

Example Competency Test Problems



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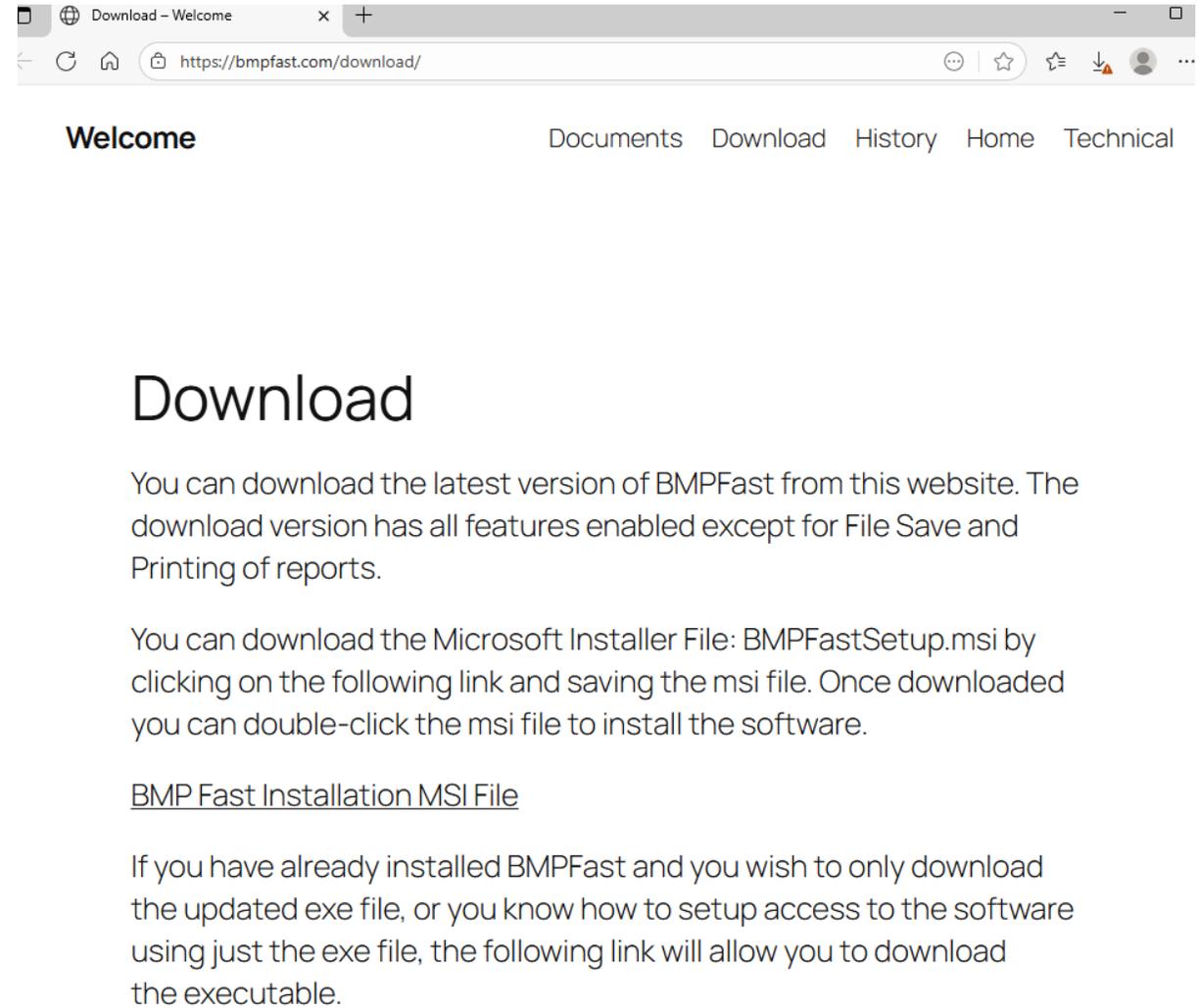


Learning Objectives

- Interpretation of data used for BMPFast analysis.
- Show how to set up the analysis in BMPFast.
- Example of how to submit the BMPFast input/output for grading.
- Example questions asked.
- The testing, how many different questions, and retaking.
- Grade needed to earn a certificate of competency.

BMPFast Download

- <https://bmpfast.com/download/>
- Download of Microsoft Software Installer (MSI) file
- Download of executable file

A screenshot of a web browser showing the BMPFast website's download page. The browser's address bar displays the URL 'https://bmpfast.com/download/'. The page content includes a navigation menu with 'Welcome', 'Documents', 'Download', 'History', 'Home', and 'Technical'. The main heading is 'Download', followed by a paragraph explaining that the latest version of BMPFast is available for download, with some features disabled. Below this, another paragraph describes how to download the Microsoft Installer File (BMPFastSetup.msi) and how to install it. A link for 'BMP Fast Installation MSI File' is provided. The final paragraph offers instructions for downloading an executable file for users who already have the software installed.

Download – Welcome

Documents Download History Home Technical

Download

You can download the latest version of BMPFast from this website. The download version has all features enabled except for File Save and Printing of reports.

You can download the Microsoft Installer File: BMPFastSetup.msi by clicking on the following link and saving the msi file. Once downloaded you can double-click the msi file to install the software.

[BMP Fast Installation MSI File](#)

If you have already installed BMPFast and you wish to only download the updated exe file, or you know how to setup access to the software using just the exe file, the following link will allow you to download the executable.

Welcome to BMPFast 2025

Software by: Marty Wanielista, Ron Eaglin, Harvey Harper, and Dingbao Wang

Input for improvements to content was from professionals representing local and state government agencies as well as from the academic and consulting areas. This software is in agreement with State laws on the distribution of intellectual property as well as current practice related to applicant handbooks, research, and regulatory decisions made through 2025.

Disclaimer: The user is responsible for all input data and an understanding and navigation of the software.



Enter Valid User Email:

Enter Validation Code:

About BMPFast Validation

Continue with Validation

Continue without Validation



Login with a test account and code; access will be removed after beta testing.
Click **“Continue with Validation”**.
Validation code will be available after completing a competency evaluation (test).

Example Test Problem 1

Retention basin: pre- vs. post-development loading

This example problem includes the step-by-step procedure to input information for retention basin average annual effectiveness. Retention basins also are identified as infiltration cells, retention ponds, and infiltration basins. They are used for regional and on-site treatment. The site is located in Marion County, near Ocala FL, with 2 acres and 50 inches of annual rainfall on Hydrologic Soil Group C. The pre-development land use condition is citrus with a non-DCIA Curve Number (CN) of 80 and 0% DCIA. The post-development land use condition is multi-family with a non-DCIA Curve Number (CN) of 80 and 28% DCIA.

The onsite retention basin must provide treatment for discharge to a non exempted (non OFW or impaired water). The usual retention design depth for this area is a rainfall depth of 1 inch. Thus, the volume of the retention basin is 7,260 CF (i.e., 1-inch x 2 acres x (43,560 SF/acre) / (12 inches/foot)), which is equivalent to 0.167 acre-feet. The retention depth for the 1 inch of treatment is on the average 3 feet. Thus, the area at design depth of 1 inch over the watershed is 2420 SF (7260 CF/3ft) or 0.056 acres. There is an option to double the retention treatment depth up to 0.333 acre-feet. The retention area is part of the catchment area. The depth of retention (inches) is calculated from the volume of the retention basin and the catchment area. The catchment area may change if there is additional runoff to the retention basin from another catchment area as an example.

There is no additional treatment volume onsite that can result from a deeper basin because of water table depth. The BMPFast 2025 software is used to analysis one inch of treatment depth first. Calculating the treatment efficiency needed so that the post development average annual loading of nutrients equals the predevelopment nutrient loading. Comparing the result from the calculated treatment efficiency by the pre- vs. post-development to the percent reduction required in treatment performance standards for all sites non-exempt. The greater load reduction (the more protective) will be the requirement for the project. The analysis option selected is for all sites non-exempt. The net improvement analysis option selected is to calculate treatment efficiency by pre- vs. post-development. The question is to determine if the 1-inch size of retention meets the performance standard.

1. General Site Information Worksheet

General Site Information (Current User: Beta_Tester) — □ ×

[Help and Documentation](#) Project Name:

Select Meteorological Zone for Project: ?

Enter the Mean Annual Rainfall: inches ?

Performance Standard of Surface Discharge Analysis: ▾

Conduct Groundwater Discharge Analysis: ▾

Nitrogen Removal Efficiency (%):

Phosphorus Removal Efficiency (%):

1.
2.
3.
4.
5.
6.

2. Watershed Characteristics Worksheet

Watershed Characteristics Worksheet

Add Catchment **Catchment 1**

Current Catchment

Land Use Catchment Name:

Pre:

Post:

Single-Family: (TN=1.770 TP=0.320)

Undeveloped - Dry Prairie: (TN=2.110 TP=0.180)

Undeveloped - Marl Prairie: (TN=2.110 TP=0.180)

Undeveloped - Mesic Flatwoods: (TN=2.110 TP=0.180)

Undeveloped - Ruderal/Upland Pi...

Undeveloped - Scrubby Flatwoods...

Post-Development DCIA Per...

Wet Pond Area (No loading from pumped and other non-runoff sources (kg/yr) Pre: ... Post: ...)

Watershed Characteristics Worksheet

Add Catchment **Catchment 1**

Current Catchment Number : **1 Example Problem 1**

Land Use Catchment Name:

Pre:

Post:

Total Pre-Development Catchment Area (ac):

Total Post-Development Catchment Area (ac):

Pre-Development Non DCIA Curve Number:

Pre-Development DCIA Percentage (0 - 100%):

Post-Development Non DCIA Curve Number:

Post-Development DCIA Percentage (0 - 100%):

Wet Pond Area (No loading from this area, ac):

Load from pumped and other non-runoff sources (kg/yr) Pre N: P: Post N: P:

Concentrations used in Analysis

	Pre:	Post:	
EMC(N) mg/l	<input type="text" value="2.110"/>	<input type="text" value="1.840"/>	
EMC(P) mg/l	<input type="text" value="0.180"/>	<input type="text" value="0.520"/>	
Annual ROC	<input type="text" value="0.111"/>	<input type="text" value="0.306"/>	<input type="button" value="?"/>
Runoff (ac-ft/yr)	<input type="text" value="0.925"/>	<input type="text" value="2.550"/>	
N Loading (kg/yr)	<input type="text" value="2.407"/>	<input type="text" value="5.785"/>	<input type="button" value="?"/>
P Loading (kg/yr)	<input type="text" value="0.205"/>	<input type="text" value="1.635"/>	

3. Treatment Options

retention basin with design depth of 1 inch

General Site Information (Current User: Beta_Tester)

Help and Documentation Project Name:

Select Meteorological Zone for Project: ?

Enter the Mean Annual Rainfall: inches ?

Performance Standard of Surface Discharge Analysis: v

Conduct Groundwater Discharge Analysis: v

Nitrogen Removal Efficiency (%): 1. Enter Catchment

Phosphorus Removal Efficiency (%): 2. Enter Treatment

3. Configure Catchments

4. Summary Treatment Report

5. Complete Report

6. Cost Comparisons

Open Project New Project

Save Project Exit BMPTrains



Select Treatment Options for individual performance, n

Catchment 1 FDOT Roadway

Treatment Options

Retention Basin	Greenroof
Wet Detention	Rainwater Harvesting
Exfiltration Trench/Vault	Vegetated Buffer
Permeable Pavement	Vegetated Filter Strip
Stormwater Harvesting	Rain Garden
Surface Discharge Filter	Tree Well
Swale	User Defined
BMPs in Series	



Retention System Worksheet Analysis: All sites non-exempted

Provided Retention Volume (acre-feet):

Watershed Non-DCIA Curve Number ((0-100))	80
Watershed DCIA Percent (%)	28.00
Rainfall Zone	Florida Zone 2
Rainfall (in)	50.00

Surface Water Discharge

Required Nitrogen Treatment Efficiency (%)	55.00
Provided Nitrogen Treatment Efficiency (%)	82.8
Required Phosphorus Treatment Efficiency (%)	80.00
Provided Phosphorus Treatment Efficiency (%)	82.8

Calculate Media Get Depth Copy Plot Cost Print Back

4. Configure Catchments

retention basin with design depth of 1 inch

General Site Information (Current User: Beta_Tester)

Project Name:

Select Meteorological Zone for Project: ?

Enter the Mean Annual Rainfall: inches ?

Performance Standard of Surface Discharge Analysis:

Conduct Groundwater Discharge Analysis:

Nitrogen Removal Efficiency (%):

Phosphorus Removal Efficiency (%):

Select Catchment Configuration

	From	To	Area	BMP Used	Edit
▶	1	0	2.00	None	<input type="button" value="Edit"/>
*					

Routing Catchment From: 1

Routing Catchment From: 1

Select Catchment to Route to:

Select BMP to use in routing:

Catchment Active

Delay Time (hr):

Select Catchment Configuration

	From	To	Area	BMP Used	Edit
▶	1	0	2.00	Retention	<input type="button" value="Edit"/>
*					

Full Routing Report

Select Catchment Configuration

	From	To	Area	BMP Used	Edit
▶	1	0	2.00	Retention	Edit
*					

By using existing and adding new Catchments create a routing configuration. Specify default BMP to be used.

0 is Outlet

Calculation Options

Report Options

Independent Catchments

Full Routing Report

Project: Example Test Problem 1 one inch

Date: 01/12/2026
Generated by: Beta_Tester

Balance Diagrams — Routing Blocks

Each block shows upstream routing, inputs, treatment efficiencies, outputs and mass reduction for the selected BMP.

Catchment 1 Retention



5. Summary Report

retention basin with design depth of 1 inch

General Site Information (Current User: Beta_Tester)

Help and Documentation Project Name: Example Test Problem 1 one inch

Select Meteorological Zone for Project: Florida Zone 2 ?

Enter the Mean Annual Rainfall: 50 inches ?

Performance Standard of Surface Discharge Analysis: All sites non-exemptec

Conduct Groundwater Discharge Analysis: No

Nitrogen Removal Efficiency (%): 55 1. Enter Catchment

Phosphorus Removal Efficiency (%): 80 2. Enter Treatment

3. Configure Catchments

4. Summary Treatment Report

5. Complete Report

6. Cost Comparisons

Open Project New Project

Save Project Exit BMPTrains

Project: Example Test Problem 1 one inch

Summary Treatment Report

Catchments and Associated BMP Types

ID	Catchment Name
1	Example Problem 1

Volume of Runoff Summary

Scenario	Effect
Pre-Condition	
System Post-Condition (with BMPs)	
Post-Condition (no BMP)	

Effective Area is the watershed area used to normalize runoff (acres). Runoff volumes are shown in acre-feet per year.

Summary Loading Analysis

% Target Removals

Is system total nitrogen target removal met? **Yes** (Required: 55% Provided: 82.77%)
Is system total phosphorus target removal met? **Yes** (Required: 80% Provided: 82.77%)

Pre vs. Post Removals

Is % less than predevelopment system loading for TN met? **Yes** (Required: 58.4% Provided: 82.77%)
Is % less than predevelopment system loading for TP met? **No** (Required: 87.44% Provided: 82.77%)

Nitrogen Loading

Surface Water Discharge

Total N pre load	2.41 kg/yr	
Total N post load	5.79 kg/yr	
Percent N load reduction	83 %	
Provided N discharge load	1 kg/yr	2.2 lb/yr
Provided N load removed	4.79 kg/yr	10.56 lb/yr

Phosphorus Loading

Surface Water Discharge

Total P pre load	.205 kg/yr	
Total P post load	1.635 kg/yr	
Percent P load reduction	83 %	
Provided P discharge load	.282 kg/yr	.62 lb/yr
Provided P load removed	1.353 kg/yr	2.984 lb/yr

6. Complete Report

retention basin with design depth of 1 inch

General Site Information (Current User: Beta_Tester)

Help and Documentation Project Name: Example Test Problem 1 one inch

Select Meteorological Zone for Project: Florida Zone 2 ?

Enter the Mean Annual Rainfall: 50 inches ?

Performance Standard of Surface Discharge Analysis: All sites non-exemptec

Conduct Groundwater Discharge Analysis: No

Nitrogen Removal Efficiency (%): 55

Phosphorus Removal Efficiency (%): 80

1. Enter Catchment

2. Enter Treatment

3. Configure Catchments

4. Summary Treatment Report

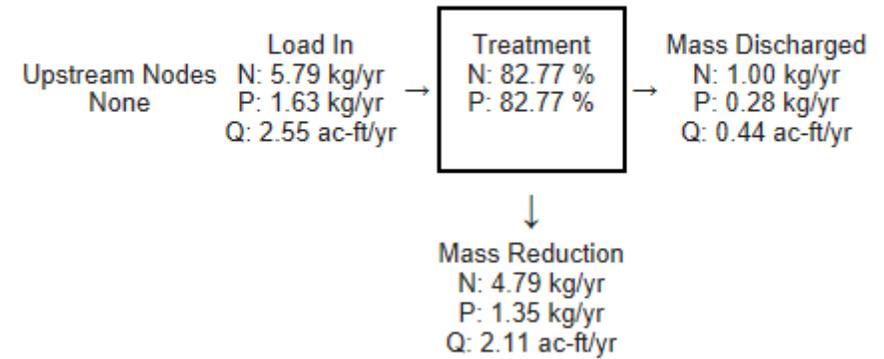
5. Complete Report

6. Cost Comparisons

Open Project New Project

Save Project Exit BMPTrains

Load Diagram for Retention (As Used In Routing)



Summary Loading Analysis

% Target Removals

Is system total nitrogen target removal met? **Yes** (Required: 55% Provided: 82.77%)
Is system total phosphorus target removal met? **Yes** (Required: 80% Provided: 82.77%)

Pre vs. Post Removals

Is % less than predevelopment system loading for TN met? **Yes** (Required: 58.4% Provided: 82.77%)
Is % less than predevelopment system loading for TP met? **No** (Required: 87.44% Provided: 82.77%)

7. Analysis Result of the Net improvement retention basin with design depth of 1 inch

General Site Information (Current User: Beta_Tester)

Help and Documentation Project Name: Example Test Problem 1 one inch

Select Meteorological Zone for Project: Florida Zone 2 ?

Enter the Mean Annual Rainfall: 50 inches ?

Performance Standard of Surface Discharge Analysis: Net Improvement

Conduct Groundwater Discharge Analysis: [Dropdown]

- 1. Impaired Water
- 2. Impaired Water + OFW
- 3. Redevelopment
- 4. Redevelopment + OFW
- 5. Redevelopment + Impaired Water
- 6. Specified Removal Efficiency

Buttons: Open Project, New Project, Save Project, Exit BMPTrains

General Site Information (Current User: Beta_Tester)

Help and Documentation Project Name: Example Test Problem 1 one inch

Select Meteorological Zone for Project: Florida Zone 2 ?

Enter the Mean Annual Rainfall: 50 inches ?

Performance Standard of Surface Discharge Analysis: Net Improvement

Conduct Groundwater Discharge Analysis: No

- 1. Enter Catchment
- 2. Enter Treatment
- 3. Configure Catchments
- 4. Summary Treatment Report
- 5. Complete Report
- 6. Cost Comparisons

Buttons: Open Project, New Project, Save Project, Exit BMPTrains

7. Analysis Result of the Net improvement retention basin with design depth of 1 inch

Select Treatment Options for individual performance, not

Catchment 1 Example problem 2

Treatment Options

Retention Basin	Greenroof
Wet Detention	Rainwater Harvesting
Exfiltration Trench/Vault	Vegetated Buffer
Permeable Pavement	Vegetated Filter Strip
Stormwater Harvesting	Rain Garden
Surface Discharge Filter	Tree Well
Swale	User Defined
BMPs in Series	

Retention System Worksheet Analysis: Net Improvement Required Removal N: 58% P: 87%



Provided Retention Volume (acre-feet): 0.167

Watershed Non-DCIA Curve Number ((0-100))	80
Watershed DCIA Percent (%)	28.00
Rainfall Zone	Florida Zone 2
Rainfall (in)	50.00

Surface Water Discharge

Required Nitrogen Treatment Efficiency (%)	58.40
Provided Nitrogen Treatment Efficiency (%)	82.8
Required Phosphorus Treatment Efficiency (%)	87.44
Provided Phosphorus Treatment Efficiency (%)	82.8

Calculate

Media

Get Depth

Copy

Plot

Cost

Print

Back

8. General Site Information Worksheet

The analysis indicates that a design depth of 1 inch, while sufficient to meet the All Sites performance standard, does not fulfill the requirement that post-development average annual nutrient loading be equal to or less than pre-development levels. Therefore, a design depth of 2 inches was selected for further evaluation to determine whether the performance standard can be achieved.

General Site Information (Current User: Beta_Tester)

[Help and Documentation](#) Project Name:

Select Meteorological Zone for Project: ?

Enter the Mean Annual Rainfall: inches ?

Performance Standard of Surface Discharge Analysis:

Conduct Groundwater Discharge Analysis:

Nitrogen Removal Efficiency (%):

Phosphorus Removal Efficiency (%):

1.

2.

3.

4.

5.

6.

9. Watershed Characteristics Worksheet

Watershed Characteristics Worksheet

Add Catchment **Catchment 1**

Current Catchment

Land Use Catchment Name:

Pre: Agricultural - Citrus: (TN=2.110 TP=0.180)

Post: Multi-Family: (TN=1.840 TP=0.520)

Single-Family: (TN=1.770 TP=0.320)

Undeveloped - Dry Prairie: (TN=2.110 TP=0.180)

Undeveloped - Marl Prairie: (TN=0.520 TP=0.050)

Undeveloped - Mesic Flatwoods: (TN=0.520 TP=0.050)

Undeveloped - Ruderal/Upland Pine: (TN=0.520 TP=0.050)

Undeveloped - Scrubby Flatwoods: (TN=0.520 TP=0.050)

Post-Development DCIA Percentage:

Wet Pond Area (No loading from this area, ac):

Load from pumped and other non-runoff sources (kg/yr) Pre: Post:

Watershed Characteristics Worksheet

Add Catchment **Catchment 1**

Current Catchment Number : 1 Example problem 1

Land Use Catchment Name:

Pre: Agricultural - Citrus: (TN=2.110 TP=0.180) ?

Post: Multi-Family: (TN=1.840 TP=0.520) ?

Total Pre-Development Catchment Area (ac):

Total Post-Development Catchment Area (ac):

Pre-Development Non DCIA Curve Number: +

Pre-Development DCIA Percentage (0 - 100%):

Post-Development Non DCIA Curve Number: +

Post-Development DCIA Percentage (0 - 100%):

Wet Pond Area (No loading from this area, ac):

Load from pumped and other non-runoff sources (kg/yr) Pre N: P:

Post N: p:

Concentrations used in Analysis

	Pre:	Post:	
EMC(N) mg/l	<input type="text" value="2.110"/>	<input type="text" value="1.840"/>	
EMC(P) mg/l	<input type="text" value="0.180"/>	<input type="text" value="0.520"/>	
Annual ROC	<input type="text" value="0.111"/>	<input type="text" value="0.306"/>	?
Runoff (ac-ft/yr)	<input type="text" value="0.925"/>	<input type="text" value="2.550"/>	
N Loading (kg/yr)	<input type="text" value="2.407"/>	<input type="text" value="5.785"/>	?
P Loading (kg/yr)	<input type="text" value="0.205"/>	<input type="text" value="1.635"/>	

8. Treatment Options

retention basin with design depth of 2 inches

General Site Information (Current User: Beta_Tester)

Help and Documentation | Project Name:

Select Meteorological Zone for Project: ?

Enter the Mean Annual Rainfall: inches ?

Performance Standard of Surface Discharge Analysis:

Conduct Groundwater Discharge Analysis:

Nitrogen Removal Efficiency (%): | 1. Enter Catchment

Phosphorus Removal Efficiency (%): | 2. Enter Treatment

3. Configure Catchments

4. Summary Treatment Report

5. Complete Report

6. Cost Comparisons

Open Project | New Project

Save Project | Exit BMPTrains



Select Treatment Options for individual performance, n

Catchment 1 FDOT Roadway

Treatment Options

Retention Basin	Greenroof
Wet Detention	Rainwater Harvesting
Exfiltration Trench/Vault	Vegetated Buffer
Permeable Pavement	Vegetated Filter Strip
Stormwater Harvesting	Rain Garden
Surface Discharge Filter	Tree Well
Swale	User Defined
BMPs in Series	



Retention System Worksheet Analysis: All sites non-exempted

Provided Retention Volume (acre-feet):

Watershed Non-DCIA Curve Number ((0-100))	80
Watershed DCIA Percent (%)	28.00
Rainfall Zone	Florida Zone 2
Rainfall (in)	50.00

Surface Water Discharge

Required Nitrogen Treatment Efficiency (%)	55.00
Provided Nitrogen Treatment Efficiency (%)	93.6
Required Phosphorus Treatment Efficiency (%)	80.00
Provided Phosphorus Treatment Efficiency (%)	93.6

Calculate | Media | Get Depth | Copy | Plot | Cost | Print | Back

9. Configure Catchments

retention basin with design depth of 2 inches

General Site Information (Current User: Beta_Tester)

Project Name:

Select Meteorological Zone for Project: ?

Enter the Mean Annual Rainfall: inches ?

Performance Standard of Surface Discharge Analysis:

Conduct Groundwater Discharge Analysis:

Nitrogen Removal Efficiency (%):

Phosphorus Removal Efficiency (%):

Select Catchment Configuration

	From	To	Area	BMP Used	Edit
▶	1	0	2.00	None	<input type="button" value="Edit"/>
*					

Routing Catchment From: 1

Routing Catchment From: 1

Select Catchment to Route to:

Select BMP to use in routing:

Catchment Active

Delay Time (hr):

Select Catchment Configuration

	From	To	Area	BMP Used	Edit
▶	1	0	2.00	Retention	<input type="button" value="Edit"/>
*					

9. Full Routing Report

retention basin with design depth of 2 inches

Select Catchment Configuration

	From	To	Area	BMP Used	Edit
▶	1	0	2.00	Retention	Edit
*					

0 is Outlet

Calculation Options

-
-
-

Report Options

-
-
-
-

Independent Catchments

-
-

By using existing and adding new Catchments create a routing configuration. Specify default BMP to be used.

Full Routing Report

Project: Example Test Problem 1 two inches

Date: 01/12/2026
Generated by: Beta_Tester

Balance Diagrams — Routing Blocks

Each block shows upstream routing, inputs, treatment efficiencies, outputs and mass reduction for the selected BMP.

Catchment 1 Retention



10. Summary Report

retention basin with design depth of 2 inches

General Site Information (Current User: Beta_Tester)

Help and Documentation Project Name: Example Test Problem 1 two inch

Select Meteorological Zone for Project: Florida Zone 2 ?

Enter the Mean Annual Rainfall: 50 inches ?

Performance Standard of Surface Discharge Analysis: All sites non-exemptec

Conduct Groundwater Discharge Analysis: No

Nitrogen Removal Efficiency (%): 55 1. Enter Catchment

Phosphorus Removal Efficiency (%): 80 2. Enter Treatment

3. Configure Catchments

4. Summary Treatment Report

5. Complete Report

6. Cost Comparisons

Open Project New Project

Save Project Exit BMPTrains

Project: Example Test Problem 1 two inches

Summary Treatment Report

Catchments and Associated BMP Types

ID	Catchment Name
1	Example problem 1

Volume of Runoff Summary

Scenario	Effect
Pre-Condition	
System Post-Condition (with BMPs)	
Post-Condition (no BMP)	

Effective Area is the watershed area used to normalize runoff (acres). Runoff volumes are shown in acre-feet per year.

Summary Loading Analysis

% Target Removals

Is system total nitrogen target removal met? **Yes** (Required: 55% Provided: 93.65%)
Is system total phosphorus target removal met? **Yes** (Required: 80% Provided: 93.65%)

Pre vs. Post Removals

Is % less than predevelopment system loading for TN met? **Yes** (Required: 58.4% Provided: 93.65%)
Is % less than predevelopment system loading for TP met? **Yes** (Required: 87.44% Provided: 93.65%)

Nitrogen Loading

Surface Water Discharge

Total N pre load	2.41 kg/yr	
Total N post load	5.79 kg/yr	
Percent N load reduction	94 %	
Provided N discharge load	.37 kg/yr	.81 lb/yr
Provided N load removed	5.42 kg/yr	11.95 lb/yr

Phosphorus Loading

Surface Water Discharge

Total P pre load	.205 kg/yr	
Total P post load	1.635 kg/yr	
Percent P load reduction	94 %	
Provided P discharge load	.104 kg/yr	.23 lb/yr
Provided P load removed	1.531 kg/yr	3.376 lb/yr

11. Complete Report

retention basin with design depth of 2 inches **Load Diagram for Retention (As Used In Routing)**

General Site Information (Current User: Beta_Tester)

Help and Documentation Project Name: Example Test Problem 1 two inch

Select Meteorological Zone for Project: Florida Zone 2 ?

Enter the Mean Annual Rainfall: 50 inches ?

Performance Standard of Surface Discharge Analysis: All sites non-exemptec

Conduct Groundwater Discharge Analysis: No

Nitrogen Removal Efficiency (%): 55 1. Enter Catchment

Phosphorus Removal Efficiency (%): 80 2. Enter Treatment

3. Configure Catchments

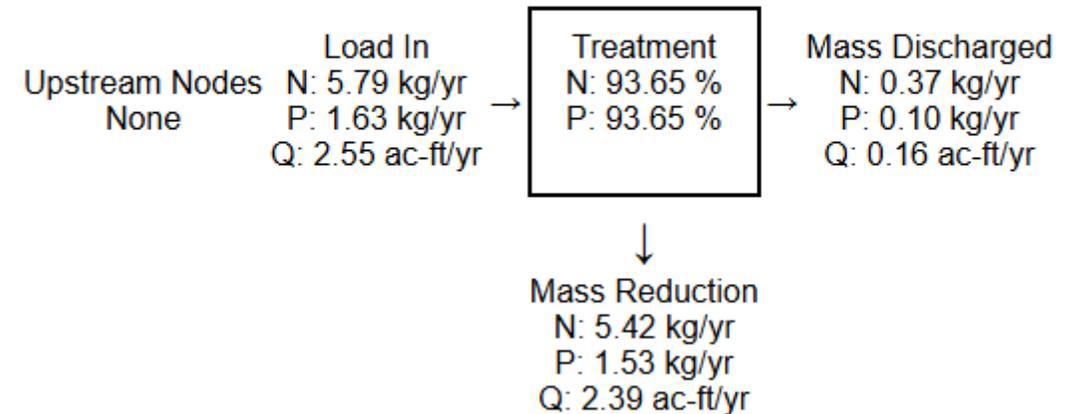
4. Summary Treatment Report

5. Complete Report

6. Cost Comparisons

Open Project New Project

Save Project Exit BMPTrains



Summary Loading Analysis

% Target Removals

Is system total nitrogen target removal met? **Yes** (Required: 55% Provided: 93.65%)
Is system total phosphorus target removal met? **Yes** (Required: 80% Provided: 93.65%)

Pre vs. Post Removals

Is % less than predevelopment system loading for TN met? **Yes** (Required: 58.4% Provided: 93.65%)
Is % less than predevelopment system loading for TP met? **Yes** (Required: 87.44% Provided: 93.65%)

12. Analysis Report of the Net improvement retention basin with design depth of 2 inches

General Site Information (Current User: Beta_Tester)

Help and Documentation Project Name: Example Test Problem 1 two inch

Select Meteorological Zone for Project: Florida Zone 2 ?

Enter the Mean Annual Rainfall: 50 inches ?

Performance Standard of Surface Discharge Analysis: Net Improvement

Conduct Groundwater Discharge Analysis: [Dropdown]

1. Impaired Water
2. Impaired Water + OFW
3. Redevelopment
4. Redevelopment + OFW
5. Redevelopment + Impaired Water
6. Specified Removal Efficiency

Open Project New Project

Save Project Exit BMPTrains

5. Net Improvement
6. BMP Analysis

6. Cost Comparisons

General Site Information (Current User: Beta_Tester)

Help and Documentation Project Name: Example Test Problem 1 two inch

Select Meteorological Zone for Project: Florida Zone 2 ?

Enter the Mean Annual Rainfall: 50 inches ?

Performance Standard of Surface Discharge Analysis: Net Improvement

Conduct Groundwater Discharge Analysis: No

1. Enter Catchment

2. Enter Treatment

3. Configure Catchments

4. Summary Treatment Report

5. Complete Report

6. Cost Comparisons

Open Project New Project

Save Project Exit BMPTrains

12. Analysis Report of the Net improvement retention basin with design depth of 2 inches

Select Treatment Options for individual performance, not

Catchment 1 Example problem 2

Treatment Options

Retention Basin	Greenroof
Wet Detention	Rainwater Harvesting
Exfiltration Trench/Vault	Vegetated Buffer
Permeable Pavement	Vegetated Filter Strip
Stormwater Harvesting	Rain Garden
Surface Discharge Filter	Tree Well
Swale	User Defined
BMPs in Series	

Retention System Worksheet Analysis: Net Improvement Required Removal N: 58% P: 87%

 Provided Retention Volume (acre-feet):

Watershed Non-DCIA Curve Number ((0-100))	80
Watershed DCIA Percent (%)	28.00
Rainfall Zone	Florida Zone 2
Rainfall (in)	50.00

Surface Water Discharge

Required Nitrogen Treatment Efficiency (%)	58.40
Provided Nitrogen Treatment Efficiency (%)	93.6
Required Phosphorus Treatment Efficiency (%)	87.44
Provided Phosphorus Treatment Efficiency (%)	93.6

Buttons: Calculate, Media, Get Depth, Copy, Plot, Cost, Print, Back

Example questions for example test Problem 1

1. What meteorological zone? (1, 2, or 3)
2. For the target removal of all sites non-exempt, what is the target nitrogen removal? (55, 58, or 60)
3. For net improvement, what is the target nitrogen removal? (55, 58, or 60)
4. Is the multi-family EMC value of TN greater or less than the pre condition one? (less, more)
5. What value of provided retention volume (acre-feet) should be entered? (0.167, 1 or 7260)
6. For the 0.167 ac-ft design, what is the mass reduction of TN (kg/yr)? (4.79, 5.80 or 9.97)
7. For the 0.167 ac-ft design, what is the mass reduction of TP (kg/yr)? (0.66, 0.69 or 1.35)
8. For the 0.167 ac-ft design, What is the discharge to surface water (ac-ft/yr)? (0.44, 3.09 or 3.83)
9. For the 0.333 ac-ft design, what is the TN treatment efficiency (%)? (22, 93.65, 99)
10. If allowed by local regs, is permeable pavement an option to increase removal? (Yes, No)

Question 1

2.5 pts

Question 1 for Problem 1

What meteorological zone?

 1

 2

 3**Question 2**

2.5 pts

Question 2 for Problem 1

For the target removal of all sites non-exempt, what is the target nitrogen removal?

 55

 58

 60

Wrong answer

Question 1

0 / 2.5 pts

Question 1 for Problem 1

What meteorological zone?

1

2

3

Correct answer

Question 2

2.5 / 2.5 pts

Question 2 for Problem 1

For the target removal of all sites non-exempt, what is the target nitrogen removal?

55

58

60

Example Test Problem 2

Wet detention: net improvement

A half-acre wet detention pond is serving a 5.5-acre highway expansion from one lane in each direction to two lanes in each direction. The existing portion of highway is not served by any treatment system. The existing and proposed portion of the highway will be treated in the post-development condition. The site is located in West Palm Beach with 61 inches of annual rainfall, FL on Hydrologic Soil Group D. The existing land use condition is a highway with a non-DCIA Curve Number of 80 and 40% DCIA. The post-development land use condition is a highway with a non-DCIA Curve Number of 80 and 85% DCIA (pavement of 4.675 acres and a wet pond area of 0.50 acres which is not part of the DCIA). The analysis will be a net improvement analysis using a wet detention pond which will utilize a littoral zone in the design. The permanent pool is 2.472 acre-feet. Note for net improvement alone, there is no target % removal. How much Nitrogen and Phosphorus removal can be expected from the wet detention ?

1. General Site Information Worksheet

General Site Information (Current User: Beta_Tester) - □ ×

[Help and Documentation](#) Project Name:

Select Meteorological Zone for Project: ?

Enter the Mean Annual Rainfall: inches ?

Performance Standard of Surface Discharge Analysis:

Conduct Groundwater Discharge Analysis:

1.

2.

3.

4.

5.

6.

2. Watershed Characteristics Worksheet

Watershed Characteristics Worksheet

Add Catchment **Catchment 1**

Current Catchment Number : 1 Example Problem 2

Land Use Catchment Name: ?

Pre: ?

Post: ?

Total Pre-Development Catchment Area (ac):

Total Post-Development Catchment Area (ac):

Pre-Development Non DCIA Curve Number: +

Pre-Development DCIA Percentage (0 - 100%):

Post-Development Non DCIA Curve Number: +

Post-Development DCIA Percentage (0 - 100%):

Wet Pond Area (No loading from this area, ac):

Load from pumped and other non-runoff sources (kg/yr) Pre N: P:

Post N: P:

Concentrations used in Analysis

	Pre:	Post:
EMC(N) mg/l	<input type="text" value="1.250"/>	<input type="text" value="1.250"/>
EMC(P) mg/l	<input type="text" value="0.173"/>	<input type="text" value="0.173"/>
Annual ROC	<input type="text" value="0.417"/>	<input type="text" value="0.710"/> ?
Runoff (ac-ft/yr)	<input type="text" value="11.659"/>	<input type="text" value="18.046"/>
N Loading (kg/yr)	<input type="text" value="17.969"/>	<input type="text" value="27.813"/> ?
P Loading (kg/yr)	<input type="text" value="2.487"/>	<input type="text" value="3.849"/>

Report Calculate

Cancel Back

3. Treatment Options

Wet Detention

General Site Information (Current User: Beta_Tester)

Help and Documentation Project Name: Example Problem 2 Wet Detention

Select Meteorological Zone for Project: Florida Zone 5

Enter the Mean Annual Rainfall: 61 inches

Performance Standard of Surface Discharge Analysis: Net Improvement

Conduct Groundwater Discharge Analysis: No

1. Enter Catchment
2. Enter Treatment
3. Configure Catchments
4. Summary Treatment Report
5. Complete Report
6. Cost Comparisons

Open Project New Project

Save Project Exit BMPTrains



Select Treatment Options for individual performance, not i

Catchment 1 Catchment

Treatment Options	
Retention Basin	Greenroof
Wet Detention	Rainwater Harvesting
Exfiltration Trench/Vault	Vegetated Buffer
Permeable Pavement	Vegetated Filter Strip
Stormwater Harvesting	Rain Garden
Surface Discharge Filter	Tree Well
Swale	User Defined
BMPs in Series	



Wet Detention Analysis: Net Improvement Required Removal N: 35% P: 35%

Note: For credit, in some applications, annual residence times cannot exceed an upper limit. Pond must include a littoral zone. If no littoral zone, the credit is reduced by 10%.

Check if there is a littoral zone

Permanent Pool Volume (acre-feet): 2.472

Floating Wetland or and other MAPs Credit (%): 0

Input Pond TP (ug/l) if data available: 0

Rainfall (in) 61.00

Surface Water Discharge

Required Nitrogen Treatment Efficiency (%)	35.39
Provided Nitrogen Treatment Efficiency (%)	40.2
Required Phosphorus Treatment Efficiency (%)	35.39
Provided Phosphorus Treatment Efficiency (%)	68.3

Calculate Anoxic Depth Cost Print Plot Back

4. Configure Catchments

General Site Information (Current User: Beta_Tester)

Project Name:

Select Meteorological Zone for Project: ?

Enter the Mean Annual Rainfall: inches ?

Performance Standard of Surface Discharge Analysis:

Conduct Groundwater Discharge Analysis:

1.
2.
3.
4.
5.
6.



Select Catchment Configuration

	From	To	Area	BMP Used	Edit
▶	1	0	5.50	None	<input type="button" value="Edit"/>
*					<input type="button" value="Edit"/>



Routing Catchment From: 1

Routing Catchment From: 1

Select Catchment to Route to:

Select BMP to use in routing:

Catchment Active

Delay Time (hr):

Select Catchment Configuration

	From	To	Area	BMP Used	Edit
▶	1	0	5.50	Wet Detention	Edit
*					

0 is Outlet

Calculation Options

-
-
-

Report Options

-
-

Independent Catchments

-

By using existing and adding new Catchments create a routing configuration. Specify default BMP to be used.

Full Routing Report

Project: Example Problem 2 Wet Detention

Date: 01/12/2026
Generated by: Beta_Tester

Balance Diagrams — Routing Blocks

Each block shows upstream routing, inputs, treatment efficiencies, outputs and mass reduction for the selected BMP.

Catchment 1 Wet Detention



5. Summary Treatment Reports

General Site Information (Current User: Beta_Tester)

Project Name:

Select Meteorological Zone for Project: ?

Enter the Mean Annual Rainfall: inches ?

Performance Standard of Surface Discharge Analysis:

Conduct Groundwater Discharge Analysis:

1.
2.
3.
4.
5.
6.

No Target % Removals for Analysis Type: Net Improvement

Pre vs. Post Removals

Is % less than predevelopment system loading for TN met? **Yes** (Required: 35.39% Provided: 40.23%)
 Is % less than predevelopment system loading for TP met? **Yes** (Required: 35.39% Provided: 68.32%)

Nitrogen Loading

Surface Water Discharge

Total N pre load	17.97 kg/yr	
Total N post load	27.81 kg/yr	
Target N load reduction	%	
Target N discharge load	17.97 kg/yr	
Percent N load reduction	40.23 %	
Provided N discharge load	16.62 kg/yr	36.66 lb/yr
Provided N load removed	11.19 kg/yr	24.67 lb/yr

Phosphorus Loading

Surface Water Discharge

Total P pre load	2.487 kg/yr	
Total P post load	3.849 kg/yr	
Target P load reduction	%	
Target P discharge load	2.487 kg/yr	
Percent P load reduction	68 %	
Provided P discharge load	1.22 kg/yr	2.69 lb/yr
Provided P load removed	2.63 kg/yr	5.799 lb/yr

6. Complete Report

General Site Information (Current User: Beta_Tester)

Project Name:

Select Meteorological Zone for Project:

Enter the Mean Annual Rainfall: inches

Performance Standard of Surface Discharge Analysis:

Conduct Groundwater Discharge Analysis:

1.
2.
3.
4.
5.
6.

BMPFast Reports

Print Save Copy Help Back

Date: 01/12/2026
Generated by: Beta_Tester

Project: Example Problem 2 Wet Detention

BMPFast Complete Report (not including cost)

1/12/2026 Project: Example Problem 2 Wet Detention

Site and Catchment Information

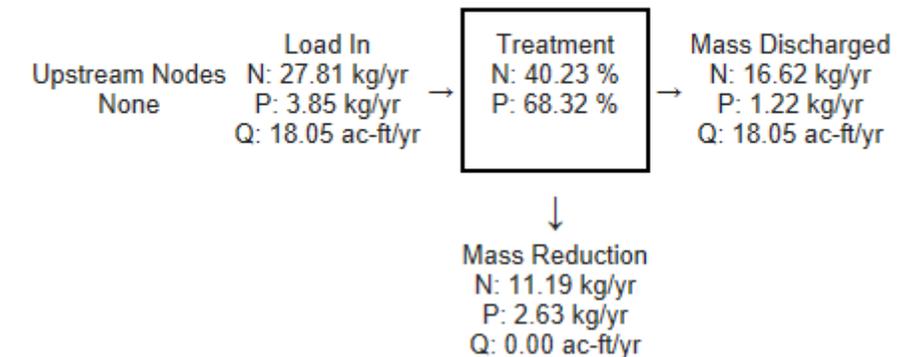
Analysis: Net Improvement

Catchment Name	Example Problem 2
Rainfall Zone	Florida Zone 5
Annual Mean Rainfall	61.00

Pre-Condition Landuse Information

Landuse	Highway: (TN=1.250 TP=0.173)
Area (acres)	5.50
Rational Coefficient (0-1)	0.42
Non DCIA Curve Number	80.00
DCIA Percent (0-100)	40.00
Nitrogen EMC (mg/l)	1.250
Phosphorus EMC (mg/l)	0.173
Runoff Volume (ac-ft/yr)	11.659
Groundwater N (kg/yr)	0.000
Groundwater P (kg/yr)	0.000
Nitrogen Loading (kg/yr)	17.969
Phosphorus Loading (kg/yr)	2.487

Load Diagram for Wet Detention (As Used In Routing)



Example questions for example test Problem 2

- | | |
|---|-----------------|
| 1. What meteorological zone? (1, 3, or 5) | 5 |
| 2. Which analysis type should be selected in the BMPFast for this scenario? (BMP Analysis, Impair Water or Net Improvement) | Net Improvement |
| 3. If no littoral zone, how many credits will be reduced in (%)? (5, 10 or 15) | 10 |
| 4. What value of wet pond area without loading should be entered (acre)? (0, 0.5 or 1) | 0.5 |
| 5. Is the TN target treatment efficiency (%) less than required for OFW (yes, no) | yes |
| 6. What is the mass reduction of TN (kg/yr)? (11.19, 16.62 or 27.81) | 11.19 |
| 7. What is the mass reduction of TP (kg/yr)? (1.22, 2.63 or 3.85) | 2.63 |
| 8. What is the discharge to surface water after wet detention(ac-ft/yr)? (0, 11.19 or 18.05) | 18.05 |
| 9. What is the TN treatment efficiency (%) of the wet detention? (35, 40.2 or 45.5) | 40.2 |
| 10. What is the TP treatment efficiency (%) of the wet detention? (35, 68.3 or 82) | 68.3 |

The testing, how many different questions, and retaking

- There are 4 BMPFast problems per test.
- Each has 10 questions for a total of 40.
- The test must be completed in 24 hours.
- The test can be repeated once before having to repeat and pay for another training class.

Grade needed to earn a certificate of competency

- A grade of 75% (30 out of 40) correct is needed to earn the certificate.
- After passing the competency test, a validation code will be provided to access the professional BMPFast software

BMPFast

Example Competency Test Problems

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