SOLIDS WORKSHEET 1 EXAMPLE - ESTIMATING NUTRIENTS GENERATED PER CONFINEMENT PERIOD

Step 1. Nutrients Generated (As Excreted)

	Animal Type (See Table 1.1)	Number of Animals		Percent Waste as Solid [a]		Average Weight (lbs.)		1000		Confinement Period [b] (days/year)		Animal Unit Days		Table 1.1 Values		N	P_2O_5	K_2O
													N	0.96	=	41,472		
													P_2O_5	0.64	=	+	27,648	
1.)	Poultry Litter Broiler	300,000	x	100%	x	3.0	÷	1000	x	48	=	43,200	x K_2O	0.65	=		+	28,080
													N		=			+
													P_2O_5		=	+		
2.)			x		x		÷	1000	x		=		x K_2O		=		+	
													N		=			+
													P_2O_5		=			
3.)			x		x		÷	1000	x		=		x K_2O		=	=	=	
																		=
														Step 1 Total	=	41,472	27,648	28,080
																	(lbs)	

Step 2. Manure Generated (As Excreted)

	Animal Unit Days (from Step 1)		Manure/A.U. (See Table 1.1)		Volume of Manure	
1.)	43,200	x	1.4	=	60,480	cubic feet
2.)		x		=		cubic feet
3.)		x		=		cubic feet

Step 2 Total = **60,480** **cu.ft.**

1 + 2 + 3

Step 3. Total Tons

	Step 2 Vol. of Manure		See Table 1.1 Bedding Value		Total Tons
1.)	60,480	÷	74	=	817
2.)		÷		=	
3.)		÷		=	

Step 3 Total = **817** **tons**

1 + 2 + 3

Step 4. Weighted Nutrient Values Before Nutrient Losses

	Step 1		Step 3 Total	
N	41,472	÷	817	=
P_2O_5	27,648	÷	817	=
K_2O	28,080	÷	817	=

	N	P_2O_5	K_2O
Step 4 Total =	**50.7**	**33.8**	**34.4**
		(lbs/ton)	

[a] The percent of the manure that is handled as a solid.

[b] Confinement period should be adjusted for animals that are only in confinement for a portion of the day. For example, if animals spend 16 hours on pasture and 8 hours in confinement, then the confinement period would be 1/3 of a day or 122 days/year.

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EXAMPLE SOLIDS WORKSHEET 2 - NUTRIENT BALANCE

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Tract	Field No.	Acres
	1	200

Soil Test P Value (Mehlich 3) 200

Step 1. Crop or Crop Sequence/Rotation — Corn Grain (Bushel)

See Table 2.1 Options

Step 2. Realistic Yield (Average from 5-10 Years on a per acre basis) — 200

	N	P_2O_5	K_2O
Step 3. Plant Nutrients Needed or Allowed (lbs/ac)	180	80	70

N	0.9 (Table 2.1 Value for N)	×	200 (Step 2)	=	180
P	0.4 (Table 2.1 Value for P)	×	200 (Step 2)	=	80
K	0.35 (Table 2.1 Value for K)	×	200 (Step 2)	=	70

	P_2O_5
Step 4. Adjusted P_2O_5 Application Rate According to Threshold	0

P	80 (Step 3 P_2O_5)	×	0 (Table 2.2 Value)	=	0

	N	P_2O_5	K_2O
Step 5. Fertilizer Credits (lbs/ac)	0	0	0

	N	P_2O_5	K_2O
Step 6. Plant Nutrients Needed Minus Credits (lbs/ac)	180	80	70

N	180 (Step 3 for N)	–	0 (Step 5 for N)	=	180
P	If Step 4 > 0: (Step 4 for P)	–	(Step 5 for P)	=	
	If Step 4 = 0: 80 (Step 3 for P)	–	0 (Step 5 for P)	=	80
K	70 (Step 3 for K)	–	0 (Step 5 for K)	=	70

	N	P_2O_5	K_2O
Step 7. Nutrients in Manure (lbs/ton)	50.7	33.8	34.4

Step 4 Values from Solids Worksheet 1 **or** use Lab Results

	N	P_2O_5	K_2O
Step 8. Percent Nutrients Retained in System	70%	95%	95%

Enter Table 2.3 values **or** Enter zero if lab analysis is used (Manure with bedding in roofed storage)

	N	P_2O_5	K_2O
Step 9. Net Retained Nutrients in Manure (lbs/ton)	35.5	32.1	32.6

Enter zero if lab analysis is used

N	50.7 (Step 7 for N)	×	0.7 (Step 8 for N)	=	35.5
P	33.8 (Step 7 for P)	×	0.95 (Step 8 for P)	=	32.1
K	34.4 (Step 7 for K)	×	0.95 (Step 8 for K)	=	32.6

	N	P_2O_5	K_2O
Step 10. Percent of Available Nutrients	45%	80%	100%

Enter Table 2.4 Value for N

(Spring: Incorporated 7 days or more)

	N	P_2O_5	K_2O
Step 11 . Net Available Nutrients (lbs/ton)	16.0	25.7	32.6

If Lab Results are used in Step 7:

N	_____ Step 7 for N	×	_____ Step 10 for N	=	_____
P	_____ Step 7 for P	×	_____ Step 10 for P	=	_____
K	_____ Step 7 for K	×	_____ Step 10 for K	=	_____

If Solid Worksheet 1 Values are used in Step 8:

N	35.5 Step 9 for N	×	0.45 Step 10 for N	=	16
P	32.1 Step 9 for P	×	0.8 Step 10 for P	=	25.7
K	32.6 Step 9 for K	×	1 Step 10 for K	=	32.6

	N	P_2O_5	K_2O
Step 12 . Application Rate (tons/ac)	11	3	2

N	180 Step 6 for N	÷	16 Step 11 for N	=	11
P	80 Step 6 for P	÷	25.7 Step 11 for P	=	3
K	70 Step 6 for K	÷	32.6 Step 11 for K	=	2

	N	P_2O_5	K_2O
Step 13 . Net Application Amount for All Nutrients (lbs/ac)	64	103	130

N	16 Step 11 for N	×	4 Application Rate	=	64
P	25.7 Step 11 for P	×	4 Application Rate	=	103
K	32.6 Step 11 for K	×	4 Application Rate	=	130

	N	P_2O_5	K_2O
Step 14 . Nutrient Needs (negative) or Surpluses (positive) (lbs/ac)	-116	23	60

N	64 Step 13 for N	–	180 Step 6 for N	=	-116
P	103 Step 13 for P	–	80 Step 6 for P	=	23
K	130 Step 13 for K	–	70 Step 6 for K	=	60

Step 15 . Balance

Tons Available		-	**Tons Applied in Field**		= **Balance**
	817			**800**	**17**
	Step 3 from Solids Worksheet 1 or Balance from Previous Worksheet 2			Application Rate x Field Acres **or** to deplete supply in one field: Tons Available ÷ Num. of Acres = Uniform App. Rate (Be sure not to exceed 10 tons/acre)	

EXAMPLE SOLIDS WORKSHEET 3 - APPLICATION RATES AND LAND REQUIREMENTS [1]

Tract No.

Field No.	Acres	Soil Test Phosphorus (STP)	Crop Rotation / Sequence	Planned Application Date or Timing	Planned Application Rate[2] (tons/ac)	Solid or Commercial Fertilizer (S or C)	Actual Application Date	Actual Application Rate[2] (tons/ac)	Weather at Time of Application[3] (Cloudy, Raining, Sunny)	
									24 Hours Before	24 Hours After
1	200	200	Corn Grain (Bushel)	Spring 2014	4	S	Spring 2014	Spring 2014	Sunny	Sunny

1. Where land application is occurring under long term lease or agreement with adjacent landowner, fields must be included in the above table.
2. Fields that have a "High" soil test phosphorus (>400) should implement Best Management Practices (BMPs) to reduce the risk of nutrient movement to sensitive waterbodies. BMPs may include, but not be limited to: installing conservation buffers, reducing P2O5 application rate, incorporating manure, adding chemical treatments to litter that tie up soluble P and keep it from moving over the landscape, and/or adjusting application timing.
3. It illegal to make land applications when the ground is frozen. It is recommended that land applications are not made within 48 hours of forecasted precipitation.

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