Exhibit Name:	Premium Calculation		
Exhibit Number:	P11-13, Plan 16	**Reinsurance Year:**	2016
Record Name:	Acreage	**Version:**	Draft
Record Code:	P11	**Release Date:**	12/29/2016

Margin Protection (MP)

Insurance Plan Code 16 Margin Protection

Commodity Code 0011 Wheat | 0018 Rice | 0041 Corn | 0081 Soybeans

Calculations	Field Name	Record Number	Field Number	Field Format	Field Rounding	Rules
Section 1: Dollar Amount of Insurance						
Dollar Amount of Insurance = Round((Expected Margin Amount * Coverage Level Percent) + (Approved Yield * 0.85 * Projected Price),2)	Dollar Amount of Insurance	Internal		99999999.99	2 decimal places	
	Expected Margin Amount	ADM		99999.999999	None	Expected Margin Amount. Edit with ADM Price, "A00810".
	Coverage Level Percent	P14	49	9.9999	2 decimal places	Coverage Level Percent in 5% increments as selected for MP.
	Approved Yield	P11	42	99999999.99	None	Approved Yield.
	Projected Price	ADM		99999.9999	None	Projected Price. Edit with ADM Price, "A00810".
Section 2: Liability Calculation						
Total Guarantee Amount = Dollar Amount of Insurance * Reported Acreage	Total Guarantee Amount	P11	100	9999999999	Round to whole number.	
	Reported Acreage	P11	48	9999999.99	None	
Liability Amount = Total Guarantee Amount * Insured Share Percent	Liability Amount	P11	91	9999999999	Round to whole number.	
	Insured Share Percent	P11	43	9.999	None	
Section 3: Total Premium, Subsidy, and Producer Premium Calculation						**Sections 3 and 4 will be used if base (companion) record does not have qualifying information for MP Net Premium.**
Preliminary Total Premium Amount = Reported Acreage * Base Rate * Insured Share Percent	Preliminary Total Premium Amount	Internal		9999999999	Round to whole number.	
	Base Rate	ADM		999999.9999	None	Base Rate is Margin Protection Premium Amount Per Acre. Edit with ADM Area Risk Rate, "A01005".
Total Premium Amount = Preliminary Total Premium Amount	Total Premium Amount	P11	92	9999999999	Round to whole number.	
Subsidy Amount = Total Premium Amount * Subsidy Percent	Subsidy Amount	P11	90	9999999999	Round to whole number.	If this record qualifies for Beginning Farmer and Rancher or Native Sod, see Section 4 for subsidy calculations.
	Subsidy Percent	ADM		9.999	None	Edit with ADM Subsidy Percent, "A00070".
Producer Premium Amount = Total Premium Amount - Subsidy Amount	Producer Premium Amount	P11	93	9999999999	Round to whole number.	

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Margin Protection (MP)

Insurance Plan Code 16 Margin Protection

Commodity Code 0011 Wheat 0018 Rice 0041 Corn 0081 Soybeans

Calculations	Field Name	Record Number	Field Number	Field Format	Field Rounding	Rules
Section 4: Beginning Farmer and Rancher (BFR), Native Sod (NS), and Conservation Compliance (CC) Subsidy Calculations						
Base Subsidy Amount = Total Premium Amount * Subsidy Percent	Base Subsidy Amount	Internal		9999999999	Round to whole number	Cupped by the standard rule of $1 if applicable.
	Subsidy Percent	ADM		9.999	None	Edit with ADM Subsidy Percent, "A00070".
BFR Subsidy Amount = Total Premium Amount * 0.10 * (1 - CC Subsidy Reduction Percent)	BFR Subsidy Amount	Internal		9999999999	Round to whole number	Beginning Farmer Rancher Subsidy Amount. If Applicable; else 0. 0.10 (10%).
Native Sod Subsidy Amount = Total Premium Amount * 0.50	Native Sod Subsidy Amount	Internal		9999999999	Round to whole number	If Applicable; else 0. 0.50 (50%). For CAT coverage, Native Sod Subsidy Amount is always 0.
CC Subsidy Reduction Amount = Base Subsidy Amount * CC Subsidy Reduction Percent	CC Subsidy Reduction Amount	P11	108	9999999999	Round to whole number	CC Subsidy Reduction Amount. If Applicable; else 0.
	CC Subsidy Reduction Percent	P11	76	9.999	None	If Applicable; else 0.
Subsidy Amount = Base Subsidy Amount + BFR Subsidy Amount - Native Sod Subsidy Amount - CC Subsidy Reduction Amount	Subsidy Amount	P11	90	9999999999	Round to whole number	Subsidy Amount cannot exceed Total Premium Amount. Subsidy Amount will be cupped at $0.
Producer Premium Amount = Total Premium Amount - Subsidy Amount	Producer Premium Amount	P11	93	9999999999	Round to whole number	
Section 5: Premium Credit for MP Policies with Base Policy						**MP policy has an associated base (companion) policy. Use Sections 3 and 4 when base (companion) record does not have qualifying information for MP Net Premium.**
Simple Average Annual Yield = ∑Average Annual Yield(s) / N	Simple Average Annual Yield	Internal		99999999.99	Round to 2 decimals.	Sum all average annual yields in the APH database for a type/practice unit divide by the number of yields. Step 5 of Parameter Example Exhibit P15-6.
	Average Annual Yield	Internal		99999999.99	Round to 2 decimals.	APH average annual yields for each year in the APH database. Step 3 of Parameter Example Exhibit P15-6.
	N	Internal		99999	Whole Number	Count of the yields in the APH database.

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Margin Protection (MP)

Insurance Plan Code 16 Margin Protection

Commodity Code 0011 Wheat 0018 Rice 0041 Corn 0081 Soybeans

Calculations	Field Name	Record Number	Field Number	Field Format	Field Rounding	Rules
Simple Average County Yield = ∑Yield(s) / N	Simple Average County Yield	Internal		99999999.99	Round to 2 decimals.	Sum (county) yields for the same years that yields are reported for the unit and divide by the number of yields. Step 8 of Parameter Example Exhibit P15-6.
	Yield	ADM		99999999.99	Round to 2 decimals.	Yield(i) found in the ADM Historical Yield Trend, "A01115". Step 7 of Parameter Example Exhibit P15-6.
	N	Internal		99999	Whole Number	Count of the yields in the APH database.

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Margin Protection (MP)

Insurance Plan Code 16 Margin Protection

Commodity Code 0011 Wheat 0018 Rice 0041 Corn 0081 Soybeans

Calculations	Field Name	Record Number	Field Number	Field Format	Field Rounding	Rules
County Yield Deviation(i) = Yield(i) - Average County Yield	County Yield Deviation(i)	Internal		999999.99	Round to 2 ~~4~~ decimals.	Step 9 of Parameter Example Exhibit P15-6.
Unit Yield Deviation(i) = Unit Yield(i) - Average Unit Yield	Unit Yield Deviation(i)	Internal		999999.99	Round to 2 decimals.	Step 6 of Parameter Example Exhibit P15-6.
Cross Product(i) = County Yield Deviation(i) * Unit Yield Deviation(i)	Cross Product(i)	Internal		999999.9999	Round to 4 decimals	Step 10 of Parameter Example Exhibit P15-6.
Squared County Deviation(i) = County Yield Deviation(i) * County Yield Deviation(i)	Squared County Deviation(i)	Internal		999999.9999	Round to 4 decimals	Step 11 of Parameter Example Exhibit P15-6.
Beta = ∑Cross Product(i) / ∑Squared County Deviation(i)	Beta	Internal		999999.9999	Round to 4 decimals	If calculated Beta < 0.3 or if N < 4, set Beta = 0.3 or if calculated Beta > 1.6, set Beta = 1.6. Step 13 of Parameter Example Exhibit P15-6.
Alpha = Average Unit Yield - Beta * Average County Yield	Alpha	Internal		999999.9999	Round to 4 decimals	Step 14 of Parameter Example Exhibit P15-6.
Squared Yield Deviation(i) = $[\text{Unit Yield - Alpha - Beta * Yield(i)}]^2$	Squared Yield Deviation(i)	Internal		999999.9999	Round to 4 decimals	Step 15 of Parameter Example Exhibit P15-6.
Sigma = $[\sum\text{Squared Yield Deviation(i)} / (N-2)]^{0.5}$	Sigma	Internal		999999.9999	Round to 4 decimals	If N < 4, Sigma = 0. Steps 16 and 17 of Parameter Example Exhibit P15-6.
Trigger Margin Calculation:						
Simulateed Trigger Margin = Expected Margin * Coverage Level Percent	Simulateed Trigger Margin	Internal		99999999.99	Round to 2 decimals.	
	Expected Margin	ADM		99999999.99	Round to 2 decimals.	Expected Margin found in the ADM Price, "A00810".
Simulated MP Losses Calculation:						
MP Liability Amount = Liability Amount / Insured Share Percent	MP Liability Amount	Internal		9999999999	Round to whole number.	MP Liability Amount is the amount without Insured Share Percent for use in the determination of MP Gross Indemnity.

Exhibit Name:	Premium Calculation		
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Record Name:	Acreage	**Version:**	Draft
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Margin Protection (MP)

Insurance Plan Code 16 Margin Protection

Commodity Code 0011 Wheat 0018 Rice 0041 Corn 0081 Soybeans

Calculations	Field Name	Record Number	Field Number	Field Format	Field Rounding	Rules
Margin Draw (t,j) = For t = 1 to 57 and j= 1 to 100 Detrended Yield(t) * Commodity Price Draw Quantity (t,j) - Input Cost Draw Quantity (t,j)	Margin Draw	Internal		99999999.99	Round to 2 decimals.	
	Detrended Yield	ADM		9999999999.99	Round to 2 decimals.	Do not make calculations if Detrended Yields = 0, skip to next value. Detrended Yield found in the ADM Historical Yield Trend, "A01115".
	Commodity Price Draw Quantity	ADM		99999. 9999999999	Round to 4 decimals.	Commodity Price Draw Quantity found in the ADM Draw Data, "A00615".
	Input Cost Draw Quantity	ADM		9999.99999999	Round to 2 decimals.	Input Cost Draw Quantity found in the ADM Draw Data, "A00615".
Counter = Counter + 1	Counter	Internal		99999999.99	Whole Number	Counter is set = 0 to begin the simulation. Do not increment counter when any County Detrended Yield = 0.
MP Gross Indemnity Draw(t,j) = MIN(MAX[Trigger Margin - Margin Draw(t,j),0], MP Liability Amount)	MP Gross Indemnity Draw(t,j)	Internal		99999999.99	Round to 2 decimals.	
MP Gross Indemnity = MP Gross Indemnity + MP Gross Indemnity Draw(t,j)	MP Gross Indemnity	Internal		99999999.99	Round to 2 decimals.	Sum the MP Gross Indemnities for all iterations.
Simulated Farm Yield Calculation:						
Farm Yield Draw(t,j) = MAX[Alpha + Beta * Detrended Yield(t) + Sigma * Farm Deviation Quantity (j),0]	Farm Yield Draw(t,j)	Internal		99999999.99	Round to 2 decimals.	
	Farm Deviation Quantity (j)	ADM		99999999.9999	Round to 2 decimals.	Farm Deviation Quantity (j) found in the ADM Draw Data, "A00615".
Farm Revenue Draw(t,j) = Farm Yield Draw(t,j) * Commodity Price Draw Quantity (t,j)	Farm Revenue Draw(t,j)	Internal		99999999.99	Round to 2 decimals.	

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Margin Protection (MP)

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Commodity Code 0011 Wheat | 0018 Rice | 0041 Corn | 0081 Soybeans

Calculations		Field Name	Record Number	Field Number	Field Format	Field Rounding	Rules
Simulated Indemnities for Base (Companion) Policy Calculation:							
Coverage Level	= Coverage Level for Base (Companion) Policy	Coverage Level	P14	49	9.9999	2 decimal places	**Note** - this is the Coverage Level for Base (Companion) Policy.
YP Indemnity Draw(t,j)	= Projected Price * MAX(Coverage Level * Approved Yield - Farm Yield Draw(t,j),0)	YP Indemnity Draw(t,j)	Internal		99999999.99	2 decimal places	
RP Guarantee Draw(t,j)	= Round(Approved Yield * Coverage Level,1) * MAX(Commodity Price Draw Quantity (t,j), Projected Price)	RP Guarantee Draw(t,j)	Internal		99999999.99	2 decimal places	
RP Indemnity Draw(t,j)	= MAX (RP Guarantee Draw(t,j) - Farm Revenue Draw(t,j),0)	RP Indemnity Draw(t,j)	Internal		99999999.99	2 decimal places	
RPHPE Indemnity Draw(t,j)	= MAX[Coverage Level * Approved Yield * Projected Price - Farm Yield Draw(t,j) * Commodity Price Draw Quantity (t,j),0]	RPHPE Indemnity Draw(t,j)	Internal		99999999.99	2 decimal places	
Net Indemnities:							
YP Net Indemnity Draw(t,j)	= MAX[MP Gross Indemnity Draw(t,j) - YP Indemnity Draw(t,j),0]	YP Net Indemnity Draw(t,j)	Internal		99999999.99	2 decimal places	
RP Net Indemnity Draw(t,j)	= MAX[MP Gross Indemnity Draw(t,j) - RP Indemnity Draw(t,j),0]	RP Net Indemnity Draw(t,j)	Internal		99999999.99	2 decimal places	
RPHPE Net Indemnity Draw(t,j)	= MAX[MP Gross Indemnity Draw(t,j) - RPHPE Indemnity Draw(t,j),0]	RPHPE Net Indemnity Draw(t,j)	Internal		99999999.99	2 decimal places	
Summed Net Indemnities:							
Summed YP Net Indemnity	= ∑(YP Net Indemnity Draw) + YP Net Indemnity Draw(t,j)	YP Net Indemnity	Internal		99999999.99	2 decimal places	
Summed RP Net Indemnity	= ∑(RP Net Indemnity Draw) + RP Net Indemnity Draw(t,j)	RP Net Indemnity	Internal		99999999.99	2 decimal places	
Summed RPHPE Net Indemnity	= ∑(RPHPE Net Indemnity Draw) + RPHPE Net Indemnity Draw(t,j)	RPHPE Net Indemnity	Internal		99999999.99	2 decimal places	
Gross Premium and Net Premium Per Acre on a 100% share basis:							
Gross Premium	= Round(Summed Gross Indemnity / Counter,2)	Gross Premium	Internal		99999999.99	2 decimal places	
YP Net Premium Per Acre	= Round(Summed YP Net Indemnity / Counter,2)	YP Net Premium Per Acre	Internal		99999999.99	2 decimal places	
RP Net Premium Per Acre	= Round(Summed RP Net Indemnity / Counter,2)	RP Net Premium Per Acre	Internal		99999999.99	2 decimal places	
RPHPE Net Premium Per Acre	= Round(Summed RPHPE Net Indemnity / Counter,2)	RPHPE Net Premium Per Acre	Internal		99999999.99	2 decimal places	

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Margin Protection (MP)

Insurance Plan Code 16 Margin Protection

Commodity Code 0011 Wheat 0018 Rice 0041 Corn 0081 Soybeans

Calculations	Field Name	Record Number	Field Number	Field Format	Field Rounding	Rules
Base (Companion) Policy Credit and MP Net Premium:						
YP Base Policy Credit = Gross Premium - YP Net Premium Per Acre	YP Base Policy Credit	Internal		99999999.99	2 decimal places	
RP Base Policy Credit = Gross Premium - RP Net Premium Per Acre	RP Base Policy Credit	Internal		99999999.99	2 decimal places	
RPHPE Base Policy Credit = Gross Premium - RPHPE Net Premium Per Acre	RPHPE Base Policy Credit	Internal		99999999.99	2 decimal places	
MP Net Premium = Base Rate - (YP Base Policy Credit, RP Base Policy Credit, or RPHPE Base Policy Credit)	MP Net Premium	Internal		99999999.99	2 decimal places	
	Base Rate	ADM		999999.9999	None	Base Rate is Margin Protection Premium Amount Per Acre. Edit with ADM Area Risk Rate, "A01005". Use Sections 3 and 4 when base (companion) record does not have qualifying information for MP Net Premium.
Section 6: Total Premium, Subsidy, and Producer Premium Calculation for MP Policies with Base (Companion) Policy:						
Preliminary Total Premium Amount = Reported Acreage * MP Net Premium * Insured Share Percent	Preliminary Total Premium Amount	Internal		9999999999	Round to whole number.	
Total Premium Amount = Preliminary Total Premium Amount	Total Premium Amount	P11	92	9999999999	Round to whole number.	
Subsidy Amount = Total Premium Amount * Subsidy Percent	Subsidy Amount	P11	90	9999999999	Round to whole number.	If this record qualifies for Beginning Farmer and Rancher or Native Sod, see Section 4 for subsidy calculations.
	Subsidy Percent	ADM		9.999	None	Edit with ADM Subsidy Percent, "A00070".
Producer Premium Amount = Total Premium Amount - Subsidy Amount	Producer Premium Amount	P11	93	9999999999	Round to whole number.	