

FINAL

MUA SCREENING CRITERIA AND 50-YEAR VISION

NEW Water Facility Plan

B&V PROJECT NO. 402658

PREPARED FOR



15 JULY 2020

1 Introduction and Purpose

Task 5 of the Green Bay and De Pere Facility Plan will complete a multi-attribute utility analysis (MUA) on each of the Task 4 alternatives, including the long-term vision and alternatives for the De Pere facility. A MUA is an evaluation tool that allows considerations of a variety of criteria in evaluating alternatives. NEW Water has used MUA's for both planning level and design decisions over the past several years. The purpose of this technical memorandum is to present draft MUA criteria for use the Facility Plan alternative evaluations. The criteria and focus of the MUA was discussed in depth in several of the visioning workshops completed during Task 3 of the Facility Plan, and the presented MUA structure looked to capture the key decision factors for NEW Water and its stakeholders.

2 Background for the MUA Criteria

MUA criteria need to be based on the overall strategic direction and values of an organization. Thus, they allow alternatives to be evaluated in the context of that strategic direction. Three sources of information were considered in developing the MUA criteria for the Facility Plan, which are:

- NEW Water's 2019-2021 Strategic Plan
- The series of Vision Workshops held as part of this project
- MUA criteria developed as part of previous projects.

NEW Water has a 2019-2021 Strategic Plan built around five Strategic Plan Pillars which guide its decision making and investments. These five pillars are shown in Figure 1. Each of these strategic plan pillars has strategic goals which were considered in the MUA criteria development. The strategic goals relevant to this Facility Plan were mapped to one or more MUA criteria.

Through May, June and early July of 2020, a series of four workshops were completed with NEW Water staff, three outside advisors and the consulting team to support the development of a long-term vision for NEW Water. The workshop materials for each meeting are included in the Appendix to this TM. In general, the workshops focused on the following key



Figure 1 The five pillars of the NEW Water Strategic Plan (source: newwater.us/)

concepts, which informed the proposed MUA criteria and established the approach for considering a 50-year vision for NEW Water:

- Workshop No. 1 focused on reviewing the current infrastructure at NEW Water, discussing approaches to long-term planning, and future goals for NEW Water.
- In Workshop No. 2, criteria for evaluating the long-term vision for De Pere were discussed and some of these criteria were appropriate for the overall Facility Plan MUA criteria.
- In Workshop No. 3, additional discussion focused on the types of alternatives and the approach for evaluating

A specific MUA criteria and 50-year vision discussion was held in Workshop No. 4 to identify paths forward for each area. The visioning workshops served as a key aspect for the development of Facility Plan MUA criteria and the approach for developing a 50-year vision in the Facility Plan.

Finally, two previous projects were reviewed (the R2E2 project and the clarifier improvements project) in addition to industry trends to refine the MUA criteria development.

3 MUA Criteria

Based on the workshop discussions and the documented information sources, the following five MUA categories with associated criterium were developed. The following is a short summary of the intent for each criterium. A spreadsheet tool has been provided for the MUA criteria (hard copy included in Appendix B) and presents the MUA criteria and presents two to four evaluation metrics within each criterium. Subsequent discussions with NEW Water will result in weighting factors for each category and each evaluation metric.

1. Financial. This category is intended to focus on the financial impacts of the alternative being considered, both capital and operational financial costs, and maps back to the Organizational Optimization Pillar. This criterium will also consider cash flow, meaning does the alternative require immediate capital or capital spread out over time. Two criteria were developed for this category:
 - a. Life cycle cost
 - b. Cashflow requirement dispersion over time
2. Operational. This category is intended to focus more narrowly on the operational efficiency of an alternative as it relates to the need of operational and maintenance staff. The criteria in this category map back to the Organizational Optimization and Team Pillars. It will consider the complexity of operations, the uniqueness of the equipment and amount of specialty operations and maintenance efforts required. Two criteria were identified to capture these components:



- a. Human intervention requirements (operations) – this criterion is intended to capture operational skill required, complexity of operation, and the increase or decrease in operational staff requirements
 - b. Human intervention requirements (maintenance) – this criterion captures similar aspects as the operations criterion, but with a focus on maintenance, to enable a discussion around the asset maintenance requirements
3. Environmental. This category relates back directly to NEW Water’s Strategic Plan Water Quality Improvements, Innovation, and Operational Optimization Pillars and is based on quantifying the amount of energy saved, nutrients and TSS loadings reduced, and other resources recovered as part of proposed alternatives. The energy savings serves as a reflection of the Greenhouse Gas (GHG) emissions impacts of alternatives. Four criteria were established for the MUA:
- a. New opportunities for resource recovery – this category provides the identification of a benefit for recovery of resources
 - b. Dependency on external resources – in addition to impact the life cycle cost of an alternative, a high dependency on chemical addition should be considered from an environmental impact
 - c. New impact on energy consumption – energy reduction or increased energy production are captured by this category, which indirectly captures GHG emissions (less net energy consumption is less net GHG emissions)
 - d. Potential impact on nutrient/TSS reduction – if an alternative improves net nutrient removal, this mass discharge is accounted for in this criterion
4. Community. NEW Water’s Strategic Plan speaks to the importance of providing for regional partnerships and continuing to improve the NEW Water brand with the Community Outreach Pillar. The goal of the community assessment is to identify if there are any key differentiating components for alternatives related to community benefits. The implementation of a community outreach program and stakeholder engagement is an action item and approach that will be adopted for the recommended alternatives but would not differentiate between alternatives. These outcomes will be considered under this category, in the following key criteria:
- a. Relinquished assets – provides a criteria to capture the level of existing assets that are relinquished before their useful life
 - b. Non-economic community benefits or costs – these benefits could include land availability to development, removal of high-odor risk facilities, and community resources
 - c. Non-economic NEW Water benefits or costs – a major item captured in this category would be land use on-site and preservation of land for future facilities

5. Knowledge/Information. NEW Water’s Strategic Plan also speaks to the importance of innovation, collaboration with industry leaders, providing more professional growth opportunities for its workforce, and attracting and retaining a dedicated workforce. This category will provide for the evaluation of each alternative through the perspective of NEW Water’s human capital, with the following criteria:
 - a. Opportunity for demonstration/pilot testing – innovation is driven by testing new equipment, and this criterion captures the ability to test an alternative at a demonstration level prior to implementation
 - b. Opportunity for operational innovation and adaptation – this criterion captures the flexibility of alternatives to enable operational innovation and adaptation
 - c. Ability to operate in a single-shift operations paradigm – alternatives that require a high degree of technical input, but can be operated effectively over a single shift, can be assessed using this criterion

In addition to the MUA criteria, six foundational requirements were established for the Facility Plan. These requirements will be assessed for each alternative evaluated and should be viewed as non-negotiable for future NEW Water projects. The six foundation requirements identified are:

- Instill a culture of safety
- Streamlined, efficient operations and maintenance
- Resilience to changes in current and future regulations and loadings
- Proven, effective technologies that embrace innovation
- Provide opportunities for efficient resource use and recovery
- Provide benefits to the community and stakeholders

The MUA criteria and foundational requirements will serve as the key tools for evaluating recommended technical solutions and alternatives in the different infrastructure areas for the NEW Water facilities.

A major discussion during the visioning workshops was related to rates, and the range of rates for different NEW Water stakeholders. Our initial proposal is to include rate calculations and evaluations as a final step in developing the enhanced CIP for near-term projects, providing an additional layer of information to assist in the phasing and implementation plan for selected alternatives.



4 Incorporation of a 50-year Vision

The MUA criteria and foundational goals will serve as the key evaluation tools to identify feasible infrastructure packages to be incorporated into the NEW Water CIP. An additional layer to the foundation goals is to identify a 50-year vision for NEW Water and ensure that the solutions identified position NEW Water for a range of potential futures. Risk categories were discussed during Workshop No. 4 that have the potential to be realized and addressed for a 50-year period. Specific risks for each category, a likely response, and the opportunities in the facility plan were then discussed. These risks and opportunities will be considered as part of every alternative infrastructure package to ensure that the current facility plan positioning NEW Water for a range of future scenarios. The risks and opportunities are presented in the following table.

RISK CATEGORY	RISK	LIKELY RESPONSE	FACILITY PLAN OPPORTUNITY
Regulatory	New effluent compounds	Tertiary treatment/ membrane filtration	Maintain site footprint, consider as part of DPF improvements
	Effluent nitrogen limits	Aeration basin modifications	Develop plan for basin modifications
	Microplastics	Tertiary treatment/ membrane filtration	Maintain site footprint, consider as part of DPF improvements
	GHG emission regulations	Reduce use of non-renewable energy	Prioritize alternatives that reduce net energy use
	New pathogen categories	Elimination of blending; multi-phase disinfection	Maintain flexibility for multi-barrier disinfection
	Chlorides/TDS limitations	Source reduction; advanced filtration	Maintain site footprint, consider as part of DPF improvements
Aging infrastructure	Concrete failure	Repair and maintain	Plan for concrete rehabilitation in all projects

RISK CATEGORY	RISK	LIKELY RESPONSE	FACILITY PLAN OPPORTUNITY
Shift in industry / demographics	Significant reduction in organic loading	Reduction in dry weather hydraulic capacity needs	Phased implementation of organic loading projects
	Decreased water usage from conservation	Optimization of basin operation	Identify alternatives the provide operational flexibility
	Rapid population growth	Expansion of facilities	Maintain expansion flexibility
	Shift to residential wastewater flows	Reduced organic strength of wastewater	Phased implementation of organic loading projects
Climate change	Intense weather patterns	Increased wet weather flow treatment	Prioritize improvements that improve wet weather treatment
Community changes	Increased demand for reuse water	Tertiary treatment/ membrane filtration	Maintain site footprint, consider as part of DPF improvements
	Neighbor impacts, gentrification	More odor control, less noise,	Maintain site footprints
Workforce	Workforce availability (technical skill set)	Alternatives that provide simplified operation	Focus on human intervention requirements of alternatives
		Reduced human interaction	

