



SAN MATEO COUNTYWIDE  
**Water Pollution  
Prevention Program**

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# ASSET MANAGEMENT PLAN TEMPLATE

SAN MATEO COUNTYWIDE WATER  
POLLUTION PREVENTION PROGRAM

Revised Draft - October 2024

*In compliance with the San Francisco Bay Municipal Regional Stormwater  
National Pollutant Discharge Elimination System (NPDES) Permit, Order No. R2-  
2022-0018, Provision C.21.*

*This template outline is to be used by San Mateo Countywide Water Pollution Prevention Program (SMCWPPP) members to develop Asset Management (AM) Plans as required by the San Francisco Bay Municipal Regional Stormwater Permit (MRP) Provision C.21. The template provides a proposed stormwater asset management framework based on MRP Provision C.21 requirements, and examples of language as guidance to individual agencies. It is meant to assist permittees in the AM plan development and may be adjusted by individual agencies based on their specific needs. Formatting and visual branding standards such as fonts, logos, colors, and layout will be determined by each permittee to remain consistent with their other agency-planning documents.*

*Annotations are presented in brackets. They include descriptions of the intent of each section, subsection(s), and/or proposed content.*

*[AGENCY COVER PAGE]*

*[AGENCY PREFACE]*

# SMCWPPP ASSET MANAGEMENT PLAN TEMPLATE

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## 1.0 EXECUTIVE SUMMARY

*[The Permittee will provide a brief overview of the MRP requirements, AM Plan purpose, asset categories to be managed, the AM O&M Plan, data management approach, funding, and reporting strategy].*

The [Permittee Name] developed this asset management plan to guide implementation of operation and maintenance (O&M) of assets installed to comply with the Municipal Regional Stormwater Permit (MRP). Through implementation of an asset management plan, municipalities (or the [Permittee]) can more effectively plan for system replacements and upgrades to meet MRP goals.

The MRP requires permittees to develop asset management plans to ensure the satisfactory condition of all hard assets. In the context of stormwater, hard assets are publicly-owned structural controls that serve a water quality function. Examples provided in the MRP include bioretention areas, pervious pavement systems, and full trash capture devices. The MRP also specifically requires that this asset management plan includes a description of asset categories, the City's asset inventory, an O&M Plan, and a reporting strategy.

The purpose of this Asset Management Plan is to serve as a long-range O&M planning document that provides a rational framework for:

- Identifying and categorizing assets;
- Characterizing the conditions of assets;
- Prioritizing O&M activities;
- Managing and analyzing asset data; and
- Determining current and future costs.

This asset management plan establishes a categorization hierarchy for the City's structural controls that serve a water quality function. They include Control Type groups which are assets categorized at a high level based on the source of their requirements (e.g., Provision C.3 or C.10) and whether they meet LID standards or not; Asset Category which refers to groups of assets that generally function similarly and; Asset Class which represents the specific types of assets that have been constructed. All of the assets within the hierarchy make up the City's asset inventory.

In order to inform a strategy for prioritizing and scheduling O&M of inventoried assets and to comply with the MRP, this asset management plan includes an O&M Plan. The O&M Plan will guide how data is obtained through asset assessment and evaluated with a risk-based prioritization strategy that considers an asset's likelihood of failure and

consequence of failure when establishing O&M schedules. Data obtained with the O&M Plan will be stored [*describe Permittee's data management here*].

In addition to strategic prioritization of O&M, it is useful to understand costs which directly impact the amount of resources that can be allocated for asset management. For the purposes of this Asset Management Plan, the [Permittee Name] considered costs related to the processes for:

1. Prioritizing and scheduling O&M activities;
2. Evaluating the current condition, and identifying the need for maintenance, rehabilitation and replacement of inventoried assets;
3. Carrying out the routine maintenance, rehabilitation, and/or replacement of inventoried assets; and
4. Conducting reevaluation of risk and prioritization as part of adaptive management.

[*Summarize costs for asset management processes here*]

On an ongoing basis, the [Permittee Name] will compare cost projections with available funding sources. Per Provision C.20 of the MRP, Permittees are required to report costs of permit implementation annually, at the end of each fiscal year, and estimate costs of implementation for the subsequent fiscal year. [Permittee Name] will use the Bay Area Cost Reporting Framework to estimate and report costs for permit implementation, including implementation of asset management requirements.

The [Permittee Name] will report on Asset Management Plan implementation annually, starting with the 2026 Annual Report. At a minimum, for each asset in the inventory, the [Permittee Name] will provide the following information:

- Asset category;
- relevant design information;
- tributary drainage area;
- location;
- condition; and
- O&M need.

## 2.0 TERMINOLOGY AND DEFINITIONS

The following is a list of terminology used throughout the Asset Management Plan and the definitions for each.

- **Asset** – physical structures, including all associated or integrated components, that serve a water quality function.
- **Asset Category** – groups of assets that generally function similarly.
- **Asset Class** - specific classifications that group assets in the asset hierarchy.
- **Asset Condition** - the physical state of the asset determined based on periodic inspections.
- **Asset Inventory** – the list of publicly owned assets serving a water quality function that are managed, operated, and maintained.
- **Component** – a single physical part of an asset that supports its functionality.
- **Consequence of Failure** – measure of the magnitude of impact (e.g., on public safety, water quality, and permit compliance) an asset will have if it fails.
- **Control Type** – highest level functional groupings of assets in the asset hierarchy.
- **Corrective Maintenance** – the remedial actions performed to restore an asset or component to a specified condition after a failure has occurred but does not include rehabilitation or replacement.
- **Cost of Failure** – total cost of replacing or significantly rehabilitating an asset to bring it back to a functioning condition, including the cost of mitigating any impacts associated with its failure.
- **End of Life** – the date or point in time at which the asset is no longer expected or considered to be functioning as intended.
- **Failure** - an event which prevents the asset from meeting minimum condition necessary to achieve minimum performance level(s).
- **Life Cycle Cost** – an aggregated set of costs for each stage of an asset’s life cycle that is used to identify cost-effective interventions to make throughout its life.
- **Likelihood of Failure** – measure of the probability that an asset will fail due to certain considerations such as asset condition, function, location, or age.
- **Rehabilitation** – Non-routine activities that pertain to the majority of the system or include excavation and/or construction of new components.
- **Repair** - Spot treatment to restore isolated damage.
- **Replacement** – removal of all or a majority of the asset and reconstruction of the same or similar asset to fulfill its intended purpose.
- **Risk** – the combined consideration of likelihood of failure and consequence of failure.

- **Routine Maintenance Activities** – ongoing inspection, maintenance, and repair activities conducted during regularly-scheduled maintenance visits that may include minor repairs but are not significant enough to warrant a corrective work order or be considered rehabilitations, replacements, or upgrades).



## 3.0 INTRODUCTION

Stormwater quality-related assets such as bioretention areas, pervious pavement systems, and full trash capture devices, are relatively new to municipal asset inventories compared to other infrastructure types. The majority of these assets were recently constructed or installed and have not yet begun to fail, but as they age, there is potential for unknown or undiscovered defects if they are not properly inspected and maintained. The years and decades to come present risks for a greater number and degree of deficiencies and failures. Asset management can reduce unexpected, expensive, and reactive repairs and increase asset performance over their functional life. An effective asset management plan can help guide efficient implementation of operation and maintenance (O&M) of assets installed to comply with the Municipal Regional Stormwater Permit (MRP). Through implementation of an asset management plan, municipalities (or the [Permittee]) can more effectively plan for needed system replacements and upgrades and meet MRP goals.

This chapter provides a general description of the [Permittee Name] and characteristics relevant to asset management; a description of MRP Provision C.21 requirements and rationale for stormwater quality-related asset management; and a discussion of the purpose and scope of this Asset Management Plan.

### 3.1 AGENCY DESCRIPTION

*[The Permittee will provide a general description/background of their agency as it relates to asset management and to the AM Plan approach that will be undertaken and further described in the document. Refer to Permittee-specific GI Plans and Trash Load Reduction Plans as a starting point for general information].*

### 3.2 MRP REQUIREMENTS

[Permittee Name] is one of 79 agencies subject to the requirements of the San Francisco Bay Area Municipal Regional Stormwater Permit (MRP). Provision C.21 of the MRP requires each permittee to develop and implement an Asset Management Plan in order to ensure the satisfactory condition of all hard assets constructed to comply with various provisions of the MRP, such as Provision C.3 (New and Redevelopment Controls), C.10 (Trash Load Reduction), and C.12 (PCBs Controls).

The MRP defines hard assets, in the stormwater context, as publicly-owned structural controls that serve a water quality function. Examples provided in the MRP to illustrate this concept include bioretention areas, pervious pavement systems, and full trash capture

devices. Permittees must develop an Asset Management Plan by June 30, 2025, and begin implementing the Plan by July 1, 2025. The Asset Management Plan must include, at a minimum:

1. A description of asset categories.
2. An inventory (or link to such an inventory) of existing assets, including at a minimum all Low Impact Development (LID)/(Green Infrastructure (GI) systems and trash capture devices.
3. An Operation, Maintenance, Rehabilitation, and Replacement Plan (Asset Management O&M Plan) with processes for:
  - a. Prioritizing and scheduling O&M;
  - b. Evaluating asset conditions and identifying the need for and carrying out rehabilitation and replacement of inventoried assets; and
  - c. An evaluation or forecast of costs necessary for the implementation of a. & b. above, at least through the end of the current permit term.
4. A strategy for reporting on Asset Management Plan implementation to the Regional Water Quality Control Board (Water Board) annually.

Plans must be submitted to the Water Board with the 2025 Annual Report and implementation reports must be submitted beginning with the 2026 Annual Report. The MRP also requires reassessment and updates to Asset Management Plans on an as-needed basis, to address changing conditions and resources.

### **3.3 ASSET MANAGEMENT PLAN PURPOSE**

Asset management planning creates an opportunity for municipalities to strategically manage their assets and reduce risks of failure. Development of an asset management plan can help to improve the way work is done, knowledge is managed, and limited finances are used effectively.

The purpose of this Asset Management Plan (Plan) is to serve as a long-range O&M planning document that provides a rational framework for:

- Identifying and categorizing assets;
- Characterizing the conditions of assets;
- Prioritizing O&M activities;
- Managing and analyzing asset data; and
- Determining current and future costs.

The Plan is intended to guide efficient implementation of O&M for existing and future hard assets that serve a water quality function, such as bioretention areas, pervious pavement systems, and full trash capture devices, per Provision C.21 of the MRP. While assets

discussed in this Plan may connect to stormwater conveyance systems, the assets pertaining to those stormwater conveyance systems are not included in the inventory of assets to be managed under this Plan.

## 4.0 STORMWATER QUALITY ASSET INVENTORY

**Commented [JS1]:** Required: C.21.b.i.(1) and C.21.b.i.(2)

The [Permittee Name] has assets across all [or some] of the Control Types and Asset Categories. In total, there are [Insert number or approximate number of Assets] owned and operated by the [Permittee]. Chapter 6 provides details on how [Permittee] tracks and manages tabular and geospatial data for each asset. The entire asset inventory list is included in Appendix X.

Asset hierarchies help to make data management and determination of risk levels more efficient. Figure 1 shows the asset hierarchy used for this Plan.

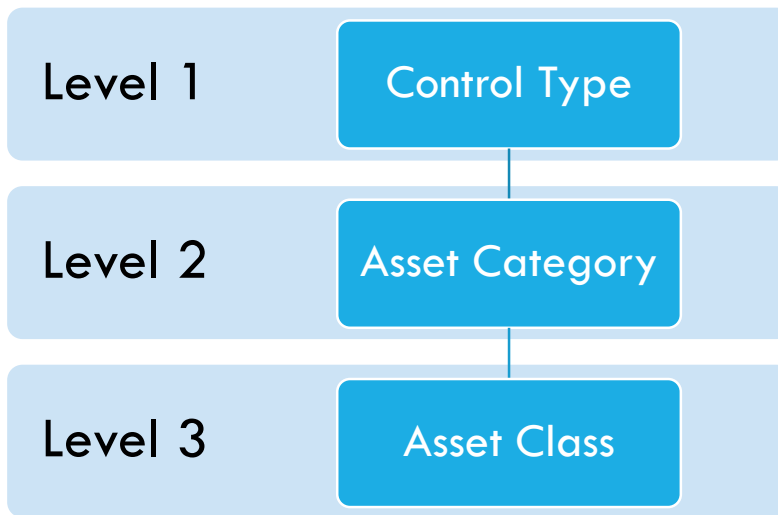


Figure 1. Asset Hierarchy

Control Type groups assets at a high level based on the source of their requirements (e.g., Provision C.3 or C.10) and whether they meet LID standards or not. Asset Category is the next grouping that refers to groups of assets that generally function similarly. Asset Class represents the specific type of assets that have been constructed. Finally, the asset inventory is the list or database of actual assets and their characteristics. Table 1 below defines the top three levels of the hierarchy for stormwater quality-related structural controls included in this Plan.

Table 1. Asset Hierarchy Definitions

Control Type	Asset Category	Asset Class
LID/GI	Biotreatment Systems	<ul style="list-style-type: none"> <li>- Bioretention lined with underdrain</li> <li>- Bioretention unlined with underdrain</li> <li>- Bioretention unlined w/o underdrain</li> <li>- Flow-through planter lined with underdrain</li> <li>- Tree well filter with bioretention soil with underdrain</li> <li>- Tree well filter with bioretention soil w/o underdrain</li> <li>- Green Roof</li> </ul>
	Infiltration	<ul style="list-style-type: none"> <li>- Infiltration trench</li> <li>- Proprietary media filter system</li> <li>- Subsurface infiltration system</li> <li>- Dry wells</li> <li>- Pervious pavement with underdrain</li> <li>- Pervious pavement w/o underdrain</li> </ul>
	Capture and use systems	<ul style="list-style-type: none"> <li>- Rainwater harvesting (e.g., cisterns)</li> <li>- Stormwater capture and use (regional)</li> </ul>
Non-LID Treatment Systems	High flow rate media systems	<ul style="list-style-type: none"> <li>- Media filters (e.g., Vault-based high flowrate media filters)</li> <li>- Media filter with vegetation (e.g., Tree-box-type high flowrate biofilters)</li> <li>- Sand filters</li> </ul>
	Others	<ul style="list-style-type: none"> <li>- Extended detention basin</li> <li>- Vegetated swale</li> <li>- Constructed wetlands</li> <li>- Hydromodification vault</li> <li>- Hydromodification basin</li> <li>- Water Quality Pond</li> </ul>
Trash Controls	Full Trash Capture systems/devices	<ul style="list-style-type: none"> <li>- Hydrodynamic separator                             <ul style="list-style-type: none"> <li>▪ Vortex separators (e.g., CDS)</li> <li>▪ Baffle boxes (NSBB/DSBB)</li> </ul> </li> <li>- GSRD - Gross solids removal device</li> <li>- Netting devices</li> <li>- Surface inlet baskets/screens</li> <li>- Outflow screens (e.g., CPS)</li> </ul>
	Partial Trash Capture Devices	<ul style="list-style-type: none"> <li>- Auto retractable screen (ARS)</li> <li>- Fixed screen</li> </ul>
	Other types of trash control devices	<ul style="list-style-type: none"> <li>- Booms</li> <li>- Interceptors</li> <li>- Debris Rack</li> <li>- Media Filters</li> </ul>

It should be noted that each asset has components on which inspection and maintenance may be focused at any given time. For example, bioretention components include concrete curbs/braces, drain rock, plants, mulch, soil, underdrain, and drain rock. For the purposes of this Asset Management Plan, a single asset is considered the entire water quality structure or system and all of its components. Thresholds for what triggers replacement of an asset will be based on consideration of the entire asset.

#### 4.1.1 Equipment Related to Stormwater Quality

Equipment related to stormwater quality may include types of equipment such as trash receptacles and pet waste stations. While they have been included in the MRP as examples of hard assets, they do not meet the criteria to be considered or managed as structural controls (e.g., O&M is performed on an as-needed basis instead of having periodically scheduled inspections for assessment of condition and maintenance to achieve the minimum condition for performance, as described in Chapter 5). Therefore, they will not be included in the Asset Management O&M Plan.

A subset of San Mateo County Permittees [including Permittee Name] are currently subject to the C.14 Bacteria Controls Provision of the MRP. However, pet waste stations and other equipment that may typically be used to help address bacteria are not applicable to this Plan.

[Permittee Name] currently manages trash receptacles through its solid waste management program. Receptacle locations and conditions are managed for waste collection purposes only, since they will be located in either the drainage flow path of structural trash controls (addressed under this Asset Management Plan) or within areas of other programmatic trash management activities that are evaluated by on-land visual trash assessments (per requirements of MRP Provision C.10 Trash Load Reduction).

## 5.0 ASSET MANAGEMENT O&M PLAN

Commented [JS2]: Required: C.21.b.i.(3)

This section describes the [Permittee Name's] Asset Management O&M Plan that will guide how data is obtained through asset assessment and evaluated in order to inform a strategy for prioritizing and scheduling maintenance, rehabilitation, and replacement of inventoried assets. The process described here includes assessing asset condition and determining a risk-based prioritization strategy.

## 5.1 ASSET CONDITION ASSESSMENT

Asset condition assessments are conducted to provide an indication of immediate and future O&M needs of an asset to ensure adequate performance. In addition, condition assessments can be used to inform an asset’s likelihood of failure as described in Subsection 5.1.3. A condition assessment provides an understanding of the asset’s physical state through periodic inspections.

Stormwater volume and pollutant load reduction, necessary to comply with applicable MRP Provisions, are evaluated and incorporated as part of the siting, design, and installation of stormwater hard assets such as full trash capture devices and bioretention areas. If an asset is impeded in some way, then the intended design-based performance could be effected. The standard for management of stormwater quality related assets, as expressed in MRP Provision C.21.b.i.(3)(b)(i), is to maintain “the minimum condition necessary to achieve minimum performance level(s) for each type of hard asset”.

[Permittee Name] developed a process for evaluating asset condition and identifying the need for and carrying out, as appropriate, the routine/corrective maintenance, rehabilitation, and replacement of inventoried assets (per Provision C.21.b.i.(3)(b)). The condition assessment approach is specific to the asset control type and will be conducted as a part of the implementation of this Asset Management Plan, beginning in FY 25-26. The approach takes into account factors such as design, capacity, and condition and function relative to the asset’s design, intended operating conditions, and intended function.

### 5.1.1 Data Collection Process

[Permittee Name] will collect data on the condition of all assets within the inventory. The process will involve field inspections conducted by a combination of maintenance and inspection staff depending on the oversight of the particular asset. Data will be collected using electronic forms and stored in the [Permittee Name’s] database used for managing O&M as later described in Chapter 6. It is anticipated that this initial data collection process will be completed within one year, and no prioritization has been established for the order in which data will be collected. [Permittee may provide additional information here about the data collection process.]

### 5.1.2 Parameters to Evaluate Asset Condition

Table 3, Table 4, and Table 5 describe the parameters that will be used for evaluating the condition of assets. Table 3 outlines the parameters for LID/GI. Table 4 outlines the parameters for Non-LID assets. Finally, table 5 shows the parameters for trash control

**Commented [JS3]:** Required: C.21.b.i.(3)(b). Sections 5.1.1 and 5.1.2 describe the proposed process for evaluating condition and identifying need for maintenance. While a process is required, there is flexibility to modify what is proposed in the template.

**Commented [JS4]:** Tables are not required.

assets. Only applicable parameters will be rated for each asset class and separate score ranges will be applied.

Table 2. LID/GI Condition Assessment Parameters

Parameters	Biotreatment Systems							Infiltration					Capture and Use Systems	
	Bioretention lined with underdrain	Bioretention unlined with underdrain	Bioretention unlined w/o underdrain	Flow-through planter lined with underdrain	Tree well filter with bioretention soil with underdrain	Tree well filter with bioretention soil w/o underdrain	Green Roof	Infiltration trench	Subsurface infiltration system	Dry wells	Pervious pavement with underdrain	Pervious pavement w/o underdrain	Rainwater harvesting (e.g., cisterns)	Stormwater Capture and Use (regional)
Plant Health	X	X	X	X	X	X	X							
Mulch	X	X	X	X	X	X								
Irrigation System	X	X	X	X	X	X	X							
Trash/Debris	X	X	X	X	X	X		X	X	X	X	X	X	X
Erosion/Sedimentation	X	X	X	X	X	X		X			X	X		
Structure	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Drainage & Standing Water	X	X	X	X	X	X	X	X	X	X	X	X		
Clogging or Blockage	X	X	X	X	X	X	X	X	X	X	X	X	X	X



**Table 3. Non-LID Condition Assessment Parameters**

Parameters	High Flow Rate Media Systems			Other					
	Media filters (e.g., Vault-based high flowrate media filters)	Media filter with vegetation (e.g., Tree-box-type high flowrate biofilters)	Sand filters	Extended detention basin	Bioswales/Vegetated swale	Constructed wetlands	Hydromodification vault	Hydromodification basin	Water Quality Pond
Plant Health		X			X	X	X	X	X
Mulch		X							
Irrigation System		X			X				
Trash/Debris	X	X	X	X	X	X	X	X	X
Erosion/Sedimentation		X	X	X	X	X		X	
Structure	X	X	X	X	X	X	X	X	X
Drainage & Standing Water	X	X	X	X	X		X	X	
Clogging or Blockage	X	X	X	X	X	X	X	X	X

**Table 4. Trash Controls Condition Assessment Parameters**

Parameters	Full Trash Capture Systems/Devices				Partial Trash Capture Devices		Other types of trash control devices				
	Hydrodynamic separator	GSRD - Gross solids removal device	Netting devices	Surface inlet baskets/screens	Outflow screens (e.g., CPS)	Auto retractable screen (ARS)	Fixed screen	Booms	Interceptors	Debris Rack	Media Filters
Screen Plugging	X	X		X	X	X	X	X	X	X	X
Screening Portion Capacity	X	X		X	X	X	X	X	X	X	X
Water Depth	X	X	X	X	X	X			X	X	X
Drainage & Standing Water	X	X	X	X	X	X			X	X	X
Structure	X	X	X	X	X	X	X	X	X	X	X
Net			X								
Net Attachment			X								
Net Capacity			X								
Net Attachment Structure			X								

The condition assessment will evaluate the parameters associated with each of the assets, as indicated in Tables 3, 4, and 5. The [Permittee Name] grouped assets with similar sets of parameters to create a consolidated set of condition assessment scoring tables. To evaluate the overall condition for each asset, the [Permittee Name] will average sum the scores from all parameters to develop an overall asset condition score. Figure 2 shows the condition assessment scoring level rubric with descriptions for each scoring level.

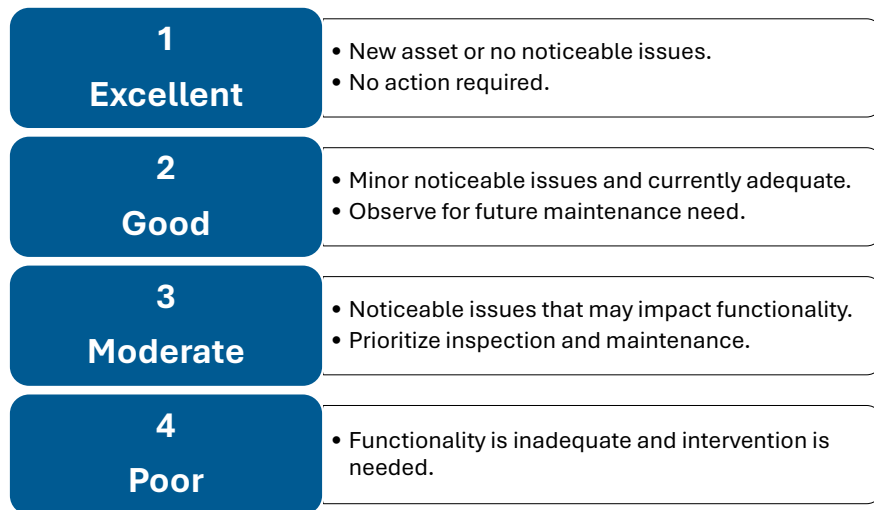


Figure 2. Condition Assessment Rating Rubric

## 5.2 RISK EVALUATION

Evaluating risk can ultimately inform prioritization strategies for efficient use of limited resources. Assets that are determined to be at higher risk of failure can be prioritized for maintenance, allowing greater access to necessary resources for maintaining their condition. Assets with lower risk of failure will still need access to resources for maintenance but at a lower level or frequency. For asset management planning, an initial risk level is identified for setting frequencies of inspection and maintenance activities for assets. The risk level may be periodically evaluated and updated along with asset inspection and maintenance frequencies, based on data collection or new information. The two primary components for determining risk are likelihood of failure and consequence of failure.

**Commented [JS5]:** Technically not required but LoF and CoF must be considered.

### 5.2.1 Likelihood of Failure

Likelihood of Failure (LoF) is a metric score or consideration based on known or collected data or anecdotal information. An asset's condition can be the sole basis for the LoF, but if more information is available, it can be determined as a composite score/consideration that includes information such as asset age, performance, asset residual life, maintenance history, and capacity. Given that an asset's condition is a point-in-time assessment, one assessment may not be representative of the asset's actual LoF, if that asset is exposed to variable external conditions affecting its performance. For example,

**Commented [JS6]:** Required: C.21.b.i.(3)(b),(iii)

trash loads can be variable within a given trash management area. If a connector pipe screen is inundated with trash prior to a condition assessment, its observed condition may not be representative for that particular location and thus may not be a good indicator of overall frequency needs. Utilizing a composite score or set of observations can help offset this potential for over-conservative LoF classification.

[Permittee Name] identified the potential LoF considerations shown Table 6 below. The table also lists the corresponding ranges of scores that could be applied to each asset to calculate an overall LoF score. The [Permittee Name] will collect LoF data as part of the condition assessment process. The data will be used to evaluate the LoF for each asset in the inventory based on the considerations defined below.

**Table 5. Likelihood of Failure Considerations per Control Type**

Control Type	LoF Parameter	Score Range
LID/GI	Condition Assessment	1 – 4
	Location in high traffic area	1 – 3
	Presence of irrigation	0, 1
Non-LID Treatment Systems	Condition Assessment	1 – 4
Trash Controls	Condition Assessment	1 – 4
	Trash Generation Rate	1 – 4
	Past Inspection Findings	1 – 4

Commented [JS7]: Scoring not required.

### 5.2.2 Consequence of Failure

Commented [JS8]: Required: C.21.b.i.(3)(b)(iii)

Consequence of failure (CoF) is a measure of the magnitude of impact (e.g., on public safety, water quality, and permit compliance) an asset will have if it fails. Considering CoF helps guide municipalities to which assets should have priority and demonstrate why. For example, should the CoF for an asset be a threat to public safety, that asset would likely be considered to have a more critical need for resources. CoF can be a consideration or score that is based on one or a combination of parameters, similar to LoF. Table 7 lists potential parameters for CoF scoring/consideration which can be applied across all types of assets. In addition, the table provides a score range for each CoF. The [Permittee Name] will collect CoF data as part of the initial condition assessment process. The data will be used to evaluate the CoF for each asset in the inventory based on the considerations defined below.

Table 6. Consequence of Failure Parameters

CoF Parameters	Score Range
Size of Drainage Area (i.e. greater impact to drainage and WQ)	1 – 3
Cost of Repair/Replacement (small, medium, large)	1 – 3
Localized Flooding	1 – 3
Public Perception	1 – 3
Public Safety	1 – 3

Commented [JS9]: Scoring not required.

### 5.2.3 Risk

Risk analysis is conducted by assessing a combination of LoF and CoF. Once the LoF and CoF is determined for each asset, the [Permittee Name] will evaluate overall risk [Option 1: For a small inventory use the following text, “using a general assessment approach that considers the list of LoF and CoF with best professional judgement to determine overall risk”. Option 2: For small and/or large inventories use the following language, “by combining LoF and CoF scores utilizing the equation shown in Figure 2.”] The [Permittee Name] will allow room for modifications to the risk analysis approach and outputs based on best professional judgement (e.g., historical knowledge that doesn’t align with scores).

Commented [JS10]: Not required. While consideration of LoF and CoF (above) make up the risk analysis, this section is not specifically required.



Figure 3. Risk Analysis Calculation

When combined with a risk analysis, LoF and CoF considerations/scores allow for development of a risk profile or matrix. Once completed, the [Permittee Name] will utilize the profile as a guide for prioritizing inspection and maintenance frequencies for assets. The [Permittee Name’s] risk profile will be broken down into High, Medium, and Low sections as shown in the examples in Table 8 and Figure 3 below.

Table 7. Example Risk Profile

Asset	Risk
Asset X	High
Asset Y	Medium
Asset Z	Low

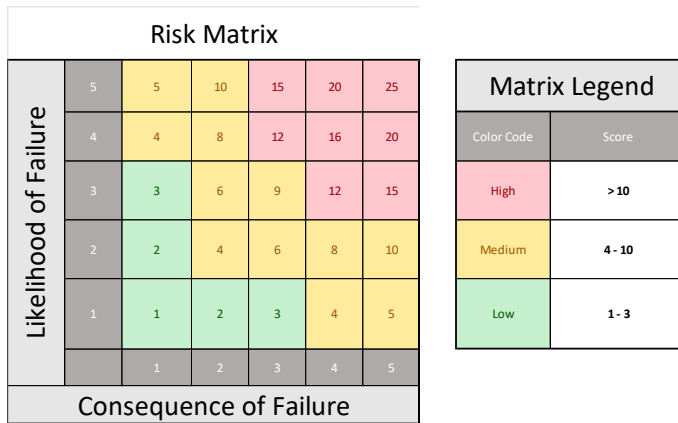


Figure 4. Example Risk Matrix

### 5.3 O&M STRATEGY

Commented [JS11]: Required: C.21.b.i.(3)(a)

It is generally not cost-effective and often infeasible to maintain all assets at the same frequency and to the same extent. Even with sufficient resources, implementing a homogenous maintenance regime may not be the best use of public funds. The risk-based approach to prioritizing and scheduling actions is a more strategic means of maintaining asset conditions. The risk-based approach described in the previous section establishes the assignment of asset priorities based on the likelihood and consequence of failure for each. This section identifies the strategy for implementing O&M per the risk-based analysis for each asset. O&M protocols will follow the MRP requirements for related assets and/or align with existing permittee practices, as appropriate.

#### 5.3.1 Prioritization and Scheduling

Commented [JS12]: Required: C.21.b.i.(3)(a)

The [Permittee Name] will evaluate the findings from the risk analysis to inform a strategy for prioritizing and scheduling maintenance, rehabilitation, and replacement of inventoried assets. O&M actions will be assigned based on the risk category (i.e. High, Medium, or Low) that was assigned to the asset.

Scheduling and frequency will need to consider several factors assessed against the asset risk analysis. Once the entire inventory has been analyzed and assessed for condition, the [Permittee Name] will evaluate an approach to scheduling O&M based on funding availability. In addition, the [Permittee Name] will take into account the geographical locations for all assets and the internal responsibility assigned for O&M. For example,

assets may be maintained by different departments, and each has other non-stormwater assets for which they are responsible. O&M scheduling may need to take into account grouping of assets by department and geographical location for more efficient use of resources.

### 5.3.2 Adaptive Management

The [Permittee Name] will periodically reassess and update the Asset Management Plan and O&M Prioritization Strategy on an as-needed basis. Changing conditions and resources will be considered and modifications to risk analyses, O&M prioritization, and scheduling frequencies may be made. The first year of implementation of the Asset Management Plan will be an opportunity to begin to implement the O&M strategy and develop standard operating procedures to support the O&M Plan with additional details and guidance.

Commented [JS13]: Required: C.21.b.iii.

## 6.0 STORMWATER QUALITY ASSET DATA MANAGEMENT

*[Describe how the permittee is managing their AM data. For example, previous and/or current practices used for stormwater-related assets inventory development and update (including description of data currently available in the GI Tracking Tool). Additionally, the permittee should indicate what is currently saved/updated in their local database(s) and describe how they plan to use their data management tool(s) available and whether these available tools are required to be integrated.]*

*This section will also include suggested language regarding the permit requirements for the AM inventories (e.g., asset features, relevant design information, tributary drainage area, location, and asset condition). Some examples of the two types of data to be managed (that may be needed for the AM Plan implementation) are indicated below. Example(s) of inventory records may be provided].*

### **Fixed data:**

- *Asset Unique Identifier*
- *Asset Category*
- *Asset Type*
- *Address (i.e., full address, if available, or cross streets)*
- *Locations (i.e., Latitude and Longitude)*
- *Tributary drainage area*
- *Owned by (Public only)*
- *Maintained by (Public only; Department, contractor, etc.)*
- *Date construction completed or installed*

### **Data changing over time:**

- *Date of last maintenance*
- *Maintenance activities performed*
- *Inspection date*
- *Condition*
- *Likelihood of failure*
- *Next maintenance type (Routine/Rehabilitation/Replacement)*
- *Next maintenance date*

*Other types of fields/data that permittees may manage in the same or different database are:*

- *Field inspection reports*
- *Maintenance reports*
- *Pictures*



## 7.0 CURRENT AND FUTURE COSTS AND FUNDING SOURCES

Commented [JS14]: Required: C.21.b.i.(3)(c)

Asset management planning can guide cost effective use of resources for ongoing O&M programs. In addition to strategic prioritization of O&M, it is useful to understand asset-related costs which directly impact the amount of resources that can be allocated. Furthermore, the ongoing asset management planning and adaptive management will also incur costs. For the purposes of this Asset Management Plan, the [Permittee Name] considered costs related to the processes for:

1. Prioritizing and scheduling O&M activities;
2. Evaluating the current condition, and identifying the need for maintenance, rehabilitation, and replacement of inventoried assets;
3. Carrying out the routine maintenance, rehabilitation, and/or replacement of inventoried assets; and
4. Conducting reevaluation of risk and prioritization as part of adaptive management.

On an ongoing basis, the [Permittee Name] will compare cost projections with available funding sources to determine the best manner in which to fund the operation, maintenance, rehabilitation, and replacement of inventoried assets.

Per Provision C.20 of the MRP, Permittees are required to report costs of permit implementation annually, at the end of each fiscal year, and estimate costs of implementation for the subsequent fiscal year. [Permittee Name] will use the Bay Area Cost Reporting Framework to estimate and report costs for permit implementation, including implementation of asset management requirements. The efforts described in this section to evaluate and forecast costs to implement the Asset Management Plan will be coordinated with and inform Provision C.20 cost reporting but will be performed by [Permittee Name] specifically to plan and allocate resources to asset management tasks.

## 7.1 COST EVALUATION FOR ASSET MANAGEMENT PLANNING AND IMPLEMENTATION

Commented [JS15]: Required: C.21.b.i.(3)(c)

Over the course of the first year of Asset Management Plan implementation, the [Permittee Name] will conduct condition assessments, perform a risk analysis, and prioritize and schedule O&M actions. As part of the development of this Asset Management Plan, the [Permittee Name] evaluated the level of effort necessary to complete each of these tasks in Year 1 (FY 25/26) for the total asset inventory. The [Permittee Name] also estimated future costs for FY 26/27, the last year of the MRP term. In order to determine future costs, the [Permittee Name] evaluated the level of effort for each activity per year. The first year is anticipated to have higher costs due to the initial startup activities. The results of the cost evaluation are shown in Table 9.

**Table 8. Cost Evaluation for Current Permit Term**

Activity	Total Costs	
	FY 25/26	FY 26/27
Condition Assessments	\$	\$
Risk Analysis	\$	\$
Prioritization and Scheduling of O&M	\$	\$
Conducting O&M Activities	\$	\$

Without completing the first three activities listed in Table 9, the [Permittee Name] cannot adequately assess the estimated costs for operation, routine maintenance, and rehabilitation. However, the [Permittee Name] will consider evaluating and forecasting these costs using factors such as cost per asset or cost per square foot that can be applied to develop future costs and that consider inventory growth, changing asset conditions, and escalation.

It is worth noting that rehabilitation costs are more difficult to estimate because rehabilitation needs depend on many variables. Stormwater assets may need rehabilitation due to unpredictable external events, lack of maintenance, or other factors. Implementing corrective maintenance as part of the O&M strategy can help avoid this scenario.

Replacement costs are also challenging to estimate for many of the assets considered in this plan, because they are relatively new and there is limited data available related to the longevity of these assets. However, using the installation date for each asset, the [Permittee Name] will assume an end-of-life scenario and estimate a useful life for each asset class. Then, the [Permittee Name] will estimate the expected replacement cost based on the cost of installation escalated to the year in which the asset may ultimately fail.

## 8.0 ASSET MANAGEMENT REPORTING STRATEGY

Commented [JS16]: Required: C.21.b.i.(4)

*[This section will describe the Permittee’s proposed approach for reporting on asset management implementation in compliance with Provision C.21.b.i.(4) (e.g., combining attachments and links to data sources, that may vary by permittee depending on the size of their inventory of assets, and whether any information will be collected or made available from a countywide database, i.e., the GI Tracking Tool). The approach will include identified opportunities to integrate information currently tracked/reported for MRP Annual Reports].*

The [Permittee Name] will report on Asset Management Plan implementation annually, starting with the 2026 Annual Report. The [Permittee Name] will provide *(or link to)* an inventory of all assets accounted for in the Asset Management Plan.

At a minimum, for each asset in the inventory, the [Permittee Name] will provide the following information:<sup>1</sup>

- Asset category;
- relevant design information;
- tributary drainage area;
- location;
- condition; and
- O&M need.

Based on periodic inspections, either by municipal or contracted staff, the [Permittee Name] will update the condition and O&M need for inclusion with the annual report. The inspection frequencies and updates will be tied to the risk analysis and prioritization process described in Chapter 5.

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<sup>1</sup> Per discussions with the Bay Area Municipal Stormwater Collaboration (BAMSC) Asset Management Work Group and the ACCWP Asset Management Work Group, all asset management data will be submitted in the [Permittee Name’s] Annual Report. No data compilations or summaries at the countywide or regional level will be reported.

## 9.0 REFERENCES

*[References to examples of stormwater asset management programs may also be provided in this section. This section is intended for guidance only and would not be included in the permittee's actual AM Plan].*