

# Metropolitan Sewer District of Greater Cincinnati Wastewater Engineering Division

## Triple Bottom Line Analysis Handbook

Social and Environmental Issues



Triple Bottom Line Analysis for  
Business Case Evaluations  
Revised 08/2022

## Instructions

- Use the latest approved Triple Bottom Line Analysis worksheet. Do not re-use a worksheet from a previous project. The worksheet is available on SharePoint in Volume III Section 11 of the MPMP under “BCE Scoring Tool.”
- Each alternative presented in the Business Case Evaluation for the project must be scored for social and environmental impacts (in addition to economic impacts). Social and environmental impacts are scored by considering social and environmental issues.
- Issues are sub-divided into resources. Resources are sub-divided into attributes. For example, *Preservation of Hillside* is an attribute of *Land Resources* and *Land Resources* relates to *Environmental issues*.
- Each attribute is scored as having a negative, neutral, or positive impact based on the alternative being scored. Each attribute must be scored for each alternative. Do not add or omit attributes.
- Each resource and attribute receives a weighted value expressed as a percentage. Do not alter weighted values.
- Document all individuals who assisted with scoring. If more than one individual assisted in scoring, document the scoring method (i.e., group scoring by consensus during meeting, average of individual scores, etc.). The Planner should discuss with PBD Senior Management regarding who (and how many) should be involved and the scoring method utilized. This will vary from project to project.
- Document assumptions and reasoning supporting scoring outcome for each attribute. This is especially important if scoring was done only by the PBD Planner or by group consensus. Documentation of assumptions for group consensus scoring during a meeting can be summarized in meeting minutes. Documentation of assumptions may be difficult or may not be possible if scoring is to be completed by members of the public or by other non-MSD stakeholders.
- The Triple Bottom Line Analysis worksheet computes the environmental and social impact outcome for the alternative being scored. The environmental and social scores computed by the worksheet represent the resulting impact for the alternative being scored based on the impact grading scale located below.
- The subsequent sections in this report describe each resource and attribute for environmental and social issues. Information includes a description of each attribute, weighted value associated with each attribute, and MSD core value associated with each attribute. This information is also included in the Triple Bottom Line Analysis worksheet.

## Impact Grading Scale

|            |                               |
|------------|-------------------------------|
| >90        | Major Positive Impact         |
| 70 to 90   | Significant Positive Impact   |
| 50 to 70   | Above Average Positive Impact |
| 30 to 50   | Average Positive Impact       |
| 1 to 30    | Minor Positive Impact         |
| -30 to 0   | Minor Negative Impact         |
| -50 to -30 | Average Negative Impact       |
| -70 to -50 | Above Average Negative Impact |
| -90 to -70 | Significant Negative Impact   |
| <-90       | Major Negative Impact         |

## Environmental Issues

| Attribute/Resource             | Weighted Value |
|--------------------------------|----------------|
| Air Resources                  | 14%            |
| Pollutants                     | 9%             |
| Heat Island Effect             | 5%             |
| Biological Resources           | 24%            |
| Terrestrial Animals and Plants | 8%             |
| Water Habitat                  | 8%             |
| Wetlands                       | 8%             |
| Hazardous Materials and Waste  | 4%             |
| Hazardous Materials            | 4%             |
| People                         | 10%            |
| Health & Safety                | 10%            |
| Land Resources                 | 24%            |
| Land Use                       | 6%             |
| Land Cover                     | 6%             |
| Soils                          | 6%             |
| Preservation of Hillsides      | 6%             |
| Water Resources                | 24%            |
| Water Quality: Surface         | 12%            |
| Water Quality: Groundwater     | 12%            |
| <b>Total</b>                   | <b>100%</b>    |

## Social Issues

| Attribute/Resource                    | Weighted Value |
|---------------------------------------|----------------|
| Socioeconomics                        | 39%            |
| Employment and Income                 | 3%             |
| Housing and Property Value            | 12%            |
| Community Services and Infrastructure | 6%             |
| Construction                          | 8%             |
| Environmental Justice                 | 10%            |
| Aesthetic Resources                   | 40%            |
| Visual Aesthetic                      | 15%            |
| Noise                                 | 15%            |
| Odor                                  | 10%            |
| Utilities and Infrastructure          | 18%            |
| Utilities                             | 10%            |
| Solid Waste                           | 5%             |
| Transportation                        | 3%             |
| Cultural Resources                    | 3%             |
| Historic Sites                        | 3%             |
| <b>Total</b>                          | <b>100%</b>    |

## Air Resources

### Pollutants



#### MSD Core Value

Minimize air pollution emissions.

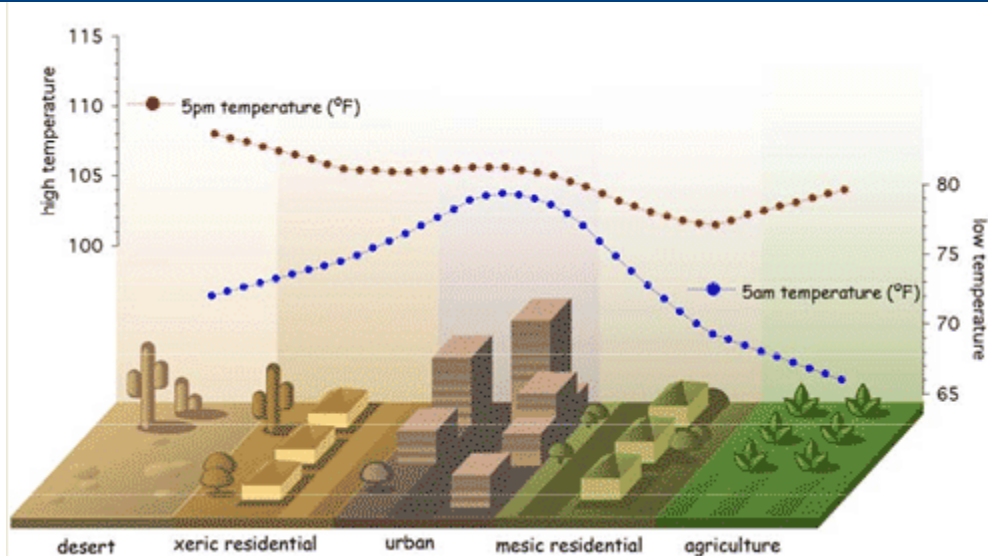
#### Description

Evaluated for pollutant emissions affecting the air quality within the vicinity of the initial capital placement (a 50-mile radius) and after initial capital investment. (i.e., smoke stacks or chemical introduction to air quality).

#### Weight

9%

### Heat Island Effect



#### MSD Core Value

Minimize surfaces that contribute to the heat island effect.

#### Description

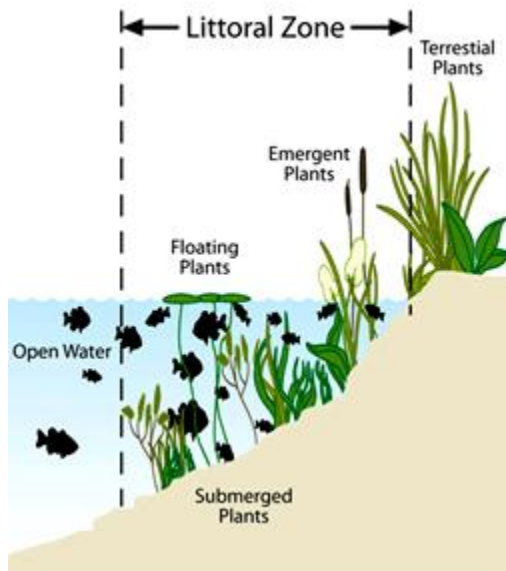
Heat islands are built up areas that are hotter than nearby rural areas. Heat islands can affect communities by increasing summer-time peak energy demand, air conditioning costs, air pollution and greenhouse gas emissions, heat-related illness and mortality, and water quality. Evaluated if heat island effect is in the vicinity of the project, and if the project contributes to the heat island effect after initial capital placement.

#### Weight

5%

## Biological Resources

### Terrestrial Animals and Plants



#### MSD Core Value

Minimize the long-term project impact to terrestrial plants/animals.

#### Description

The term terrestrial is defined as: of or relating to the earth or its inhabitants. Evaluated if project affects plant creation, plant restoration, species introduction, exotic species extinction, habitat creation, habitat advancement, and nutrient cycling in the project area. This evaluation is for the long term impact and not impact related to initial capital placement.

#### Weight

8%

### Water Habitat



#### MSD Core Value

Minimize the long-term project impact to aquatic life and water habitat.

#### Description

Evaluated if project affects aquatic plant beds, aquatic population, stream erosion control and habitat elevation (increase or decrease in aquatic life forms) in the project area. This evaluation is for long-term impact, not the impact related to the initial capital placement.

#### Weight

8%



## Wetlands



### MSD Core Value

MSD recognizes the inherent value of wetlands to our community and strives to minimize impact to existing wetlands.

### Description

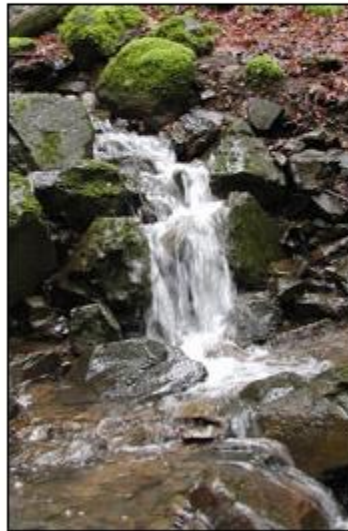
The term wetlands describes lands where saturation with water is the dominant factor determining the nature of soil development and the types of plant and animal communities living in the soil and on its surface. Wetlands vary widely because of regional and local differences in soils, topography, climate, hydrology, water chemistry, vegetation, and other factors, including human disturbance. Evaluated if project impact affects wetlands in the project area. This evaluation is for long-term impact, not impact related to initial capital placement.

### Weight

8%

## Hazardous Materials and Waste

### Hazardous Materials



#### MSD Core Value

Minimize the use of hazardous materials and their potential release into the environment.

#### Description

The term hazardous materials describes discarded materials with properties that make them potentially harmful to human health or the environment, which include things such as chemicals, heavy metals, or substances generated as byproducts during commercial manufacturing processes, as well as discarded household products like paint thinners, cleaning fluids, and old batteries. Evaluated for the long term affect on the reduction or increase of hazardous materials and waste usage.

#### Weight

4%

Health & Safety



MSD Core Value

Promote the health safety and welfare of all the communities within Metropolitan Sewer District's service area.

Description

Evaluated for the long-term effect of new and existing health and safety hazards, flood control, and bacteria on the population in the immediate vicinity of the project.

Weight

10%



## Land Resources

### Land Use



#### MSD Core Value

Conform as closely as possible to the community established zoning and land use plans.

#### Description

Evaluated if the placement of the project has a long-term effect on land utilization in the immediate vicinity (i.e., construction, parks, housing expansions, and restoring natural vegetation).

#### Weight

6%

### Land Cover



#### MSD Core Value

Mimic natural landscape to promote return of runoff into the natural hydrologic cycle.

#### Description

The term land cover is defined as the physical material at the surface of the earth, such as grass, asphalt, trees, bare ground, water etc. Evaluated if the project would have a long-term impact on land cover.

#### Weight

6%



## Water Resources

### Water Quality: Surface



#### MSD Core Value

MSD strives to improve surface water quality and to have no negative impact on ground water quality.

#### Description

§ Evaluated for the long-term affect of contaminates on surface water quality after initial capital placement.

§ Evaluated for the long-term affect of contaminates on groundwater quality after initial capital placement.

#### Weight

12%

### Water Quality: Groundwater



#### MSD Core Value

MSD strives to improve surface water quality and to have no negative impact on ground water quality.

#### Description

§ Evaluated for the long-term affect of contaminates on surface water quality after initial capital placement.

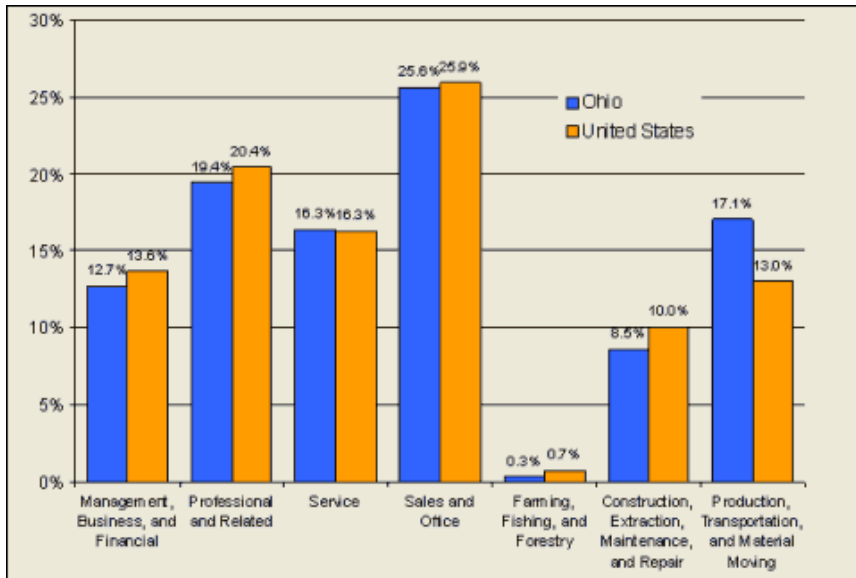
§ Evaluated for the long-term affect of contaminates on groundwater quality after initial capital placement.

#### Weight

12%

## Socioeconomics

### Employment and Income



#### MSD Core Value

Maximize the opportunity for future income and minimize the impact to the existing economy within the immediate and intermediate area.

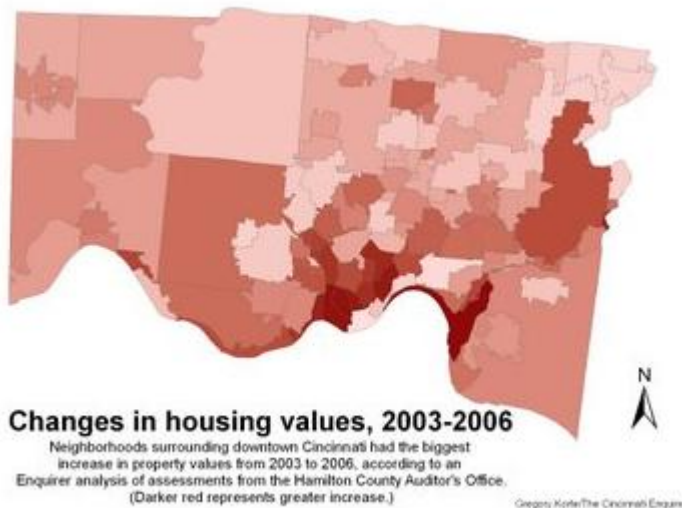
#### Description

Evaluated the short- and long-term impact the capital asset will have on the local community, and determine if income will be gained or lost in the immediate and intermediate area relative to the project.

#### Weight

3%

### Housing and Property Value



#### MSD Core Value

Support of housing development and retention of residents within the Metropolitan Sewer district service area.

#### Description

Evaluated for the long-term impact on housing demand, housing construction, and property value within the immediate and intermediate vicinity of the project and after the initial capital placement has been completed.

#### Weight

12%



## Community Services & Infrastructure



### MSD Core Value

Minimize the change in demand for community services and infrastructure.

### Description

Evaluated for the project's impact on demand for community services and infrastructure after initial capital placement.

### Weight

6%

## Construction



### MSD Core Value

Minimize the impediment to the future commercial and/or residential developmental growth.

### Description

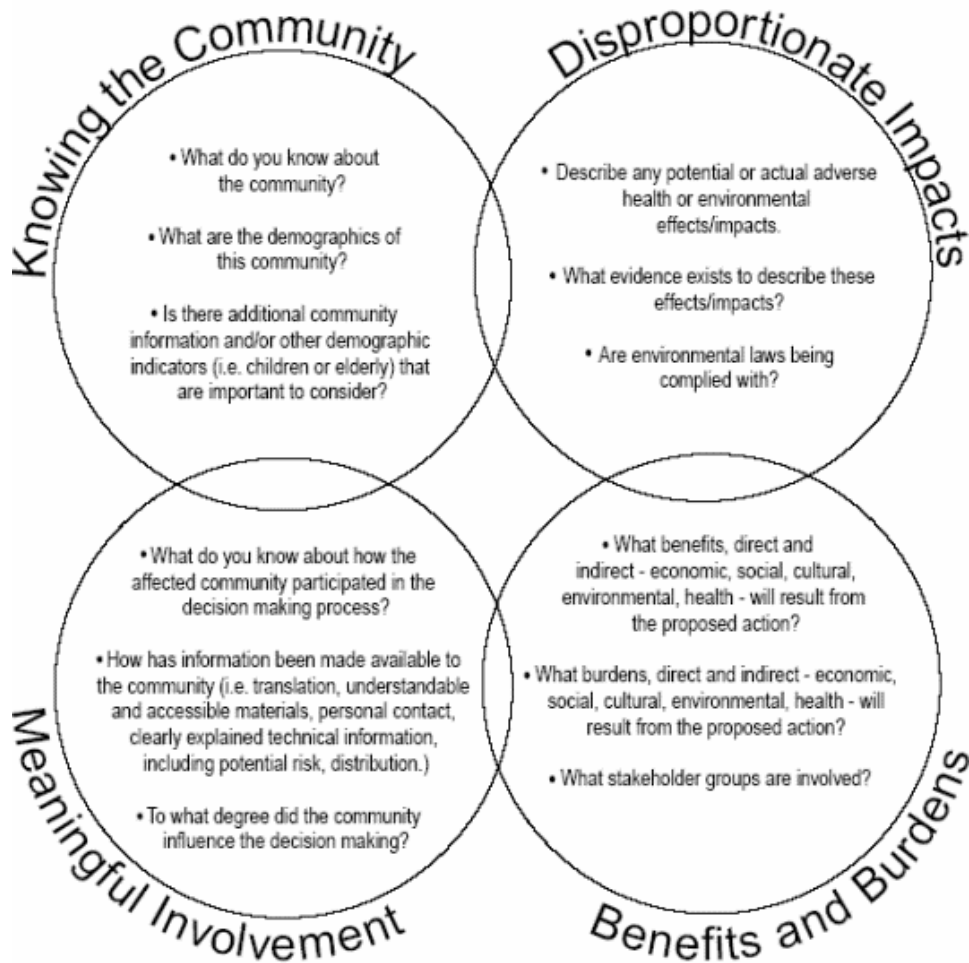
Evaluated to determine the impact of the project on the commercial and/or residential developmental growth and future construction within the immediate and intermediate vicinity of the project and after the initial capital placement has been completed.

### Weight

8%



## The Four Domains of Environmental Justice



### MSD Core Value

Minimize the disproportionate impact to a community that is economically depressed.

### Description

Evaluated the impact of the project on minority and low income populations within the immediate and intermediate vicinity of the project and after the initial capital placement has been completed.

### Weight

10%

## Aesthetic Resources

### Visual Aesthetic



#### MSD Core Value

MSD strives to enhance the visual aesthetics of our community.

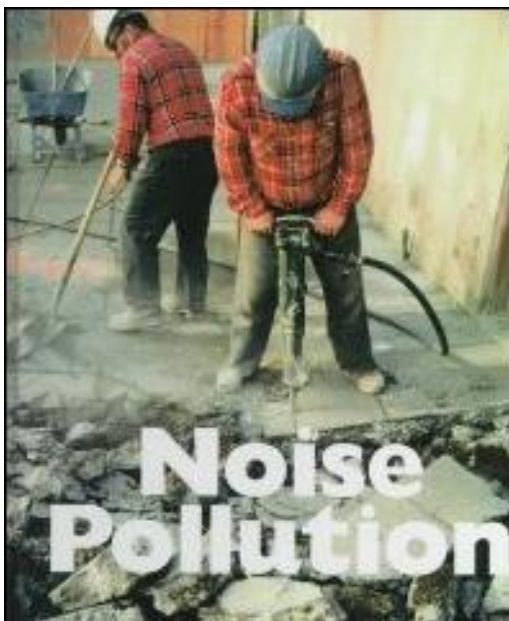
#### Description

Evaluated for the project's impact, through horticulture and landscaping, on therapeutic view and urban agriculture after initial capital placement. For example, if a pump station is being removed and relocated to another area it is considered a neutral impact because the removal equates to a positive impact for one area but the relocation equates to a negative impact for another area.

#### Weight

15%

### Noise



#### MSD Core Value

Minimize the generation of noise.

#### Description

Evaluated for the impact of the project on noise annoyance, disturbance, and agitation within the immediate and intermediate vicinity of the project and after the initial capital placement has been completed.

#### Weight

15%

## Odor



### MSD Core Value

Minimize odor emissions.

### Description

This applies to all odor emissions that are introduced into the environment after initial capital placement (i.e., odors from a pump station or wastewater treatment facility).

### Weight

10%

## Utilities and Infrastructure

### Utilities



#### MSD Core Value

Minimize new infrastructure required to solely support Metropolitan Sewer District assets.

#### Description

Evaluated for the impact of the project on the need for additional infrastructure construction in support of initial capital placement (Electricity, Natural Gas, Potable Water, Wastewater, Storm Water).

#### Weight

10%

### Solid Waste



#### MSD Core Value

Minimize the long-term generation of solid wastes.

#### Description

Solid wastes are materials that would traditionally be disposed of in a permitted solid waste landfill. Evaluated for the long-term affect on the reduction or increase of solid waste.

#### Weight

5%



## Transportation



### MSD Core Value

Minimize the negative impact on current traffic patterns in the immediate vicinity of the project.

### Description

Evaluated for traffic control impact within the immediate and intermediate vicinity of the project and before the initial capital placement has been completed.

### Weight

3%



## Cultural Resources

### Historic Sites



#### MSD Core Value

The project should have no impact to the present nature of buildings, areas and structures designated as historically significant.

#### Description

Evaluated for the impacts on the preservation of historical buildings, areas and structures before initial capital placement.

#### Weight

3%

Appendix “A”  
(TBL Analysis Handbook)

FLAMROC BENEFITS SCORE METHOD

MSD typically uses the Triple Bottom Line Scoring Criteria that includes Social, Environmental, and Cost to evaluate BCE project alternatives where scores are tabulated for Social and Environmental.

The FLAMROC Benefits score evaluates projects in accordance with the definitions listed below and provides a broader impact of the project alternative to MSD’s ongoing operation. The Planner has flexibility in evaluating alternatives by one of the two methods or could add the FLAMROC score onto the Triple Bottom line score. These two named methods are no inclusive and other scores such as project risk score can also be considered for evaluation of project alternatives.

Customize FLAMROC definitions to meet project needs:

**Flexibility**

Manageable methods of operation in the event of a service interruption or change including increase in service. Adjust definitions to meet project needs.

**Land Availability**

Need for additional land for project is minimized.

**Adaptability**

The project can be changed in the future for changing conditions.

**Maintainability**

The project has a long expected useful life, requiring a minimum of regular and preventative maintenance.

**Reliability**

The projects operation provides reliable and consistent service over useful life.

**Operability**

The projects ease of operation is provided throughout the useful life.

**Constructability**

The proposed project and the sequence of construction will minimize the risk of Cost overruns and delays.

The proposed FLAMROC scoring criterion and their respective maximum possible points are shown in Table 1. Note that the concept of maximum possible score combines the separate concepts of weighting and scoring, so that the Scoring Team only needs to assign one number to a category.

**Table 1 FLAMROC Criteria and Weights**

| <b>Criteria</b>            | <b>Weight*</b> |
|----------------------------|----------------|
| <b>Flexibility</b>         | 15             |
| <b>Land Availability</b>   | 15             |
| <b>Adaptability</b>        | 15             |
| <b>Maintainability</b>     | 15             |
| <b>Reliability</b>         | 15             |
| <b>Operability</b>         | 10             |
| <b>Constructability</b>    | 15             |
| <b>FLAMROC TOTAL SCORE</b> | 100            |

\*- Adjust weight to meet project needs