

Transcript:
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PROGRAM

1982 AWWA
Annual
Conference
& Exposition

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Miami Beach
May 16-20



Better Water
for the Americas

Don Stinson
AC 203
2507277

Your Personal Conference Planner

	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY
8-10 AM		9:30 Opening Session & Awards Ceremony MBCC Theatre			
10 AM-12 PM					
12-2 PM	12:00 Opening Ceremony 12:00-5:00 Meet & Greet MBCC South Hall				12:30 Closing Luncheon Outlook—Science & Technology Fontainebleau Hilton
2-4 PM					
4-6 PM					
6-8 PM				7:00 Annual Banquet Fontainebleau Hilton	
8 PM-					

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Abbreviated Program

All rooms are located in the Miami Beach Convention Center unless otherwise noted. Hotels listed by the first portion of their name include: Fontainebleau Hilton Hotel, Eden Roc Hotel, and Doral Hotel on the Ocean. All committee meetings are open, and AWWA members are invited to observe; participation by those not members of a committee is at the discretion of the committee chairman.

Sunday, May 16

Time	Event	Location
7:00	Preconference Seminar Registration	South Hall
7:30	ABC Executive Com. Board Room 517	Eden Roc
	Session Monitor Orientation Breakfast	154
9:00	Preconference Seminar S1 Water Quality	208
	Preconference Seminar S2 Water Quality	207
	Preconference Seminar S3 Distribution	206
	Preconference Seminar S4 Management	204
	*Preconference Seminar S5 International Affairs	203
	Preconference Seminar S6 Health Effects	103
	AWWA Board of Directors	Pasteur/Lafayette Fontainebleau
10:00	Fire Protection Com.	157
11:00	Cleaning & Lining Water Mains Com.	Imperial 2 Fontainebleau
12:00	AWWA Board of Directors Lunch	Voltaire Fontainebleau
	Filtration Com. Research	152
	Exposition Opening Ceremony	South Hall
	Meet & Greet	South Hall
	Preconference Seminar Lunch	102
1:00	Automation & Instrumentation Com.	Imperial 1 Fontainebleau
2:00	Leak Detection Com.	Imperial 4 Fontainebleau
4:00	A21 Subcommittee 3	Imperial 2 Fontainebleau
	Corrosion & Stability Com. Research	156
6:00	Michigan Section Reception and Dinner	Mona Lisa Eden Roc

Monday, May 17

7:00	Distribution Div. Board of Trustees Breakfast	Imperial 4 Fontainebleau
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*These sessions will be translated into Spanish

Times in boldface indicate p.m.

All technical sessions and meetings will be held in the Miami Beach Convention Center unless otherwise indicated

	Morning Exercise Class	Cabana Area (Fontainebleau)
7:30	Diamond Pin Club Breakfast	Louis Philippe (Fontainebleau)
	ABC Executive Com. Board Room 517 (Eden Roc)	
	General Policy Council (Ad Hoc Com.)	Madrid (Doral)
8:00	Water Treatment Plant Waste Disposal Com.	153
	WWEMA Exhibitors Breakfast	150
8:30	Research Div. Board of Trustees	Imperial 2 (Fontainebleau)
9:00	WWEMA Meeting	Valencia (Doral)
9:30	Session 1 (General) Theatre of the Performing Arts	
12:00	Coagulation Com. (Research)	156
	Education Board of Trustees Lunch	Francine (Fontainebleau)
	Finance Com. Lunch	Imperial 4 (Fontainebleau)
	Organic Contaminants Com. (Research)	153
	ABC Membership	Mona Lisa (Eden Roc)
12:30	Spouse Tour (Vizcaya)	South Entrance (Fontainebleau)
	Spouse Tour Fairchild Gardens	South Entrance (Fontainebleau)
1:00	Butterfly Valves Com.	Lafayette Fontainebleau
	Control of Water Quality in Transmission & Distribution Systems Com.	Imperial 2 (Fontainebleau)
	Taste & Odor Control Chemicals Com.	Imperial 6 (Fontainebleau)
1:30	Automation & Instrumentation Com.	Imperial 1 (Fontainebleau)
	Grooved & Shouldered Type Joints Com.	Imperial 3 (Fontainebleau)
	Membership Com.	Board Room 417 (Eden Roc)
	Thermoplastic Pressure Pipe Com.	Bonaparte B (Fontainebleau)
	Wells Com.	Voltaire (Fontainebleau)
	Spouse Program (Handling Stress 1)	Pasteur (Fontainebleau)
2:00	Session 2 Distribution	102A
	Session 3 Management	103A
	Session 4 Research	208
	Session 5 Resources	203
	Session 6 (Water Quality)	207
	Backflow Preventers Com.	154
	Disinfection Com. (Water Quality)	152
	Fire Hydrants Com.	Bonaparte A (Fontainebleau)
	Sludge Disposal Com.	157
	Steel Pipe Com.	150
	Spouse Tour (Vizcaya)	South Entrance (Fontainebleau)
3:30	Spouse Program (Handling Stress 2)	Pasteur (Fontainebleau)
3:45	Metrickation Com.	155
4:00	Water Quality & Treatment Com.	153
5:00	Research Div. Board of Trustees	Imperial 2 (Fontainebleau)

Tuesday, May 18

7:00	Morning Exercise Class	Cabana Area (Fontainebleau)
7:15	AAEE Breakfast	Paladium (Eden Roc)
7:30	Past Presidents Breakfast	Imperial 6 (Fontainebleau)
8:00	Early Bird Session 7 (Management)	206
	ANSI A21 Cast-Iron Pipe & Fittings Com.	Miramar (Doral)
	Accounting Com.	Imperial 1 (Fontainebleau)
	Engineering & Construction Div. Board of Trustees	Louis Philippe (Fontainebleau)
	Filtering Materials Com.	150
9:00	Session 8 Distribution	102A
	Session 9 Management	103A
	Session 10 Resources	203
	Session 11 Universities Forum 1	208
	Session 12 Water Quality	207
	A-C Pressure Pipe Com.	154
	Economic Research Com.	153
	General Policy Council Ad Hoc Com.	Madrid Doral
	Power Actuating Devices for Valves & Sluice Gates Com.	152
	Quicklime & Hydrated Lime Com.	Imperial 2 (Fontainebleau)
	Water Meters Com.	Bonaparte B (Fontainebleau)
	Water Rates Com.	156
	Water Softening Com. Research	157
	Golf Tournament	Doral Country Club
	WWEMA Meeting	Valencia (Doral)
	NETA Meeting	Regency Conference (Doral)
	Spouse Tour (Vizcaya)	South Entrance (Fontainebleau)
	Spouse Tour Fairchild Gardens	South Entrance (Fontainebleau)
10:00	External Corrosion of Underground Facilities Com.	Bonaparte A (Fontainebleau)
	Spouse Program (Self Identity)	Pasteur (Fontainebleau)
	Spouse Program Self-Presentation Skills 1	Lafayette (Fontainebleau)
	Spouse Program Rustproofing People 1	Voltaire (Fontainebleau)
10:30	Public Information Com.	Board Room 417 (Eden Roc)
12:00	Disinfection Com. Research	154
	New England Section Lunch	Mona Lisa (Eden Roc)
12:30	Coagulation & Filtration Com. (Water Quality)	Imperial 5 (Fontainebleau)
	Resources Div. Board of Trustees Lunch	Imperial 4 (Fontainebleau)
1:00	Exposition Com.	Imperial 2 (Fontainebleau)
	Flexible Tanks, Covers & Linings for Potable Water Storage Com.	Imperial 3 (Fontainebleau)
	Industrial Water Com.	157

*These sessions will be translated into Spanish

Times in boldface indicate p.m.

All technical sessions and meetings will be held in the Miami Beach Convention Center unless otherwise indicated

1:30	Management Div. Board of Trustees	Imperial 6 (Fontainebleau)
	Publications & Marketing Advisory Com.	Board Room 417 (Eden Roc)
	Thermoplastic Pressure Pipe Com.	Bonaparte B (Fontainebleau)
	Facility Tour (Hialeah, Preston Plants)	MBCC Entrance
	Facility Tour (Hollywood Plant)	MBCC Entrance
	Spouse Program (Conflict Resolution)	Pasteur (Fontainebleau)
	Spouse Program (Self-Presentation Skills 2)	Lafayette (Fontainebleau)
	Spouse Program (Rustproofing People 2)	Voltaire (Fontainebleau)
2:00	Session 13 (Education)	207
	Session 14 (Engineering & Construction)	102A
	*Session 15 (International Affairs)	203
	Session 16 (Standards Council)	103A
	Session 17 (Universities Forum 2)	208
	Chlorine Com.	154
	Dual Distribution Systems Com.	Imperial 1 (Fontainebleau)
	Material Spills Hazardous to Water Supply Com.	Louis Philippe (Fontainebleau)
	Water Quality Div. Board of Trustees	Bonaparte A (Fontainebleau)
	Water Utility Council	202
	Watershed Protection & Control Com.	156
3:30	Spouse Program (Capabilities & Aspirations)	Pasteur (Fontainebleau)
	Spouse Program (Rustproofing People 3)	Voltaire (Fontainebleau)
4:00	Inorganics Com. (Water Quality)	Imperial 5 (Fontainebleau)
5:00	International Visitors Reception	101
	Student Reception	204
8:00	AEEP Seminar	208

Wednesday, May 19

7:00	Fuller Award Breakfast	Cotillion (Eden Roc)
	Morning Exercise Class	Cabana Area (Fontainebleau)
8:00	Early Bird Session 18 (Management)	103A
	Prestressed Concrete Water Tanks Com.	Bonaparte B (Fontainebleau)
	Resources Div. Board of Trustees Breakfast	Imperial 1 (Fontainebleau)
	Standards Council Breakfast	Francine (Fontainebleau)
	Use of Asbestos in Utility Construction Com.	155
	Water Desalting Com.	Imperial 6 (Fontainebleau)
8:30	Spouse Program (Communicating Effectively)	Versailles (Fontainebleau)
9:00	Session 19 (Operators' Forum)	207
	*Session 20 (International Affairs)	203
	Session 21 (Research)	208
	Session 22 (Water Utility Council)	204
	Accident Prevention Com.	156
	Activated Carbon Com.	152
	Carbon Dioxide Com.	Imperial 4 (Fontainebleau)

	Concrete Pressure Pipe Com.	Bonaparte A Fontainebleau
	Customer Metering Practices Com.	157
	Data Processing Systems Com.	Imperial 5 Fontainebleau
	Gate Valves & Swing Check Valves Com.	Imperial 2 Fontainebleau
	Iron & Aluminum Salts Com.	154
	Organic Contaminants Com. Water Quality	Board Room 517 Eden Roc
	Quality Control in Reservoirs Com.	150
	Standards Council Com.	Louis Philippe Fontainebleau
	WWEMA Meetings	Valencia Doral
	Facility Tour Hialeah, Preston Plants	MBCC Entrance
	Facility Tour Hollywood Plant	MBCC Entrance
	Tennis Tournament	Fontainebleau Courts
10:00	Compensation Com.	Board Room 417 Eden Roc
	Thermosetting FRP Tanks Com.	153
10:15	Spouse Program Plans for the Future	Versailles Fontainebleau
11:30	WWEMA Manufacturers Reception & Lunch	102B/103B
12:00	Research Div. Board of Trustees	155
	Student Activities Com.	150
1:00	Regionalization Com.	Louis Philippe Fontainebleau
	Spouse Program Mellowing	Versailles Fontainebleau
1:30	Emergency Planning Com.	153
2:00	Session 23 Distribution	102A
	Session 24 Management	103A
	Session 25 Research	208
	Session 26 Resources	203
	Session 27 Water Quality	207
	Ball Valves Com.	157
	Fluorides Com.	156
	International Affairs Com.	152
	Standard Methods Com.	150
	Steel Elevated Tanks, Standpipes & Reservoirs Com.	Imperial 3 Fontainebleau
	Water Quality Monitoring Com.	Imperial 6 Fontainebleau
	Water Service Line Fittings Com.	154
3:00	Energy Management Com.	Imperial 1 Fontainebleau
4:00	Polyelectrolytes Com.	155
6:00	Annual Banquet Reception	Grand Gallerie Fontainebleau
7:00	Annual Banquet	Grand Ballroom Fontainebleau

Thursday, May 20

7:30	AIDIS Breakfast	Roof Garden Doral
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*These sessions will be translated into Spanish

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	AWWA Board of Directors Breakfast	Voltaire Fontainebleau
8:30	AWWA Board of Directors Meeting	Pasteur/Lafayette (Fontainebleau)
	Disinfection of Facilities Com.	Imperial 2 Fontainebleau
9:00	*Session 28 (AIDIS)	203
	Session 29 (Engineering & Construction)	204
	Session 30 (Research)	208
	Session 31 (Water Quality)	207
	Thermosetting FRP Pipe Com.	Bonaparte B Fontainebleau
10:00	Water Quality Goals Com.	Imperial 5 Fontainebleau
12:00	Trace Inorganic Substances Com. Research	Imperial 3 Fontainebleau
12:30	Closing Luncheon Outlook—Science & Technology	Fontaine Fontainebleau
1:30	Facility Tour North District Plant	South Entrance Fontainebleau
3:00	Technical Program Com.	Imperial 5 Fontainebleau
	AWWA/AIDIS Officers Meeting	Imperial 6 Fontainebleau

Friday, May 21

1:30	Facility Tour Central District Plant	South Entrance Fontainebleau
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Continuous Services and Activities

AWWA Bookstore	Theme Center
Sunday, May 16	Miami Beach
12:00-5:00	Convention Center
Monday, May 17-Wednesday, May 19	
9:00-5:00	
AWWA Conference Office	Room 210
Sunday, May 16	Miami Beach
9:00-5:00	Convention Center
Monday, May 17-Wednesday, May 19	
8:00-5:00	
Employment Center	Registration Area
Sunday, May 16	Miami Beach
12:00-5:00	Convention Center
Monday, May 17-Wednesday, May 19	
8:30-5:00	
Exposition "Fiesta Mercado"	South Hall
Sunday, May 16	Miami Beach
12:00-5:00	Convention Center
Monday, May 17-Wednesday, May 19	
9:00-5:00	

Information & Local Host Booth Registration Area
 Sunday, May 16 Miami Beach
 12:00-5:00 Convention Center
 Monday, May 17-Wednesday, May 19
 8:30-5:00

International Visitors' Lounge Room 101
 Sunday, May 16 Miami Beach
 12:00-5:00 Convention Center
 Monday, May 17-Wednesday, May 19
 8:30-5:00

Membership Booth Theme Center
 Sunday, May 16 Miami Beach
 12:00-5:00 Convention Center
 Monday, May 17-Wednesday, May 19
 9:00-5:00

Message Center Registration Area
 Sunday, May 16 Miami Beach
 12:00-5:00 Convention Center
 Monday, May 17-Wednesday, May 19
 8:30-5:00

Press Room/Government Affairs Room 210
 Sunday, May 16 Miami Beach
 12:00-5:00 Convention Center
 Monday, May 17-Wednesday, May 19
 8:00-5:00

Registration Registration Area
 Sunday, May 16 Miami Beach
 7:00-5:00 Convention Center
 Monday, May 17-Wednesday, May 19
 8:30-5:00

Speakers' Lounge Room 200
 Sunday, May 16 Miami Beach
 11:00-6:00 Convention Center
 Monday, May 17-Wednesday, May 19
 8:00-5:30

Spouses' Hospitality Center Fontaine Room
 Sunday, May 16 Fontainebleau Hilton
 8:00-4:00
 Monday, May 17
 8:00-3:30
 Tuesday-Wednesday, May 18-19
 8:00-4:00

Theme Center Exposition
 Sunday, May 16 Miami Beach
 12:00-5:00 Convention Center
 Monday, May 17-Wednesday, May 19
 9:00-5:00

Times in boldface indicate p.m.

All technical sessions and meetings will be held in the Miami Beach Convention Center unless otherwise indicated.

General Conference Information

Airline Offices

American Airlines	358-6800
Braniff International	358-9400
Continental Airlines	371-8421
Delta Airlines	448-7000
Eastern Airlines	873-3000
Northwest Orient Airlines	377-0311
TWA	371-7471
United Airlines	377-3461

Annual Banquet

The annual banquet with its traditional passing of the gavel will be held at 7:00 p.m., Wednesday, May 19, in the Grand Ballroom of the Fontainebleau Hilton. A cash-bar reception from 6:00 to 7:00 p.m. will take place in the Grand Gallerie outside the entrance to the ballroom.

Entertainment will include the music of the Jerry Marshall Orchestra, a spectacular show of Broadway hits by Explosion, and dancing until midnight.

For reserved seating, diners must exchange their banquet coupons for tickets at the Banquet Exchange Booth in the AWWA registration area of the Miami Beach Convention Center in advance or at the door of the Grand Ballroom Wednesday evening. Extra banquet tickets may be purchased for \$35.

Shuttle buses will operate between official conference hotels and the Fontainebleau Hilton Hotel from 5:30 p.m. until midnight on Wednesday.

Awards

The awards ceremony, recognizing AWWA members who have devoted their expertise and energy to the association and the water supply industry, will be part of the opening general session on Monday, May 17, at 9:30 a.m., in the Miami Beach Theatre of the Performing Arts adjacent to the convention center.

Badges

Registrants will be given official conference badges when they register. Admission to all official events of the conference is by badge only.

Bookstore

AWWA publications, public relations aids, and other items produced by the association are on sale at the AWWA Bookstore, located in the AWWA Theme Center at the Exposition in the South Hall of the Miami Beach Convention Center.

Bus Service

For the convenience of conferees, AWWA provides free bus service from all official conference hotels to the Miami Beach Convention Center during the day and to the Fontainebleau Hilton Hotel on Wednesday evening for the annual banquet. Sunday through Tuesday evenings, mini-buses will circulate between official conference hotels. For route information, see AWWA shuttle bus system pamphlets and route signs posted at your hotel and the Miami Beach Convention Center.

Daytime Service

Sun., May 16-Wed., May 19—7:00 a.m.-6:00 p.m.
Thu., May 20—7:00 a.m.-3:00 p.m.

Evening Service

Sun., May 16-Tues., May 18—6:00 p.m.-12:00 midnight
Wed., May 19—5:30 p.m.-12:00 midnight

Closing Luncheon

The closing luncheon, titled "Outlook—Science and Technology," will feature John W. Hernandez Jr., deputy administrator of the US Environmental Protection Agency, speaking on the role of the science in a practical setting. Concluding the conference on Thursday, May 20, at 12:30 p.m., the luncheon will be held at the Fontaine Room of the Fontainebleau Hilton Hotel. Tickets are \$15 and may be purchased at the AWWA registration counter in the Miami Beach Convention Center.

Convention Roster

To locate the hotel assignment of friends and associates who have preregistered, stop by the AWWA Information & Service Booth in the AWWA registration area of the Miami Beach Convention Center during registration hours.

Emergency Medical Service

A first-aid room at the Miami Beach Convention Center is open during the hours of AWWA activities at the convention center.

All hotels have a house physician on call who may be reached by calling the hotel security office or the main desk.

In addition, emergency medical assistance can be obtained by calling

Fire Department	673-7131
Police Department	673-7911

Employment Board

Information about positions available and people available to fill job openings is posted on the Employment Board in the AWWA registration area of the Miami Beach Convention Center.

To post information on the board, pick up an employment information card at the AWWA Information & Service Booth in the registration area.

Exercise Class

"A Fun Way to Fitness" is open to conferees and their families during the conference. Monday through Wednesday from 7:00 to 7:30 a.m. Rhonda DuBord, the associate director of campus sports and recreation at the University of Miami, will lead men, women, and children in easy aerobic activities. Anyone can do this kind of exercise. Be sure to dress comfortably, and bring a towel if you wish. All other equipment will be provided by the instructor. At the end of the session, fresh fruit and juice will be provided by AWWA. There is no cost; so come join the fun in the Cabana area of the Fontainebleau Hilton Hotel.

Exhibits

AWWA urges you to visit the 1982 AWWA Exposition, "Fiesta Mercado," in the South Hall of the Miami Beach Convention Center, where you will find the latest in products and services for the water industry.

Facility Tours

Four facility tours are offered this year. A tour of the Hialeah and John E. Preston water treatment plants will depart the Miami Beach Convention Center at 1:30 p.m. on Tuesday and at 9:00 a.m. on Wednesday; another tour to the Hollywood Water Treatment Plant will follow the same schedule. The Thursday afternoon tour will visit the North District Wastewater Treatment Plant and the Friday tour the Central District Wastewater Treatment Plant; both leave at 1:30 p.m.

The tours take about three hours and will be translated into Spanish for the convenience of the Latin American conferees. Each tour includes transportation and a snack and costs \$20. Reservations for any of the tours can be made at the AWWA registration counter in the convention center.

Gimmicks & Gadgets

The winning entries in the AWWA Gimmicks & Gadgets contest are on display at booth 538 at the Exposition in the South Hall of the Miami Beach Convention Center.

Golf

The Doral Country Club will host the AWWA annual golf tournament on Tuesday, May 18. The \$35 entry fee includes transportation, greens fees, electric cart, lunch at the clubhouse, and prizes. Registration will be accepted at the Local Host Information Booth in the AWWA registration area at the Miami Beach Convention Center on a space-available basis.

Specially marked buses will begin the circuit of the official convention hotels at 8:00 a.m. in time for the shotgun start at 9:00. Golfers will return to their hotels in mid-afternoon.

Hotels

The telephone numbers for the official AWWA hotels are

Alexander	865-6500
Carillon	865-7561
di Lido	538-0811

Deauville	865-8511
Doral on the Ocean	532-3600
Eden Roc	531-0000
Fontainebleau Hilton	538-2000
Holiday Inn—22nd St.	534-1500
Konover	865-1500
Konover Flamingo	865-8645
Sans Souci	531-8261
Seville	532-2511
Shellbourne	531-1271
Versailles	531-6092

International Visitors' Hospitality Center

The AWWA International Affairs Committee maintains a hospitality room for attendees from outside the United States. The hospitality center is in room 101 of the Miami Beach Convention Center. It will be open from 11:00 a.m. to 5:00 p.m. on Sunday, May 16, and from 9:00 a.m. to 5:00 p.m. Monday through Wednesday, May 17-19.

Sala Internacional

El Comité de AWWA de Asuntos Internacionales tiene una sala especial para los extranjeros fuera de los Estados Unidos. La Sala Internacional está en el cuarto 101 del Miami Beach Convention Center. Está abierta desde 1100 hasta 1700 el día domingo, el 16 de mayo, y también desde 900 hasta 1700 lunes hasta miércoles, mayo 17-19.

International Visitors' Reception

Visitors from outside the United States are invited to a reception on Tuesday, May 18, from 5:00 to 7:00 p.m. in the International Visitors' Hospitality Center, Room 101 of the Miami Beach Convention Center.

Recepción Para Extranjeros

Hay una recepción especial para los que vienen fuera de los Estados Unidos el día martes, el 18 de mayo, de 1700 hasta 1900 en la Sala Internacional cuarto 101 del Miami Beach Convention Center.

Local Host Information Booth

The Local Host Committee maintains an information booth in the AWWA registration area of the Miami Beach Convention Center. Should you have questions about points of interest, sightseeing, or restaurants, please ask a member of the committee who will be at the booth.

Meet & Greet

The Exposition opening ceremony at noon on Sunday, May 16, is followed by the traditional "Meet & Greet" in the South Hall of the Miami Beach Convention Center until 5:00 p.m. Complimentary beer, soft drinks, and snacks will be served. Meet & Greet is a great time to visit the exhibits and catch up with old friends or even meet new ones.

Message Center

The Message Center provides conferees with a special answering service during registration hours. Messages will be posted at the Message Center in the AWWA registration area of the Miami Beach Convention Center.

Outlook—Science & Technology

See Closing Luncheon

Opening General Session

The conference officially opens with the general session on Monday, May 17, at 9:30 a.m. in the Miami Beach Theatre of the Performing Arts, adjacent to the Miami Beach Convention Center.

The session features a musical program, the presentation of awards to distinguished contributors to AWWA and the water supply industry, and keynote speaker Jorge Matute R. of Guadalajara, Mexico.

The doors open at 9:00 a.m. All registrants, spouses, and guests are invited to attend.

Prize Drawings

Conferees with a technical-professional registration are eligible for the daily prize drawing at the Exposition. To register for the drawings, tear off the prize drawing ticket, which is attached to the name badge, and drop it in the drum in the AWWA Theme Center, located in the exhibit hall of the Miami Beach Convention Center. Drawings are scheduled for

Sunday, May 16, 2:00 p.m. and 4:00 p.m.

Monday and Tuesday, May 17 and 18, 12:45 p.m. and 1:45 p.m.

Wednesday, May 19, 12:45 p.m. and 5:00 p.m.

You must be present to win. The final drawing at 5:00 p.m. on Wednesday will be for the grand prize.

Recepción Para Extranjeros

Vea International Visitors' Reception

Reservation of Recording Rights

AWWA reserves all rights with respect to conference programs and other presentations offered or sponsored directly or indirectly by the association and for which there is a direct charge or registration fee. The preparation of tape recordings, audio-visual tracks, or the like for subsequent public use or sale or for group presentation or other similar distribution or use without prior written consent from AWWA is expressly prohibited.

Sala Internacional

Vea International Visitors' Hospitality Center

Spanish Translations

For the convenience of attendees from Spanish-speaking countries, one Sunday seminar and three technical sessions will be translated into Spanish simultaneously.

The sessions are preconference seminar S5, Developing Human Resources in the Drinking Water Decade and technical sessions 15, International Affairs Forum 1; 20, International Affairs Forum 2; and 28, Improving Overseas Operation and Maintenance: The Design Challenge. In addition, all facilities tours will be translated into Spanish.

Traducciones al Español

Para ayudar a los de la habla español, tenemos traducción simultánea para un seminario el día domingo, el 16 de mayo, y también para tres programas técnicos. El seminario es el preconference seminar S5, Desarrollando Recursos Humanos en la Década de Agua, y los programas numero 15, International Affairs Forum 1; numero 20, International Affairs Forum 2; y numero 28, Mejorando el Mantenimiento y la Operación Extranjera: La Meta del Diseño. También, todos los paseos a las plantas van a tener una traducción al español.

Special Events Tickets

Tickets for special events, except the golf and tennis tournaments and the optional tours, can be purchased at the AWWA registration counter in the Miami Beach Convention Center.

AAEE Breakfast, Tue., May 18, 7:15 a.m.

AIDIS Breakfast, Thu., May 20, 7:00 a.m.

Annual Banquet, Wed., May 19, 7:00 p.m.

Closing Luncheon, Outlook—Science & Technology, Thu., May 20, 12:30 p.m.

Diamond Pin Club Breakfast, Mon., May 17, 7:30 a.m.

Facility Tours, Tue., May 18, 1:30 p.m.; Wed., May 19, 9:00 a.m.; Thu., May 20, 1:30 p.m.; Fri., May 21, 1:30 p.m.

Fuller Award Breakfast, Wed., May 19, 7:30 a.m.

Spouse Programs

Fairchild Tropical Gardens, Mon., May 17, 12:30 p.m.; Tue., May 18, 9:00 a.m.

Vizcaya, Mon., May 17, 12:30 p.m. and 2:00 p.m.; Tue., May 18, 9:00 a.m.

Handling Stress, Mon., May 17, 1:30 p.m. and 3:30 p.m.

Clarifying Self-Identity, Tue., May 18, 9:00 a.m.

Self-Presentation Skills, Tue., May 18, 10:00 a.m. and 1:30 p.m.

Rustproofing People, Tue., May 18, 10:00 a.m., 1:30 p.m., and 3:30 p.m.

Productive Conflict Resolution, Tue., May 18, 1:30 p.m.

Capabilities and Aspirations, Tue., May 18, 3:30 p.m.

Communicating Effectively, Wed., May 19, 8:30 a.m.

Plans for the Future, Wed., May 19, 10:15 a.m.

Mellowing—An Alternative to Coping, Wed., May 19, 1:00 p.m.

Spouses' Hospitality Center

Located in the Fontaine Room at the Fontainebleau Hilton Hotel, the Spouses' Hospitality Center will be open Saturday, 2:00 p.m.–6:00 p.m.

Sunday, 8:00 a.m.–4:00 p.m.

Monday, 8:00 a.m.–3:30 p.m.

Tuesday, 8:00 a.m.–4:00 p.m.

Wednesday, 8:00 a.m.–4:00 p.m.

It's a great place to congregate and enjoy a relaxing coffee break with old and new friends. Plan to stop by and meet Annie Garrett and her committee.

Spouses' Program

The spouses' program offers a variety of activities for conferees not attending the technical sessions. There are tours of Vizcaya, an Italian villa with magnificent period rooms and formal gardens, and of the Fairchild Tropical Gardens, the largest tropical garden in the United States. In addition, there are enrichment sessions on self identity, self-presentation skills, conflict resolution, handling stress, effective communication, physical and mental health, and the future. The spouses' hospitality center at the Fontainebleau Hilton Hotel is always a popular place to gather.

The spouses' registration costs \$95 with the banquet and \$60 without and can be purchased in the AWWA registration area of the Miami Beach Convention Center. Tickets for separate events can be purchased also at the AWWA registration counter in the convention center.

Student Reception

All students attending the conference are invited to a reception Tuesday, May 18, from 5:00 to 6:30 p.m. in Room 204 of the Miami Beach Convention Center. It is an opportunity for students to meet each other and to meet professionals at work in the water supply field.

Tape Recordings

The technical sessions and the enrichment sessions at the spouses' program will be recorded by Mobiltape Co., Inc., and the tapes will be on sale in the registration area of the Miami Beach Convention Center. Tapes of the spouses' programs will also be sold at the Spouses' Hospitality Center at the Fontainebleau Hilton Hotel.

Tennis

The Fontainebleau Hilton Hotel has reserved its courts for the annual AWWA tennis competition on Wednesday, May 19, from 9:00 a.m. to 5:00 p.m. Two round-robin tournaments will be held—one for men's doubles and one for women's doubles. The \$12 fee includes court fees, balls, and prizes. Registration will be accepted on a space-available basis at the Local Host Information Booth in the registration area of the Miami Beach Convention Center.

Traducciones al Espanol

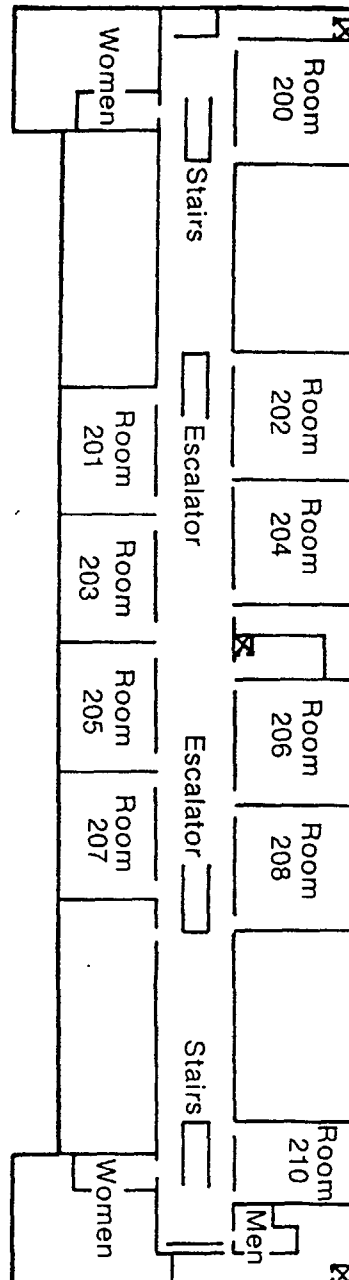
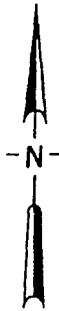
Vea Spanish Translations

Transportation to the Airport

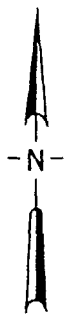
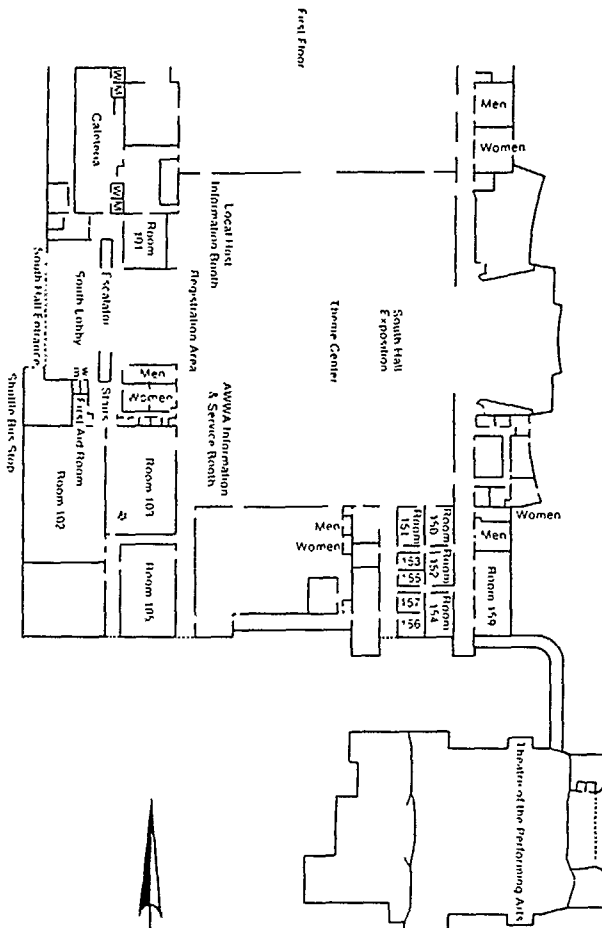
For your return transportation to Miami International Airport, service is provided by Red Top Sedan Service, Inc., at a cost of \$6.50 per person. Reservations are required 24 hours in advance with service to all participating AWWA hotels. The telephone number is 526-5764. It is recommended that you schedule your departure from your hotel 2 hours before flight time. Red Top Sedan Service also provides transportation to the Fort Lauderdale Airport.

Taxi service from Miami Beach hotels to the Miami International Airport costs about \$14 and takes about 30 minutes.

Miami Beach Convention Center

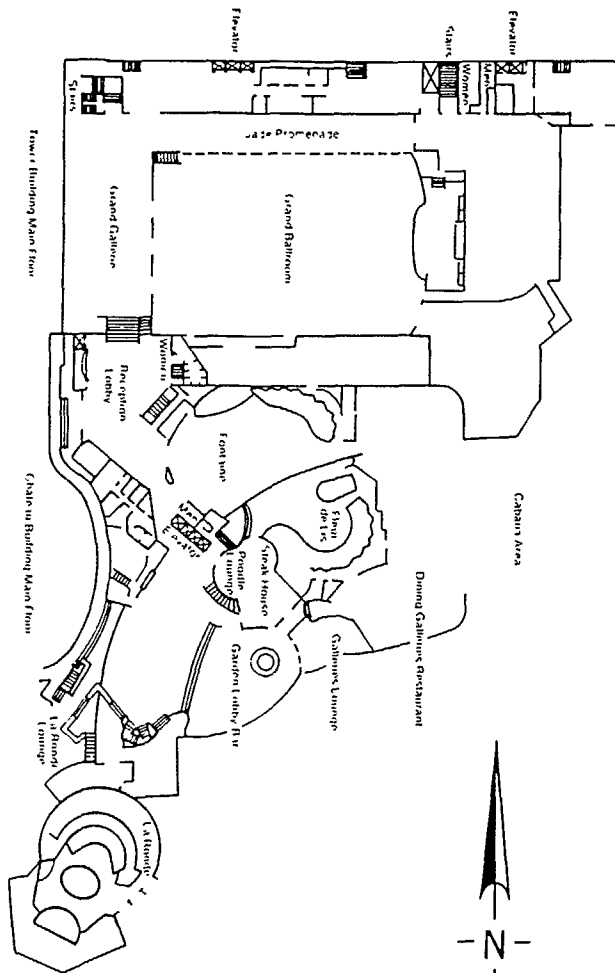


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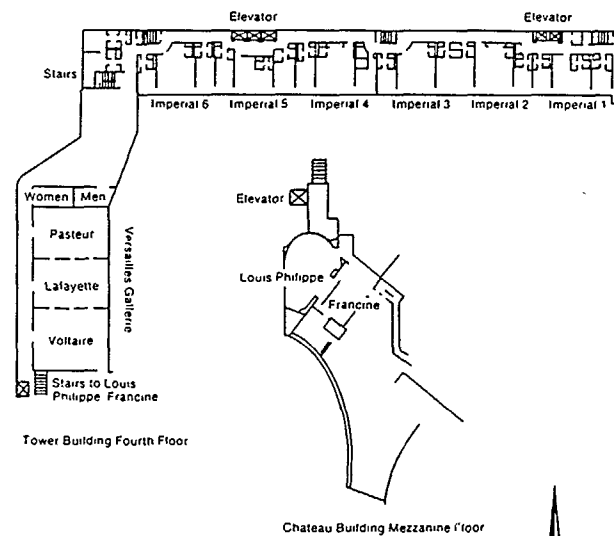
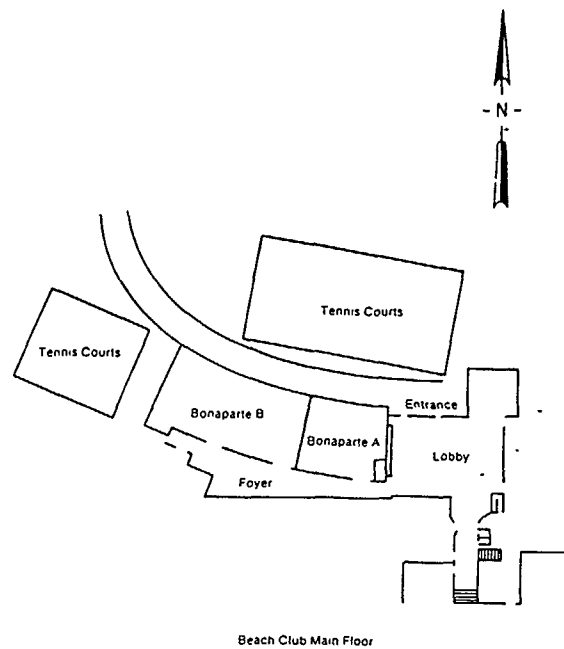


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Fontainebleau Hilton Hotel

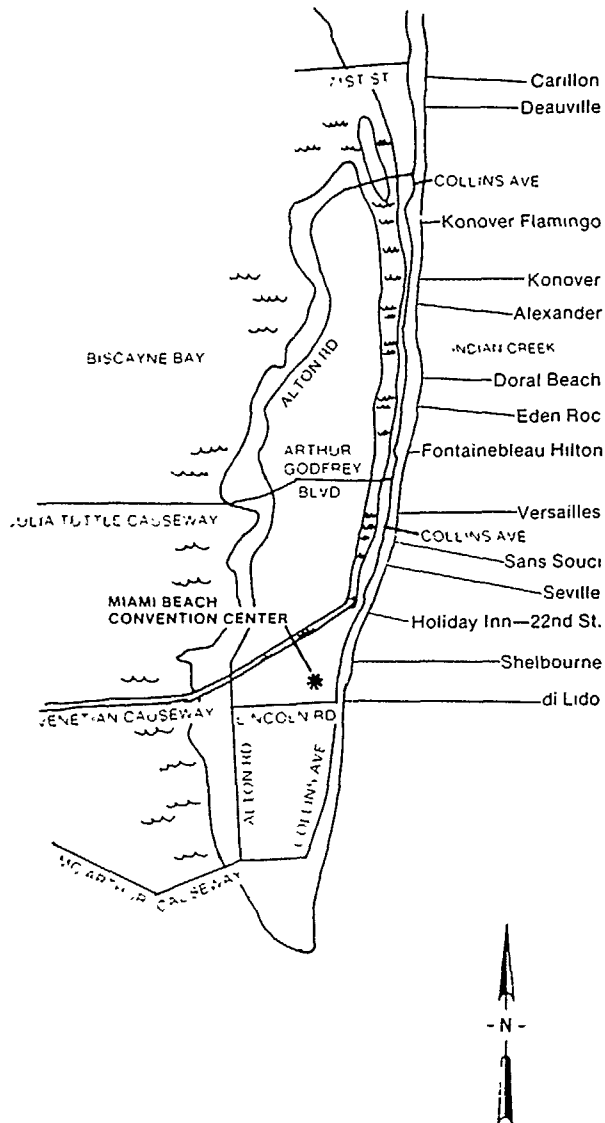


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Miami Beach Hotels

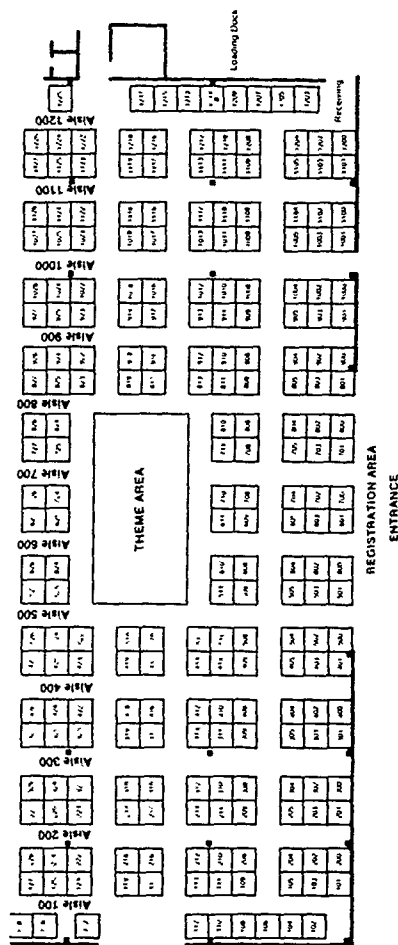
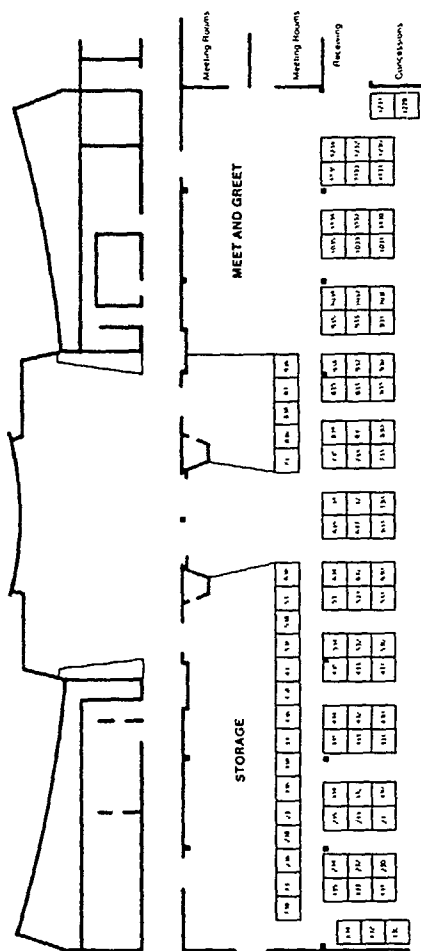


Exhibitors & Exhibit Locations

A E International,	435	GHA Lock Joint, Inc.	1017
Div. of Hartford Steam Boiler		Girard Polly Pig, Inc.	1022
Inspection, & Insurance		Globe Linings, Inc.	927
AWWA Gimmicks	538	Griffin Pipe Products Co.	422
& Gadgets		Ground Water Assoc., Inc.	925
ACUTEC, Inc.	204	H F Instrument Div.,	426
Agua Magazine/Agua	1225	Shaban Mfg. Inc.	
Expo '83		HACH Co.	222
American Cast Iron	709	Harco Corp.	1016
Pipe Co.		Harrington Corp.	531
American Chemical	326	Hays Fluid Controls Div.,	1117
Corp.		Zurn Industries, Inc.	
American City & County	1231	Hayward Tyler, Inc.	1210
Municipal Index		Heath Consultants Inc.	1132
Ameron Pipe Lining Div.	909	Hefner Plastics, Inc.	312
Ametek/Plymouth Products	502	Hersey Products, Inc.	1023
Andco Actuator Products,	323	Honeywell Information	400
Inc.		Systems, Inc.	
APCO/Valve & Primer	508	Hydra-Shield Mfg., Inc.	835
Corp.		Hydro-Metric Service Corp	432
AQUA PURA Inc.	117	Hydrotronic Corp. of	313
Aqua Technic International	324	America	
Asahi/America	108	ISCO, Inc.	226
Badger Meter, Inc., Flow	823	Intercontinental Plastics,	1024
Products & Precision		A K-5 Co.	
Products Div.		International Water	936
Chas. M. Bailey Co., Inc.	308	Supply Assn.	
Bilco Co.	500	JCM Industries, Inc.	1000
F. S. Brainerd & Co.	413	James Jones Co.	1031
Brooks Products,	1004	Kavouras, Inc./RAM, Inc	105
Poly Plastics Div.		Kent Meter Sales, Inc.	417
California-Nevada Section	636	LaBarge Tubular Div.	216
AWWA		Layne-Western Co., Inc.	1125
Capital Controls	1008	Leopold Co.	809
Capco Pipe Co., Inc.	830	Master Meter, Inc.,	1203
Carus Chemical Co.	509	ARAD U.S.A.	
Centriline Dept., Raymond	1122	McCrometer Div. of	1113
International Builders, Inc.		Ametek	
Chicago Steel Tape Co.	205	McCullough Industries, Inc.	430
CIFEC	1109	A.Y. McDonald Mfg. Co.	831
Cla-Val Co.	1101	McWane, Inc.	402
Controlotron Corp	1012	Metrotech Corp.	1134
Crom Corp.	303	Michigan State University	537
CUES, Inc.	209	Motorola Communications	900
Culligan USA	208	& Electronics, Inc.	
Data Industrial Corp.	212	Mud Cat Div., NCRS, Inc.	225
Dresser Mfg. Div.	1216	Mueller Co.	609
EBAA Iron Inc.	525	NSS Industries	535
Expo AIDIS '82	838	NAPCO/Uni-Flange Corp.	608
FEBCO Sales, Inc	310	NASCO	327
Fisher Research Lab.	1030	Natgun Corp.	624
Fluid Conservation	109	National Environmental	102
Systems Corp.		Training Assn.	
Ford Meter Box Co., Inc.	801	National Lime Assn.	104
Foxboro Co., Municipal	1001	National Sanitation	106
Sales Div.		Foundation	
G-A Industries, Inc.,	917	Neptune Water Meter Co.	501
Golden-Anderson Div		NIPAK, Inc.	431

Network Control Corp.	200	Reed Mfg. Co.	409
OCV Control Valves	1208	Rio Linda Chemical Co., Inc.	834
Ocean Valves, Inc.	1126	Rockwell International, Municipal & Utility Div.	625
PARCO Engineering Corp.	316	Ross Valve Mfg. Co., Inc.	805
Parkson Corp.	530	Schonsted Instrument Co.	934
Peabody Tectank, Inc.	1123	Scranton Gillette Communications, Inc.	123
Pipesavers, Inc.	201	Shell Chemical Co.	1229
Pittsburgh-Des Moines Corp.	725	Singer Valve	112
Joseph G. Pollard Co., Inc.	1032	A.O. Smith Harvestore Products, Inc.	902
Pollution Equipment News	309	Sparling	901
Polly Pig by Knapp, Inc.	935	Spiniello Construction Co.	403
Polysonics Inc.	322	Standard Water Works Equipment Co.	224
Porta-Printer Systems, Inc.	1027	Stanley Hydraulic Tools	317
Precision Meters, Inc.	1130	Star National Products	1026
Preload Co., Inc.	930	Steel Plate Fabricators Assn.	1209
Price Brothers Co.	1033	Superior Utility Products, Inc.	434
Pro Minent Fluid Controls Inc.	301	Sylvax Corp.	630
Public Works Publications Publishers for Conventions, Inc.	113		
QEI, Inc.	227		
Ranney Co.	923		

TS Products Inc.	111	Warminster Fiberglass Co., 1213
Temcor	903	Subsidiary of Fisher & Porter Co.
TNEMEC Co., Inc.	423	Water & Sewer Distributors of America
Tomco Equipment Co.	1230	Water Pollution Control Federation
Traffic Guide	130	Water Research Centre/ Palmer EaE
Trico Industries, Inc., Columbian Div.	634	Water Specialties Corp.
Trinity Valley Iron & Steel Co.	931	Waterous Co.
Trojan Manufacturing Co., Inc.	223	Watts Regulator Co.
Tyler Pipe Utilities Div.	1103	Waukesha Engine Div., Dresser Industries, Inc.
U.V. International	1135	Welsbach Ozone Systems Corp.
US Army Environmental Hygiene Agency	737	Wheeler Pilot International
US Pipe & Foundry Co. Utilities' Computer Services, Ltd.	817	World Water
VASSALLO Industries	300	Worthington Group
Vericom Telemetry Systems	1131	McGraw-Edison Co.
Virginia Chemicals Inc.	217	Xerox Computer Services
E.H. Wachs Co.	911	
Wallace & Tiernan Div., Pennwalt Corp.	408	



Preconference Seminars

Sunday, May 16

S1 • SMALL WATER SYSTEM SOLUTIONS

Water Quality Division—Room 208

Coordinator and Moderator: *R.G. McCall*

- 9:00 1. **AWWA Directions**—*L.J. Hash*
- 9:30 2. **USEPA Small Water Systems Program**—*Alan Levin, John Trax*
- 10:00 3. **USEPA Small Water System Research Program**—*T.J. Sorg*
Highlights of a recent USEPA seminar on small water systems research technology
- 11:00 4. **Workshop on State Support of Small Water Systems**—*W.C. Ford*
Results of the April 1982 AWWA Research Foundation workshop in Vail, Colo.
- 11:30 5. **State Regulations of Small Water Utilities**—*Richard Stevie, R.M. Clark*
A systematic approach for evaluating the financial viability of small water utilities
- 1:30 6. **Economic Evaluation of Alternative Technology for Small Water System Management**—*A.K. Deb, W.G. Richards*
A model for economically evaluating alternatives available to small water systems
- 2:00 7. **Cost-Analysis System for Small Water Utilities**—*R.M. Clark, J.I. Gilleen*
The development of a spatial costing system that allows small-water-system managers to determine the real costs of delivering water
- 2:30 8. **Latin American Approaches**—*E.G. Wagner*
Direct state and federal assistance, both technical and financial, is essential to the solutions in Latin America.
- 3:00 9. **Developing County-Wide Management Systems and Satellite System Operations**—*R.L. Wubbena, W.B. Bosch, N.C. Thompson*
Examples of the management designs of four county-wide satellite systems, developed to solve small water system problems
- 3:30 10. **Small Water System Management Training**—*C.A. Burke*
An overview of political solutions to the management training problems in a small water utility organization

S2 • DESIGN OF PILOT-PLANT STUDIES

Water Quality Division—Room 207

Coordinator: *A.F. Hess III*

Moderator: *Jack DeMarco*

The course covers all aspects of pilot-plant design for all types of water treatment. Emphasized are plant scale-up considerations, pilot-plant flexibility, and data collection and handling.

Times in boldface indicate p.m.

All technical sessions and meetings will be held in the Miami Beach Convention Center unless otherwise indicated

S3 • CORROSION CONTROL SEMINAR

Distribution Division—Room 206

Coordinator and Moderator: *W.H. Smith*

- 9:00 1. **Welcome**—*F.O. Waters*
- 9:15 2. **Introduction**—*W.H. Smith*
- 9:25 3. **Corrosion in Waterworks**—*D.L. Tippin*
- 9:55 4. **Interference Corrosion Problems Resulting From Stray Current and Methods to Resolve the Problem**—*D.M. Waters*
Solutions to stray current problems from cathodic protection stations and mass transit systems
- 10:55 5. **Waterworks Corrosion and Concrete Cylinder Pipe**—*R.C. Robinson*
Design methods for preventing corrosion of concrete cylinder pipe in aggressive environments
- 11:25 6. **Underground Behavior of Copper Water Tubes**—*J.R. Myers, Arthur Cohen*
When copper is exposed to an aggressive soil, the corrosion can be mitigated effectively.
- 11:30 7. **External Corrosion of Asbestos-Cement Pipe**—*H.L. Olson*
- 2:00 8. **Use and Abuse of Cast- and Ductile-Iron Pipe**—*T.F. Stroud*
The cause, effect, and extent of iron-pipe corrosion; an evaluation of corrosive environments; and protective measures
- 2:30 9. **Advanced Concepts in Soil Evaluation for Exterior Pipeline Corrosion**—*L.D. McMullen*
A new equation to forecast corrosive areas may reduce water main breaks by as much as 75 percent.
- 3:00 10. **Discussion with Speakers' Panel**
- 11. **Summary**—*F.O. Waters*

S4 • FINANCIAL PLANNING AND THE USE OF FINANCIAL INFORMATION FOR GENERAL MANAGEMENT PERSONNEL

Management Division—Room 204

Moderators: *S.M. Massarelli, C.E. Woods*

- 9:00 1. **Introduction**—*S.M. Massarelli*
- 9:15 2. **Effective Financial Management: A Plan**—*C.E. Woods*
Well-planned budgeting and an effective cost-budget-general-accounting system are the cornerstones of an effective management plan.
- 10:00 3. **Accounting Information As a Tool in Financial Management**—*L.G. Shaw*
Nontechnical explanation of how accounting information is useful in managing water utilities
- 11:15 4. **Forecasting and Budgeting As Tools for Financial Management**—*J.P. Tonkinson*
A discussion of forecasts and budgets, comparison of various examples of budget versus actual results, and presentation of computer-driven aids
- 11:30 5. **Reports and Control Procedures for Financial Management**—*L.S. Graven*
Methods of establishing reports and control procedures for utility financial data

- 2:30 6. **Innovative Financing in Troubled Capital Markets**—*A.L. Anders*
 Troubled capital markets require flexibility, but financial innovations must be distinguished from gimmicks.
- 3:30 7. **Summary**—*S.M. Massarelli, C.E. Woods*

S5 • DEVELOPING HUMAN RESOURCES IN THE DRINKING WATER DECADE
 Spanish Translation

International Affairs Committee and Pan American Health Organization—Room 203

Moderator: *J.M. Carrillo*

- 9:00 1. **Human Resources for the IDWSSD* in Latin America: Dimensions of the Problem, Alternative Solutions**—*L.U. Jauregui*
 Alternative approaches to education and training of human resources to meet the decade's goals
- 9:40 2. **National Training and Educational Programs for Human Resource Development for IDWSSD***—*R.A. Rios*
 The technical and institutional capabilities the educational system needs to meet human resource development requirements
- 10:45 3. **Subregional Training Systems As a Support Mechanism for Institutional Training Needs**—*Olman Cordero*
 The characteristics of a subregional training system and its links with collaborating organizations
- 11:20 4. **International Cooperation in Educating and Training Through a Network of Collaborating Institutions**—*F.A. Butrico*
 Mechanisms of cooperation among universities and training institutions at the international level

*International Drinking Water Supply and Sanitation Decade

S6 • HEALTH EFFECTS

AWWA Research Foundation—Room 103

Moderator: *J.B. Mannion*

- 9:00 1. **Analytical Findings and Problems**—*R.F. Christman*
 Monitoring techniques, their limitations, and applications
- 10:30 2. **Toxicological Principles and Procedures**—*John Doull*
 Basic principles of toxicology, including dose-response relationships, acute versus chronic effects reversible versus irreversible damage, and how these are used in setting drinking water standards
- 11:30 3. **Risk Assessment and Standard Setting**—*E.J. Calabrese*
 Principles of risk assessment and the problems high-risk groups present in setting standards
- 4:00 4. **Discussion**

Times in boldface indicate p.m.

All technical sessions and meetings will be held in the Miami Beach Convention Center unless otherwise indicated

Technical Program

Monday, May 17—Morning

1 • BETTER WATER FOR THE AMERICAS

General Session—Miami Beach Theatre of the Performing Arts

Chairman: *K.J. Miller*

Vice Chairmen: *J.H. Stacha, W.O. Lynch, J.B. Gilbert, T.J. Blair III, D.B. Preston*

Music

9:30

10:00

Processional

1. Invocation
2. Welcome
3. President's Statement—*K.J. Miller*
4. Awards
5. Friendship Award—*E.C. Reed*
6. Invitation to Panama—*J.M. Carrillo*
7. IWSA—*Guy Dejouany*
8. Keynote Address—*Jorge Matute R.*

Monday, May 17—Afternoon

2 • THE ENERGY DILEMMA

Distribution Division—Room 102A

Chairman: *J.M. Rasberry*

Vice Chairman: *G.O. Muller*

- 2:00 1. **The Cost of Energy**—*Claude L'Engle*
- 2:30 2. **Cost Savings Through Pipe Design for Energy Efficiency**—*T.M. Walski*
 Rules on how to pick a least-cost diameter in a time of increasing energy costs
- 3:00 3. **Energy Versus Pump Selection**—*G.A. Aldworth*
 An account of optimizing pump selection for wide-range operation by using two-speed motors or broad-coverage pump curves
- 3:30 4. **Energy Saving Through Reduction of Leakage**—*Jochen Kuhner*
- 4:00 5. **Energy Conservation by Cement-Mortar Lining**—*W.R. Dahl*
 Pipeline rehabilitation by cement-mortar lining as an effective method toward energy conservation

3 • ARE COMPENSATION AND BENEFIT PROGRAMS A COST OR A SAVINGS?

Management Division—Room 103A

Cochairmen: *L.J. Hash, W.H. Abbott Jr.*

- 2:00 1. **Developing a Salary Program**—*W.C. Money*
 Why salary programs and essential management tools are necessary and how to institute them
- 2:30 2. **Is Management Incentive Compensation Viable for the Water Utility Industry?**—*Sylvester Murray*
 Developing innovative management compensation programs to attract, motivate, reward, and retain executives

- 3:00 3. **Flexible Benefit Plans for Employees—D.R. Jomo**
How benefit plans can be designed to offer more individual choice to employees

4 • ECONOMIC PROBLEMS OF THE WATER INDUSTRY: DO WE KNOW HOW TO SOLVE THEM?

Research Division—Room 208

Cochairmen: *P.L. McCarty, B.G. Stone*

- 2:00 1. **Economic Problems of a Water Utility—R.S. McGarry**
The general manager of a publicly owned water utility raises questions for consideration by the members of the AWWA Economics Research Committee
- 2:25 2. **Demanding Forecasting and Facilities Planning—J.J. Boland**
- 2:50 3. **Cost Estimation and Water Pricing—P.C. Mann**
- 3:15 4. **Setting Standards for Drinking Water—R.M. Clark**
- 3:40 5. **Priorities for Economic Research—D.T. Lauria**
- 4:00 6. **More Effective Water Use in New Homes and an Aggressive Retrofit Program Reduces Water Demand and Wastewater Flow—W.O. Maddaus, D.S. Parker, A.J. Hunt**
An aggressive program to reduce residential waste water flows 10 to 15 percent
- 4:30 7. **The Application of Zonal Pricing to Metropolitan Utilities—D.L. Schlenger, D.T. Lauria**
A simple model can determine optimal zonal prices based on cost differences between pressure districts

5 • AQUIFER DEVELOPMENT AND PROTECTION

Resources Division—Room 203

Cochairmen: *T.J. Buchanan, J.R. George*

- 2:00 1. **Groundwater Resource Development and Protection in South Florida—J.R. Maloy**
- 2:30 2. **Groundwater Supply Operation in Florida for Wet-Dry Cycle Environments—G.A. Heath**
- 3:00 3. **Protection of Public Supply Aquifers in Areas of Deep Water Disposal—J.I. Garcia-Bengochea**
Special precautions are needed for constructing and operating deep-injection systems through public supply aquifers
- 3:30 4. **Aquifer Protection From Salt Water Intrusion in South Florida—K.W. Ratzlaff**
How saltwater intrusion in a Biscayne, Fla., aquifer is controlled by water levels and saltwater barriers in coastal canals

Times in boldface indicate p.m.

All technical sessions and meetings will be held in the Miami Beach Convention Center unless otherwise indicated

6 • BETTER WATER QUALITY—THE CHALLENGE

Water Quality Division—Room 207

Chairman: *A.F. Hess III*

Vice Chairman: *J.M. Symons*

- 2:00 1. **Drinking Water and Legionnaires' Disease—A.P. Dufour, Walter Jakubowski**
Legionella pneumophila: a potential waterborne pathogen found in potable water
- 2:30 2. **Automatic Closed-Loop Control Lime-Slurry Feed System—L.D. McMullen**
The Des Moines (Iowa) Water Works has designed an automatic closed-loop control lime-slurry feed system to reduce operational costs by \$90 000 per year
- 3:00 3. **The Small Water System Challenge—R.G. McCall**
Better understanding of small water utilities and their unique problems are required of larger utilities, consulting engineers, educators, regulators, manufacturers, legislators, and consumers.
- 3:30 4. **Evaluation of GAC Performance and On-Site Reactivation at the Manchester Water Treatment Plant—D.B. Paris, Robert Beurivage, David Kittredge, Benjamin Lykins**
The findings from a cooperative agreement between the USEPA and the Manchester (N.H.) Water Works to determine the feasibility of an on-site fluidized-bed GAC reactivation system
- 4:00 5. **The Reuse Challenge—J.G. DeBoer**
The challenge to water utilities of water reuse, including research needs, development incentives, and health aspects
- 4:30 6. **THM Regulation—V.J. Kimm**

Tuesday, May 18—Morning

7 • ENERGY MANAGEMENT (Early Bird Session)

Management Division—Room 206

Moderator: *E.A. Persson*

- 8:00 1. **Report on Energy Management Programs—E.A. Persson, E.R. Collierain**
AWWA's newly formed Energy Management Committee is launching a three-year program emphasizing section-level action

8 • DISTRIBUTION OPERATION AND MAINTENANCE

Distribution Division—Room 102A

Chairman: *J.H. Wilson*

Vice Chairman: *S.R. Saylor*

- 9:00 1. **The Need for Rehabilitation of the Nation's Aged Water Systems: A Case Study—A.K. Deb, Charles Zernentsch, James McElheny**
A study of the Buffalo, N.Y., water system to develop a cost-effective rehabilitation and replacement program
- 9:30 2. **Proper Application of Protective Coatings—K.B. Tator**

- 10:00 3. **A Water Company's Survival in a Major Flood—**
Meyer Rosenthal
Learning to survive a major flood: a personal experience in the 1977 Johnstown, Pa., flood
- 10:30 4. **Preventative Distribution Valve Maintenance—**
D.L. Skorcz, John Hill
The value and methods of establishing a valve exercise program
- 11:00 5. **Disinfection Following Pipeline Repairs—**
T.M. Peck

9 • MANAGEMENT OF STRESS AND CRIME

Management Division—Room 103A

Cochairmen: *C.A. Froman, R.L. Lee*

- 9:00 1. **Stress Versus Distress—W.J. Romanos Jr.**
How to fully understand stress in a biological state in order to enhance professional potential
- 9:30 2. **Water Utility Experience in Stress Management—**
G.L. Lavery
Stress management for supervisors and other employees was an important ingredient in meeting water utility supply problems related to a drought
- 10:00 3. **Management's Role in Crime Prevention—L. R. Riccio**
Management can and must plan its defense against the threat of crime
- 10:30 4. **Utility Security—R.G. Jensen**
A risk management program utilizing internal controls, guards, insurance, loss prevention, claims control, and education is solving some of the problems of the Denver Water Department

10 • ALTERNATE WATER SUPPLY

Resources Division—Room 203

Cochairmen: *N.M. Cline, J.D. Bakken*

- 9:00 1. **Desalting in Florida—Glenn Dykes Jr.**
A study of the resolution to Florida's water resource problem through use of reverse osmosis
- 9:30 2. **Desalting: Water Supply Alternatives for Virginia Beach—M.P. Robinson Jr., G.P. Westerhoff, T.V. Leahy**
- 10:00 3. **Regional Financing of Water Reclamation—Wiley Horne**
- 10:30 4. **Denver's Practical Conservation Program—R.D. Wiley**

11 • UNIVERSITIES FORUM I

Room 208

Chairman: *J.K. Edzwald*

Vice Chairman: *S.J. Randtke*

- 9:00 1. **Fundamental Characteristics of Water Treatment Plant Sludges—D.L. Wakeland, W.R. Knocke**
In recent years, more emphasis has been placed on water plant sludge handling especially where land is not available for holding ponds

- 9:25 2. **Sulfur Chemistry and Removal From Groundwater Supplies—D.A. Dohnalek, J.A. FitzPatrick**
How to increase the degree of sulfur removal economically in the oxidation and precipitation steps by the use of catalysts and oxidants other than air
- 9:50 3. **Predicting the Effect of Hydrolizing Salts on Flocculation Efficiency Using Computerized Chemical Equilibrium Models—D.R. Iyer, R.D. Letterman**
Computerized chemical equilibrium models have great potential for evaluating the extent of chemical reactions in the physical-chemical treatment of water.
- 10:15 4. **Evaluation of Barium Removal Methods for Groundwater Supplies—T.L. Krause, R.S. Gemmell**
An investigation of alternative water treatment methods that could reduce the levels of barium contained in groundwater
- 10:40 5. **A Better Calculation Method for the Calcium Carbonate Saturation Index and Corrosion of Steel in Water With Different Saturation Indices—R.A. Pisigan Jr., J.E. Singley**
A new pH formula was derived based on a constructed chemical model of CaCO_3 saturation taking into account ionic speciation.
- 11:05 6. **Development of Pipe Manifold System for Monitoring Water Quality in Water Distribution Systems—T.M. Prakash, S.K. Banerji, J.T. O'Connor**
Accumulations on different pipe materials and the effect of commonly used disinfectants and corrosion inhibitors were studied in order to evaluate a proposed monitoring system.
- 11:30 7. **Domestic 1/2-Inch Meter Accuracy and Testing, Repair, and Replacement Programs—G.J. Newman, R.R. Noss**
"Unaccounted for" water in urban water supply systems is receiving greater attention because the water represents lost revenue and may be an indicator of the system's physical condition
- 11:50 8. **Economic Analysis of Leak Detection and Repair—E.E. Moyer, J.W. Male**
The benefits and costs of leak detection and repair, using the Westchester (N.Y.) Joint Water Works as a case study

12 • PILOT PLANT CASE STUDIES

Water Quality Division—Room 207

Chairman: *J.L. Cleasby*

Vice Chairman: *N.J. Davoust*

- 9:00 1. **Pilot-Scale Studies of the Treatment of the Susquehanna River for Baltimore—A.F. Hess III, G.C. Cline, J.E. Dyksen, D.J. Hiltnerbrand**
- 9:30 2. **Studies on the Loss of Media During Air Scour—Appiah Amirtharajah, S.L. Trusler**
The causes and magnitudes of the carry-over of media into the wash-water gutter during air-scour backwash
- 10:00 3. **A Study of THM Removal by Packed-Tower Aeration—M.D. Umphres, C.H. Tate**
Results of a pilot-study investigation of packed-tower aeration for the removal of trihalomethanes

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- 10:30 4. **Advances in the Development of Design Criteria for Packed-Column Aeration**—*J.E. Singley, L.J. Bilello*
- 11:00 5. **The Potomac Estuary Experimental Water Treatment Plant: Treating a Highly Contaminated Source for Drinking Water**—*M.C. Kavanaugh, H.C. Ways*
The first-year monitoring results for Potomac estuary experimental water treatment
- 11:30 6. **Evaluation of Taste and Odor Reduction Processes by Pilot-Plant Operation**—*S.L. Davis, S.L. Lackey*
Alternative taste and odor control processes were evaluated by pilot-plant studies at the Buffalo Pound Water Administration Board's plant near Moose Jaw, Sask

Tuesday, May 18—Afternoon

13 • IMPROVING MANAGEMENT PERFORMANCE THROUGH CONTINUING EDUCATION PROGRAMS

Education Division—Room 207

Cochairmen: *M.J. McGuire, M.T. Chiaraluce*

- 2:00 1. **Toward Managerial Competence**—*E.A. Powers*
Findings of the American Management Association's graduate management program
- 2:30 2. **Certified Managers and Group Dynamics in Management Learning**—*R.E. Mignerey*
Information about the certified-manager process and approaching managerial development through group discussion learning sessions
- 3:00 3. **Management Training in South Dakota Rural Systems**—*D.N. Davis*
A review of the on-site training program for rural water systems, emphasizing the needs of the small water systems manager
- 3:30 4. **Supervisory Training: A Diagnostic Guide**—*V.W. Langworthy*
Supervisory training can help identify and solve management problems and improve group relationships
- 4:00 5. **AWWA Water Utility Management Institute: An Investment in Improvement**—*Kay Kutchins*
An overview of the institute concept and a case study of its further application in a utility

14 • CONSTRUCTION CLAIMS: HOW TO MINIMIZE

Engineering and Construction Division—Room 102A

Chairman: *G.H. Abplanalp*

Vice Chairman: *J.V. Miner*

- 2:00 1. **Contractor**—*R.S. Gabrielse*
- 2:30 2. **Supplier**—*Orem Hopkins*
- 3:00 3. **Engineer**—*R.E. Vansant*
- 3:30 4. **Owner**—*R.H. Reinert*
- 4:00 5. **Lawyer**—*G.W. Farquhar*

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15 • RURAL WATER SUPPLIES AND SANITATION PROGRAM IN LATIN AMERICA (Spanish Translation)

International Affairs 1—Room 203

Chairman: *W.W. Aultman*

Vice Chairman: *J.J. Mayol*

- 2:00 1. **An Overview of the Rural Water and Sanitation Programs of the Americas**—*David Donaldson*
A PAHO staff member will cover progress to date, types of programs, degrees of success, and future outlook.
- 2:30 2. **Practical Water Treatment for Communities in Developing Countries**—*D.A. Okun, C.R. Schulz*
A reasonable approach for designing water treatment facilities using techniques that are tailored to the social and economic conditions of the region
- 3:00 3. **Developing Appropriate Human Resources for Rural Water Programs: The Agua del Pueblo Experiment**—*S.B. Cox*
A discussion of the use of multiskilled rural water and sanitation personnel in developing countries
- 3:30 4. **Community Participation**—*John Grant*
Local participation in a rural water supply versus direction by a national program
- 4:00 5. **Financing, Management, and Operations**—*Juan Alfaro*
A discussion of how and to what degree subsidies are given

16 • STANDARDS COUNCIL

Room 103A

Chairman: *J.H. Robinson*

Vice Chairman: *G.L. Lavery*

- 2:00 1. **Disinfection of Pipelines and Water Storage Facilities**—*G.W. Adrian*
- 2:30 2. **Standards Committee on Water Meters**—*H.E. Snider, Steve Lyons, S.J. Prazer*
- 3:00 3. **An Overview of Ductile-Iron Pipe Standards**—*A.M. Tinkey*
A discussion of present and future A-21 standards
- 3:30 4. **Concrete Pipe Procedures and Manuals**—*Conrad Hohener Jr.*
- 4:00 5. **Recommendations for Elastic Buckling Design Requirements for Buried Flexible Pipe**—*L.L. Cagle, B.C. Glascock*

17 • UNIVERSITIES FORUM 2

Room 208

Chairman: *J.A. FitzPatrick*

Vice Chairman: *J.E. Ferguson*

- 2:00 1. **Formation and Control of Organic Chlorine in Public Water Supplies**—*S.J. Fleischacker, D.E. Johnson, S.J. Randtke*
The extent and rate of formation of organic chlorine in water supplies and the potential of conventional water treatment processes to remove organic chlorine and organic chlorine precursors

- 2:25 2. **The Reaction of Ozone and Bromide in Aqueous Solutions and Its Implications in Water Treatment**—*M.T. Garcia-Rivera, H.E. Moore, M.F. Mehran, W.J. Cooper*
The study of the aqueous chemistry of ozone has been stimulated recently by the concern over the formation of chlorinated organics during water treatment
- 2:50 3. **Reactions of Hypochlorous Acid and Monochloramine With Phenolic Compounds: Effects of Activated Carbon**—*E.A. Voudrias, R.A. Larson, V.L. Snoeyink*
The reactions of HOCl with phenols in the presence and absence of GAC
- 3:15 **AWWA Academic Achievement Awards**
- 3:25 4. **Air Stripping of Volatile Organics in Water**—*R.L. Mumford, J.L. Schnoor*
The application of packed-bed stripping technology to the task of removing several volatile organic chemicals from water
- 3:50 5. **A Parametric Study of Metal Coagulants for Removing Trihalomethane Precursors From Various Natural Waters**—*P.A. Chadik, G.L. Amy*
A study of alum and ferric chloride-coagulated THM precursors in natural waters from various areas of the United States
- 4:15 6. **Mass Transfer and Phase Equilibria in a Bubble Column**—*C.D. Munz, P.V. Roberts*
Henry's constants were estimated for five volatile chlorinated hydrocarbons using a bubble-column technique
- 4:40 7. **Removal of Naturally Occurring Trihalomethane Precursors by Polymer Coagulation and Direct Filtration**—*M.C. Zapata-Moreno, K.B. Black, F.A. DiGiano*

Tuesday, May 18—Evening

RESEARCH SEMINAR • DISINFECTANT RESIDUALS IN WATER DISTRIBUTION SYSTEMS: MICROBIOLOGICAL PROTECTION VERSUS THM CONTROL

Association of Environmental Engineering Professors—Room 208

Chairman: *P.C. Singer*

- 8:00 1. **Effectiveness of Free Chlorine in Water Distribution Systems**—*V.P. Oliveri*
2. **When Should Chloramines Be Considered As a Means for THM Control?**—*R.R. Trussell*

Wednesday, May 19—Morning

18 • ACCIDENT PREVENTION (Early Bird Session)

Management Division—Room 103A

Moderator: *D.M. Hungerford*

- 8:00 1. **Safe Entry Into Confined Spaces**
Panelists: *A.L. Dubiel, R.J. Oliphant, M.D. Rothenberg*
A discussion of recommended safety procedures for entering and working in confined areas

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19 • DISTRIBUTION SYSTEM: THE OPERATORS' COMMON BOND (Operators' Forum)

Education Division—Room 207

Cochairmen: *D.K. Sander, J.W. Hoffbuhr*

- 9:00 1. **Troubleshooting the Water Distribution System**—*S.A. Brook*
Several procedures and the equipment available for troubleshooting water distribution systems
- 9:30 2. **Construction and Inspection**—*Rex Powers, R.B. Lennex*
Performance by an inspector helps make a good project. Some duties of the inspector are described.
- 10:00 3. **Effective Flushing and Disinfection Practices**—*L.V. Jones*
The operations necessary for distribution system cleaning to maintain and improve in-system water quality
- 10:30 4. **Corrosion: The Operator's Perspective**
a. **Monitoring for Corrosion Control**—*G.J. Kirmeyer, G.S. Logsdon*
Corrosion monitoring methods used by utilities to investigate corrosiveness of a water supply
b. **Control and Testing by the Operator**—*G.M. Haskew*
How the operator can determine if internal corrosion is a problem

20 • URBAN WATER SUPPLIES IN LATIN AMERICA (Spanish Translation)

International Affairs 2—Room 203

Chairman: *H.R. Shipman*

Vice Chairman: *H.J. Graesser*

- 9:00 1. **The Diversion of Rio Mantaro to the Rio Rimac River Valley to Produce Electricity and Drinking Water for Lima**—*Alfonso Zavala C.*
A joint hydropower-water supply scheme for the city of Lima involved the transfer of water from the Atlantic to the Pacific basin in Peru
- 9:45 2. **Bogota Water Supply**
- 10:30 3. **Mexico City Water Supply**—*Guillermo Guerrero Villalobos*
The technical and financial aspects of the solutions to Mexico City's water supply problems
- 11:15 4. **Irregular Urban Settlements and Potable Water Service**—*Jorge Matute R.*
Providing water supply to fringe areas of a large city with a rapidly expanding population

21 • RESEARCH 2

Research Division—Room 208

Cochairmen: *P.D. Foley, C.R. O'Melia*

- 9:00 1. **A Comparison of Competitive Adsorption on Selected Carbonaceous and Polymeric Resins and Activated Carbon: Expected and Unexpected Preferential Adsorptions**—*R.A. DiMambro, F.A. DiGiano, Chen-Yu Yen*
Anomalies in competitive adsorption were caused by differences in micropore volumes among resins
- 9:30 2. **Coagulation of Humic Substances: Concepts and Applications**—*B.A. Dempsey, R.M. Ganho, C.R. O'Melia*

Mechanisms for the removal of humic substances by coagulation and their applications

- 10 00 3. **Mass Transfer of Volatile Organic Contaminants During Surface Aeration**—*P.V. Roberts, Paul Dandliker*
A simple method to predict the transfer rates of volatile organic contaminants during surface aeration
- 10 30 4. **Competitive Interactions Between Humic Substances and Chloroform in Fixed-Bed Adsorbers**—*J.C. Crittenden, Mriganka Ghosh, Gary Mueller, B.R. Sabin*
The competition, desorption, and displacement of chloroform adsorbed chloroform with humic substances are examined
- 11 00 5. **A Study of TOC and THM Precursor Removals by Conventional Treatment and Direct Filtration**—*J.K. Edzwald, W.C. Becker, S.J. Tambini*
An actual treatment plant is compared against direct filtration for a highly colored water
- 11 30 6. **Influence of Coagulation Adsorption on Behavior in Minicolumns**—*M.J. Semmens*

22 • WATER UTILITY COUNCIL

Government Affairs Forum—Room 204

Chairman: *F.S. Burba*

- 9 00 1. **Introduction**—*K.J. Miller*
- 9 10 2. **Overview of the Water Utility Council**—*F.S. Burba*
- 9 30 3. **Washington Activity**—*J.B. Groff*
- 10 00 4. **EPA's Drinking Water Program**—*F.A. Eidsness Jr.*
- 10 30 5. **Impact of Budget Cuts on the Water Utility Industry**—*Water Utility Council Panel*

23 • AUTOMATION AND CONTROL OF DISTRIBUTION SYSTEMS

Distribution Division—Room 102A

Chairman: *D.E. Jackson*

Vice Chairman: *H.E. Snider*

- 2:00 1. **Distribution System Design Through Network Modeling**—*J.E. Wood*
A time-saving approach to system design and control scheme development
- 2:30 2. **Telemetry for Remote Control of Small and Medium Distribution Systems**—*J.E. Von Rader*
Telemetry methods and practical solutions to problems of remote control in water distribution systems
- 3:00 3. **Central Control for a Large Distribution System**—*P.M. Emery*
The growth of Metropolitan Toronto and the implementation of a central pumping station
- 3:30 4. **Automatic Pump Sequencing in an Unmanned Water Pump Station**—*D.A. Klym, I.B. Henderson, Edwin Klassen, George Remple*
Unattended pumps maintain flows from 20 to 150 mgd (90 to 680 MLD) rates with minimal variation

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- 4:00 5. **Maintenance of Instrumentation**—*R.C. Freeston*
Maintenance of instrumentation can be handled even by the inexperienced with a minimum of tools

24 • PLANNING AND CONTRACTING FOR WATER SUPPLY, 1982-2022

Management Division—Room 103A

Cochairmen: *R.L. Wubbena, K.W. Peltz*

- 2:00 1. **Planning for Future Needs**—*Murray Ellis*
- 2:30 2. **Central City Wholesale Contracts: Joint Project Development and Cost Sharing**—*R.D. Hardten*
The benefits of wholesale contracts, including service requirements, cost sharing, and methods for resolving disputes
- 3:00 3. **Resolving Intergovernmental Conflict on Water Rate Disputes**—*T.E. Taylor, Matalyn Harp*
Resolving intergovernmental conflict on wholesale rates and service requirements demands a fresh approach and cooperative action between the supplying city and its customers
- 3:30 4. **Operation and Maintenance Contracts for Management of Small Water Supplies**—*N.C. Thompson, W.B. Bosch, J.M. Maxwell*
Small water systems can be helped with assistance from larger water purveyors

25 • RESEARCH 3

Research Division—Room 208

Cochairmen: *R.H. Taylor, P.R. Cairo*

- 2:00 1. **Hydrogen Peroxide Formation in Groundwater Exposed to Sunlight: Implications in Water Treatment**—*W.J. Cooper, R.G. Petasne, R.G. Zika*
Aqueous solutions of natural humic substances exposed to sunlight produce hydrogen peroxide that can reduce oxidants used in water treatment
- 2:30 2. **Research Needs in the Area of Drinking Water Research: A Committee Report**—*J.D. Johnson, R.C. Hoehn*
- 3:00 3. **Limiting Bacterial Aftergrowth in Distribution Systems by Removing Biodegradable Organics**—*M.M. Bourbigot, Andre Dodin, Raymond Lheritier*
Drinking water upkeep in a system was improved by using ozonation and activated carbon in the plant
- 3:30 4. **Mean Coliform Density of a Water Distribution System**—*W.O. Pipes, R.R. Christian*
Mean coliform density is a poor acceptance criteria for the bacteriological safety of drinking water
- 4:00 5. **Plumbosolvency in Scotland: The Problem, the Remedy, the Effects**—*W.N. Richards, M.R. Moore*
- 4:30 6. **The Interior Surface Character of Galvanized Steel Pipe: A Potential Factor in Corrosion Resistance**—*K.P. Fox, C.H. Tate, A.E. Bowers*
Results of tests for interior surface integrity of galvanized steel pipe and pipe corrosion potential

26 • INDUSTRIAL WATER: CONSERVATION AND REUSE

Resources Division—Room 203

Chairman: *P.K. MacEwan*

Vice Chairman: *L.F. O'Connor*

- 2:00 1. **Industry's Response to Forced Water Conservation in a Drought**—*Joseph Adamo*

- 2:30 2. **Electric Utility Water Reuse and Zero Discharge—**
W.P. Grobmyer, W.J. Wilson, M.L. Kurtz, J.F. Hancock
 The requirements for station zero discharge, the environmental benefits, and how zero discharge is achieved through advanced water treatment techniques and station water management
- 3:00 3. **Zero-Discharge Wastewater Treatment at an Electronics Manufacturing Plant—O.P. Chopra**
 How a wastewater treatment plant recycles most of the site's wastewater with losses only through evaporation
- 3:30 4. **Wastewater Recycling at Inland Steel Company—E.J. McCluskey**
 A discussion of industrial wastewater treatment for recycling purposes and minimizing pollutant discharge
- 4:00 5. **Discussion—P.K. MacEwan, L.F. O'Connor**

27 • UNDERGROUND CONTAMINANTS

Water Quality Division—Room 207

Cochairmen: *J.E. Courchene, R.G. McCall*

- 2:00 1. **Development of Revised Drinking Water Standards for Groundwater Contaminants—Joseph Cotruvo**
- 2:30 2. **Approaches to Solving a Complex Problem—W.A. Mullen, Robert James, John Littler, Derek Sandison**
- 3:00 3. **Rapid Source Identification of Pollutants Through Mutual Cooperation—H.J. Borchers Jr.**
 Results of a cooperative study to identify sources of volatile organic contaminants in a geologically complicated multi-aquifer system
- 3:30 4. **The Use of Aeration to Remove Volatile Organics From Groundwater—J.E. Dyksen, A.F. Hess III, M.J. Barnes, G.C. Cline**
 A review of aeration principles and processes and the application of pilot-test results to determine removal efficiencies and design criteria
- 4:00 5. **Removal of Inorganic Contaminants From Groundwater by Reverse Osmosis—T.J. Sorg, Martin Huxstep**
- 4:30 6. **Control of THMs and Color at Fort Lauderdale—T.P. Brodeur, J.E. Singley, Horton Wasserman, A.F. Hess III**

Thursday, May 20—Morning

28 • IMPROVING OVERSEAS OPERATION AND MAINTENANCE: DESIGN CHALLENGE (Spanish Translation)

AIDIS (Inter-American Association of Sanitary Engineers)—Room 203

Cochairmen: *E.A. Merryfield, F.W. Montanari*

- 9:00 1. **Introduction—E.A. Merryfield**
 Water facility design practices to improve operation and maintenance of overseas waterworks facilities
- 9:05 2. **Background and Brief Case Histories of Poor Design—F.W. Montanari**
- 9:10 3. **Modern Water Treatment Plant Design**
- 9:20 4. **Opportunities for Good Design for Overseas Plants—E.G. Wagner**

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- 9:30 5. **What American Practice Can Contribute to Simple Design to Enhance Good Operation and Maintenance—W.W. Aultman**
- 9:40 6. **Brazilian Practice Under PLANASA: Contribution of Good Design Toward Improved Operation and Maintenance—E.R. Yassuda**
- 10:00 7. **Panel Discussion**

29 • WATER PROJECTS FOR THE AMERICAS

Engineering and Construction Division—Room 204

Chairman: *J.E. Layne*

Vice Chairman: *C.N. Bohrer*

- 9:00 1. **Trinidad's Water Projects: Prelude to Progress—F.E. Harem, E.A. Jack**
 The problems of financing, contracting, and managing a major project in a small developing country
- 9:30 2. **Design, Construction, and Treatment of the Trap Falls Water Treatment Plant—P.W. Doe, M.L. Johnson**
- 10:00 3. **Innovative Well-Field Control—R.M. Armstrong**
- 10:30 4. **Water Supply Master Plan for Guayaquil, Ecuador: 1980-2000—D.R. Harris, C.P. Zielaskowski, Mario Semiglia**
 Comparative studies were conducted to select the most favorable water supply expansion projects

30 • RESEARCH 4

Research Division—Room 208

Cochairmen: *V.L. Snoeyink, M.C. Kavanaugh*

- 9:00 1. **Enhancement of Flocculation With Pre-Ozonation—B.M. Saunier, R.E. Selleck, R.R. Trussell**
- 9:30 2. **Particles in Drinking Water: Their Significance and Current Technology for Identification and Characterization—J.C. Hoff, R.R. Trussell**
- 10:00 3. **Changes in Particle-Size Distributions During Batch Flocculation and Sedimentation—D.F. Lawler, J.C. Kao, Wanpen Wirojanagud, Emundo Izurieta**
 Measured size distributions are compared with predictions of mathematical models for practical behavior in unit processes
- 10:30 4. **Turbidity Removal by a Coal-Aluminum Filter—A.G. Collins, R.L. Johnson**
 Turbidity removal from unconditional low alkalinity raw waters by coal-aluminum granular media filters
- 11:00 5. **Color-Turbidity Removal Domains on the Alum Coagulation Diagram—Appiah Amirtharajah, G.A. Edwards**
 A design and operation diagram for color and combined color and turbidity removal
- 11:30 6. **Cationic Polyelectrolytes As Primary Coagulants for Removing Trihalomethane Precursors—G.L. Amy, P.A. Chadik**
 Evaluation of several cationic polyelectrolytes as primary coagulants for removing trihalomethane precursors from various waters

31 • IMPROVING WATER TREATMENT PLANT OPERATION

Water Quality Division—Room 207

Chairman: *E.W. Bailey Jr.*

Vice Chairman: *H.E. Pearson*

- 9:00 1. **Process Analysis: Upgrading Existing Water Treatment While Meeting Organic Drinking Water Regulations**—*G.C. Hartman, T.D. Furman Jr., J.E. Singley, D.L. Tippin*
Upgrading existing treatment—optimized flocculation, coagulation, filter operations, pumping controls; THM control and disinfection modifications
- 9:30 2. **Trihalomethane Formation at Ann Arbor**—*R.S. Sacks*
The THM concentration in Ann Arbor, Mich., was significantly reduced using combined chlorination.
- 10:00 3. **Control of Lead-Pipe Corrosion in the Boston Metropolitan Area**—*P.C. Karalekas Jr., C.R. Ryan, F.B. Taylor*
The need for a systematic monitoring program to evaluate a corrosion control scheme
- 10:30 4. **Bacterial Regrowth in a Distribution System and Its Relationship With the Efficiency of the Water Treatment Plant for the Removal of Total Organic Carbon, Assimilable Organic Carbon, Algae, and Various Microorganisms**—*M. Rizet, F. Fiessinger, N. Cauhape*
- 11:00 5. **Large-Scale Optimization of Water Treatment Processes for Asbestos Fiber Removal**—*M.J. McGuire, A.E. Bowers, D.A. Bowers*
Significant removals of asbestos from drinking water were accomplished by large-scale optimization of treatment processes in Southern California.
- 11:30 6. **Post-Precipitation in Distribution Lines Following Water Treatment**—*J.J. Costello*
Types of precipitation in mains that could adversely affect water quality are examined

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C.A. Fitzsimmons	L.W. Hooton	Phillip Gwinnup
J.L. Cleasby	C.L. Kron	Leonard Thomas
J.H. Robinson	N.J. Burris	J.L. May
Lenard Lynch	L.F. Wolf	Paul Sumner
N. Urrutia L.	Federico Villarreal	G.F. Davalos
K.M. Squiers	J.H. Wagner Jr.	G.E. Olivier
S.T. Stephens	W.L. Marshall Jr.	J.R. Popalisky
R.L. Sanks	G.N. Mannix	D.L. Fraser
J.L. Gerlt	T. St. Onge	R.G. Seidelman Jr.
R.C. Drake	P.C. Karalekas Jr.	L.F. Peters
G.M. Haskew Jr.	F.J. Grieder	Michael Cronin
Samuel Syrotynski	J.R. Dineen	C.V. Seal Jr.
Donald Knibb	E.J. Morris	A.T. Rolan
G.L. Englund	L.T. Dittrich	William Lloyd
R.L. Powers	J.E. Moses	G.L. Hoffman
J.D. Pawley	B.L. Hodgins	B.L. Hodgins
K.G. Johnson	J.R. Meckley	J.F. Meharry
R.A. Luksa	R.F. Walker	J.B. Smith
Carlos Fernandez	N.R. Sirgado	Ventura Bengoechea
J.L. Rancourt	Normand Filiatrault	Bertrand Samson
Noel Hobbs	Sue Mikkelsen	S.H. Fonda
C.W. Kuecker	Doug Herron	Ertis Osterberg
J.A. Andrea	B.G. Turner	R.T. Tindal
B.E. Price	A.J. Hamlett Jr.	F.P. Moss Jr.
M.K. Tubbs	Bill Healer	R.G. Toler
W.J. Hunt	S.P. Tansill	H.A. Johnson
R.J. Cain	P.N. Bright	V.R. Wilford
G.D. Balacko	Calvin Johnston	Derrick Harrison
Louis Schulze	R.F. Dickinson	J.W. Schulz

Conference Committees

Technical Program Committee

A.E. Bowers, Chairman	R.A. Pavia
J.A. Cotruvo	D.B. Preston
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A.F. Hess III	W.H. Richardson
W.R. Inhoff	H.R. Shipman
J.E. Layne	B.G. Stone
J.T. Quigley	R.R. Lamson, Secretary

Conference Management Committee

Garrett Sloan, General Chairman

J.D. Buckley	J.J. Menendez
A.J. Clemente	F.E. Moore
J.T. Cowgill	Annie Sloan
C.N. Hammond	Paul Wood

Facility Tours Committee

C.N. Hammond, Chairman
F.R. Austin
Howard Fallon
Thomas Maxwell
Roger Varona

Golf & Tennis Committee

F.E. Moore, Chairman
E.F. Donnelly
J.H. Johnson

Host Committee

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Carmen Bengochea
J.T. Cowgill
Lourdes Cowgill
George Durkin
Judy Durkin
Jackie Gordon
C.N. Hammond
Emma Kafoury
Mary McAtee
Jeris Pope
C.R. Rittenhouse
Linda Rosean
C.R. Schultz
Nancy Schultz
Phillip Young
Sue Young

International Visitors

Committee

J.J. Menendez, Chairman
Damodar Airan
George Arevalo
Javier Borbolla
Ben Chen
Richard Coates
Orlando Diez
John Guidry
Manuel Lauredo
Armando Lopez
Eugene Pelaez
George Perez
George Rodriguez
Roland Santos
Plinio Villanueva
Wilson Wardwell
Nathaniel Zemel

Spouse Activities Committee

Annie Sloan, Chairwoman
Becky Black
Ginny Crowson
Judy Eidsness
Annalee Hart
Donna Haygood
Doris Holman
Olga Jones
Pat Kellermann
Phyllis Moore
Claire Stanton

Session Monitors Committee

A.J. Clemente, Chairman
Ewart Anderson
Vince Arrebola
Julie Baker
Jana Bares
Dudley Brown
Frank Davis
Frank Delgado
Steve Durocher
Ed Gancher
Pedro Hernandez
Carmen Iber
Joseph Kehoe
Harvey Kottke
Elmer Morrell
Musa Nossier

Ben Nwadike
Rick Poley
Jorge Rodriguez
Nick Rodriguez
Larry Welch

Student Activities Committee

Paul Wood, Chairman
R.G. Rice
Marister Ruiz
Melissa Rutledge

Transportation Committee

J.D. Buckley, Chairman
Ray Bailey
Tom Checca
Don McDermott
John Orsillo

AWWA Staff

Executive Director D.B. Preston
Deputy Executive Director P.A. Schulte
Deputy Executive Director—Government
Affairs J.B. Groff
Assistant to the Executive Director J.A. Wilson
Executive Secretary L.J. DeBoer
Director of Administration R.E. Uhlenburg
Data Processing Manager B.A. England
Registration Assistant E.C. Youngren
Director of Education B.D. Haskins
Technical Information Services Manager ... K.M. Keeley
Director of Marketing M.S. Abusamra
Advertising Representative C.L. Cole
Advertising Representative F.K. Holen
Director of Meetings J.A. Hookey
Exhibits Manager C.M. Potter
Meetings Coordinator S.K. Kring
Director of Public Information R.M. Spangler
Director of Technical Services R.R. Lamson
Distribution Engineer J.I. Capito
Quality Engineer F.W. Pontius
Resources Engineer G.L. Craft

AWWA Research Foundation Staff

Executive Director J.F. Manwaring
Deputy Director E.F. Spitzer
Director of Development and
Communication J.B. Mannion
Project Director M.J. Taras
Project Director J.G. DeBoer
Consultant W.N. Long
Information Specialist Linden Jeffers

Meetings of AWWA Boards, Councils, & Committees

All rooms are located in the Miami Beach Convention Center unless otherwise indicated. Times in boldface type indicate p.m. All committee meetings are open, and AWWA members are invited to observe; participation by those not members of a committee is at the discretion of the committee chairman.

ANSI A21 Cast-Iron Pipe & Fittings (A.M. Tinkey)	
Tue., 8:00-12:00	Miramar (Doral)
A21 Subcommittee 3 (P.J. McGrath Jr.)	
Sun., 4:00-6:00	Imperial 2 (Fontainebleau)
A-C Pressure Pipe (R.S. Bryant)	
Tues., 9:00-12:00	154
Accident Prevention (D.M. Hungerford)	
Wed., 9:00-12:00	156
Accounting (S.M. Massarelli)	
Tues., 8:00-12:00	Imperial 1 (Fontainebleau)
Activated Carbon (S.J. Medlar)	
Wed., 9:00-11:00	152
Automation & Instrumentation (Robert Weir)	
Sun., 1:00-5:00	Imperial 1 (Fontainebleau)
Mon., 1:30-5:00	Imperial 1 (Fontainebleau)
Backflow Preventers (E.J. Havlina)	
Mon., 2:00-5:00	154
Ball Valves (Ernest Cedroni)	
Wed., 2:00-5:00	157
Board of Directors	
Sun., 9:00-5:00	Pasteur/Lafayette (Fontainebleau)
Sun., 12:00-1:30 (Lunch)	Voltaire (Fontainebleau)
Thu., 7:30-8:30 (Breakfast)	Voltaire (Fontainebleau)
Thu., 8:30-11:00	Pasteur/Lafayette (Fontainebleau)
Butterfly Valves (F.C. Campbell)	
Mon., 1:00-3:00	Lafayette (Fontainebleau)
Carbon Dioxide (F.W. Pogge)	
Wed., 9:00-12:00	Imperial 4 (Fontainebleau)
Chlorine (K.E. Shull)	
Tue., 2:00-4:00	154
Cleaning & Lining Water Mains (G.M. Haskew Jr.)	
Sun., 11:00-1:00	Imperial 2 (Fontainebleau)
Coagulation—Research (M.C. Kavanaugh)	
Mon., 12:00-2:00	156
Coagulation & Filtration—Water Quality (C.H. Tate)	
Tue., 12:30-1:30	Imperial 5 (Fontainebleau)
Compensation (W.C. Money)	
Wed., 10:00-12:00	Board Room 417 (Eden Roc)
Concrete Pressure Pipe (Conrad Hohener Jr.)	
Wed., 9:00-12:00	Bonaparte A (Fontainebleau)
Conference Management	
Sat., May 15, 12:00-2:00	LaFayette (Fontainebleau)
Control of Water Quality in Transmission & Distribution Systems (J.J. Costello)	
Mon., 1:00-3:00	Imperial 2 (Fontainebleau)

Times in boldface indicate p.m.

All technical sessions and meetings will be held in the Miami Beach Convention Center unless otherwise indicated.

Corrosion & Stability—Research (J.F. Ferguson)	
Sun., 4:00-5:30	156
Customer Metering Practices (G.S. Lyons)	
Wed., 9:00-12:00	157
Data Processing Systems (R.H. Serafin)	
Wed., 9:00-12:00	Imperial 5 (Fontainebleau)
Disinfection of Facilities (G.W. Adrian)	
Thu., 8:30-12:00	Imperial 2 (Fontainebleau)
Disinfection—Research (J.D. Johnson)	
Tue., 12:00-1:00	154
Disinfection—Water Quality (K.E. Longley)	
Mon., 2:00-5:00	152
Distribution Division Board of Trustees	
Sat., May 15, 8:00-9:00	
Breakfast	Francine (Fontainebleau)
Sat., May 15, 9:00-1:00	Louis Philippe (Fontainebleau)
Mon., 7:00-8:30 (Breakfast with committee chairmen)	Imperial 4 (Fontainebleau)
Dual Distribution Systems (L.A. Dove)	
Tue., 2:00-4:00	Imperial 1 (Fontainebleau)
Economic Research (D.T. Lauria)	
Tue., 9:00-11:00	153
Education Division Board of Trustees	
Mon., 12:00-1:30 (Lunch)	Francine (Fontainebleau)
Emergency Planning (R.G. Jensen)	
Wed., 1:30-3:00	153
Energy Management (E.A. Persson)	
Wed., 3:00-5:00	Imperial 1 (Fontainebleau)
Engineering & Construction Division Board of Trustees	
Tue., 8:00-12:00	Louis Philippe (Fontainebleau)
Executive Committee (K.J. Miller)	
Sat., May 15, 9:00-5:00	Imperial 6 (Fontainebleau)
Sat., May 15, 12:00-1:30 (Lunch)	Imperial 4 (Fontainebleau)
Exposition (R.B. Hilbert)	
Tue., 1:00-4:00	Imperial 2 (Fontainebleau)
External Corrosion of Underground Facilities (F.O. Waters)	
Tue., 10:00-12:00	Bonaparte A (Fontainebleau)
Filtering Materials (G.S. Logsdon)	
Tue., 8:00-12:00	150
Filtration—Research (K.J. Roberts)	
Sun., 12:00-2:30	152
Finance (T.J. Blair III)	
Mon., 12:00-5:00	Imperial 4 (Fontainebleau)
Fire Hydrants (R.A. Jackson)	
Mon., 2:00-5:00	Bonaparte A (Fontainebleau)
Fire Protection (D.F. Newnham)	
Sun., 10:00-12:00	157
Flexible Tanks, Covers, & Linings for Potable Water Storage (R.L. Nichols)	
Tue., 1:00-4:00	Imperial 3 (Fontainebleau)
Fluorides (E.A. Huset)	
Wed., 2:00-4:00	156
Gate Valves & Swing Check Valves (M.C. Stout)	
Wed., 9:00-12:00	Imperial 2 (Fontainebleau)
General Policy Council	
Fri., May 14, 12:00-1:30 (Lunch)	Fontainebleau Restaurant

Fri., May 14, 1:30-5:00 Imperial 2 Fontainebleau
 Mon., 7:30-10:00 Ad Hoc Com. Madrid (Doral)
 Tue., 9:00-12:00 Ad Hoc Com. Madrid (Doral)
Grooved & Shouldered Type Joints (L.W. Weller)
 Mon., 1:30-5:00 Imperial 3 (Fontainebleau)

Incoming Directors Orientation
 Sat., May 15, 2:00-4:00 Pasteur Fontainebleau

Industrial Water (P.K. MacEwen)
 Tue., 1:00-2:30 157

Inorganics—Water Quality T.J. Sorg
 Tue., 4:00-6:00 Imperial 5 Fontainebleau

International Affairs W.W. Aultman
 Wed., 2:00-5:00 152

Iron & Aluminum Salts R.L. Sutphen
 Wed., 9:00-11:00 154

Leak Detection J.E. Pilzer
 Sun., 2:00-4:00 Imperial 4 Fontainebleau

Management Development Kay Kutchins
 Sat., May 15, 8:30-5:00 Imperial 1 Fontainebleau

Management Division Board of Trustees
 Sat., May 15, 3:00-6:00 Imperial 4 Fontainebleau
 Tue., 1:30-4:30 Imperial 6 Fontainebleau

Material Spills Hazardous to Water Supply C.H. Thompson
 Tue., 2:00-4:00 Louis Philippe Fontainebleau

Membership W.B. Jeffcoat
 Mon., 1:30-5:00 Board Room 417 Eden Roc

Metritation R.J. Baker
 Mon., 3:45-5:00 155

Organic Contaminants—Research P.V. Roberts
 Mon., 12:00-2:00 153

Organic Contaminants—Water Quality C.A. Blanck
 Wed., 9:00-12:00 Board Room 517 Eden Roc

Polyelectrolytes R.D. Letterman
 Wed., 4:00-6:00 155

Power Actuating Devices for Valves & Sluice
 Gates C.E. White
 Tue., 9:00-12:00 152

Prestressed Concrete Water Tanks F.E. Harem
 Wed., 8:00-11:00 Bonaparte B Fontainebleau

Public Information J.F. Alexander
 Tue., 10:30-12:00 Board Room 417 Eden Roc

Publications & Marketing Advisory F.F. Eunpu
 Tue., 1:30-5:00 Board Room 417 Eden Roc

Quality Control in Reservoirs A.R. Castorina
 Wed., 9:00-12:00 150

Quicklime & Hydrated Lime J.E. Singley
 Tue., 9:00-10:00 Imperial 2 Fontainebleau

Regionalization C.R. Morris
 Wed., 1:00-4:00 Louis Philippe Fontainebleau

Research Division Board of Trustees
 Mon., 8:30-12:00 Imperial 2 Fontainebleau
 Mon., 5:00-7:00 Imperial 2 Fontainebleau
 Wed., 12:00-2:00 155

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All technical sessions and meetings will be held in the Miami Beach Convention Center unless otherwise indicated

Research Foundation Board of Trustees

Fri., May 14, 8:30-5:00 Louis Philippe (Fontainebleau)
 Fri., May 14, 12:00-1:30 (Lunch) ... Francine (Fontainebleau)

Research Foundation Executive Committee

Thu., May 13, 2:00-5:00 Board Room 417 (Eden Roc)

Resources Division Board of Trustees

Tue., 12:30-6:00 (Lunch) Imperial 4 (Fontainebleau)
 Wed., 8:00-12:00 (Breakfast with committee chairmen)
 Imperial 1 (Fontainebleau)

Session Monitors Orientation

Sun., 7:30-9:00 (Breakfast) 154

Sludge Disposal

 (G.P. Westerhoff)

Mon., 2:00-4:00 157

Standard Methods

Wed., 2:00-4:00 150

Standards Council

 (J.H. Robinson)

Wed., 8:00-9:00 (Breakfast) Francine (Fontainebleau)

Wed., 9:00-12:00 Louis Philippe (Fontainebleau)

Steel Elevated Tanks, Standpipes, & Reservoirs

R.E. Vansanti

Wed., 2:00-4:00 Imperial 3 (Fontainebleau)

Steel Pipe

 (R.D. Dickson)

Mon., 2:00-4:30 150

Student Activities

 (J.K. Edzwald)

Wed., 12:00-1:30 150

Taste & Odor Control Chemicals

 (J.E. Courchene)

Mon., 1:00-2:30 Imperial 6 (Fontainebleau)

Technical Program Committee

 (A.E. Bowers)

Thu., 3:00-5:00 Imperial 5 (Fontainebleau)

Thermoplastic Pressure Pipe

 (D.L. Crowson)

Mon., 1:30-4:30 Bonaparte B (Fontainebleau)

Tue., 1:30-4:30 Bonaparte B (Fontainebleau)

Thermosetting FRP Pipe

 (J.G. Hendrickson Jr.)

Thu., 9:00-5:00 Bonaparte B (Fontainebleau)

Thermosetting FRP Tanks

 (C.R. Meek)

Wed., 10:00-12:00 153

Trace Inorganic Substances—Research

 (P.C. Singer)

Thu., 12:00-2:00 Imperial 3 (Fontainebleau)

Use of Asbestos in Utility Construction

 (J.A. Wade Jr.)

Wed., 8:00-10:00 155

WQTC Planning

Fri., May 14, 3:00-8:00 Imperial 5 (Fontainebleau)

Water Desalting

 (N.M. Cline)

Wed., 8:00-12:00 Imperial 6 (Fontainebleau)

Water Meters

 (H.E. Snider)

Tue., 9:00-12:00 Bonaparte B (Fontainebleau)

Water Quality & Treatment

 (H.E. Pearson)

Mon., 4:00-5:00 153

Water Quality Division Board of Trustees

Sat., May 15, 8:00-5:00 Imperial 2 (Fontainebleau)

Sat., May 15, 12:00-1:30 (Lunch) Imperial 5 (Fontainebleau)

Tue., 2:00-4:00 Bonaparte A (Fontainebleau)

Water Quality Goals

 (K.P. Barney)

Thu., 10:00-12:00 Imperial 5 (Fontainebleau)

Water Quality Monitoring

 (J.J. Smith Jr.)

Wed., 2:00-4:00 Imperial 6 (Fontainebleau)

Water Rates

 (R.F. Banker)

Tue., 9:00-10:30 156

Water Service Line Fittings (W.C. Ewing)	
Wed., 2:00-5:00	154
Water Softening (C.W. Reh)	
Tue., 9:00-10:30	157
Watershed Protection & Control (J.A. Roller)	
Tue., 2:00-3:00	156
Water Treatment Plant Waste Disposal (P.W. Doe)	
Mon., 8:00-10:00	153
Water Utility Council (F.S. Burba)	
Tue., 2:00-5:00	202
Wells (S.L. Zeid)	
Mon., 1:30-4:00	Voltaire Fontainebleau

Meetings of AWWA Sections

Boldface times indicates p.m.

Michigan Section Reception & Dinner	
Sun., 6:00-10:00	Mona Lisa (Eden Roc)
New England Section Lunch	
Tue., 12:00-1:30	Mona Lisa (Eden Roc)
Rocky Mountain Section Lunch	
Tue., 11:30-1:30	Roof Top Garden (Doral)

Meetings of Other Organizations

All rooms are located in the Miami Beach Convention Center unless otherwise indicated. Boldface times indicate p.m.

AAEE	
Tue., 7:15-9:15 Breakfast	Paladium (Eden Roc)
ABC	
Sun., 7:30-5:00 Executive Com.	Board Room 517 (Eden Roc)
Mon., 7:30-5:00 Executive Com.	Board Room 517 (Eden Roc)
Mon., 12:00-5:00 Membership	Mona Lisa (Eden Roc)
AEEP	
Tue., 8:00-10:00 Seminar	208
AIDIS	
Thu., 7:30-10:00 Breakfast	Roof Garden (Doral)
Thu., 3:00-5:00 AWWA/AIDIS Officers	Imperial 6 Fontainebleau
NETA	
Tue., 9:00-12:00	Regency Conference (Doral)
WWEMA	
Mon., 8:00-9:00 Exhibitors Breakfast	150
Mon., 9:00-5:00	Valencia (Doral)
Tue., 9:00-5:00	Valencia (Doral)
Wed., 9:00-5:00	Valencia (Doral)
Wed., 11:30-12:30 Reception	103B
Wed., 12:30-2:00 Lunch	102B

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Participants

Abbott, W.H. Jr.: utility supt., Ann Arbor Utilities Dept., City Hall, Box 8647, Ann Arbor, MI 48107; **3 (cochairman)**

Abplanalp, G.H.: vice pres., Havens & Emerson, 299 Market St., Saddle Brook, NJ 07662; **14 (chairman)**

Adamo, Joseph: supervisor of engr., Hoffman-Roche, Inc., Bldg. 46, 340 Kingsland St., Nutley, NJ 07110; **26-1**

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Amirtharajah, Appiah: prof., dept. of civil engr., Montana State Univ., Bozeman, MT 59715; **12-2, 30-5**

Amy, G.L.: asst. prof., dept. of civil engr. & engr. mechanics, Univ. of Arizona, Tucson, AZ 85721; **17-5, 30-6**

Anders, A.L.: vice pres., public finance dept., Morgan Guaranty Trust Co., 23 Wall St., New York, NY 10015; **S4-6**

Armstrong, R.M.: CDM/Ross, Saarinen, Bolton & Wildes, 2280 US 19 N., Suite 202, Clearwater, FL 33515; **29-3**

Aultman, W.W.: chairman of the board, J.M. Montgomery Consult Engrs., Inc., 250 N. Madison Ave., Pasadena, CA 91101; **15 (chairman), 28-5**

Bailey, E.W. Jr.: mgr., water div., Dept. of Utilities, Box 1103, Colorado Springs, CO 80132; **31 (chairman)**

Bakken, J.D.: Indianapolis Water Co., 1220 Waterway Blvd., Indianapolis, IN 46202; **10 (cochairman)**

Banerji, S.K.: prof., dept. of civil engr., Univ. of Missouri, Columbia, MO 65211; **11-6**

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Beaurivage, Robert: water supply engr., Manchester Water Works, 281 Lincoln St., Manchester, NH 03103; **6-4**

Becker, W.C.: research engr., dept. of civil & envir. engr., Clarkson College of Technology, Potsdam, NY 13676; **21-5**

Black, K.B.: dept. of civil engr., Univ. of Massachusetts, Amherst, MA 01003; **17-7**

Blair, T.J. III: president, Kelley, Gidley, Blair & Wolfe, 1260 Greenbrier St., Charleston, WV 25311; **1 (vice chairman)**

Bohrer, C.N.: consultant, Gulf Contracting, 5349 Forest Springs Dr., Dunwoody, GA 30338; **29 (vice chairman)**

Boland, J.J.: dept. of geography & envir. engr., Johns Hopkins Univ., Baltimore, MD 21218; **4-2**

Borchers, H.J. Jr.: exec. mgr., North Pennsylvania Water Authority, 200 N. Chestnut St., Lansdale, PA 19446; **27-3**

Bosch, W.B.: dir. of water utility, Public Utility Dist. of Clark County, Box 1626, Vancouver, WA 98668; **S1-9, 24-4**

Bourbigot, M.M.: engr., Compagnie Generale des Eaux, 52 Rue D'Anjou, 75008 Paris, France; **25-3**

Bowers, A.E.: water quality engr., Metropolitan Water Dist. of Southern California, 1111 Sunset Blvd., Box 54153, Los Angeles, CA 90054; **25-6, 31-5**

Bowers, D.A.: engrg. technician 3, Metropolitan Water Dist. of Southern California, 700 N. Moreno Ave., La Verne, CA 91750; **31-5**

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Brook, S.A.: sr. utilities engr., City of Gainesville Regional Utilities, Box 490, Gainesville, FL 32602. **19-1**

Buchanan, T.J.: asst. ch. hydrologist, US Geological Survey, 1834 St. Boniface St., Vienna, VA 22180. **5 (cochairman)**

Burba, F.S.: president, Louisville Water Co., 435 S. 3rd St., Louisville, KY 40202. **22 (chairman), 22-2**

Burke, C.A.: president, Burke & Assoc., Inc., 14291 E. 4th Ave., Suite 270, Aurora, CO 80011. **S1-10**

Butrico, F.A.: ch. div. of envir. health protection, Pan American Health Organization, 525 23rd St. NW, Washington, DC 20037. **S5-4**

Cagle, L.L.: Fibercast Co., Box 968, Sand Springs, OK 74063. **16-5**

Cairo, P.R.: mgr., research & development, Philadelphia Water Dept. 1270 Municipal Services Bldg., Philadelphia, PA 19107. **25 (cochairman)**

Calabrese, E.J.: assoc. prof., envir. health program, Univ. of Massachusetts, Amherst, MA 01003. **S6-3**

Carrillo, J.M.: president, AIDIS, Apartado de Correos, Caracas 1010, Venezuela. **S5 (moderator); 1-6**

Cauhape, N.: Laboratoire Central, Societe Lyonnaise des Eaux & de l'Eclairage, 38 Rue de President Wilson, 78230 Le Pecq, France. **31-4**

Chadik, P.A.: graduate student, dept. of civil engrg. & engrg. mechanics, Univ. of Arizona, Tucson, AZ 85721. **17-5, 30-6**

Chiaraluce, M.T.: vice pres. & secy., New Haven Water Co., 90 Sargent Dr., New Haven, CT 06511. **13 (cochairman)**

Chopra, O.P.: sr. envir. engr., envir. programs group, real estate & construction div., IBM, 540 White Plains Rd., Room E323, Tarrytown, NY 10591. **26-3**

Christian, R.R.: assoc. prof., biology dept., East Carolina Univ., Greenville, NC 27834. **25-4**

Christman, R.F.: prof. & chairman, dept. of envir. sciences & engrg., Univ. of North Carolina, Chapel Hill, NC 27514. **S6-1**

Clark, R.M.: ch., economic analysis activities, drinking water research div., USEPA, 26 W. St. Clair St., Cincinnati, OH 45268. **S1-5, S1-7, 4-4**

Cleasby, J.L.: prof., dept. of civil engrg., Iowa State Univ., 492 Town Engrg. Bldg., Ames, IA 50011. **12 (chairman)**

Cline, G.C.: engr., Malcolm Pirnie, Inc., 100 Eisenhower Dr., Paramus, NJ 07652. **12-1, 27-4**

Cline, N.M.: Orange County Water Dist., 10500 Ellis Ave., Box 8300, Fountain Valley, CA 92708. **10 (cochairman)**

Cohen, Arthur: mgr., standards & safety engrg., Copper Development Assn., Inc., 405 Lexington Ave., New York, NY 10174. **S3-6**

Collerain, E.R.: dir., Dept. of Water & Sewerage, 1234 Texas Ave., Shreveport, LA 71130. **17-1**

Collins, A.G.: instructor, dept. of civil engrg., Lehigh Univ., Fritz Engrg. Lab. 13, Bethlehem, PA 18015. **30-4**

Cooper, W.J.: assoc. prof., drinking water research center, Florida International Univ., Miami, FL 33199. **17-2, 25-1**

Cordero, Orlan: exec. president, Inst. Costarricense de Acueductos y Alcantarillados, Apt. Postal 5120, San Jose, Costa Rica. **S5-3**

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