

### Embed sustainable asset management practices throughout the organization.

- Engage the entire organization to provide training on asset management processes and procedures appropriate to individual roles and responsibilities.
- Establish defined roles and responsibilities to implement and sustain asset management practices.
- Apply effective data and information technology solutions to support the asset management program.
- Dedicate adequate resources to support the continued development and implementation of the asset management program.

See Appendix D for a copy of the finalized SAM Policy.

The SAM vision, mission and policy are key elements of the implementation strategy for MWU.

## 4.2 Levels of Service Framework and Performance Measurement

### **Policy Statement – Maintain a high level of service to MWU’s customers and stakeholders.**

Objectives:

- Understand customer and stakeholders requirements and expectations.
- Understand and record the current levels of service provided.
- Continually refine and report levels of service to meet future demands and expectations.
- Communicate frequently and effectively to customers and stakeholders.

One of the key elements of an SAM Program is to define the levels of service (LOS) that customers, end users, and key stakeholders experience. LOS describes the outcomes that a utility expects to achieve in providing services to its customers. LOS connects the strategic direction of the utility to the performance requirements established within the various parts of the organization.

As stated in the International Infrastructure Management Manual (IIMM), levels of service:

*“are a key business driver and influence all Asset Management decisions. Levels of Service statements:*

- *Describe the outputs the organization intends to deliver to customers;*
- *Commonly relate to service attributes such as quality, reliability, responsiveness, sustainability, timeliness, accessibility and cost;*
- *Should be written in terms the end user can understand and relate to; and*
- *Should drive the selection of performance measures.”*

A LOS framework links operational activities with tactical and strategic outcomes and articulates how the management of assets contributes to the overall vision, mission and guiding principles. This type of framework helps utility organizations place focus on continuous improvement efforts that keep the service output foremost in mind while measuring and minimizing asset life cycle cost and asset system risk. LOS also is used in determining needed investment levels across utility’s asset portfolio by understanding performance, condition and operations targets to be achieved through asset maintenance, renewals and new construction.

For MWU, customers and the services provided are summarized in Figure 6 as identified in the SAM Framework development process.



**Figure 6 MWU Customers and Services Provided**

Customer expectations can be articulated in the following service attributes:

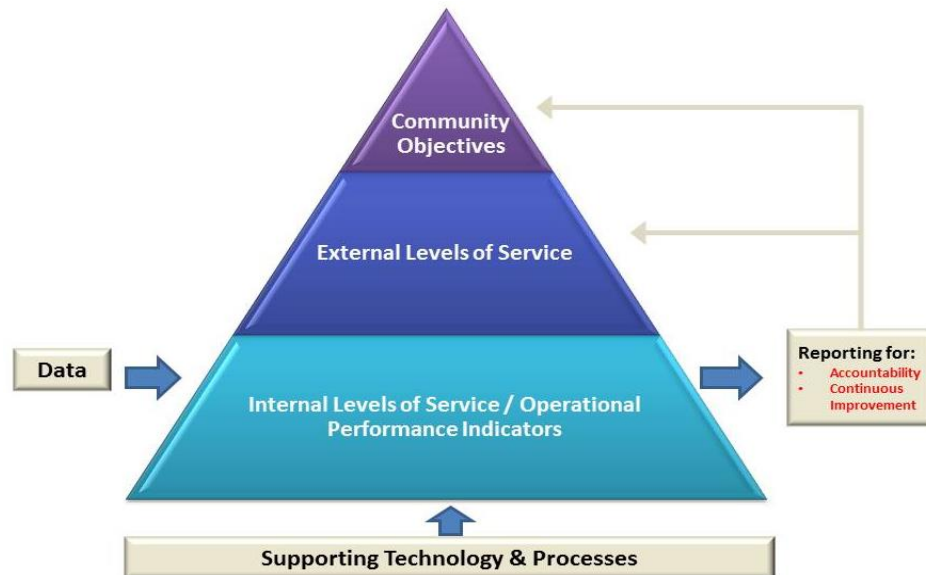
- **Water Quality/Safety:** Services are delivered such that they minimize health, safety and security risks and meet all regulations.
- **Reliable:** Services are predictable and continuous.
- **Suitable:** Services are suitable for the intended function (fit for purpose).
- **Sustainable:** Services preserve and protect the natural and heritage environment.
- **Available:** Services of sufficient capacity are convenient and accessible to the served community.
- **Cost Effective:** Services are provided at the lowest possible cost for both current and future customers, for a required level of service, and are affordable.
- **Responsive:** Opportunities for community involvement in decision making are provided; and customers are treated fairly and consistently, within acceptable timeframes, demonstrating respect, empathy and integrity.

For purposes of MWU's SAM Program, the term **External LOS** refers to performance metrics related to how MWU customers and stakeholder experience MWU's service delivery and how performance is *received and perceived by the customer*. External LOS do not seek to measure the internal activities or the efficiency of the organization. The term **Internal LOS** refers to performance metrics related to how MWU operates internally on a day-to-day basis with metrics that are important to MWU staff but not specifically visible to MWU customers and stakeholders.

Like other performance measures, External LOS must have specific, measurable indicators that provide the organization with a focus when planning the physical (asset) infrastructure and functional (organizational) infrastructure required to deliver the service. LOS define a set of service characteristics that identify the minimum level of performance expected to be generated by the

assets. These characteristics typically include aspects such as *how much* and *how frequently* the service will be delivered. They also serve as reference points to measure the effectiveness of the organization in delivering on its objectives, and provide a focus for day-to-day activities and decisions.

Figure 7 shows the relationship between output objectives, External LOS, Internal LOS, data, and underlying technology tools. A LOS framework identifies the metrics that have the most significant and direct impact on service delivery to customers and stakeholders. It also enables utility organizations to track trends, report progress against targets, and make critical adjustments when necessary.



**Figure 7 Levels of Service and Performance Measure Framework**

#### 4.2.1 Identifying Levels of Services for MWU

MWU has identified the following Key Service Areas (from the 2016 Madison Measures Report) as the utility's primary categories of External Levels of Service as shown in Figure 8 below.

| Key Service Area | Key Service Area Description                                                                                                                                                                                                                                    |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| KS1              | We deliver every day a high quality, reliable supply of drinking water that protects public health. The citizens of Madison depend on it for safe water to drink, prepare our food, wash our clothes, and bathe our families.                                   |
| KS2              | We work to protect our precious groundwater source by using sustainable practices ourselves and encouraging conservation by our customers. We are all stewards of the water infrastructure and resources handed down to us by previous generations.             |
| KS3              | We ensure that a sufficient supply of water is available at hydrants throughout the city to fight fires. We keep this water flowing at the right pressure to enable the Fire Department to protect lives and property.                                          |
| KS4              | The water pipes below our streets make everyday conveniences possible and provide the Madison community a high quality of life. We all support essential water service by paying for the necessary infrastructure and processes to get water to every customer. |
| KS5              | We deliver a reliable and affordable supply of fresh water to support the local economy, to supply business, industry, government, and a world-class research university with an essential need.                                                                |

**Figure 8 MWU Key Services Areas**

To determine if MWU is delivering its services as defined in the Key Service Area description, performance indicators are identified and associated with each Key Service Area. Table 1 below identifies performance indicators that are aligned with the Key Service Areas and service delivery attributes.

To meet the performance identified for the Key Service areas, MWU is using the following strategies:

- Long-term planning for capital improvements.
- Infrastructure management and business strategies.
- Preventative maintenance and repair.
- Continual monitoring, sampling and reporting of water quality.
- Compliance with state and federal regulations.
- Water conservation and source water protection.
- Attention to financial matters, business practices and customer service.

**Table 1 External Levels of Service Performance Measures**

| Service Criteria Area                           | Key Performance Indicator # | Key Performance Indicator                               | Target Level of Service (Interim Goal) | Measurement Data                                      | Current Performance |
|-------------------------------------------------|-----------------------------|---------------------------------------------------------|----------------------------------------|-------------------------------------------------------|---------------------|
| Water Quality - Color<br>KS1                    |                             | # of complaints per year                                | <200 per year                          | Madison Measures; WQ Correspondence database          | 265 (2015)          |
| Water Quality - Taste<br>KS1                    |                             | # of complaints per year                                | <30 per year                           | Madison Measures; WQ Correspondence database          | 24 (2015)           |
| Water Quality - Odor<br>KS1                     |                             | # of complaints per year                                | <30 per year                           | Madison Measures; WQ Correspondence database          | 41 (2015)           |
| Water Safety - Microbiology                     |                             | # E. coli positive samples                              | 0                                      | Wisconsin State Laboratory of Hygiene (WSLH) analysis | 0                   |
| Water Safety - Chemistry                        |                             | # samples above a primary drinking water standard (MCL) | 0                                      | WDNR and internal MWU databases                       | 1                   |
| Water Safety - Lead                             |                             | 90th percentile lead level, single family residential   | <5 ppb                                 | Lead & Copper Rule monitoring results                 | 3.5 ppb (2014)      |
| Water Safety - Compounds of Concern             |                             | # unregulated contaminants monitored per year           | 2-3                                    | EPA UCMR program; Internal MWU database               | 3                   |
| Reliability - High Pressure                     |                             | # complaints per year                                   | <25 per year                           | Madison Measures; WQ Correspondence database          | TBD                 |
| Reliability - Low Pressure                      |                             | # complaints per year                                   | <25 per year                           | Madison Measures; WQ Correspondence database          | TBD                 |
| Reliability – Pressure<br>KS1                   |                             | Pressure levels at the tap                              | 80 psi 99% of time tested              | SCADA, pressure gauge data                            | TBD                 |
| Water Quality / Safety – Lead Mitigation<br>KS1 |                             | # of known lead service laterals in the system          | 0 known lead laterals                  | Lead database                                         | TBD                 |

| Service Criteria Area                                                     | Key Performance Indicator # | Key Performance Indicator                                 | Target Level of Service (Interim Goal)                                                                             | Measurement Data                         | Current Performance                                                  |
|---------------------------------------------------------------------------|-----------------------------|-----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|------------------------------------------|----------------------------------------------------------------------|
| Sustainability - WHP                                                      |                             | # of wellhead protection plans reviewed                   | 4/year                                                                                                             | Madison Measures                         | 100%                                                                 |
| Sustainability – Aquifer Water Levels<br>KS2                              |                             | Aquifer water levels at each well point within X standard | 100% of wells                                                                                                      | Well location aquifer water level data   | 100%                                                                 |
| Reliability / Availability / Safety - Fire Protection<br>KS3              |                             | Hydrant functions correctly                               | Each zone and every hydrant meets fire flow capacity 100% of the time. (Interim Goal: 99%)<br>Fire Rating: Class 1 | See Capacity report                      | 98%<br><br>MWU has Class 1 utility fire rating                       |
| Reliability / Availability / Safety - Fire Protection<br>KS3              |                             | Hydrant functions correctly                               | 100% of hydrants repaired within 72 hours of hydrant issue identified (except construction areas)                  | Fire Dept. log in / log out hydrant data | TBD                                                                  |
| Reliability / Availability / Safety - Fire Protection<br>KS3              |                             | Hydrant functions correctly                               | 100% of hydrants inspected every two years and issues addressed                                                    | Hydrant database                         | 100% of hydrants assessed within the last two years or more recently |
| Reliability / Availability / Safety / Responsive - Fire Protection<br>KS3 |                             | Hydrant flow test                                         | 33% of all hydrants tested every 5 years.                                                                          | Hydrant database?                        | 100% of flow test requests addressed in one week or less             |
| Reliability / Availability - Planned Water Outages<br>KS1, 3, 4, 5        |                             | Time out of service                                       | 85% of planned outages <4 hours in duration                                                                        | Work order time stamp data; leak reports | TBD                                                                  |

| Service Criteria Area                                                     | Key Performance Indicator # | Key Performance Indicator                                                          | Target Level of Service (Interim Goal)       | Measurement Data                         | Current Performance                  |
|---------------------------------------------------------------------------|-----------------------------|------------------------------------------------------------------------------------|----------------------------------------------|------------------------------------------|--------------------------------------|
| Reliability / Availability – Unplanned Outages<br>KS1, 3, 4, 5            |                             | Time out of service                                                                | 95% of planned outages <8 hours in duration  | Work order time stamp data; leak reports | TBD                                  |
| Reliability – City Call Center Management and Execution<br>KS1, 3, 4, 5   |                             | % of City Call Center issues routed to the appropriate dept. in the first instance | TBD                                          | Call Center data                         | TBD                                  |
| Reliability / Availability – Residential Customers<br>KS1, 4              |                             | Number of residential system leaks per year                                        | 1/block/year<br>3/block/7 years              | Leak and repair information              | TBD                                  |
| Reliability / Availability – Wholesale Customers<br>KS4, 5                |                             | Volume of water provided per agreements                                            | Meet 100% of agreed water volume supply      | Water meters                             | 100% of agreed water volume provided |
| Reliability / Availability – Commuters<br>KS4, 5                          |                             | # of commuter complaints per year                                                  | TBD                                          | Customer complaint database              | TBD                                  |
| Reliability – Availability – Business Owners<br>KS4, 5                    |                             | # of business complaints per year                                                  | TBD                                          | Customer complaint database              | TBD                                  |
| Responsiveness – Permit Issuance for New Potable Water<br>KS1, 2, 3, 4, 5 |                             | Average time to review applications and issue permits                              | 60 days from completed application submitted | PW database                              | TBD                                  |

| Service Criteria Area                                                                           | Key Performance Indicator # | Key Performance Indicator                                                  | Target Level of Service (Interim Goal)                              | Measurement Data                 | Current Performance                                             |
|-------------------------------------------------------------------------------------------------|-----------------------------|----------------------------------------------------------------------------|---------------------------------------------------------------------|----------------------------------|-----------------------------------------------------------------|
| Reliability / Responsive – Mapping Customers Internal/External System Connections<br>KS 1, 4, 5 |                             | Map accuracy                                                               | 100% of DSRs to scale                                               | Map data source                  | 15% exceeding (TBD)                                             |
| Responsive – Public Communication<br>KS 1, 2, 3, 4, 5                                           |                             | # of press releases                                                        | TBD                                                                 | Press releases                   | 22 in 2016                                                      |
|                                                                                                 |                             | # of earned media mentions                                                 | TBD                                                                 | Earned media mentions            | 57 in 2016                                                      |
|                                                                                                 |                             | # of content media articles                                                | TBD                                                                 | Content media articles           | 11 in 2016                                                      |
|                                                                                                 |                             | # of content media articles picked up                                      | TBD                                                                 | Content media articles picked up | TBD                                                             |
| Responsive – Public Communication<br>KS 1, 2, 3, 4, 5                                           |                             | # of email list subscribers                                                | TBD                                                                 | Email list subscribers           | ~2,000                                                          |
| Well Capacity / Pumping Ratio                                                                   |                             | Ratio of capacity to pumping for all wells and reported to the Water Board | 50% pumping vs. capacity for all 22 wells                           | TBD                              | 16 of 22 wells are pumping at 50% or less of available capacity |
| Facility Inspections                                                                            |                             | # of inspections for high hazard facilities per year                       | 100% of high hazard facilities inspected at least once in two years | Database                         | TBD                                                             |



**Table 2 Internal Levels of Service Performance Measures**

| Service Criteria Area            | Key Performance Indicator # | Key Performance Indicator                                                  | Target Level of Service (Interim Goal)                                                                 | Measurement Data                                   | Current Performance  |
|----------------------------------|-----------------------------|----------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|----------------------------------------------------|----------------------|
| Water Safety - Microbiology      |                             | # coliform samples collected                                               | 250/month                                                                                              | WSLH and Public Health Analysis                    | Monthly average: 305 |
| Water Clarity – Turbidity        |                             | Miles of main flushed per year (UDF)                                       | xxx miles/year                                                                                         | Field reports                                      | xxx miles (201X)     |
| Water Quality - Iron & Manganese |                             | % samples above the secondary standard (SMCL)                              | <5%                                                                                                    | Internal MWU database                              | 1.4%                 |
| Disinfection - Entry Point       |                             | % samples within the range, 0.30 - 0.55 mg/L chlorine                      | >95%                                                                                                   | Chlorine analyzer; daily check by Rounder, WQ Aide | 96.5%                |
| Disinfection - Distribution      |                             | % samples >0.1 mg/L chlorine                                               | >99%                                                                                                   | Measurements by Water Quality Aide                 | 98.9%                |
| Fluoridation                     |                             | % samples within the range, 0.70 +/- 0.15 mg/L fluoride                    | >90%                                                                                                   | Daily check by Operator II                         | 91.9%                |
| Water Quality - Water Age        |                             | TBD                                                                        | TBD                                                                                                    | TBD                                                | TBD                  |
| Water Supply                     |                             | # of deep wells off-line at the same time                                  | 1 deep well off-line due to mechanical failure.<br>Well returned to service within 60 days of failure. | TBD                                                | TBD                  |
| Booster Pump Down Time           |                             | # of pumps impacted at any one time                                        | Maximum of one booster pump off line at any one time                                                   | SCADA                                              | TBD                  |
| Chlorine Level                   |                             | Chlorine residual concentration at key representative points in the system | 0.30 - 0.55 mg/L<br>No more than one chlorine related facility outage per year.                        | Measured by CI2 monitor                            | TBD                  |

| Service Criteria Area         | Key Performance Indicator # | Key Performance Indicator                                                     | Target Level of Service (Interim Goal)                              | Measurement Data                             | Current Performance                                           |
|-------------------------------|-----------------------------|-------------------------------------------------------------------------------|---------------------------------------------------------------------|----------------------------------------------|---------------------------------------------------------------|
| Fluoride Level                |                             | Fluoride concentration at key representative points in the system             | No more than one fluoride incident per year                         | TBD                                          | TBD                                                           |
| Chemical Usage Volume         |                             | % on-time monthly reporting of chemical usage volume to DNR                   | 100% on-time monthly reporting                                      | Calculated and actual values based on volume | 100% on time monthly reporting to DNR                         |
| Flow Meter Testing            |                             | % of flow meters tested annually and reported to the PSC                      | 100% of flow meters tested annually and reported to the PSC         | TBD                                          | 100%                                                          |
| Well Capacity / Pumping Ratio |                             | Annual ratio of capacity to pumping for each well reported to the Water Board | 50% pumping vs. capacity                                            | TBD                                          | Wells are pumping at 50% of less of available annual capacity |
| Facility Inspections          |                             | # of inspections for high hazard facilities per year                          | 100% of high hazard facilities inspected at least once in two years | Database                                     | TBD                                                           |