

How to Complete Rainfall Worksheet

Purpose:

This procedure describes how to complete the optional Rainfall Worksheet in the Nutrient Management Plan (NMP) spreadsheet. This worksheet will calculate the amount of rainfall or runoff contributing to a manure storage group.

Whether or not you need to use this worksheet will be addressed when you complete the manure group information, (Appendix 3 Input) section. Only manure groups receiving rainfall or runoff and using the "Calculated" inventory method will have the rainfall additions added to the manure group.

This particular worksheet is an optional worksheet so it has a green colored sheet tab in the NMP workbook. The tab in the NMP Spreadsheet that looks like this:



Or you can find it using the hyperlink in the NMP spreadsheet Index:

	A	B	C	D	E	F	G
1	NMP Spreadsheet Index						
2	NMP Version 6.2 2018-06(2007-2016 Excel)						
16	Appendix 10: Supporting Information and Documentation						
17	Printout: Manure Analysis Average						
18	Printout Winter Manure Application Matrix						
19	Rainfall Worksheet						
20	Animal Types & Manure Production Values						
21	Growing Animal Weight Calculator						
22	Crop List Options						
NMP Index							

How to Complete Rainfall Worksheet

Procedure

1. Determine if the Rainfall Worksheet needs to be completed when completing Appendix 3 Input

Manure Group Identification	Manure Group Site Description	Manure Group Season Applied	Inventory Method	RECORDS: Total Manure Collected Per Manure Group	Total Manure Collected Units	Manure Exported Amount	Manure Exported Units	Total Rainfall and Runoff	Rainfall Units	Animal Group 1 Name
Dairy Liquid Spring	Slurrystore	Spring	Calculated		gallons	0	gallons	Rainfall Additions?		Milk Cows Spring
								Rainfall Additions?		

Total Rainfall and Runoff
 If the manure group inventory method selected is "Calculated", then use the Rainfall/Runoff worksheet if the manure group receives rain water.
 The link above will take you to the rainfall tab.
 The rainfall worksheet values for the manure group will transfer to the cell below.

Only manure groups that meet the following criteria need the rainfall worksheet completed.

- The Inventory Method selected is "Calculated"
- The manure storage facility receives and retains rainfall or surface runoff is directed to the manure storage facility.

If the manure storage inventory method is selected is calculated and will directly receive rainfall or surface runoff then complete the Rainfall Worksheet. There is a hyperlink directly above the Rainfall and Runoff column that can be used to navigate to the Rainfall worksheet

2. Layout of the Rainfall worksheet

Rainfall Worksheet	
County	
Evaporation or no Evaporation	
Paved or Unpaved	
Manure Group	0 gallons of rain water added to this manure group
Beginning Month (1-12)	
Ending Month (1-12)	Gallons of water for this manure group
Storage Surface Area (Sq. Ft.)	0 gallons directly on storage
Runoff Surface Area (Sq. Ft.)	0 gallons directed to storage
County	
Evaporation or no Evaporation	
Paved or Unpaved	
Manure Group	0 gallons of rain water added to this manure group
Beginning Month (1-12)	
Ending Month (1-12)	Gallons of water for this manure group
Storage Surface Area (Sq. Ft.)	0 gallons directly on storage
Runoff Surface Area (Sq. Ft.)	0 gallons directed to storage
County	
Evaporation or no Evaporation	
Paved or Unpaved	
Manure Group	0 gallons of rain water added to this manure group
Beginning Month (1-12)	
Ending Month (1-12)	Gallons of water for this manure group
Storage Surface Area (Sq. Ft.)	0 gallons directly on storage
Runoff Surface Area (Sq. Ft.)	0 gallons directed to storage

Each section is completed for a single manure group. Begin at the top for the first manure group.

There are 16 sections. One for each manure group.

How to Complete Rainfall Worksheet

3. Complete the Rainfall Worksheet

3.1. County – Select the County from the drop-down list.

	A	B	C	D
1	Rainfall Worksheet			
2				
3		County		
4		Evaporation or no Evaporation	Adams	
5		Paved or Unpaved	Allegheny	
6			Armstrong	
7			Beaver	
8		Manure Group	Bradford	0 gallons of rain water added to this manure group
9		Beginning Month (1-12)	Berks	
10		Ending Month (1-12)	Bradford	
11		Storage Surface Area (Sq. ft.)		0 gallons directly on storage
12		Runoff Surface Area (Sq. ft.)		0 gallons directed to storage

3.2. Evaporation or No Evaporation – Select the applicable Evaporation or no Evaporation selection from the drop-down list.

	A	B	C	D
1	Rainfall Worksheet			
2				
3		County	Berks	
4		Evaporation or no Evaporation	No Evaporation - Directly on Storage	
5		Paved or Unpaved	Evaporation - Directly on Storage	
6				
8		Manure Group		0 gallons of rain water added to this manure group
9		Beginning Month (1-12)		
10		Ending Month (1-12)		
11		Storage Surface Area (Sq. ft.)		0 gallons directly on storage
12		Runoff Surface Area (Sq. ft.)		0 gallons directed to storage

3.3. Paved or Unpaved – Select the applicable Paved or Unpaved selection from the drop-down list.

	A	B	C	D
1	Rainfall Worksheet			
2				
3		County	Berks	
4		Evaporation or no Evaporation	Evaporation - Directly on Storage	
5		Paved or Unpaved	Paved - Directed to Storage	
6			Unpaved - Directed to Storage	
8		Manure Group		0 gallons of rain water added to this manure group
9		Beginning Month (1-12)		
10		Ending Month (1-12)		
11		Storage Surface Area (Sq. ft.)		0 gallons directly on storage
12		Runoff Surface Area (Sq. ft.)		0 gallons directed to storage

3.4. Manure Group – Select the Manure Group from the drop-down list. The manure group names are entered in App 3 Input.

	A	B	C	D
1	Rainfall Worksheet			
2				
3		County	Berks	
4		Evaporation or no Evaporation	Evaporation - Directly on Storage	
5		Paved or Unpaved	Paved - Directed to Storage	
6				
8		Manure Group		0 gallons of rain water added to this manure group
9		Beginning Month (1-12)	Dairy Liquid Spring	
10		Ending Month (1-12)		
11		Storage Surface Area (Sq. ft.)		0 gallons directly on storage
12		Runoff Surface Area (Sq. ft.)		0 gallons directed to storage

How to Complete Rainfall Worksheet

3.5. Beginning / Ending Months – Enter the manure group beginning and ending months (numeric number) of the collection period. In this example the manure group is applied in the spring and the collection period begins in October and ends in March.

For October enter the month number designation of 10.

For March enter the month number designation of 3.

	A	B	C	D
1	Rainfall Worksheet			
2				
3		County	Berks	
4		Evaporation or no Evaporation	Evaporation - Directly on Storage	
5		Paved or Unpaved	Paved - Directed to Storage	
6				
7				
8	Manure Group	Dairy Liquid Spring	0	gallons of rain water added to this manure group
9	Beginning Month (1-12)	10		
10	Ending Month (1-12)	3		Gallons of water for this manure group
11	Storage Surface Area (Sq. ft.)		0	gallons directly on storage
12	Runoff Surface Area (Sq. ft.)		0	gallons directed to storage

3.6. Storage Surface Area – Calculate and enter the storage surface area. In this example it is a circular storage and has a diameter of 80 ft. The surface area of a circle is determined by the formula: $\pi * R^2$ or $3.14 * 40 * 40 = 5,024 \text{ ft}^2$. The gallons of rainfall is automatically calculated after the number is typed and you press the enter key. Additional information of calculating storage surface area can be found in the Nutrient Management Technical Manual, Supplement 8

	A	B	C	D
1	Rainfall Worksheet			
2				
3		County	Berks	
4		Evaporation or no Evaporation	Evaporation - Directly on Storage	
5		Paved or Unpaved	Paved - Directed to Storage	
6				
7				
8	Manure Group	Dairy Liquid Spring	28,404	gallons of rain water added to this manure group
9	Beginning Month (1-12)	10		
10	Ending Month (1-12)	3		Gallons of water for this manure group
11	Storage Surface Area (Sq. ft.)	5024	28,404	gallons directly on storage
12	Runoff Surface Area (Sq. ft.)		0	gallons directed to storage

3.7. Runoff Surface Area – Calculate and enter the runoff surface area. In this example a 75 ft by 75 ft paved dry lot is directed to the manure storage. The surface area calculation is $75 * 75 = 5625 \text{ ft}^2$. The gallons of rainfall is automatically calculated after the number is typed and you press the enter key.

Additional information of calculating storage surface area can be found in the Nutrient Management Technical Manual, Supplement 8

	A	B	C	D
1	Rainfall Worksheet			
2				
3		County	Berks	
4		Evaporation or no Evaporation	Evaporation - Directly on Storage	
5		Paved or Unpaved	Paved - Directed to Storage	
6				
7				
8	Manure Group	Dairy Liquid Spring	64,168	gallons of rain water added to this manure group
9	Beginning Month (1-12)	10		
10	Ending Month (1-12)	3		Gallons of water for this manure group
11	Storage Surface Area (Sq. ft.)	5024	28,404	gallons directly on storage
12	Runoff Surface Area (Sq. ft.)	5625	35,764	gallons directed to storage

How to Complete Rainfall Worksheet

3.8. Returning to Appendix 3 Input Sheet – After you complete the entries in the rainfall worksheet click on the hyper link “Go to Appendix 3 Input” to complete the manure group information.

1	A	B	C	D	E	F	G	
1	Rainfall Worksheet						Go to NMP Index	Go to Appendix 3 Input
2								
3	County <u>Berks</u>							
4	Evaporation or no Evaporation <u>Evaporation - Directly on Storage</u>							
5	Paved or Unpaved <u>Paved - Directed to Storage</u>							
6								
7								
8	Manure Group	<u>Dairy Liquid</u>		64,168	gallons of rain water added to this manure group			
9	Beginning Month (1-12)	<u>Spring</u>						
10	Ending Month (1-12)	<u>10</u>						
11	Storage Surface Area (Sq. ft.)	<u>3</u>			Gallons of water for this manure group			
12	Runoff Surface Area (Sq. ft.)	<u>5024</u>		28,404	gallons directly on storage			
13		<u>5625</u>		35,764	gallons directed to storage			
14	Rainfall Worksheet							
15	County <u>Evaporation</u>							

Note: If the manure group receives rainfall, complete the yellow manure group. The “County”, “Evaporation or no Evaporation”, and “Manure Group” selections are drop down box selections, entered as 1 for January, 2 for February, etc. The surface are typed in. The calculated rainfall amounts will be generated at manure generation calculation. Use the “Tab” key to move to To remove the Manure Group from the Rainfall Worksheet, sin information associated with a manure group or use the button Rainfall Information on the worksheet.

[Reset ALL Rainfall Info.](#)

3.9. Manure group rainfall contributions are transferred to Appendix 3 Input.

3	M	N	O	P	Q	R	S	T	U
4	Go to Grazing Group Manure Calculator				Rainfall Worksheet				
5	Manure Group Site Description	Manure Group Season Applied	Inventory Method	RECORDS: Total Manure Collected Per Manure Group	Total Manure Collected Units	Manure Exported Amount	Manure Exported Units	Total Rainfall and Runoff	Rainfall Units
6	Slurrystore	Spring	Calculated		gallons	0	gallons	64,168	gallons
	Appendix 3 Input								

How to Complete Rainfall Worksheet

4. Example of the rainfall contributions transferred to printed Appendix 3 Manure Group Information

	A	B	C
4	Appendix 3 Manure Group Information	Dairy Liquid Spring	
5	Manure Report Date (note if averaging several reports)	April 15, 2017	
6	Laboratory Name	AASL	
7	Manure Type	Dairy	
8	Manure Unit (lbs/ton or 1000 gal)	lb/1000 gal	
9	Total Nitrogen (N) (lbs/ton or 1000 gal)	28.00	
10	Ammonium N (NH ₄ -N) (lbs/ton or 1000 gal)	11.00	
11	Total Organic N (lbs/ton or 1000 gal)	17.00 Go to NMP Index	
12	Total Phosphate (P ₂ O ₅) (lbs/ton or 1000 gal)	13.00 Go to Appendix 3 Input	
13	Total Potash (K ₂ O) (lbs/ton or 1000 gal)	25.00 Go to Manure Arg Input	
14	Percent Solids	6.20 Grazing Calculator	
15	PSC Value (analytical or book value)	0.80	
16	Percent Moisture	93.80	
17	Manure Group AEU's	90.38	
18	Description:	Slurrystore	Spring
19	Site & Season Applied		
20	Inventory Method	Calculated	
		Collected Calc.	Uncollected Calc.
21	Manure Group Identification	Dairy Liquid Spring	
22	CALCULATED: Total Manure Collected Per Manure Group	554,505.5	
23	Units	gallons	
24	RECORDS: Total Manure Collected Per Manure Group		
25	Unit		
26	Manure Used On-Farm	Collected 0.0	Uncollected 0.0
27	Units	Gallons	
28	Manure Exported	0.0	
29	Units	gallons	
30	Manure Allocation	554,505.5	
31	Balance	0.0	
32	Units		
33	Manure Balance as a Percent of Total Manure Collected	100.0%	
34	Total Rainfall and Runoff	64,168	
35	Units	gallons	

Total Rainfall and Runoff
 The rainfall and runoff information is completed in the Rainfall Worksheet Tab.
 Rainfall is automatically added to the total manure collected per manure group value **if** "Calculated" is selected as the Inventory method in App 3 Input and the rainfall worksheet is completed.
 It **is not** included if "Records" is selected as the Inventory Method.

Appendix 3 Manure Group Info.

How to Complete Rainfall Worksheet

5. Enter the manure storage and surface runoff calculations in Appendix 10

	A	B	C	D	E	F	G	H	I
1	Appendix 10								
2	Supporting Information & Documentation								
3	Includes if applicable the Rainfall Additions Worksheet, Winter Application Matrix, Residual N Calculation								
4	Worksheet and other supplemental worksheets included in the NMP Spreadsheet. Attach information and								
5	documentation necessary to support plan content not included elsewhere in the NMP Spreadsheet or								
6	appendices. Examples include, but are not limited to, documentation of animal weights if Agronomy Facts 54 is not								
7	used, bedding calculations, or calculations for irrigation rates.								
8	80 ft Circular Liquid Manure Storage Surface Area Calculation (πR^2)								
9	$3.14 \times 40 \times 40 = 5,024 \text{ ft}^2$								
10	75 ft X 75 ft dry lot ACA runoff contribution								
11	$75 \times 75 = 5,625 \text{ ft}^2$								
Appendix 10 Supporting Info									

6. Revision History

Date	Description of Significant Changes
August 2018	First issue of the document.