**A Summary Overview of the**

# Working Session Exploring Opportunities to Enhance Collaboration By Water and Wastewater Utilities in Advancing Asset Management

***Sponsored by the USEPA Office of Wastewater Management***

**Convened on May 5 & 6, 2005 at the Marriott Metro Hotel, Washington DC**

## The Event

On May 5th and 6th, 2005, the USEPA Office Of Wastewater Management convened a Working Session to explore opportunities to enhance collaboration by water and wastewater utilities in advancing asset management. Approximately 140 water and asset management professionals (drawn from the US and from 11 other countries) representing the water/wastewater industry, academics, professional associations, the research community and the consultant engineering and related consultant sector met in intensive collaboration to develop an agenda for advancing asset management throughout the water industry.


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## Purpose of the Working Session

The intent of the Asset Management (AM) Working Session was to develop consensus among stakeholders in water industry asset management around an agenda for advancing the asset management practices of the US Water industry (potable water, wastewater and stormwater). Specifically, ***the purpose of the Working Session was to identify a three to five-year action agenda for the advancement of asset management practices in the water industry and in state and local government.***

## Summary Findings: Top 10 Action Item Recommendations

Several major points emerged from the Working Session:

- The following action items were voted the ten most important action items for the advancement of asset management practices in the water industry:

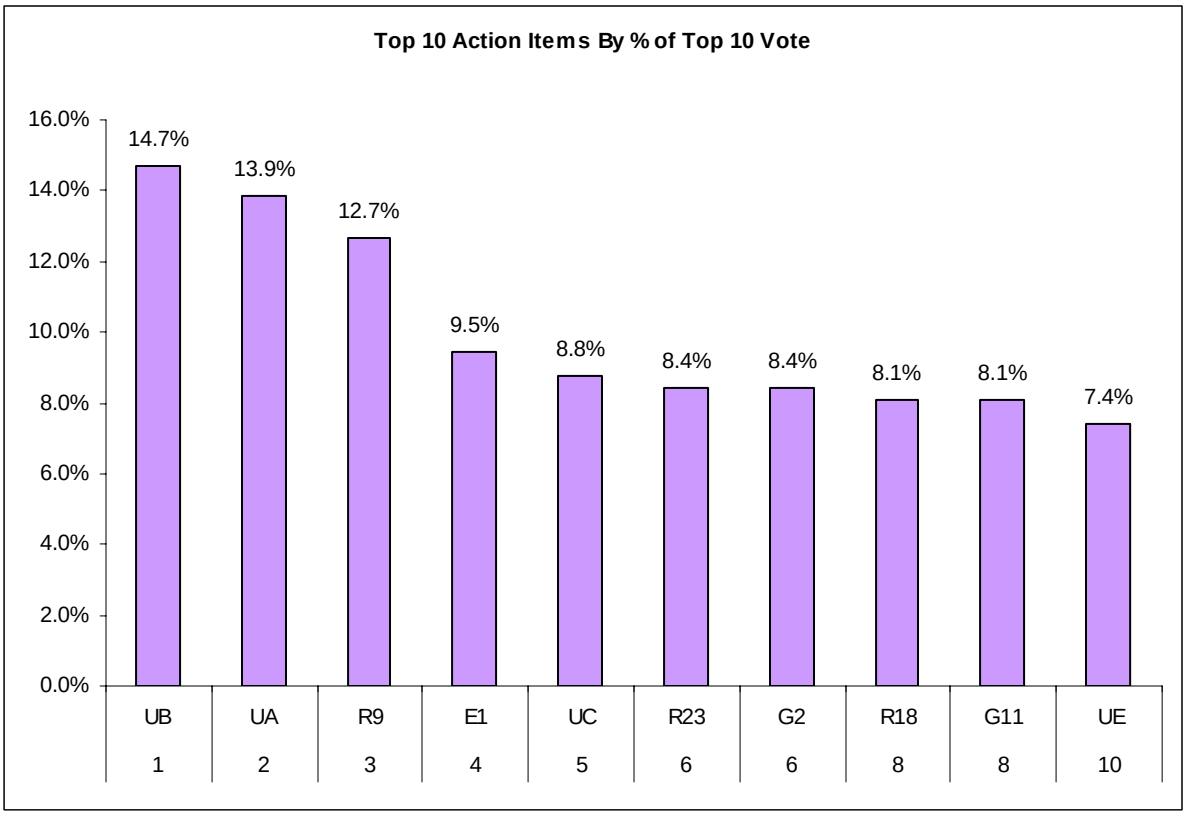
| Rank | Project No. | % of Vote | Project Name |
|---|---|---|---|
| 1 | **UB** | 7.0% | Best Practices |
| 2 | **UA** | 6.6% | Defining AM/ building business Cases |
| 3 | **R9** | 6.1% | Development of a central depository of high quality data available to researchers |
| 4 | **E1** | 4.5% | Develop an International Training and Resource Clearinghouse |
| 5 | **UC** | 4.2% | LOS/AM Business model |
| 6 | **R23** | 4.0% | Research on tools for cost effective physical conditions assessment including design standards |
| 6 | **G2** | 4.0% | Develop uniform national standards for condition assessment and asset reporting |
| 8 | **R18** | 3.9% | Develop common / Best Practice for risk management framework |
| 8 | **G11** | 3.9% | Asset Management Plans be made requirements for any Government funding |
| 10 | **UE** | 3.6% | Culture change |

- Ranked Action Items 1 and 2 are "clusters" of several closely related action items developed by the Water Industry Breakout station. These clusters are defined as follows:
    - UB - Best Practices:
        - U2 - Adopt AM as a best practice standard and develop standard terminology and processes
        - U10 - Develop and implement training on O&M best practices
        - U12 - Life cycle maintenance - best practices for process, procedure, timing, risk
        - U16 - Developing common standards for AM -- focused on the internal environment (condition assessment standards that focus on condition or reliability, e.g. KPI (key performance indicators))
        - U17 - Some mechanism for accreditation/certification, e.g., ISO
        - U35 - Need some credible authority that develops the standards
    - UA: Defining AM/Building Business Cases:
        - U1 - Define asset management
        - U9 - Definition of AM should have an objective and benefit or business case that can be made with it

- U14 - publish an American version of the International AM manual
- U31 - Get agreement on definition of AM between among the major professional water/engineering associations

- The single most prevalent theme among all four breakout groups appears to be that of “knowledge transfer” - the effective and efficient accumulation, organization and dissemination of “best practices” regarding asset management concepts, processes and practices relevant to the US management culture.

The following chart depicts the distribution of votes among the Top Ten as a percentage of total votes for all of the top ten action items. Note that after the third ranked Action Item, the votes are relatively close.



## Voting Patterns: Summary Overview

Votes were tracked by industry sector (see “How the Session Was Organized” below for a discussion of the industry sectors) and by US versus non-US residency (11 foreign countries were represented). The following graphic depicts the distribution of votes by industry sector (column percentages represent the votes cast for a given Action Item by a sector divided by total votes cast for the Top Ten Action Items by that sector).

| | | | | Voting | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Rank** | **Project No.** | **%** | **Project Name** | **Education** | **Utilities** | **Research** | **Government** | **Consultant** | **Total** |
| 1 | **UB** | 14.7% | Best Practices | 10.0% | 19.6% | 3.9% | 16.0% | 9.7% | 14.7% |
| 2 | **UA** | 13.9% | Defining AM/ building business Cases | 16.7% | 13.5% | 11.7% | 12.0% | 16.1% | 13.9% |
| 3 | **R9** | 12.7% | Development of a central depository of high quality data available to researchers | 20.0% | 10.6% | 18.2% | 8.0% | 14.5% | 12.7% |
| 4 | **E1** | 9.5% | Develop an International Training and Resource Clearinghouse | 16.7% | 9.3% | 5.2% | 6.0% | 12.1% | 9.5% |
| 5 | **UC** | 8.8% | LOS/AM Business model | 3.3% | 12.2% | 1.3% | 8.0% | 6.5% | 8.8% |
| 6 | **R23** | 8.4% | Research on tools for cost effective physical conditions assessment including design standards | 6.7% | 4.2% | 29.9% | 4.0% | 8.1% | 8.4% |
| 6 | **G2** | 8.4% | Develop uniform national standards for condition assessment and asset reporting | 3.3% | 7.4% | 11.7% | 12.0% | 8.9% | 8.4% |
| 8 | **R18** | 8.1% | Develop common / Best Practice for risk management framework | 3.3% | 9.0% | 11.7% | 6.0% | 5.6% | 8.1% |
| 8 | **G11** | 8.1% | Asset Management Plans be made requirements for any Government funding | 6.7% | 4.2% | 6.5% | 22.0% | 13.7% | 8.1% |
| 10 | **UE** | 7.4% | Culture change | 13.3% | 10.0% | 0.0% | 6.0% | 4.8% | 7.4% |
| | | 100.0% | | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| | | | **Total votes cast** | 99 | 592 | 167 | 117 | 260 | 1235 |
| | | | **Total votes cast for Top 10 as percent of all votes cast** | 30.3% | 52.5% | 46.1% | 42.7% | 47.7% | 47.9% |

Clearly, the voting for specific Action Items varied rather widely based on the sector represented. However, except for the Education Sector, the Top Ten list is a rather consistent percentage of total votes cast by each sector (while the order varied somewhat by sector, the group making the top 10 was rather consistent across all sectors except education). Subsequent analysis will examine more closely the voting patterns by industry sector and by US versus international residency.

## Top 10 Rankings by Industry Sector

The final vote for the top 10 Action Items was based on a ballot integrating the top 10 Action Items as ranked by each of the four Breakout stations (see “How the Session Was Organized” below for description of the process). The following tables present the Top 10 (from the integrated ballot list of 40 - 10 from each Breakout Group) by each of the five industry sectors.

| | | Rank |
|---|---|---|
| **Project No.** | **Project Name** | **Education** |
| **R6** | Tools / techniques to incorporate sustainability into AM | 1 |
| **E54** | Change culture to provide incentives for AM skills development | 2 |
| **R9** | Development of a central depository of high quality data available to researchers | 3 |
| **E6** | Revise existing engineering and other related courses | 3 |
| **G3** | Raising the awareness of value for services and its benefits to all levels of Government | 3 |
| **UA** | Defining AM/ building business Cases | 6 |
| **E1** | Develop an International Training and Resource Clearinghouse | 6 |
| **E3** | Define competency skills/knowledge for managers of assets | 6 |
| **E55** | Produce a tailored USA AM manual | 6 |
| **G20** | Eliminate subsidies to inefficient utilities | 6 |
| **E5** | Design training courses for small/medium system managers | 6 |

| Project No. | Project Name | Utilities |
|---|---|---|
| **UB** | Best Practices | 1 |
| **UA** | Defining AM/ building business Cases | 2 |
| **UC** | LOS/AM Business model | 3 |
| **R9** | Development of a central depository of high quality data available to researchers | 4 |
| **UE** | Culture change | 5 |
| **E1** | Develop an International Training and Resource Clearinghouse | 6 |
| **R18** | Develop common / Best Practice for risk management framework | 7 |
| **G2** | Develop uniform national standards for condition assessment and asset reporting | 8 |
| **R5** | Standard methods for comprehensive benefits analysis (economic and non-economic) | 8 |
| **G4** | Get regulators to have outcome measures (triple bottom line) as their goal | 10 |
| **G24** | Align local government codes and ordinances to enhance implementation of AM | 10 |

| Project No. | Project Name | Research |
|---|---|---|
| **R23** | Research on tools for cost effective physical conditions assessment including design standards | 1 |
| **R9** | Development of a central depository of high quality data available to researchers | 2 |
| **R6** | Tools / techniques to incorporate sustainability into AM | 3 |
| **UA** | Defining AM/ building business Cases | 4 |
| **G2** | Develop uniform national standards for condition assessment and asset reporting | 4 |
| **R18** | Develop common / Best Practice for risk management framework | 4 |
| **R5** | Standard methods for comprehensive benefits analysis (economic and non-economic) | 7 |
| **E6** | Revise existing engineering and other related courses | 8 |
| **G3** | Raising the awareness of value for services and its benefits to all levels of Government | 8 |
| **UD** | Tools and technology | 8 |

| Project No. | Project Name | Government |
|---|---|---|
| G11 | Asset Management Plans be made requirements for any Government funding | 1 |
| UB | Best Practices | 2 |
| UF | educating public, stakeholders, sustainability of business | 2 |
| G22 | Look at alternative roles of the federal government to guard against undermining the potential of AM | 4 |
| UA | Defining AM/ building business Cases | 5 |
| G2 | Develop uniform national standards for condition assessment and asset reporting | 5 |
| E6 | Revise existing engineering and other related courses | 7 |
| E4 | Establish a National AM Institute | 7 |
| G1 | Efficiency benefits through amalgamation of water & wastewater activities nationally | 7 |
| R9 | Development of a central depository of high quality data available to researchers | 10 |
| UC | LOS/AM Business model | 10 |
| G3 | Raising the awareness of value for services and its benefits to all levels of Government | 10 |
| E2 | Develop in-depth training modules for practitioners | 10 |

| Project No. | Project Name | Consultant |
|---|---|---|
| UA | Defining AM/ building business Cases | 1 |
| R9 | Development of a central depository of high quality data available to researchers | 2 |
| G11 | Asset Management Plans be made requirements for any Government funding | 3 |
| E1 | Develop an International Training and Resource Clearinghouse | 4 |
| E4 | Establish a National AM Institute | 4 |
| UB | Best Practices | 6 |
| R6 | Tools / techniques to incorporate sustainability into AM | 6 |
| G2 | Develop uniform national standards for condition assessment and asset reporting | 8 |
| G3 | Raising the awareness of value for services and its benefits to all levels of Government | 8 |
| R23 | Research on tools for cost effective physical conditions assessment including design standards | 10 |
| UF | educating public, stakeholders, sustainability of business | 10 |
| UD | Tools and technology | 10 |

**Recommendations of the Four Breakout Stations**

The following table lists the recommended “ten most important action steps” for each of the four breakout stations (a total of approximately 40 Action Items). Clearly, the perspectives of the four different stations were distinctly different, consistent with the design of the breakout groups (see “How the Session Was Organized” below). Yet the prevalent theme of knowledge transfer is again dominant. (Click here to see list of Top 10 from each Breakout Group.)

**Lists of Action Items by Breakout Station**

Listed below are links to the lists of Action Items generated at each of the four Breakout stations.

1. Utilities
2. Education
3. Research
4. Government/Regulatory

**Excel Spreadsheet of Voting Results**

Voting workbook

**How the Working Session Was Organized**

To accomplish this consensus, the agenda for the Working Session was organized around three major, sequentially staged elements:

1. A brief overview of the state of the practice in AM

This overview was accomplished through brief, highly focused PowerPoint presentations from 32 practitioners representing four major groups:

- The Water Industry (the US particularly)
- Educational Trainers (universities and professional organizations)
- Research Agencies (professional and academic), and
- Government Institutions

2. Break-out sessions for group collaboration

The heart of the consensus process was organized around four "breakout" sessions *with each session focusing on developing a working agenda from the perspective of one of the four groups listed above*. Four breakout groups or stations were defined; each attendee was randomly assigned to one of the four groups. Each group rotated through all four of the breakout "stations". The four stations and their home facilitators were:

| | |
|---|---|
| 1. The Water Industry | Duncan Rose |
| 2. Educational Trainers | Eileen O'Neill |
| 3. Research Agencies | Linda Blankenship |
| 4. Government/Regulators | Roger Byrne |

The purpose of the group sessions was to develop an action agenda (a list of specific tasks or projects) for advancing AM practices from the perspective of each of the four groups. Each station reported out a listing of what was felt were the 10 most important action items, along with notes and comments that the group deemed pertinent in support of those action items.

3. Convergence and consensus in a final plenary session

Final prioritization was reached in a session of the whole following the four break-out sessions, where the listing of (up to) forty action items was divided into two groups - ten Initial Focus action items (these were prioritized) and the remaining action items. Initial focus items are not necessarily more important that the second list, but are items that should be implemented before certain "downstream" tasks can be initiated.

**Major Focus Questions for the Four Breakout Sessions**

As outlined above, the purpose of the Working Session was to identify a three-to-five-year action agenda that reflects the coordinated efforts of

1) The water industry,

2) The industry's training stakeholders (both professional organization and academic based),

3) It's research stakeholders (private and public) and

4) Its regulators and related governmental institutions

in the advancement of asset management practices throughout the industry and, where practical, in state and local government in general.

*To be successful in this purpose, the 1) mission, 2) organizational composition and 3) agenda of such an organizational effort must be determined. This Working Session focused on the building of an initial action agenda; it is anticipated that this agenda will subsequently inform the defining of the mission and in determining the composition of some form of "Coordinating Steering Committee". The mission and composition of the "Committee" will be addressed at a subsequent, separate Working Session.*

Major questions of focus for the Working Session included (but were not limited to):

<u>Utility Coordination and Collaboration:</u>

- What specific assistance is most needed to advance the AM efforts currently underway and to support those contemplating moving forward?
- What systemic "inhibitors" to the deployment of AM need to be removed and what assistance, if any, can entities outside a specific agency effectively render in removing those inhibitors?
- How best to build on the AM efforts underway in various utilities so that "lessons learned" are readily available to peers and interested parties?
- How best to share data, techniques, examples of "deliverables", training materials, etc.?

<u>Education and Training</u>:

- How best to educate university level students who wish to develop competence in the management of infrastructure (undergraduate and graduate levels, engineering and non-engineering students)?
- How to provide systematic, integrated and staged training for working professionals (people already in the industry)?
- What about competency certification?

<u>Research</u>:

- What kind of research activities would most effectively further AM Best Practices?
- What kind of research collaboration should be encouraged and how?
- How to foster efforts to improve the effective staging of research that advances the body of knowledge through a wider base of application?
- How to avoid duplication of effort and most effectively leverage the general body of effort (nationally and internationally)?

Institutional Relationships, Including Regulatory considerations:

- What institutional relationships among the various levels of government (federal, state, local) inhibit the efficient deployment of AM practices?
- What actions, if any, can be taken to support and improve the practice of AM by making innovative adjustments in the institutional relationships among the various levels of government?
- How to improve “bottom up” intergovernmental processes to better define service levels and the impact on cost and risk of providing sustainable services (environmental, social and economic) at the community level.

Each of the four groups reported out its “top 10” actions list to a plenary session by a group spokesperson (to assure thorough knowledge of the discussions among the four groups relative to a specific station, the spokesperson was assigned to a specific “home station” and did not rotate with the group). Each group report was thoroughly discussed in open session in a question and answer format, followed by extensive discussion.

Ranking of the proposed action items occurred through a marking of a physical ballot. Each participant was given 10 index card ballots, with the exception of the Water Industry representatives; these participants were given 20 ballots each to assure a substantial emphasis of Water Industry interests in the final voting.

Each participant could vote for any of the listed action items. Participants were only limited in their voting by the number of ballots they were allocated - they could, if they wished, vote all of their ballots for one action item.

**Agenda and Supporting Handouts**

Agenda

Focus of Asset Management Collaboration Working Session

America's Pathway to Sustainable Water and Wastewater systems

## "State Of Practice" Presentations (Index)

### Session 1 – Moderator: Duncan Rose

In this session, attendees will be provided with brief overviews of major projects and activities underway through the auspices of several organizations (maximum of 10 minutes per topic)

1. Asset Management Program Learning Environment (AMPLE) - WERF (Roger Byrne)
2. Condition Assessment Measures, Matrices and Protocols - WERF (Tony Urquhart)
3. Process to Assess and Prioritize Multi-risk for Wastewater Facilities - WERF (Ken Rubin)
4. Open Source Asset Mgt. Software for Small Communities - MCET (Doug Abbot & Peter LeVoir)
5. CARE S / CARE W undertakings - Polytechnic University (Annie Vanrenterghem-Raven)
6. The Global Water Global Water Research Coalition (GWRC) efforts (Frans Schulting)
7. The Evaluation of Pipe Performance and Durability - CSIRO (Stewart Burn)
8. The Infrastructure Management Learning Community - Canada (Mark Damm)
9. Water and Wastewater Security Initiatives – USEPA (James Wheeler)
10. Environmental Management Systems – USEPA (Jim Horne)
11. The Advance Asset Management Training Initiative – USEPA (Steve Allbee)

### Session 2 – Moderator: John Griffin

Utility presentations on lessons learned in implementing asset management undertakings (Maximum of 12 minutes per presenter)

1. Orange County Sanitation District (Doug Stewart)
2. Seattle Public Utilities (Scott Haskins)
3. NEORSD (Frank Greenland)
4. Jacksonville, JEA (Jens Sapin)
5. Saskatoon, Canada (Jan-Mark Gustafson)

### Session 3 – Moderator: Roger Byrne

Learning from other experiences, the strategies to improve coordination and collaboration. (12 min. each)

1. New Zealand – Tony Wilson
2. UK – Chris Royce
3. National Research Council Canada (Leo Gohier)
4. Netherlands – Jan Vreeburg (Kiwa Water Research)
5. U.S. – Doug Stewart

**Session 4 – Moderator: Scott Haskins**

Education, Communication & Prof. Development Initiatives (Max 8 minutes per presenter)

1. AWWA (John Cromwell)
2. WEF (Eileen O'Neill)
3. NSF (Jesus M. de la Garza)
4. BAMI-I (Tom Iseley)

**Session 5 – Moderator: Paul Causey**

A Panel on Setting a Coordinated and Collaborative Asset Management Research Agenda

1. WERF (Linda Blankenship)
2. AWWARF (Jennifer Warner)
3. National Research Council Canada (Leo Gohier)
4. UKWIR (Steve Whipp)
5. CSIRO (Stewart Burn)

**Session 6 – Moderator: Steve Allbee**

Three views of the future governmental and institutional challenges for asset management

1. The Whole of Government Viewpoint (Penny Burns - Asset Management Quarterly Int'l.)
2. An Environmental Regulators View of the interface between Asset Management and Environmental Regulation (Mick Bourke, Chairman /CEO EPA Victoria, Australia)
3. A U.S. Viewpoint (Tracy Mehan – The Cadmus Group & former USEPA Assistant Administrator)

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| Brenton Marshall | *GHD LLC* |
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Click here to link to the roster of participants