrachloroethane	0.001	ND	ND	ND
Tetrachloroethylene	0.0003	ND	ND	ND
Toluene	0.0003	ND	ND	ND
1,1,2-Trichloroethane	0.001	ND	ND	ND
1,2,3-Trichloropropane	0.0003	ND	ND	0.0003
mpXylene	0.0004	ND	ND	ND
o Xylene	0.0003	ND	ND	ND
Ethylene Dibromide	0.00002	ND	0.00008	ND
12Dibromo-3-chloropropane	0.00002	ND	ND	ND
PHYSICAL/SENSORY				
Residue, Total	NA	191	320	287
Conductance, Specific umhos/cm2	NA	268	460	409

Regulated and Non-Regulated Parameters Distribution Systems

Regulated Parameter	MCL*	MDL***	Baxter Effluent	Queen Lane Effluent	Belmont Effluent
BACTERIOLOGICAL					
Coliforms, Total, 1/100 ml	*****	0.1	0.1	<0.1	0.2
ORGANIC					
Trihalomethanes, Total	0.1	0.01	0.05	0.06	0.06
Non-Regulated Parameter					
INORGANIC					
Chlorine, Free		0.05	ND	ND	ND
Total		0.05	1.82	1.64	1.46

All results are in milligram per liter (mg/l) except where indicated.

* MCL Maximum Contaminant Level under National Primary Drinking Water Regulations as of April, 1988

** SMCI Secondary Maximum Contaminant Levels as of April, 1988

*** MDL Method Detection Limit

**** Monitoring only requirement

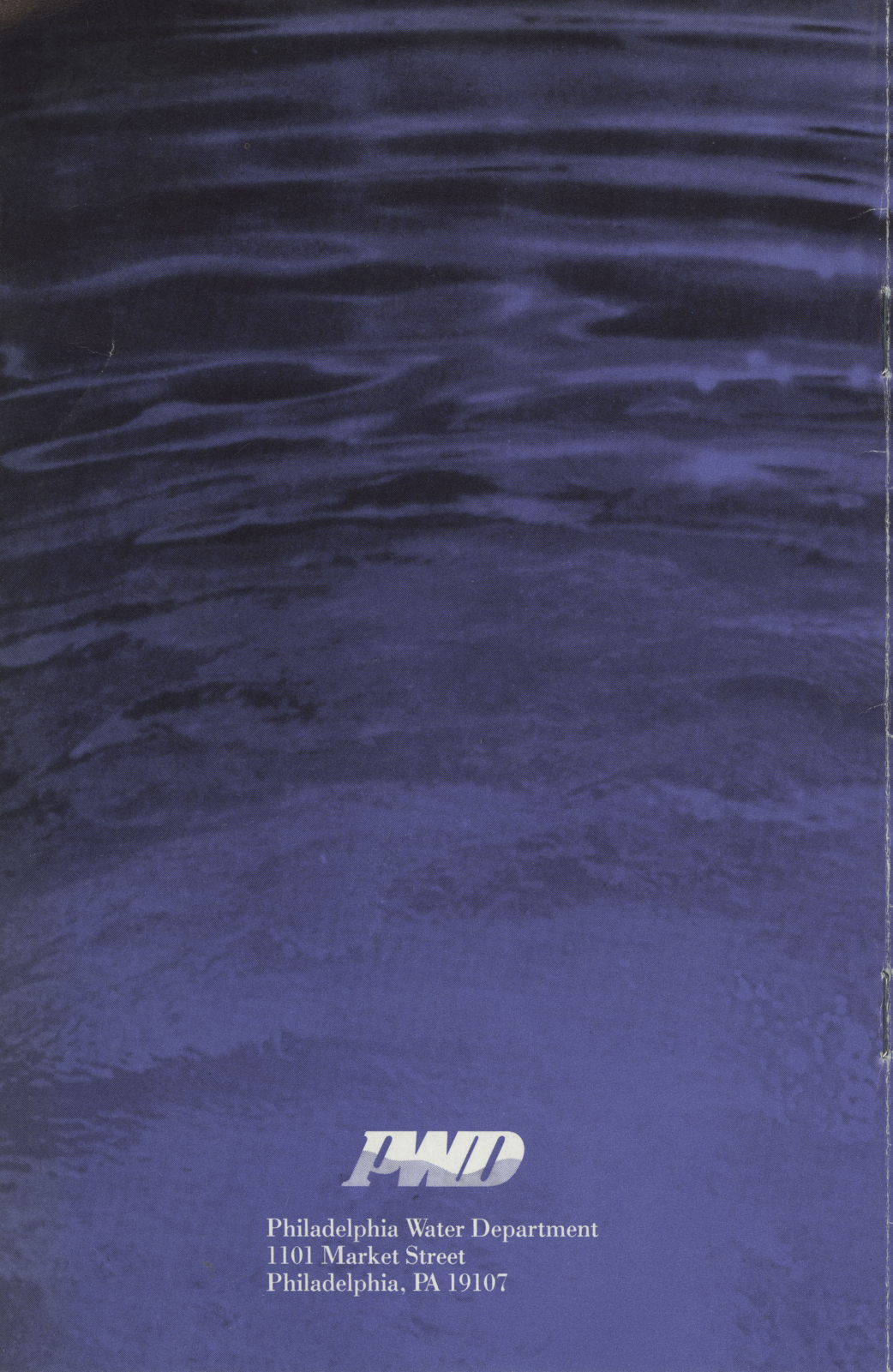
***** 4 per 100 ml in 5% of samples or monthly average 1 per 100 ml.

[1] 1987 Results

NA Not Applicable

ND None Detected

Design *ZeewyKarlin, Inc.*



Philadelphia Water Department
1101 Market Street
Philadelphia, PA 19107