This webinar is sponsored by EPA’s Decentralized Wastewater MOU Partnership, which consists of 18 organizations that work collaboratively to encourage proper decentralized system management and education on system maintenance in order to protect the nation’s public health and water resources.
CAREER PERSPECTIVES IN DECENTRALIZED WASTEWATER MANAGEMENT

March 27, 2019
FORGOTTEN GENERATIONS — BEFORE EPA AND STATE AGENCIES

MINOAN PALACE AT KNOSOS (1700 B.C.)
OLD SEPTIC TANK TECHNOLOGY

Jean-Louis Mouras developed the "Fosse Mouras" (Circa 1860)
1970’s

- 1969- Cayahoga River fire
- 1970- Congress created EPA
- 1970- NSF Standard 40
- 1972- Clean Water Act
- 1970s- First Health Department Regulations
- 1978- EPA Commissioned Onsite Report
1970’S

Jim Bell:

▪ 1971- Graduated with a B.S. in Civil Engineering
▪ Joined MO National Guard
▪ 1973- Graduated with a M.S. in Sanitary Engineering
▪ Worked as a Research Engineer for Smith & Loveless, Inc.
MANAGEMENT OF SMALL WASTE FLOWS

James Kreisel  
EPA Project Officer

Jerry Tyler  
U of WI Soil Science

Dick Otis  
U of WI Civil & Environmental Engr.

Bob Siegrist  
U of WI Civil & Environmental Engr.

James Converse  
U of WI Agricultural Engineering
1970's

Bob Rubin:

- Served as Advisor to NC DHHS Environmental Health staff
- Provided sanitarian training in soil evaluation hosted by NCSU
- EPA Region 4 grant for onsite wastewater system applications
- First publication accepted at the ASAE and NSF Onsite Wastewater Conference
SOIL SCIENCE
IMPROVEMENTS
IN SITE
ASSESSMENT

Permeability Test
Profile Descriptions
Landscape Position
SOIL DISPERSAL COMPONENT

Rules developed in many states requiring site and soil assessment

Importance of soil for treatment (not disposal) widely recognized

Soil assessment better predicts assimilative capacity and treatment potential than previous practice (perc test)
1970’S

Mary Clark:

- Graduated with a B.S. in Natural Resource Conservation
- First job was as a fire lookout on Mt. St. Helena
- 1976- Engineering technician for small civil/sanitary engineering consultant in Middlebury VT
1970’s in Vermont

- In VT, Health Department Regulations with local administration...
- Meaning most small towns did not have a way to review and approve designs
- Concern for very small lots being created around our 800+ lakes and ponds, 50’ x 100’ with no plan for drinking water, wastewater, etc.
1980’s

1980- EPA’s “Purple Book” “Onsite Wastewater Treatment and Disposal Systems” published
1980s- EPA’s Construction Grants Program
1980s- New Technologies, ATUs
1985- Onsite Demonstration Projects
1987- EPA’s “It’s Your Choice” guidebook published
1980’s

Bob Rubin:

• NSCU group assists EPA in developing:
  • Onsite Wastewater Systems Manual
  • “It’s Your Choice” guide

• Mid 80’s – Participated in onsite assessments addressing coastal issues

• Designed and Installed first Pretreatment and DRIP dispersal system in NC

• Assisted with reviews of aeration systems

• Author and Co-Chair: ASAE Onsite Wastewater Symposium
1980’s

Jim Bell:
- 1980s- Process Engineer at Smith & Loveless
- 1981- Obtained Professional Engineer license
- 1984- Participated in development of the ASCE Standard for Measurement of Oxygen Transfer in Clean Water
1980'S

Mary Clark:
- Became licensed Site Technician
- Served as Assistant Regional Engineer
- No advanced treatment technologies available in VT
1990’S

1993- Technologies include nitrogen testing
1993- NSF rewriting NSF40
1995- Massachusetts regulates onsite systems for nitrogen reduction
1996- EPA’s “Watershed Approach Framework” published
2000’s

2001- American Society of Agricultural and Biological Engineers (ASABE) publishes On-site Wastewater Treatment symposium proceedings

2002- EPA updates Design Manual

2003- EPA’s “Voluntary Guidelines for Management” published

2007- NSF adopted first Nitrogen Reduction Standard, NSF 245

2008-2010- Housing Market Crash
1990’S AND 2000’S

Bob Rubin:

- Active involvement with American Society of Agricultural and Biological Engineers (ASABE)
- Emphasized training needs for all practitioners
- 1999-2005- Participated with EPA as “visiting scientist” on Resources Development
- Developed Onsite Indoor Reuse for NC Facilities
- Worked with EPA on Guideline Development
## NSF/ANSI 350 Effluent Criteria

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LARGE SCALE REUSE EXAMPLE — BATTERY PARK (NYC)

- Decentralized reuse in highly urbanized area
- LEED Platinum
- Green roof filters and captures stormwater
- Wastewater and stormwater treated for reuse
- 48% reduction in potable water consumption
- 56% reduction in wastewater discharge

Reference — Battery Park City Authority Manhattan Borough, NYC, The Solaire — Alliance Environmental, LLC
1990’S AND 2000’S

Jim Bell:

- 1990s- Process Engineer at Smith & Loveless
- 1993- Member of the NSF Joint Committee
- 1996- Started BioMicrobics as an active Board of Directors member
- 2008- Moved to BioMicrobics as a full-time employee
1990’S AND 2000’S

Mary Clark:
- Early 90’s- Self-employed designing small scale systems
- Project Manager for Stone Environmental Inc. (1997-2007)
- Shifted to working for onsite wastewater manufacturers
2010’S TO PRESENT

2010s- Onsite systems are a major part of wastewater infrastructure
2011- First Water Reuse Standard, NSF 350
2010s- Interdisciplinary and comprehensive environmental management
2010s- Data sharing between agencies and emphasis on watershed approaches
2010s- Performance-based rules
2010s- Training and capacity building
2010’S AND BEYOND

Bob Rubin:

- 2010s- Conducting research on:
  - Low-energy wastewater treatment with energy and nutrient recovery
  - Behavioral Economics
  - Examination of codes, rules, and regulations based on new science
  - Emergence from a siloed approach toward comprehensive environmental management and resource recovery
2010’S AND BEYOND

Jim Bell:

- 2010s- Became more involved with NOWRA and SORA
- 2015- President Elect for NOWRA
- 2017- President of NOWRA
- 2018- Past President of NOWRA
- 2019- Retired from full-time employment to part-time
2010’S AND BEYOND

Mary Clark:
- 2010s- Vermont I/A System Manager, Staff Hydrogeologist
- 2018- SORA President
- 2019- Focus on water/wastewater infrastructure for small communities
- 2019 and beyond- Stay involved with SORA and EPA MOU Partners work
- 2019 and beyond- Work in our garden and hang out in our wood/wetlands
THE FUTURE: 2020’S AND BEYOND

- One Water
- More research
- Manage technology
- Better connected Environmental Engineering curriculums and degrees
- Connect with rural economic development projects to support decentralized infrastructure solutions
- Improve public perception of potable water reuse
ROLES FOR ALL PROFESSIONALS

- **Establish**
  - Establish criteria (performance and prescriptive IAW community needs, state mandates, etc.)

- **Review**
  - Review to determine adequacy of design and management needs for systems in service area

- **Advise**
  - Advise elected and appointed officials of long term management requirements associated with their decisions

- **Assure**
  - Assure sustainability of programs
QUESTIONS?