

## Liquid Waste Storage Volume Calculation Worksheet

Cumberland LLC

:Permittee Name

# of A.U.'s

6163

Dsn by:

ETL

Date:

10/20/2020

Total Annual Liquid Waste Volume (NRCS Table Values)	
Liquids Collected/Stored	Annual Gallons
Manure and Bedding	6,789,137
Parlor Wastewater	2,007,500
Feed Storage Leachate	0
Feed Storage Runoff Collected *	0
Feedlot Runoff*	0
Net Precipitation on Storage Surface(s) **	0
Stacking Pad Runoff Collected*	0
Offsite Waste	224,000
Other	
Other	
Other	
Other	
Other	
<b>TOTAL:</b>	<b>9,020,637</b>

<b>Total Annual Liquid Waste from Hauling Logs</b>	<b>#DIV/0!</b>
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<b>1</b>
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Total Annual Volume Source (1=NRCS Table Values; 2=Hauling Log Values)

Total Liquid Waste Storage Capacity (gallons)						
Waste Storage	Total Vol. from Settled Top to Bottom	-Solids Storage	-25-yr, 24-hr Precip. on Storage	25-yr, 24-hr Collected Runoff ***	-Freeboard Vol.	Max. Operating Level (MOL) Vol.
#1	6,904,220	682,759	0	0	1,079,065	5,142,396
#2	11,449,561	1,144,956	0	0	1,717,434	8,587,171
#3	2,460,322	246,032	0	0	369,049	1,845,241
#4						0
#5						0
#6						0
Total MOL Vol:						15,574,808
Days of Storage:						630
Meets Days of Storage Criteria:						YES

Jan. 2018

NOTE 1: The volumes above can be calculated in the NRCS "Waste Storage Design" spreadsheet downloaded from the Wisconsin NRCS Engineering Resources website

NOTE 2: The NRCS "Waste Storage Design" spreadsheet can be used to calculate the days of storage as well, however it is designed to be used with only one waste storage facility. Calculations for net precipitation and collected runoff volumes are month specific and can be more precise than the table above for storage periods much less than 365 days. The storage sizing calculations work only for rectangular and circular storages.

NOTE 3: Formula for days of storage: (Total Storage Capacity/Annual Liquid Waste Generation)\*365 = Days of storage

\* Collected Runoff Volumes can be calculated in the NRCS "Waste Storage Design" spreadsheet Monthly Runoff Section. Set the Days of Storage to 365.

\*\* Net Precipitation on Storage Surface depth can be calculated in the NRCS "Waste Storage Design" spreadsheet and then multiplied by the storage top area to get the net annual precipitation volume. Set the Days of Storage to 365.

\*\*\* 25-yr Collected Runoff Volumes can be calculated in the NRCS "Waste Storage Design" spreadsheet 25-yr Runoff section.

[http://www.nrcs.usda.gov/wps/portal/nrcs/detail/wi/technical/engineering/?cid=nrcs142p2\\_025422](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/wi/technical/engineering/?cid=nrcs142p2_025422)

Annual Manure and Process Wastewater Application Volumes			
Year	Gallons Applied	Avg. Yearly AUs	Gallons/AU
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
Average Volume/AU			#DIV/0!
<b>Average Annual Volume for Current AUs</b>			<b>#DIV/0!</b>

Note 1. Enter annual manure and process wastewater applications from the previous 5 years of hauling logs.

Note 2. If 5 years of hauling information is not available, "Table" based volumes from the previous tab should be used.

Note 3. The same annual manure and process wastewater volume which is used for the days storage calculation should also be used for Nutrient Mgmt. planning, whether it is based on the average hauling log values or "Table" value:



Summary of Storage  
Proposed Waste Storage Facility  
Cumberland LLC

Client: Cumberland LLC  
By: ETL

Project: Hog Facility  
Date: 10/28/22

Barn ID	Top Elevation	Bottom Elevation	MOL Elevation	180 Day Elevation	Total Volume	MOL Volume
#1 Farrowing	987.00	977.00	985.60	984.00	6,904,220	5,825,155
#2 Gestation	985.00	975.00	983.60	979.90	11,449,561	9,732,127
#3 GDU	985.00	975.00	983.60	980.90	2,460,322	2,091,273
<b>Totals</b>					<b>20,814,103</b>	<b>17,648,555</b>

Notes

All volumes are in gallons