# Workshop for Developing Evaluation Metrics to Advance a National Water Resource Resource Recovery Facility Test Bed Network: May 16-17, 2016

National Science Foundation Headquarters
NSF Stafford I, Room 375
4201 Wilson Blvd., Arlington, VA

The **workshop's primary objective** is to: define several key metrics that every new technology evaluated at the national test bed network that impacts the operations of a water resource recovery facility should measure and report.

*The workshop will focus on four technical areas*
1. *Developing Common Metrics for All Technologies*
2. *Developing a Framework for New Metrics as new Innovations Emerge*
3. *Storing the Data Generated During Testing*
4. *Sharing Information After the Pilot is Completed*

## Day One – Monday, May 16, 2016

| Time | Agenda Topic |
|------|--------------|
| 7:30 | Registration opens |
| 7:30-8:15 | Coffee provided |
| 8:15 - 8:40 | Welcome  *James Mihelcic, University of South Florida (workshop chair)* \<br>*Molly Mayo, Facilitator, Meridian Institute (1-2 minute welcome remarks from partner agencies that includes how workshop objective fits with Agency's mission/activities):*<br>• Pramod Khargonekar, Assistant Director, Engrg. Directorate, NSF<br>• Diana Bauer, Office of Policy and International Affairs, DOE<br>• Mike Shapiro, Deputy Assistant Administrator, Office of Water, EPA<br>• TBD, USDA<br>• Amit Pramanik, Director of Research, WERF |
| 8:40-9:00 | James Mihelcic, University of South Florida (workshop chair)  *Introduction to a National Test Bed Network (how workshop came to be, background on current and planned efforts related to the development of a national test bed network and directory, objectives of a national test bed, plan for a follow up workshop in Denver in June)* |
| 9:00 – 9:30 | **Keynote 1:**  *Utility Perspective: Assessing the Performance of Innovative Technologies for Treatment and Resource Recovery* (Charles Bott, Hampton Roads Sanitation District) |
| 9:30 – 10:00 | **Keynote 2:** *Choosing the Appropriate Metric from Small to Large Facilities* (Diego Rosso, University of California-Irvine) |
| 10:00 – 10:30 | Discussion Break  - *Coffee and Snacks* |
| 10:30-11:00 | **Keynote 3:** *Integrating a Sustainability Framework with Assessment of Treatment and Resource Recovery Technologies* (Qiong Zhang, University of South Florida) |
| 11:00– 12:10 | Keynote Panel Discussion: Local to Federal Perspectives on Appropriate Metrics for Assessing Treatment and Resource Recovery Technologies |

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| | (Moderator: Sudhir Murthy, DC Water) |
| | • Dan Murray, EPA, currently on detail to the Metropolitan Sewer District of Greater Cincinnati |
| | • Tania Ullah, National Institute of Standards and Technology (NIST) |
| | • Luke Mulford, Public Utilities, Hillsborough County, FL |
| | • Jeanette Brown, Manhattan College |
| | • Ken Williamson, Clean Water Services, Hillsboro, OR |
| | • Kristen Jenkins, Water Research Center |
| 12:10–12:15 | Afternoon Breakout Sessions Summary and Charge<br>*Molly Mayo, Meridian Institute, Facilitator* |
| 12:15 – 1:30 | Lunch - *Participants on their own for lunch* |
| 1:30 – 3:00 | **Breakout Session One**: *Defining Appropriate Metrics*<br>**Charge Question #1:** a) What will we be able to achieve with a common set of metrics, b) what is an appropriate set of common metrics that should be measured across a national test bed network and reported for all technologies that impact the performance of a wastewater resource recovery and treatment technologies, c) what standard procedures exist to measure these metrics?<br>• Group 1: Rapporteur: Haydee De Clippeleir, DC Water<br>• Group 2: Rapporteur:  Jeremy Guest, University of Illinois<br>• Group 3: Rapporteur: Jennifer Becker, Michigan Technological University<br>• Group 4: Rapporteur: Daniel Yeh, University of South Florida |
| 3:00 – 3:30 | Discussion Break- *Coffee and snacks provided* |
| 3:30-4:00 | Breakout Groups continue discussion of Charge Questions 1a-1c |
| 4:00 –5:00 | **Breakout Session Two**: *Developing a Framework for New Metrics*<br>**Charge Question #2:** a) How might metrics change across different levels of testbeds and b) what is the proper framework that would allow new metrics to be included in the future?<br>• Group 1: Rapporteur: Haydee De Clippeleir, DC Water<br>• Group 2: Rapporteur:  Jeremy Guest, University of Illinois<br>• Group 3: Rapporteur: Jennifer Becker, Michigan Technological University<br>• Group 4: Rapporteur: Daniel Yeh, University of South Florida |
| 5:00 | Informal  Gathering at nearby location |

## Day Two – Tuesday, May 17, 2016

| Time | Subject |
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| 8:00-8:30 | Coffee provided |
| 8:30 – 8:40 | Welcome Back<br>*Molly Mayo, Facilitator* |
| 8.40-9:20 | Breakout Presentations from Day One (Charge Questions #1 and #2)<br>≤ 10 min Presentations from Breakout Rapporteurs.<br>•      Group 1: Rapporteur: Haydee de Clippeleir<br>•      Group 2: Rapporteur:  Jeremy Guest<br>•      Group 3: Rapporteur: Jennifer Becker<br>•      Group 4: Rapporteur: Daniel Yeh |
| 9:20 – 10:10 | Discussion by all workshop participants of Breakout Group summaries to Charge Questions #1 and #2 |
| 10:10 – 10:40 | Discussion Break- C*offee and snacks provided* |
| 10:40 – 10:50 | Second set of Breakout Sessions Summary and Charge<br>*Molly Mayo, Facilitator*<br>•      Group 1 Rapporteur: Krishna Pagilla, University of Nevada-Reno<br>•      Group 2 Rapporteur: Kartik Chandran, Columbia University<br>•      Group 3 Rapporteur: Weiwei Mo, University of New Hampshire<br>•      Group 4 Rapporteur:  Belinda Sturm, Kansas University |
| 10:50 –12:05 | **Breakout Session Three:** *Storing the Data Generated During Testing & Sharing Information After the Pilot Is Over*<br>**Charge Question #3:** What is most effective method to store data generated during testing.<br>**Charge Question #4:** a) Who needs to have access to the data, b) what is the most effective way to share information after a pilot is over to ensure wide dissemination and public access?<br>**Charge Question 5:** Are there any issues you would like added to the structure workshop that will follow in June?<br>•      Group 1 Rapporteur: Krishna Pagilla, University of Nevada-Reno<br>•      Group 2 Rapporteur: Kartik Chandran, Columbia University<br>•      Group 3 Rapporteur: Weiwei Mo, University of New Hampshire<br>•      Group 4 Rapporteur:  Belinda Sturm, Kansas University |
| 12:05-12:15 | Reassemble and afternoon plan, Molly Mayo, Meridan Institute, Facilitator |
| 12:15 – 1:30 | Lunch - *Participants on their own for lunch* |
| 1:30 – 2:10 | Breakout Presentations from Day Two (Charge Question #3 & #4)<br>≤ 10 minute Presentations from Breakout Rapporteurs.<br>•      Group 1 Rapporteur: Krishna Pagilla, University of Nevada-Reno<br>•      Group 2 Rapporteur: Kartik Chandran, Columbia University<br>•      Group 3 Rapporteur: Weiwei Mo, University of New Hampshire<br>•      Group 4 Rapporteur: Belinda Sturm, Kansas University |
| 2:10-2:45 | Open Ended Discussion |
| 2:45 – 3:00 | Closing and Next Steps<br>*Molly Mayo, facilitator; Jason Ren (structures workshop chair) James Mihelcic (metrics workshop chair)* |
| 3:00 | Workshop Adjourned |