

Supplement 4
Sample Nutrient Balance Sheet

Nutrient Balance Sheet

Prepared For

Gary L. Brown
934 Pine Hill Road, Lititz, PA 17543
717-626-6032

Prepared By

Jesse A. Landis
NM 462
273 Centerville Road, Lancaster, PA 17603
717-299-5691

Jesse A. Landis

Nutrient Management Specialist or Broker Signature

Date of Development February 6, 2009

County of Origin Lancaster

Nutrient Balance Worksheet Appendices

The following appendices need to accompany the Nutrient Balance Worksheets if applicable:

- Maps of fields where manure is to be applied including required manure application setbacks
- Completed P-Index spreadsheet (or other similar information summary) listing the source and transport factors and final Index result for each crop management unit (if applicable)

Nutrient Balance Sheet Summary

CMU/ Field ID	Crop Group	Manure Group	Application Season	Application Management	Planned Manure Rate	Starter/Other Fertilizer (lb/A)			Nutrient Balance @ Planned Rate (lb/A) ¹			Notes (check)
						N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	
2-8	Corn Grain After Alfalfa	Broiler Litter	Spring	3-4 days	3 T/A	15	30	30	2	(215)	(133)	✓
2-8	Corn Grain After Corn	Broiler Litter	Spring	3-4 days	4 T/A	15	30	30	2	(277)	(207)	✓
1, 9	Grass Hay	Swine Liquid	Summer	None	6000 Gal/A	92	0	0	2	2		✓
11, 12	Corn Grain After Soybeans	Broiler Litter	Spring	3-4 days	3.5 T/A	0	0	0	5	(216)	(155)	✓

¹ Positive numbers = nutrient deficit; negative numbers = nutrient excess

Nutrient Balance Sheet Summary Notes

CMU/Field ID	Crop Group	Manure Group	Notes ^{1,2}
2-8	Corn Grain After Alfalfa	Broiler Litter	Fields 4 – 8 have a 150' manure application setback from the stream. If manure will be stacked in the field, an area has been designated in field 3 for this stack. See the map for details.
2-8	Corn Grain After Corn	Broiler Litter	Fields 4 – 8 have a 150' manure application setback from the stream. If manure will be stacked in the field, an area has been designated in field 3 for this stack. See the map for details.
1, 9	Grass Hay	Swine Liquid	Nutrient balances for P ₂ O ₅ and K ₂ O are based on crop removal (Row A) and should not be used to determine additional fertilizer needs. The P banking option was used to develop the planned manure rate. No other phosphorus sources (manure and fertilizer) may be applied for the term of the multiple year rate (next 2 years). Field 9 has a 100' manure application setback from a well and 150' manure application setback along the stream. See the map for details.
11, 12	Corn Grain After Soybeans	Broiler Litter	Field 11 has a 100' manure application setback from a sinkhole. If manure will be stacked in the field, an area has been designated in field 3 for this stack. See the map for details.

¹ If crop removal values were used in Row A for P₂O₅ and K₂O, planners should use the following standard note: Nutrient balances for P₂O₅ and K₂O are based on crop removal (Row A) and should not be used to determine additional fertilizer needs.

² If the P banking option is used, planners should use the following standard note: The P banking option was used to develop the planned manure rate. No other phosphorus sources (manure and fertilizer) may be applied for the term of the multiple year rate.

Nutrient Balance Worksheet

CMU/Field Identification <small>(Area must be clearly identified on a map)</small>		Acres	Crop Group		Yield
2-8		90	Corn Grain After Alfalfa		150 bu/A
Manure Plan Basis <small>(check planning option)</small>	OPTION 1 P Removal	OPTION 2 N Requirement		X	OPTION 3 P Index
	<ul style="list-style-type: none"> P removal rates 150' application setback from streams, lakes or ponds 	<ul style="list-style-type: none"> N requirement rates 150' application setback from streams, lakes or ponds Soil test < 200 ppm 			<ul style="list-style-type: none"> P Index evaluation (must be attached)
	Will P banking be used?	Soil Test P (ppm)			
	No	154, 154, 125, 137, 118, 142, 133			
	Yes, for _____ years.				
<small>(Use the P₂O₅ column to determine acceptable rate)</small>		<small>(Use the N column to determine acceptable rate)</small>		<small>(Use appropriate column based on the P Index to determine acceptable rate)</small>	
Manure Type	Manure Analysis (lb/ton or 1000 gal)			Application Timing	Application Method
Broiler Litter	Total N	P₂O₅	K₂O	Spring	3-4 day incorporation
Notes					

	N ¹	P ₂ O ₅ ¹	K ₂ O ¹	Recommendation Basis	
A) Recommendation or Removal (lb/A) <small>N – Soil Test or Tables 1 & 2 (AG Table 1.2-6;1.2-8) P₂O₅ & K₂O – Soil Test or Table 3 (AG Table 1.2-9)</small>	150	0	0	X	Soil Tests Crop Removal
B) Fertilizer Applied (lb/A) <small>(Regardless of Manure e.g. Starter)</small>	15	30	30	Application Record & Notes <small>Record when the planned manure and fertilizer rates were applied or note changes.</small>	
C) Other Organic Sources Applied (lb/A) <small>(e.g. Biosolids, Other Manure)</small>	0	0	0		
D) Residual Manure N (lb/A) <small>Table 4 (AG Table 1.2-14B)</small>	20				
E) Previous Legume N (lb/A) <small>Table 5 (AG Table 1.2-7) or Soil Test Report</small>	40				
F) Net Nutrient Requirement (lb/A) <small>(A – B – C – D – E)</small>	75	(30)	(30)		
G) Manure Nutrient Content (lb/ton or lb/1000gal)	54.3	61.8	44.3		
H) Nitrogen Availability Factor <small>Table 6 (AG Table 1.2-14A)</small>	.45				
I) Available Nitrogen (lb/ton or lb/1000gal) <small>(G x H)</small>	24.4				
J) Balanced Manure Rate (tons/A or gallons/A) <small>For N: (F ÷ I) For P: (F ÷ G)</small>	3.1	NA			
K) Planned Manure Rate (tons/A or gallons/A) <small>Must be less than or equal to the appropriate Balanced Rate based on the plan basis being used</small>	3 ton/A				
L) Nutrients Applied at Planned Rate (lb/A) <small>For N: (K x I) For P & K: (K x G)</small>	73	185	133	Note: Nutrient balances for P ₂ O ₅ and K ₂ O based on crop removal (Row A) should not be used to determine additional fertilizer needs. Only recommendations based on soil tests should be used for this purpose.	
M) Nutrient Balance at Planned Rate (lb/A) <small>(F - L) (Indicate short or excess)</small>	2 short	215 excess	163 excess		

¹ Completion of N column required for all options; P₂O₅ column is optional for N based rates; K₂O is optional for all rates.

Nutrient Balance Worksheet

CMU/Field Identification <small>(Area must be clearly identified on a map)</small>			Acres	Crop Group	Yield	
2-8			90	Corn Grain After Corn	150 bu/A	
Manure Plan Basis <small>(check planning option)</small>	OPTION 1 P Removal		OPTION 2 N Requirement		X	
	<ul style="list-style-type: none"> P removal rates 150' application setback from streams, lakes or ponds 		<ul style="list-style-type: none"> N requirement rates 150' application setback from streams, lakes or ponds Soil test < 200 ppm 		<ul style="list-style-type: none"> P Index evaluation (must be attached) 	
	Will P banking be used?		Soil Test P (ppm)			
	No		154, 154, 125, 137, 118, 142, 133			
	Yes, for _____ years.					
	<small>(Use the P₂O₅ column to determine acceptable rate)</small>		<small>(Use the N column to determine acceptable rate)</small>		<small>(Use appropriate column based on the P Index to determine acceptable rate)</small>	
Manure Type	Manure Analysis (lb/ton or 1000 gal)			Application Timing	Application Method	
	Total N	P₂O₅	K₂O			
Broiler Litter	54.3	61.8	44.3	Spring	3-4 day incorporation	
Notes						

	N ¹	P ₂ O ₅ ¹	K ₂ O ¹	Recommendation Basis	
A) Recommendation or Removal (lb/A) <small>N – Soil Test or Tables 1 & 2 (AG Table 1.2-6;1.2-8) P₂O₅ & K₂O – Soil Test or Table 3 (AG Table 1.2-9)</small>	150	0	0	X	Soil Tests
B) Fertilizer Applied (lb/A) <small>(Regardless of Manure e.g. Starter)</small>	15	30	30	Application Record & Notes <small>Record when the planned manure and fertilizer rates were applied or note changes.</small>	
C) Other Organic Sources Applied (lb/A) <small>(e.g. Biosolids, Other Manure)</small>	0	0	0		
D) Residual Manure N (lb/A) <small>Table 4 (AG Table 1.2-14B)</small>	35				
E) Previous Legume N (lb/A) <small>Table 5 (AG Table 1.2-7) or Soil Test Report</small>	0				
F) Net Nutrient Requirement (lb/A) <small>(A – B – C – D – E)</small>	100	(30)	(30)		
G) Manure Nutrient Content (lb/ton or lb/1000gal)	54.3	61.8	44.3		
H) Nitrogen Availability Factor <small>Table 6 (AG Table 1.2-14A)</small>	.45				
I) Available Nitrogen (lb/ton or lb/1000gal) (G x H)	24.4				
J) Balanced Manure Rate (tons/A or gallons/A) <small>For N: (F ÷ I) For P: (F ÷ G)</small>	4.1	NA			
K) Planned Manure Rate (tons/A or gallons/A) <small>Must be less than or equal to the appropriate Balanced Rate based on the plan basis being used</small>	4 tons/A				
L) Nutrients Applied at Planned Rate (lb/A) For N: (K x I) For P & K: (K x G)	98	247	177	Note: Nutrient balances for P ₂ O ₅ and K ₂ O based on crop removal (Row A) should not be used to determine additional fertilizer needs. Only recommendations based on soil tests should be used for this purpose.	
M) Nutrient Balance at Planned Rate (lb/A) (F - L) (Indicate short or excess)	2 short	277 excess	207 excess		

¹ Completion of N column required for all options; P₂O₅ column is optional for N based rates; K₂O is optional for all rates.

Nutrient Balance Worksheet

CMU/Field Identification <small>(Area must be clearly identified on a map)</small>		Acres	Crop Group	Yield	
1, 9		25	Grass Hay	3T/A	
Manure Plan Basis <small>(check planning option)</small>	OPTION 1 P Removal	X	OPTION 2 N Requirement	OPTION 3 P Index	
	<ul style="list-style-type: none"> P removal rates 150' application setback from streams, lakes or ponds 		<ul style="list-style-type: none"> N requirement rates 150' application setback from streams, lakes or ponds Soil test < 200 ppm 	<ul style="list-style-type: none"> P Index evaluation (must be attached) 	
	Will P banking be used?		Soil Test P (ppm)		
	No				
	X	Yes, for 3 years.			
	<small>(Use the P₂O₅ column to determine acceptable rate)</small>		<small>(Use the N column to determine acceptable rate)</small>		<small>(Use appropriate column based on the P Index to determine acceptable rate)</small>
Manure Type	Manure Analysis (lb/ton or 1000 gal)			Application Timing	Application Method
	Total N	P ₂ O ₅	K ₂ O		
Swine Liquid	30.4	22.1	16.1	Summer	No Incorporation
Notes					

	N ¹	P ₂ O ₅ ¹	K ₂ O ¹	Recommendation Basis
A) Recommendation or Removal (lb/A) <small>N – Soil Test or Tables 1 & 2 (AG Table 1.2-6;1.2-8) P₂O₅ & K₂O – Soil Test or Table 3 (AG Table 1.2-9)</small>	150	135		Soil Tests X Crop Removal
B) Fertilizer Applied (lb/A) <small>(Regardless of Manure e.g. Starter)</small>	92	0		Application Record & Notes <small>Record when the planned manure and fertilizer rates were applied or note changes.</small>
C) Other Organic Sources Applied (lb/A) <small>(e.g. Biosolids, Other Manure)</small>	0	0		
D) Residual Manure N (lb/A) <small>Table 4 (AG Table 1.2-14B)</small>	20			
E) Previous Legume N (lb/A) <small>Table 5 (AG Table 1.2-7) or Soil Test Report</small>	0			
F) Net Nutrient Requirement (lb/A) <small>(A – B – C – D – E)</small>	38	135		
G) Manure Nutrient Content (lb/ton or lb/1000gal)	30.4	22.1		
H) Nitrogen Availability Factor <small>Table 6 (AG Table 1.2-14A)</small>	.2			
I) Available Nitrogen (lb/ton or lb/1000gal) (G x H)	6.08			
J) Balanced Manure Rate (tons/A or gallons/A) <small>For N: (F ÷ I) For P: (F ÷ G)</small>	NA	6109		
K) Planned Manure Rate (tons/A or gallons/A) <small>Must be less than or equal to the appropriate Balanced Rate based on the plan basis being used</small>	6000 gallons/A			
L) Nutrients Applied at Planned Rate (lb/A) For N: (K x I) For P & K: (K x G)	36	133		Note: Nutrient balances for P ₂ O ₅ and K ₂ O based on crop removal (Row A) should not be used to determine additional fertilizer needs. Only recommendations based on soil tests should be used for this purpose.
M) Nutrient Balance at Planned Rate (lb/A) (F - L) (Indicate short or excess)	2 short	2 short		

¹ Completion of N column required for all options; P₂O₅ column is optional for N based rates; K₂O is optional for all rates.

Nutrient Balance Worksheet

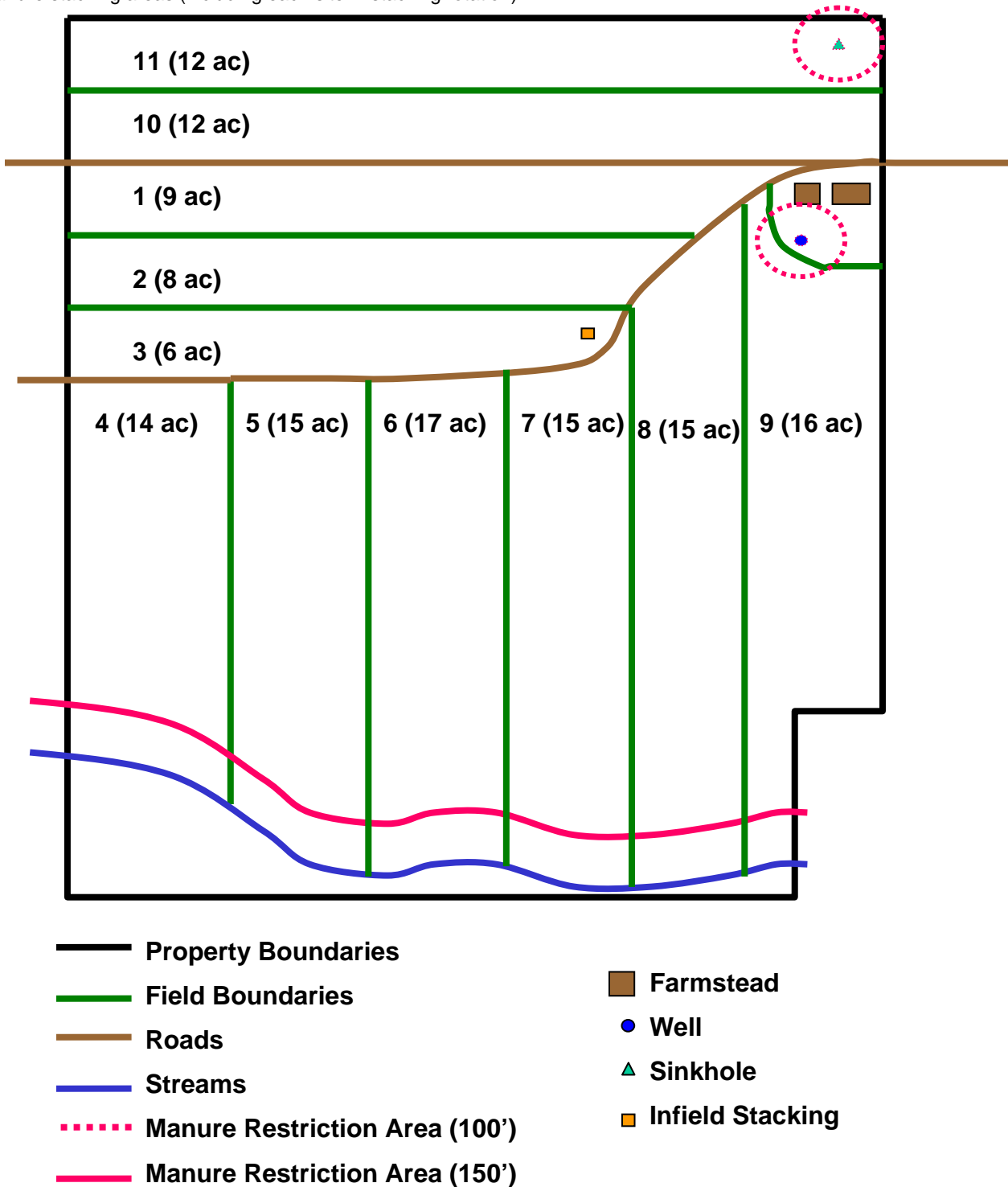
CMU/Field Identification (Area must be clearly identified on a map)		Acres	Crop Group	Yield
10, 11		24	Corn Grain After Soybeans	175 bu/A
Manure Plan Basis (check planning option)	OPTION 1 P Removal	OPTION 2 N Requirement		OPTION 3 P Index
	<ul style="list-style-type: none"> P removal rates 150' application setback from streams, lakes or ponds 	<ul style="list-style-type: none"> N requirement rates 150' application setback from streams, lakes or ponds Soil test < 200 ppm 		<ul style="list-style-type: none"> P Index evaluation (must be attached)
	Will P banking be used?	Soil Test P (ppm)		
	No	315, 334		
	Yes, for _____ years.			
(Use the P ₂ O ₅ column to determine acceptable rate)		(Use the N column to determine acceptable rate)		(Use appropriate column based on the P Index to determine acceptable rate)
Manure Type	Manure Analysis (lb/ton or 1000 gal)			Application Timing
	Total N	P ₂ O ₅	K ₂ O	Application Method
Broiler Litter	54.3	61.8	44.3	Spring 3-4 Day Incorporation
Notes	P Index values for these fields were MEDIUM allowing an N based rate.			

	N ¹	P ₂ O ₅ ¹	K ₂ O ¹	Recommendation Basis
A) Recommendation or Removal (lb/A) N – Soil Test or Tables 1 & 2 (AG Table 1.2-6;1.2-8) P ₂ O ₅ & K ₂ O – Soil Test or Table 3 (AG Table 1.2-9)	175	0	0	X Soil Tests Crop Removal
B) Fertilizer Applied (lb/A) (Regardless of Manure e.g. Starter)	0	0	0	Application Record & Notes Record when the planned manure and fertilizer rates were applied or note changes.
C) Other Organic Sources Applied (lb/A) (e.g. Biosolids, Other Manure)	0	0		
D) Residual Manure N (lb/A) Table 4 (AG Table 1.2-14B)	35			
E) Previous Legume N (lb/A) Table 5 (AG Table 1.2-7) or Soil Test Report	50			
F) Net Nutrient Requirement (lb/A) (A – B – C – D – E)	90	0	0	
G) Manure Nutrient Content (lb/ton or lb/1000gal)	54.3	61.8	44.3	
H) Nitrogen Availability Factor Table 6 (AG Table 1.2-14A)	.45			
I) Available Nitrogen (lb/ton or lb/1000gal) (G x H)	24.4			
J) Balanced Manure Rate (tons/A or gallons/A) For N: (F ÷ I) For P: (F ÷ G)	3.69	NA		
K) Planned Manure Rate (tons/A or gallons/A) Must be less than or equal to the appropriate Balanced Rate based on the plan basis being used	3.5 ton/A			
L) Nutrients Applied at Planned Rate (lb/A) For N: (K x I) For P & K: (K x G)	85	216	155	Note: Nutrient balances for P ₂ O ₅ and K ₂ O based on crop removal (Row A) should not be used to determine additional fertilizer needs. Only recommendations based on soil tests should be used for this purpose.
M) Nutrient Balance at Planned Rate (lb/A) (F - L) (Indicate short or excess)	5 short	216 excess	155 excess	

¹ Completion of N column required for all options; P₂O₅ column is optional for N based rates; K₂O is optional for all rates.

Appendix 1 Operation Maps





Maps (or aerial photographs) required to accompany Nutrient Balance Sheets must identify: crop management unit (field) identification, acreage and boundaries, manure application setback areas and buffers and associated landscape features (streams and other water bodies, sinkholes, and active water wells), and location of in-field manure stacking areas (including each site in stacking rotation).



Appendix 2

Phosphorus Index

Include the current Pennsylvania Phosphorus Index Spreadsheet or paper worksheet for each field that required Part B of the P Index when using Manure Plan Basis Option 3.

	A	B	C	D	E	F	G	H	
1	Pennsylvania P Index Version 2 (October 2009; Penn State, Dept. Crop & Soil Sciences & USDA-ARS, Pasture Systems & Watershed Mgmt. Research Unit)								
2									
3	FARM IDENTIFICATION		PART A: SCREENING TOOL			CMU/Field ID	10	11	
4	Act 38 Technical Manual	Is the CMU in a Special Protection watershed?				If the answer is Yes to any of these questions, Part B must be used.	No	No	
5	Supplement 4 - Sample NBS	Is there a significant farm management change as defined by Act 38? (see below)					No	No	
6	P Index Example	Is the Soil Test Mehlich 3 P greater than 200 ppm P? (enter soil test value in ppm)					315	334	
7		Is the Contributing Distance from this CMU to receiving water less than 150 ft.?					No	No	
8	The following Act 38 criteria determine when there is a significant farm management change:						Part B	Part B	
9	1. net increase of greater than 10% in AEU's per acre								
10	2. a change in crop management that results in a farmwide reduction of greater than 20% in nitrogen necessary for realistic expected crop yield								
11	3. alternative organic sources will replace all or some of the nutrient sources listed in the plan								
12	4. additional lands are brought into the operation (purchased or rented)								
13	PART B: SOURCE FACTORS					CMU/Field ID	10	11	
14	SOIL TEST	Mehlich 3 Soil Test P (ppm P)					315	334	
15	Soil Test Rating = 0.20 * Mehlich 3 Soil Test P (ppm P)						63	67	
16	FERTILIZER P RATE	Fertilizer P (lb P ₂ O ₅ /acre)					0	0	
17	P Applied from multiple fertilizer applications, if any (From Multiple Applications Calculator)						0	0	
18	FERTILIZER APPLICATION METHOD	0.2 Placed or injected 2" or more deep	0.4 Incorporated <1 week following application	0.6 Incorporated > 1 week or not incorporated following application in April - October	0.8 Incorporated >1 week or not incorporated following application in Nov. - March	1.0 Surface applied to frozen or snow covered soil			
19	Fertilizer Rating = Fertilizer Rate x Fertilizer Application Method						0	0	
20	MANURE P RATE	Manure P (lb P ₂ O ₅ /acre)					216	216	
21	P Applied from multiple manure applications, if any (From Multiple Applications Calculator)						0	0	
22	MANURE APPLICATION METHOD	0.2 Placed or injected 2" or more deep	0.4 Incorporated <1 week following application	0.6 Incorporated > 1 week or not incorporated following application in April - October	0.8 Incorporated >1 week or not incorporated following application in Nov. - March	1.0 Surface applied to frozen or snow covered soil	0.4	0.4	
23	P SOURCE COEFFICIENT	Refer to: Test results for P Source Coefficient OR Book values from P Index Fact Sheet Table 1					0.8	0.8	
24	Manure Rating = Manure Rate x Manure Application Method x P Source Coefficient						69	69	
25	Source Factor Sum						132	136	
26	PART B: TRANSPORT FACTORS					CMU/Field ID	10	11	
27	EROSION	Soil Loss (ton/acre/yr)					2	2	
28	RUNOFF POTENTIAL	0 <i>Drainage Class is Excessively</i>	2 <i>Drainage Class is Somewhat Excessively</i>	4 <i>Drainage Class is Well/Moderately Well</i>	6 <i>Drainage Class is Somewhat Poorly</i>	8 <i>Drainage Class is Poorly/Very Poorly</i>	4	4	
29	SUBSURFACE DRAINAGE	0 None or No direct outlet to receiving water	1 	2 Random Drainage - Outlets directly to receiving water	3 	4 Patterned drainage - Outlets directly to receiving water	0	0	
30	CONTRIBUTING DISTANCE	0 > 500 ft.	2 350 to 500 ft.	4 200 to 349 ft.	6 100 to 199 ft. OR < 100 ft. with 35 ft. buffer	8 3* < 100 ft.	0	0	
31	Transport Sum = Erosion + Runoff Potential + Subsurface Drainage + Contributing Distance						6	6	
32	MODIFIED CONNECTIVITY	0.85 50 ft. Riparian Buffer APPLIES TO DIST < 100 FT	1.0 	1.0 Grassed Waterway or None	1.1 	1.1 Direct Connection APPLIES TO DIST > 100 FT	1.0	1.0	
33	* OR rapidly permeable soil near a stream						Transport Sum x Modified Connectivity / 24	0.25	0.25
34	* "9" factor does not apply to fields with a 35 ft. buffer receiving manure.						P Index Value = 2 x Source x Transport	66	68