How to Complete Rainfall Worksheet

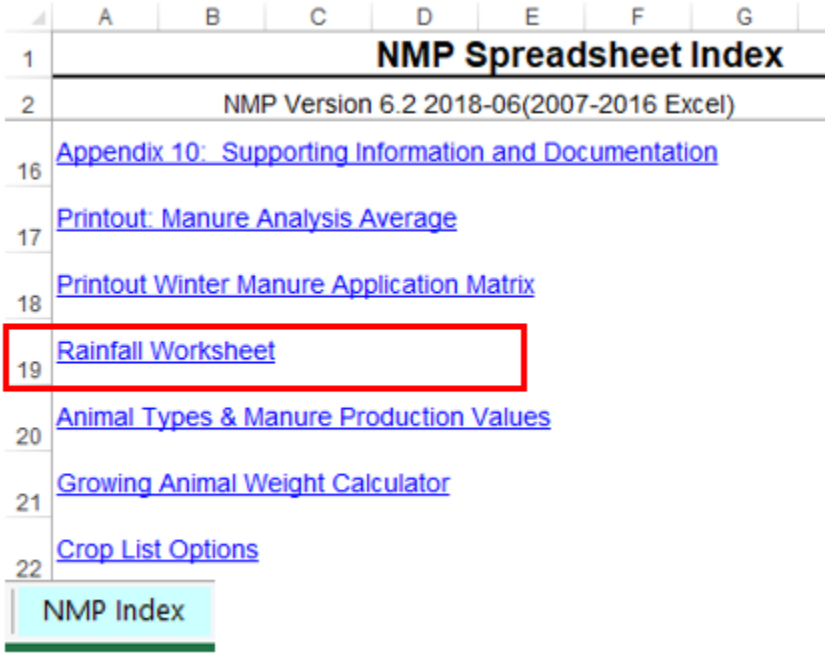
Purpose:

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:

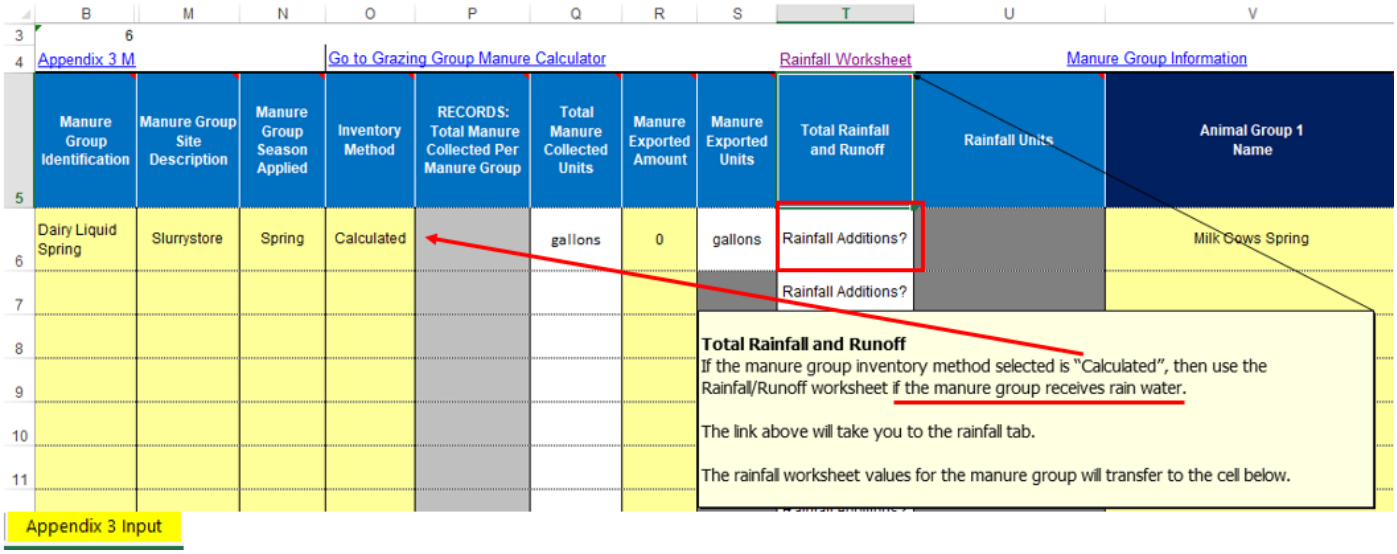
Or you can find it using the hyperlink in the NMP spreadsheet Index:



How to Complete Rainfall Worksheet

Procedure

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

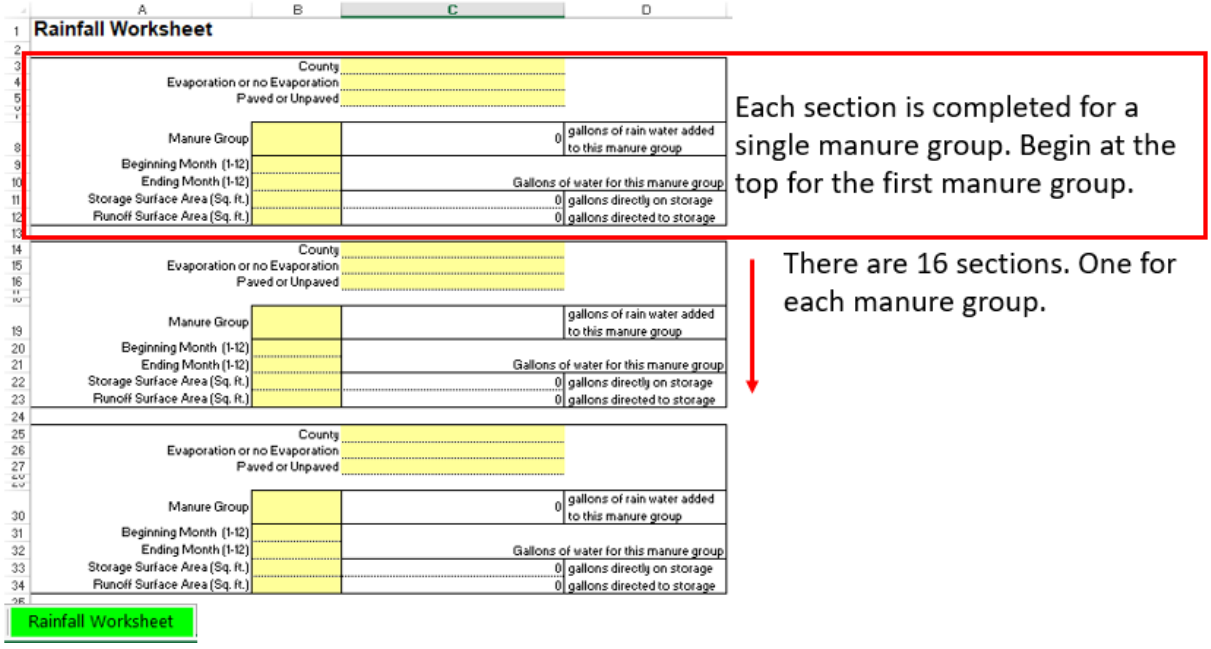


Only manure groups that meet the following criteria need the rainfall worksheet completed.

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

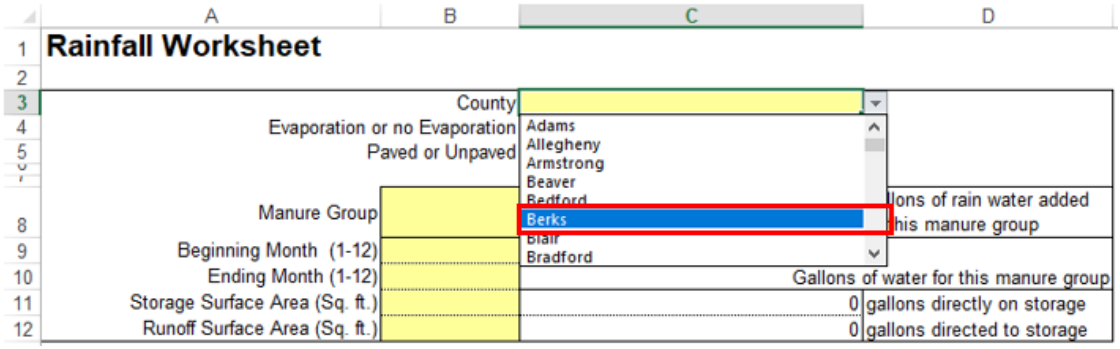
If the manure storage inventory method is selected is calculated and will directly receive rainfall or surface runoff then complete the Rainfall Worksheet. There is a hyperlink directly above the Rainfall and Runoff column that can be used to navigate to the Rainfall worksheet

2. Layout of the Rainfall worksheet

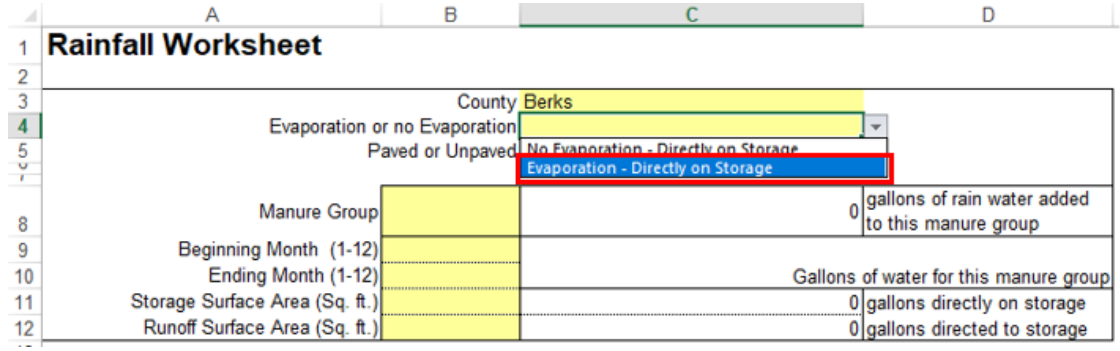


3. Complete the Rainfall Worksheet

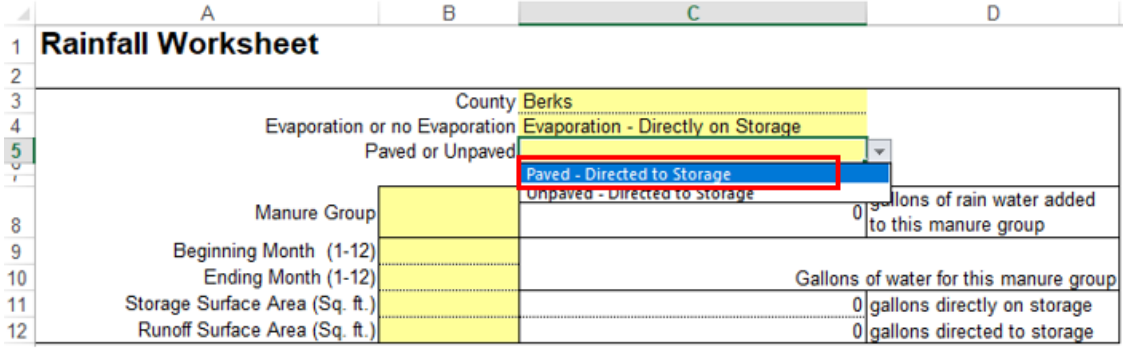
3.1. County – Select the County from the drop-down list.



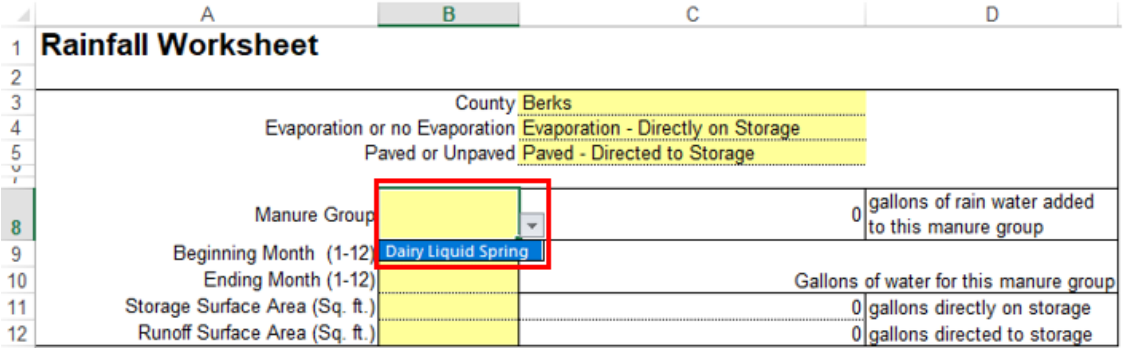
3.2. Evaporation or No Evaporation – Select the applicable Evaporation or no Evaporation selection from the drop-down list.



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



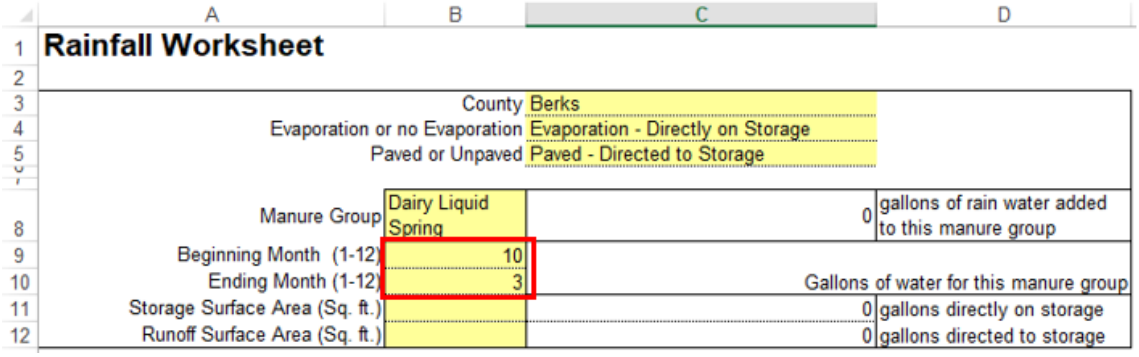
3.4. Manure Group – Select the Manure Group from the drop-down list. The manure group names are entered in App 3 Input.



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.

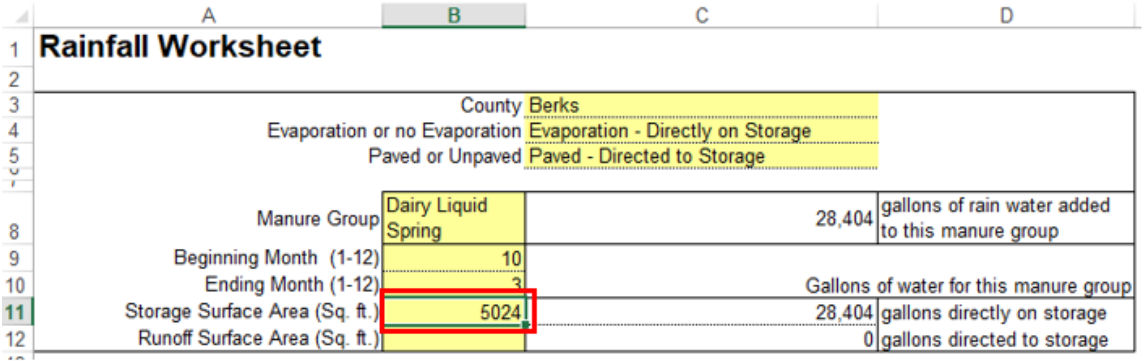
For October enter the month number designation of 10.

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		
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

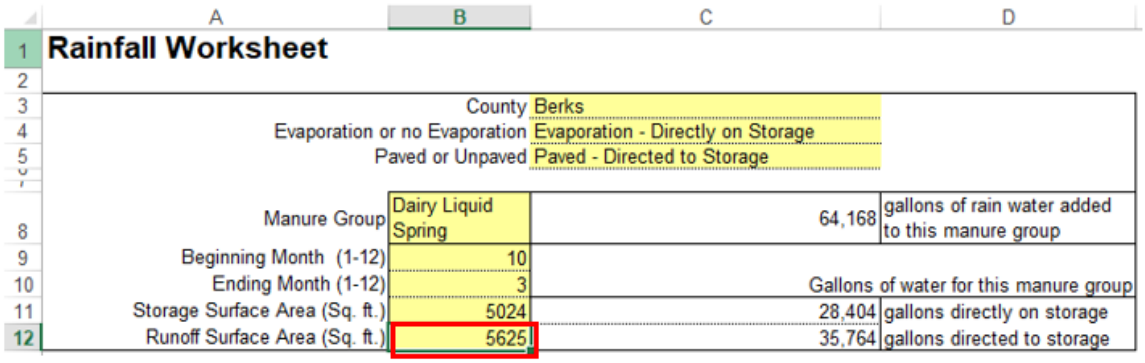
3.6. Storage Surface Area – Calculate and enter the storage surface area. In this example it is a circular storage and has a diameter of 80 ft. The surface area of a circle is determined by the formula: $\pi * R^2$ or 3.14 X 40 X 40 = 5,024 ft^2. The gallons of rainfall is automatically calculated after 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		
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

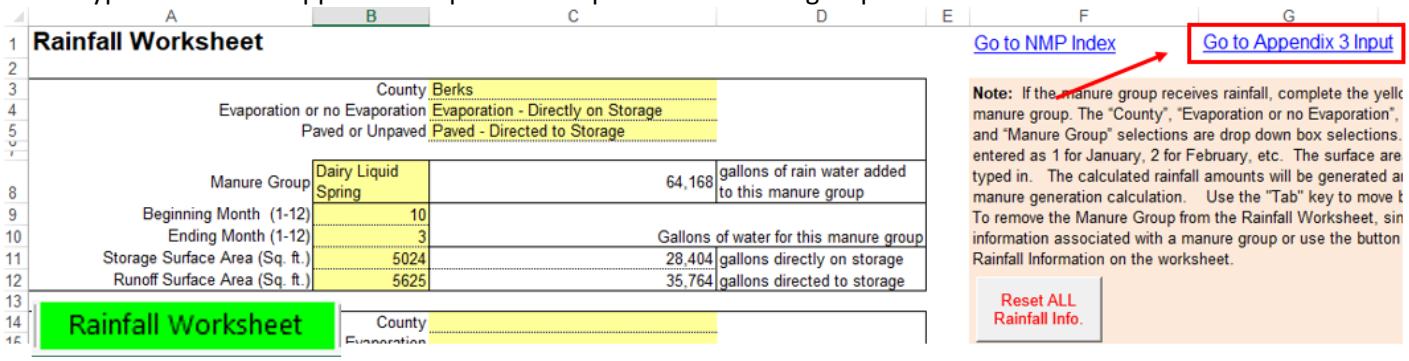
3.7. Runoff Surface Area – Calculate and enter the runoff surface area. In this example a 75 ft by 75 ft paved dry lot is directed to the manure storage. The surface area calculation is 75 X 75 = 5625 ft^2. The gallons of rainfall is automatically calculated after the number is typed and you press the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

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

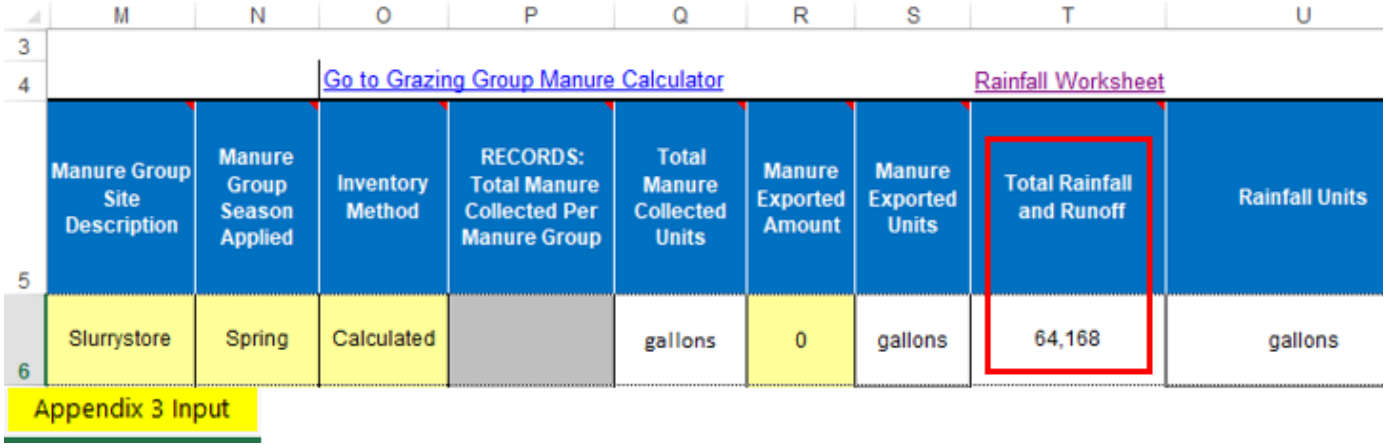


	A	B	C	D
1	**Rainfall Worksheet**			
2				
3	County	Berks		
4	Evaporation or no Evaporation	Evaporation - Directly on Storage		
5	Paved or Unpaved	Paved - Directed to Storage		
8	Manure Group	Dairy Liquid Spring	64,168	gallons of rain water added to this manure group
9	Beginning Month (1-12)	10		
10	Ending 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

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.



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



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_2O_5) (lbs/ton or 1000 gal)	13.00	Go to Appendix 3 Input
13	Total Potash (K_2O) (lbs/ton or 1000 gal)	25.00	Go to Manure Avg 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: Site & Season Applied	Slurrystore	Spring
19	Inventory Method	Calculated	
20		Collected Calc.	Uncollected Calc.
21	Manure Group Identification	Dairy Liquid Spring	
22 23	CALCULATED: Total Manure Collected Per Manure Group Units	554,505.5 gallons	
24 25	RECORDS: Total Manure Collected Per Manure Group Unit		
26 27 28	Manure Used On-Farm Units	Collected 0.0 Gallons	Uncollected 0.0
29 30	Manure Exported Units	0.0 gallons	
31 32	Manure Allocation Balance Units	554,505.5 Gallons	0.0
33	Manure Balance as a Percent of Total Manure Collected	100.0%	
34 35	Total Rainfall and Runoff	64,168 gallons	

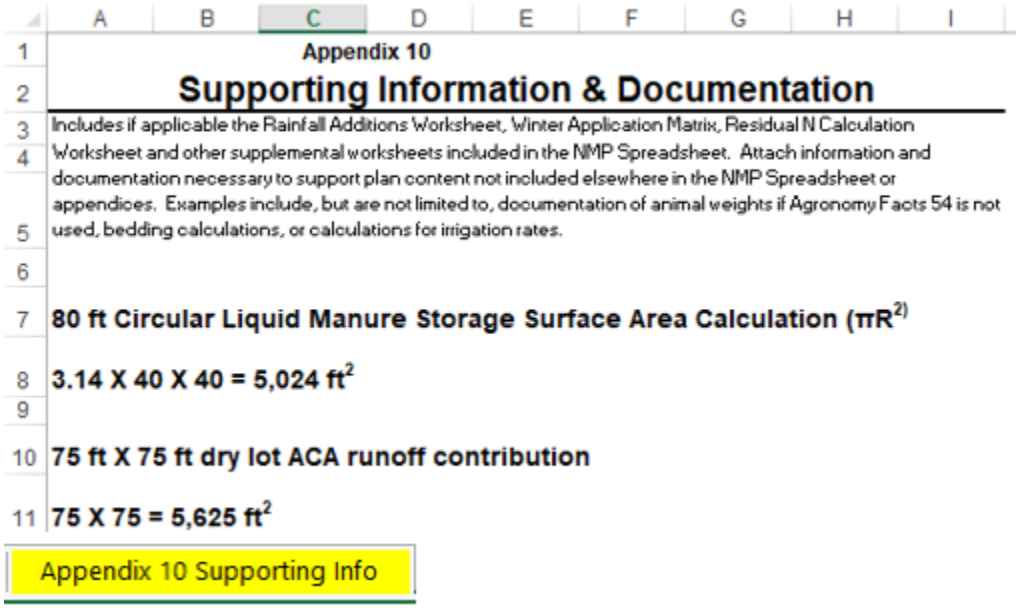
Total Rainfall and Runoff
The rainfall and runoff information is completed in the Rainfall Worksheet Tab.

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.

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 Worksheet and other supplemental worksheets included in the NMP Spreadsheet. Attach information and documentation necessary to support plan content not included elsewhere in the NMP Spreadsheet or appendices. Examples include, but are not limited to, documentation of animal weights if Agronomy Facts 54 is not used, bedding calculations, or calculations for irrigation rates.								
4									
5									
6									
7	**80 ft Circular Liquid Manure Storage Surface Area Calculation ($\pi R^{2)}$**								
8	**3.14 X 40 X 40 = 5,024 ft^2**								
9									
10	**75 ft X 75 ft dry lot ACA runoff contribution**								
11	**75 X 75 = 5,625 ft^2**								

Appendix 10 Supporting Info

6. Revision History

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