



FLORIDA
ASSOCIATION
for
WATER
QUALITY
CONTROL

June 3, 1989

Dear Attendees:

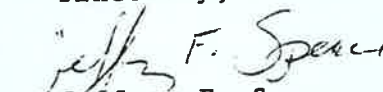
I would like to welcome you and thank you for being a participant in the 12th Annual Conference of the Florida Association for Water Quality Control. Once again, I believe that the FAWQC has pulled together an excellent technical program presented by extremely knowledgeable experts in the rapidly progressing field of water quality. This can be a great learning experience.

Just as important as the technical session is the interaction outside the formal setting. I encourage you to take advantage of the beautiful facilities, relax and become better acquainted with your fellow professionals.

Many people have contributed much time and effort in putting this conference together. Special appreciation goes to Pat O'Donnell and Dave Newport of Florida Environments for their support.

I would also urge you to become more involved in the FAWQC. Let me know if you are interested.

Sincerely,


Jeffrey F. Spence
Chairman

sac

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I. TECHNICAL PROGRAM AND MEETING AGENDA

FLORIDA ASSOCIATION FOR WATER QUALITY CONTROL
JUNE 4, 5, 6, 1989 TECHNICAL PROGRAM AND MEETING AGENDA

Sunday, June 4

8:00 am - 4:00 pm	Vendor Registration and Set-Up
12:15 am	Golf Tournament
12:45 am	Tennis Tournament
4:30 pm - 6:30 pm	Registration
6:00 pm - 7:30 pm	Opening Cocktail Social

Monday, June 5

7:15 am - 8:00 am	Continental Breakfast
7:15 am - 10:30 am	Registration
8:00 am - 8:15 am	Welcome by FAWQC Chairman Jeffrey Spence, Polk County Water Resources

SESSION I - SURFACE WATER

Moderator: Dave Newport, Florida Environments

8:15 am - 8:45 am	An Overview of Storm Water Regulations	Eric Livingston, FDER
8:45 am - 9:15 am	Phosphorous Removal from Dairy Waste: A Pilot Study	Ray Hanson, Briley, Wild & Associates Kim O'Dell, South Florida WMD
9:15 am - 9:45 am	SENIC, Criminal Prosecution of Environmental Polluters	Vinny Cassidy, City of Jacksonville
9:45 am - 10:15 am	Break	
10:15 am - 10:45 am	Mitigation Madness: Who to Contact & What to Ask	Frank Matthews, Hopping, Boyd, Green & Sams
10:45 am - 11:15 am	Citrus Packing House Wastewater Pretreatment: A Case of Less is Better	David Bouck, Boyle Engineering
11:15 am - 11:45 am	Modeling the Hydrologic Impacts of Phosphate Mining and Reclamation in Florida	Rick Powers, Bromwell and Carrier, Inc.
12:00 pm - 1:30 pm	Luncheon - Keynote Speaker Mr. Al Smith, Assistant Division Director for Water Management, U.S. EPA	

SESSION II - GROUND WATER

Moderator: Phillip Davis, Schreuder & Davis

2:00 pm - 2:30 pm	The Ambient Ground Water Monitoring Program in Florida	Rick Copeland, FDER
2:30 pm - 3:00 pm	UST Management in South Florida: A Case Study	Cynthia Barbeau, Malcolm Pirnie, Inc.
3:00 pm - 3:30 pm	Practical Considerations in the Design & Implementation of Ground Water Remediation Systems	David Rogers, Blasland, Bouck & Lee
3:30 pm - 4:00 pm	Break	
4:00 pm - 4:30 pm	Case Studies of Preliminary Contamination Assessments Using an Insitu Ground Water Sampler and Mobile Laboratory Gas Chromatograph	Doug Grant, Geraghty & Miller, Inc.
4:30 pm - 5:00 pm	Potential for Dilution of Contamination by Flow Through Braided Caverns in the Floridian Aquifers	William Wilson, Karst Environmental Services
1:30 pm - 4:30 pm	SHORT COURSE - Stormwater Permitting	Registrants Only - Runs Concurrently with Session II
6:00 pm - 7:00 pm	Cocktail Hour	
7:00 pm	Banquet	

Tuesday, June 6

Special Session: Environmental Audits
Moderator: Mike Gurr, Gurr & Associates

8:30 am - 9:00 am	Proposed Federal Legislation to Clarify the Scope of Phase I Environmental Audits	James Mauch, Environmental Audits, Inc.
9:00 am - 9:30 am	Fundamental Issues & Information Management Difficulties with Large Industrial Environmental Audits	John Bunch, Gurr & Associates
9:30 am - 10:00 am	Legal & Administrative Perspectives of Environmental Audits	Thomas Patka, Holland & Knight
10:00 am - 10:30 am	Break	
10:30 am - 11:00 am	Banking & Real Estate Requirements for Environmental Audits	John Hogan, S.E. Bank of Naples
11:00 am - 11:45 am	Panel Discussion	
11:45 am - 12:00 pm	Concluding Statements	Rick Powers, Bromwell & Carrier, Inc.

II. TECHNICAL SPEAKERS

FLORIDA ASSOCIATION FOR WATER QUALITY CONTROL

GUEST SPEAKERS

Eric Livingston
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AN OVERVIEW OF STORMWATER MANAGEMENT REGULATIONS

By: Mr. Eric Livingston, Environmental Administrator
Florida Department of Environmental Regulation

This presentation covers some of the basic principles of stormwater management and their relevancy in what is becoming a major topic of interest statewide: comprehensive watershed management. Subjects range from specific stormwater best management practices to the role of local governments in stormwater management planning. The predominant pollutants found in stormwater runoff and their sources are discussed. Insights into Florida's statewide regulatory program are also provided.

Mr. Livingston has been the Environmental Administrator for the Stormwater/Nonpoint Source Management Section of the Florida Department of Environmental Regulation since 1983. His present responsibilities include:

- * Developing policy and directing implementation of the state Stormwater Rule.
- * Coordination with WMD's and local governments of stormwater permitting/enforcement.
- * Coordination of technical assistance programs for local governments.

Prior to this Mr. Livingston was an Environmental Specialist with the Nonpoint Section. Mr. Livingston received his B.S. in Biology from Florida State University and his M.S. in Biology from the University of Alabama.

MITIGATION MADNESS: Do You Know Who to Call and What to Ask

By: Mr. Frank Matthews, Hopping, Boyd, Green & Sams

The mitigation business is booming. Mitigation is most commonly encountered when processing state and federal dredge and fill permit applications and management and storage of surface waters construction applications. Mitigation is also increasingly requested in the development of regional impact (DRI) process by local governments, regional planning councils, and the Department of Community Affairs, and by the Department of Natural Resources and Board of Trustees of the Internal Improvement Trust Fund dealing with the use of state lands.

The best advice regarding mitigation for the regulated interests is "avoid it." The Department of Environmental Regulation (DER) and U.S. Army Corp of Engineers (COE) regulations both establish a marked preference for project modification that avoids or minimizes wetland disturbance. See Rule 17-12.300, et seq., Florida Administrative Code, and 33 CFR S 320.4(r). If wetland alteration cannot be eliminated via project modifications, then a thorough mitigation analysis should be performed in anticipation of regulatory requests. From the state perspective, your mitigation objection is to render the application permittable pursuant to the public interest factors listed in Section 403.918(2) (a)1.-7., Florida Statutes. The COE almost always (never say "always" in the permitting game) follows the state's lead with respect to mitigation unless the U.S. Fish and Wildlife Service (FWS) is extremely active due to impact as to endangered or threatened species. The COE considers compensatory mitigation to mean "compensating for the impact by replacing or providing substitute resources or environments." 40 CFR S 1508.20(e).

Most wetland mitigation negotiations start with the water management district or DER, then proceed to the COE, Environmental Protection Agency, FWS and local government level. Type-for-type, on site, 1.5 acre to 1 acre or better of tried and true created wetlands is a likely starting point. I recommend a variety of low maintenance mitigation measures that require little, if any, earth-moving. Getting the elevation and substrate correct are the two primary ingredients to success, but creativity and imagination should be encouraged. Mitigation is much more an art than a science.

Mr. Matthews was born in Troy, New York, January 5, 1956; admitted to Florida Bar, 1981; admitted to New York Bar, 1983. He was educated at the University of Rochester (B.A., 1978) and the University of Miami School of Law (J.D., 1981). Mr. Matthews is specifically designated under the Florida Bar designation program in Administrative and Governmental Law and Environmental Law. He worked with Wade Hopping on the Warren S. Henderson Wetlands Protection Act during the 1984 legislative session. Mr. Matthews has been extensively involved in dredge and fill permitting and litigation for over five years with the Tallahassee law firm of Hopping Boyd Green & Sams, representing such interests as Hollywood, Inc., Amelia Island Plantation, Florida Electric Power Coordinating Group (FGC), Florida Mining and Materials Corp., E.I. du Pont de Nemours & Company, Gainesville Regional Airport, Orlando-Orange County Expressway Authority, Lake Worth Drainage District, and others.

CITRUS PACKING HOUSE WASTEWATER PRETREATMENT

A Case of "Less is Better"

By: David W. Bouck, P.E., Boyle Engineering Corporation

and

Robert H. Blair, General Manager, Mount Dora Growers Association

In mid-1988, various regulatory enforcement actions left Mount Dora Growers Cooperative, a fresh fruit packinghouse, without means of wastewater disposal. Due to treatment plant operating difficulties, the City of Mount Dora issued the Cooperative a "Cease Discharge" to stop fruit wash water from entering the City's sewerage system. To continue operation, the Cooperative temporarily disposed of wash water through land application on packinghouse property -- and was subsequently cited for land application of untreated wastewater, a potential pollutant to the ground water.

Working with jurisdictional agencies, Boyle Engineering Corporation secured an FDER Temporary Operation Permit for the land application system until methods could be implemented to allow for re-connection to the City sewer system. During the citrus off-season, Boyle designed a pretreatment settling tank, using an existing tank and other materials owned by the Cooperative (as much as possible). This gravity settling system reduces suspended pollutants and disposes accumulated sludge to a septic tank and drainfield.

Reductions in suspended solids and biochemical oxygen demand range from 50 to 70% and have required minimal investment. With a design and construction period of four months, the project schedule was truly "fast track".

Mr. Bouck is the Manager of the Environmental Engineering Office of the Boyle Engineering Corporation, Orlando Regional Office. He is a registered Professional Engineer in Florida and several other states and has 17 years consulting engineering experience with emphasis on water supply and water pollution control. Mr. Bouck has a B.S. in Civil Engineering and a M.S. in Environmental Engineering. In addition, Mr. Bouck is a member of numerous professional and technical sections (FPCA, SPCF, ASCE, AWWA, and FES).

MODELING THE HYDROLOGIC IMPACT OF PHOSPHATE MINING

AND RECLAMATION IN FLORIDA

By: Richard M. Powers, Bromwell & Carrier, Inc.

and

Phillip R. Davis, Schreuder & Davis, Inc.

and

Dr. Mark Ross, University of South Florida

In May of 1988, the Florida Institute of Phosphate Research (FIPR) funded a four-year research project to develop a computer model which would accurately predict the hydrologic impact of phosphate mining upon surface and ground water systems. The research project is directed by a committee consisting of the consultant, Bromwell & Carrier, Inc., FIPR, FDNR, FDER, SWFWMD, USGS, USSCS, FFWFGC, and the phosphate mining industry. The goal of the research project is to develop a user friendly, interactive hydrologic model which will serve as the standard for future hydrology permitting efforts between the phosphate mining industry and local and state regulatory agencies.

The core of the hydrologic model will be a highly analytical geographic information system (GIS). Selection of the appropriate GIS is critical to the success of the hydrologic modeling project as it will function as a central database and data exchange medium for the surface and ground water models. The interactive GIS/hydrologic model utilize EPA's Hydrology Simulation Program - Fortran (HSPF) surface water model and the McDonald-Harbaugh ground water model (MODFLOW) as the basis for hydrologic analysis.

Mr. Rick Powers is a Senior Vice President of Bromwell & Carrier, Inc., a geotechnical/environmental engineering firm in Lakeland, Florida. He received his B.A. in Geology from Boston University in 1974. Past work experience includes Century Geophysical Corporation, Mullen Engineering and the Tennessee Valley Authority. Mr. Powers' responsibilities at Bromwell & Carrier, Inc. center on geological, geohydrological and engineering projects. He has extensive experience in phosphate mining, waste disposal, and land reclamation. Mr. Powers holds certification as a Certified Professional Geological Scientist (CPGS).

THE AMBIENT GROUND WATER QUALITY MONITORING PROGRAM OF FLORIDA

By: Rick Copeland, Administrator, Florida Department of
Environmental Regulation

In 1983 the Florida Legislature passed the Water Quality Assurance Act, a portion of which required the Department of Environmental Regulation (DER) to establish a statewide Ambient Ground Water Quality Monitoring Network. The two primary goals of the Ambient Program are to: (1) establish baseline ground water quality and (2) detect and predict changes in the quality of ground water resulting from the effects of potential contamination sources.

The Ambient Network actually consists of two subnetworks; (1) the Background Network, designed to aid in defining background water quality and (2) the VISA (Very Intense Study Area) Network, designed to monitor the combined effects of land use and hydrogeology on ground water quality. Data generated from the program will be statistically analyzed in order to establish baseline and background water quality and to predict future changes to it. This information should be helpful in land use and zoning decisions and as an aid in monitoring DER permitted facilities.

Mr. Rick Copeland received his B.S. and M.S. in geology at the University of Florida. For over eight years he was employed as a hydrogeologist with the Suwannee River Water Management District in monitoring networks and the evaluation of data generated from the networks. He is currently the Administrator of the Ambient Ground Water Quality Monitoring Program for the Florida Department of Environmental Regulation in Tallahassee.

UNDERGROUND STORAGE TANK MANAGEMENT IN SOUTH FLORIDA

A CASE STUDY

By: Cynthia I. Barbeau, Malcolm Pirnie, Inc.

Broward County is unique in that there are two strict laws in place which regulate the tank storage of fuel oil: The Wellfield Protection Ordinance and the Broward County Storage Tank Law. Both laws relate to an ongoing project that Malcolm Pirnie is currently engaged in with the Broward County School Board. The Broward County School Board is comprised of over 100 schools, with each school having at least one or more underground fuel storage tank. This paper will discuss the available remedial measures to be undertaken for the tanks found to be leaking and has both laws apply to the remediation efforts. Additionally, the modifications for the existing tanks will be discussed.

Ms. Barbeau is a 1983 graduate of the Florida Institute of Technology with a B.S. in Environmental Engineering. She has significant experience in conducting environmental risk assessment surveys for industry, and in the review and enforcement of laws pertaining to hazardous waste management and the Clean Water Act. She has conducted investigations, acted as liaison on the Federal and State Governmental levels, and provided consulting services to the Environmental Protection Agency. Ms. Barbeau has been responsible for engineering and consulting work pertaining to hazardous waste management, including compliance audits and underground storage tank programs for the past six years.

She is currently employed by Malcolm Pirnie, Inc., and her responsibilities include providing technical assistance for underground and aboveground storage tank registrations and remedial actions, providing technical assistance in the preparation and evaluation of RCRA closure plans for industrial clients, evaluating technical documents concerning federal, state and local regulations and requirements as they relate to the Clean Water Act, RCRA, TSCA and the Clean Air Act and conducting environmental audits for industrial clients, with regard to property transfer acquisitions.

PRACTICAL CONSIDERATIONS IN THE DESIGN AND IMPLEMENTATION
OF GROUND WATER REMEDIATION SYSTEMS

By: David Rogers, P.G., Blasland, Bouck and Lee
and

Kurt D. Gildemeister, Cherokee Petroleum Equipment, Inc.

Ground water remediation systems are often designed without the benefit of pertinent data on water quality and aquifer characteristics. Appropriate aquifer testing prior to the design and implementation of such systems is necessary to properly fashion both pumping and re-infiltration systems on a site specific basis. By utilizing preliminary data collected from recovery wells and interceptor trenches, a cost effective approach may be taken prior to the installation of costly remediation equipment.

During pumping tests, water quality samples should be collected to provide accurate values necessary to (1) properly design the treatment system, (2) predict fouling of aeration tower packing and (3) evaluate long-term exfiltration gallery performance. The vertical position of the pump can be changed during pumping to detect discrete zones of contamination. Therefore, influent water quality can be determined at varying depths to enhance treatment efficiencies.

Portable treatment systems can be used to treat discharge waters during the pumping test and provide pre-design pilot study data. A typical pilot study includes an evaluation of actual removal efficiencies under a variety of operating conditions. These conditions include experimentation with various air to water ratios, packing depths, packing geometries, water distribution systems and other treatment system parameters.

The data obtained during pre-design testing is used to tailor ground water remediation systems to site-specific conditions. Systems can be designed for expected ranges of flows as well as contaminant concentration levels while providing the flexibility for fine tuning. Prior planning and data evaluation can allow for economic evaluations of long-term maintenance requirements, and thereby reduce associated long-term remediation costs

ON-SITE PLUME DELINEATION OF PURGEABLE ORGANIC CONSTITUENTS

UTILIZING A GROUND WATER SAMPLING PROBE

AND A MOBILE GC LABORATORY

By: Mr. Douglas Grant, Senior Scientist
Geraghty & Miller, Inc.

The U.S. Environmental Protection Agency (EPA) has recognized the need for on-site analysis of samples. The turnaround time for EPA samples submitted to CLP Laboratories is approximately four months. By solely relying on these laboratories for sample analysis, the EPA is behind schedule in evaluating sites to determine if they should be included on the National Priority List.

The new EPA site-evaluation concept is to bring the laboratory to the field. The EPA has organized programs to encourage the development of analytical instrumentation and methods to conduct on-site analysis of samples and generated quantitative data.

Geraghty & Miller's program to expedite the evaluation of sites impacted by purgeable organic constituents is the collection of ground water samples with a sampling probe on-site analysis with a HNU Model 321 fieldable gas chromatograph. Site applications include the collection of ground water samples from depth as great as 90 feet below land surface without installing monitor wells and completing the analysis of the samples within hours of collection. Notable benefits of this technique include reducing the time required to fully define the horizontal and vertical extent of a plume from months to weeks and significant cost savings during the contamination assessment phase of site evaluations.

Mr. Grant is a Senior Scientist with Geraghty & Miller, Inc. His field of specialization include:

- Project manager and supervisor for investigations and evaluations of ground water contamination incidents
- Manager for soil and water quality sampling activities
- Preparation of Contamination Assessment and Remedial Action Plans
- Preparation of reports proposing ground water monitoring networks

Prior to joining Geraghty & Miller, Mr. Grant was employed by the New Jersey Department of Environmental Protection, Division of Water Resources. He has a B.S. in Environmental Science from the Florida Institute of Technology and a M.S. in Pollution Control from the Pennsylvania State University.

POTENTIAL FOR DILUTION OF CONTAMINATION
BY FLOW THROUGH BRAIDED CAVERNS IN THE FLORIDA AQUIFER

By: Mr. William L. Wilson and Mr. Wesley E. Skiles,
Karst Environmental Services

Cavernous aquifers are commonly cited as archtypical examples of ground water sources that are subject to contamination because the cavernous flow paths convey water rapidly with little dilution. Pollution is most likely in cavernous aquifers where the conduits are arranged in an ordered, dendritic network and the aquifer is recharged through sinking streams that are well connected to the conduit system; thus supplying unfiltered, low-quality stormwater. The Floridan Aquifer is the largest, most heavily exploited cavernous aquifer in North America because of its great transmissivity and high quality water. The desirable character of water in the Florida Aquifer is the result of diffuse recharge through overlying clastic sediment, which filters the recharge, and the dominantly braided, highly interconnected phreatic conduit systems, which serve to disperse and rapidly dilute in-flowing contaminants. The inter-connected caves and smaller dissolution channels (spongework) function as a "probabilistic" space rather than a "deterministic" ordered network, so flow is commonly dispersed in the downstream direction, even a few hundred meters upstream from spring outlets. The magnitude of the dilution capacity was measured by quantitative dye traces performed near Ginnie Springs, Gilchrist County, Florida. Rhodamine WT was injected into cavities, through four wells and passed 400 to 1200 miles northeast, north and northwest to several springs along the Santa Fe River. The dye was consistently detected at more than one spring, and the dye curves had multiple pulses indicating flow through braided passages. The dye pulses were diluted to 1/10th of the initial concentration after 300 miles of flow, 1/100th after 600 miles, and 1/1,000 after 900 miles, thus demonsrtrating the enormous capacity of the Floridan Aquifer to dilute water soluble chemicals by flow through interconnected caverns. The ability of the Florida Aquifer to dilute pollution probaly makes it the safest source of karst ground water in the United States.

Mr. William L. Wilson received his B.S. in geology from Indiana University in 1976. He worked in the coal industry as an exploration and mine development geologist until 1983. He attended Indiana State University where he did his thesis on karst hydrogeology and received his M.A. in 1985. After graduation he joined the Florida Sinkhole Research Institute, at the University of Central Florida where he is employed as a research geologist in karst hydrogeology. At present he is also working part-time for Karst Environmental Services, High Springs, Florida, and is involved in the development of karst ground water resources, both in Florida and abroad. Over the last 15 years, Mr. Wilson has conducted geologic studies of cavernous flow paths in Kentucky, Indiana, Florida, New Mexico, the Yucatan Peninsula, and China.

PROPOSED LEGISLATION TO CLARIFY THE SCOPE OF PHASE I

ENVIRONMENTAL AUDITS

By: Mr. James C. Mauch, ESQ, Environmental Audit, Inc.

In 1980, the Superfund Act threw a scare into the commercial real estate by imposing strict, joint and several liability upon parties to real estate transactions for the cleanup costs of contamination. Since Congress allocated to the Superfund Program only six percent of the estimated cost of cleaning up known hazardous waste sites, EPA has placed great emphasis on the pursuit of liable parties to recover cleanup costs. Primary targets for EPA's cost recovery campaign are current owners or operators of contaminated real estate, as well as lenders who have been held liable parties to recover cleanup costs. Primary targets for EPA's cost recovery campaign are current owners or operators of contaminated real estate, as well as lenders who have been held liable based on expansive interpretations of the Superfund Act by the courts.

In 1986, the SARA Amendments to Superfund added the Innocent Landowner Defense which was intended to provide a narrow exemption from strict liability for purchasers who conduct an investigation of the property prior to acquisition. As currently enacted, the Innocent Landowner Defense defines the scope of investigation as "all appropriate inquiry into the previous ownership and uses of the property consistent with good commercial or customary practice in an effort to minimize liability." The problem, however, is that no one in the real estate or environmental consulting industries have been able to state with certainty what is meant by "all appropriate inquiry."

Legislation entitled "The Innocent Landowner Defense Amendment of 1989" has been drafted by Congressman Curt Weldon, R-Pa., with the technical assistance of attorneys at Environmental Audit, Inc., a Pennsylvania based consulting firm. The Bill would amend the Innocent Landowner Defense by clarifying what is required by "all appropriate inquiry into the previous ownership and uses of the property." In addition, the Bill would create a rebuttable presumption that a purchaser who follows the guidelines has satisfied the requirements of the Defense.

Mr. Mauch is an attorney and director of Marketing for Environmental Audit, Inc. EAI is an environmental consulting firm created in 1985 to provide commercial lenders, developers and real estate investors with consultation and guidance regarding environmental liability in real estate transactions. Prior to joining EAI in 1986, Mr. Mauch was in private practice for five years with a large mid-west firm based in Louisville, Kentucky. His practice was in commercial litigation and focused in part on environmental and mineral rights issues affecting land use transactions.

FUNDAMENTAL ISSUES AND INFORMATION MANAGEMENT DIFFICULTIES

WITH LARGE INDUSTRIAL ENVIRONMENTAL AUDITS

By: Mr. John P. Bunch and Mr. Michael A. Graves,
Gurr and Associates, Inc.

Information accumulating from large industrial environmental audits can quickly generate a multiplicity of issues and complex management problems that must be dealt with by the audit manager. This paper discusses some of the major issues typical of a large audit and how a manager must be prepared by organized and interact with other members of the project team. Examples are presented of audit organization structures, staffing, data management and some procedures for resolving difficult issues within the context of the audit objectives.

Mr. Bunch is Executive Vice President with Gurr & Associates, Inc., a Florida based environmental consulting firm located in Lakeland. Following graduation from Marshall University with a Bachelor of Science degree in geology, he spent the next 14 years in minerals development and environmental permitting. Since 1979 he has worked as a consultant specializing in mineral resource development and environmental management. As an active participant in environmental auditing, he has organized and managed a variety of audit projects ranging in size from properties of less than one acre to multi-million dollar property transactions.

Mr. Graves is a senior consultant with Gurr & Associates, Inc. at the firm's Lakeland office. He holds both a Bachelor of Science and a Master's degree in geology from the University of Florida. Since graduation he has worked in consulting in the areas of mineral resource development and hydrogeology. He currently heads the Water Resource Department at Gurr & Associates, Inc. and actively participates in environmental auditing and environmental risk assessments.

Mr. Graves is a licensed professional geologist in Florida and a member of the American Institute of Professional Geologists.

III. KEYNOTE SPEAKER AND MODERATORS

FLORIDA ASSOCIATION FOR WATER QUALITY CONTROL

KEYNOTE SPEAKER

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IV. SHORT COURSE

1989 FAWQC SHORT COURSE

STORMWATER PERMITTING

Short Course Chairman/Moderator

Mr. Nicholas Lago, E.I.T.
Chemical Engineer
Geraghty & Miller Consulting Engineers, Inc.
P.O. Box 270573
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Part I: "The Principles of Stormwater Management"

Speaker: Mr. Eric Livingston
Environmental Administrator
Stormwater/Nonpoint Source Management Section
Florida Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL

This section will focus on the major stormwater management design principles and best management practices. Specific stormwater management topics to be discussed include:

- * Stormwater Management and Permitting
- * Principles of Stormwater Management
- * State Perspective on Water Quality Criteria
- * Stormwater Management Design;
 - stormwater detention basins
 - exfiltration trenches
 - swales
 - porous pavement
 - retention basins

Part II: "Industrial Effluent Toxicity Reduction"

Speaker: Mr. J. Fred Heitman
Senior Project Manager
11260 Roger Bacon Drive
Reston, Virginia 22090
(703) 471-5550

This section will focus on effluent toxicity testing basis, toxicity testing methodology, and toxicity reduction methodology.

The U.S. Environmental Protection Agency is now requiring, as part of NPDES permits, whole effluent toxicity testing. This testing requires that different types of aquatic organisms be exposed to varying concentrations of contaminants in the effluent. This toxicity testing is designed to measure the impact that the effluent has on receiving water biota. During the preservation, acute and chronic testing methods will be discussed to familiarize the participants with testing protocol and requirements. If toxicity is found, then the EPA requires that the permittee eliminate or reduce toxicity to acceptable levels.

Toxicity Reduction Evaluation (TRE) protocol developed for industry and municipalities for toxicity reduction will be discussed including a TRE case study.

V. EXPO

EXPO 1989

A special thanks to the continued interest and support of our vendors exhibiting in the Expo. The vendors are very instrumental in the success of our Annual Conference.

Our exhibitors this year are represented by a variety of environmental firms specializing in laboratory services, consulting, instrumentation, and remediation.

Vendors are available throughout the Conference to present and discuss each of their areas of expertise. Please take a minute during the Conference to visit with each of the vendors.

Vendors, our thanks to you again. Your support is greatly appreciated by the Directors, Officers, and members of the Florida Association for Water Quality Control.

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VI. SCIENCE FAIR AWARDS

SCIENCE FAIR AWARDS

A very rewarding exercise the FAWQC has under taken over the past few years has been our involvement in the Florida State Science and Engineering Fair. The Association awards cash prizes to two students who have demonstrated outstanding effort in water quality research. Two FAWQC Board Members attended the 1989 State Science and Engineering Fair in West Palm Beach in April. Literally hundreds of projects were reviewed. A \$500.00 Senior Level cash award and a \$250.00 Junior Level award were presented. Once again these were the largest cash awards presented at the Fair. In addition to the cash award, the Senior Winner, Ms. Tamera S. Dew and her family have been invited as our guests, to the Annual Conference.

SENIOR WINNER

Tamera S. Dew
South Sumter High School
Bushnell, Florida

JUNIOR WINNER

Ricardo Alvarez
Crystal River Middle School
Crystal River, Florida

These awards would not have been possible without the assistance of the FAWQC Corporate Sponsors.

Florida Foundation for Future Scientists

_____ DR. ELIZABETH F. ABBOTT, Director _____

111 Norman Hall • University of Florida • Gainesville, Florida 32611 • (904)392-2310 • SUNCOM 622-2310

April 24, 1989

MAY 9 1989

Mr. Jeffrey F. Spence
Chairman
FL Assoc for Water Quality Cntrl
PO Box 798
Bartow, FL 33830

Dear Mr. Spence:

Thank you for the generous donation of Special Awards from you and the Florida Association for Water Quality Control (FAWQC) to the 34th Annual State Science and Engineering Fair (SSEF) of Florida. Your beneficence is appreciated by all involved in the SSEF.

This year's event was quite a success. There were a total of 863 projects displayed and there were several exceptional exhibits in all the represented categories. Special Awards are an excellent way of recognizing and rewarding aspiring young scientists for their hard work and dedication.

Below is a listing of the winners of your awards. For more specific information about these students and their projects, please use the 1989 SSEF Program Book which is enclosed with this letter. Each winner's abstract is also enclosed for your information and enjoyment.

\$500 Cash Award & Conf Trip	813	Dew, Tamera S.
\$250 Cash Award	851	Alvarez, Ricardo

Once again, please accept our greatest appreciation for your outstanding contributions to science education.

Sincerely,



Elizabeth F. Abbott
Director
Florida Foundation for Future Scientists

EFA:jsj

Enclosure: Winners' Abstracts

ABSTRACT

Big Springs

WHAT IS THE ENVIRONMENTAL SIGNIFICANCE OF BACTERIA IN THE WITHLACOOCHEE RIVER SYSTEM?
Dew, Tamera

P. O. Box 1081, Bushnell, FL 33513
South Sumter High School
700 N. Main Street, Bushnell, FL 33513
Mr. Richard Petty, South Sumter High School

Water is the basis for all life and plays the most significant role in determining the quality of the environment. In hopes of helping improve environmental quality, I have conducted four years of experiments on the Withlacoochee River and its tributaries. I have tested periphyton growth, light penetration, specific conductance and bacteria in the Withlacoochee River System.

The purpose of this project is to determine the environmental significance of bacteria in the Withlacoochee River System. My hypothesis states that harmful bacteria exist in the Withlacoochee River System.

My experimentation region extended along a 120 mile reach of the Withlacoochee River from the Green Swamp to its outlet at the Gulf of Mexico and consisted of nineteen (19) different testing sites. There were sixteen (16) sites on the Withlacoochee River, two (2) sites on the Rainbow River and one (1) on the Lake Panasoffkee outlet canal. At each site water samples were collected and tested for total coliform, fecal coliform and fecal streptococcus. In an attempt to identify some variables that affect bacteria growth, I measured temperature at all sites and conductance at selected sites. I compared these readings and discharge measurements from the U. S. Geological Survey to total coliform, fecal coliform and fecal streptococcus counts resulting from my experimentation.

I calculated the fecal coliform to fecal streptococcus ratio at each site. This ratio distinguished the type of contamination. It is strongly suspected that the Dunnellon wastewater treatment plant negatively impacts upon the Withlacoochee River System. The fecal coliform to fecal streptococcus ratio at one site downstream from the effluent discharge was 11.79. This high ratio indicated human feces contamination. The plant is out-of-date but under mandates to upgrade the system by April 19, 1990.

Due to highly significant t test values, I can currently accept the hypothesis: Harmful bacteria exist in the Withlacoochee River System.

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Standard Methods for the Examination of Water and Wastewater. 14th ed. Washington, D.C.: American Public Health Association, 1976.
"Water Quality Technology Conference." American Waterworks Association Journal, Vol. 79, Number 9, (September, 1987).

ABSTRACT

GROUNDWATER POLLUTION

Alvarez, Ricardo

P.O. Box 1882, Dunnellon, Florida 32630

Crystal River Middle School, 703 NE 3rd Ave., Crystal River, FL

Mr. William Farrell, Crystal River Middle School

My purpose was to find what role if any geological structure plays in groundwater contamination.

My hypothesis is "Geological structure is a factor to be considered in groundwater contamination".

I used EPA's drastic methodology. Instead of doing all of the drastic I cut it down to three, Depth of water, Soil Media, and Aquifer Media. I also made a prediction model. I took the best of my results and experimented. I did this also with my worst results. I wanted to see if my prediction was right. The best results would be a better filtering system next to the worst.

The procedure I used was to take an awl and make three holes in a clear tube big enough to put aquarium tubing in. Next, I put an end cap on the clear tube and cemented it with PVC glue. I also put the valves on and hooked up the cups. Two of the cups were used to maintain water, the other was used to collect my sample. The valves were used to keep the water from rushing in and out of the tube. Then I put my aquifer in and what other materials I needed, depending on the experiment and poured my pollutants in. I did this procedure on my Depth to Water, Aquifer Media, Prediction Model experiment. On my soil experiment I took a long clear tube put an end cap on and a sample pan underneath. The pollutant would drip from the tube. On all my experiments I used 5CC of red dye as a pollutant. I repeated all my experiments three times. From my results my hypothesis held true. "Geological structure is a factor to be considered only for this pollutant as far as I know.

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VII. CORPORATE SPONSORS

1989

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Arranging a good technical conference requires a tremendous amount of time and effort. What sets the Florida Association for Water Quality Control Annual Conference apart from many others is that, in addition to providing a good forum for the exchange of technical information, they are always enjoyable to attend. We can afford to hold an attractive conference because of the generosity and support of our Corporate Sponsors. Their donations allow the FAWQC Board to meet routinely to plan the conference, fund the hospitality hours, and more importantly in recent years, allow the FAWQC to support young people pursuing research in water quality related fields. The FAWQC Board wishes to express its sincere thanks to our Corporate Sponsors.

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Ed Pate, Pat Fleming, and Jean Hebert also contributed their time and effort to the FAWQC during the first part of the year but have since been transferred or had career changes.