Model Review Form
Soil Enrichment Protocol V1.1

Model Name & Version	ecosys_HT Model Version 1.0
Model Developer	HabiTerre, Inc.
SEP Model Requirements and Guidance Version	Version 1.1a
Model Reviewer(s)	Dr. Brian McConkey (Viresco Solutions) Dr. David Gustafson (Independent Scientist)
Project-Specific (Type 1) or Generalized Validation (Type 2)?	Generalized Validation (Type 2)
Model Review Report Submittal Date	30-Jan-2024

■ (red)	NOT valid LRR x PC x CFG
■ (green)	Valid LRR x PC x CFG, no stipulations
■ (orange)	Valid LRR x PC x CFG, some stipulations

Validated Parameters by Emission Source

SOC

LRR (list all as applicable)	PC (list individually)	C4A	C3A	C3AN	C3AS	C3AF	C3P	C3PN	C4P
F, G, H, K, L, M, N, P	TR	✓		✓					
F, G, H, K, L, M, N, P	InN	✓		✓					
F, G, H, K, L, M, N, P	OrN	—							
F, G, H, K, L, M, N, P	Crop	✓		✓					

Valid soil texture classes:	**LS, SL, SiL, L, SCL, SiCL, CL, SiC**

N2O

LRR (list all as applicable)	PC (list individually)	C4A	C3A	C3AN	C3AS	C3AF	C3P	C3PN	C4P
F, G, H, K, L, M, N, P	TR	✓		✓					
F, G, H, K, L, M, N, P	InN	✓		✓					
F, G, H, K, L, M, N, P	OrN	—							
F, G, H, K, L, M, N, P	Crop	✓		✓					

Valid soil texture classes:	**LS, SL, SiL, L, SCL, SiCL, CL, SiC**

CH4

LRR (list all as applicable)	PC (list individually)	C4A	C3A	C3AN	C3AS	C3AF	C3P	C3PN	C4P
F, G, H, K, L, M, N, P	TR								
F, G, H, K, L, M, N, P	InN								
F, G, H, K, L, M, N, P	OrN								
F, G, H, K, L, M, N, P	Crop								

Valid soil texture classes:	

Land Resource Region (LRR)

Abv	Description
C	California Subtropical Fruit, Truck, and Specialty Crop Region
E	Rocky Mountain Range and Forest Region
F	Northern Great Plains Spring Wheat Region
G	Western Great Plains Range and Irrigated Region
H	Central Great Plains Winter Wheat and Range Region
K	Northern Lake States Forest and Forage Region
L	Lake State Fruit, Truck Crop, and Dairy Region
M	Central Feed Grains and Livestock Region
N	East and Central Farming and Forest Region
O	Mississippi Delta Cotton and Feed Grains Region
P	South Atlantic and Gulf Slope Cash Crops, Forest, and Livestock Region
T	Atlantic and Gulf Coast Lowland Forest and Crop Region

Practice Category (PC)

Abv	Description
TR	Soil disturbance and/or residue management
Crop	Cropping practices, planting and harvesting
InN	Inorganic nitrogen fertilizer application
OrN	Organic amendments application
Water	Water management/irrigation

Crop Functional Group (CFG)

Abv	Description
C4A	C4 Annuals
C3A	C3 Annual herbaceous
C3AN	C3 Annual N-fixing herbaceous
C3AS	C3 Annual shrub
C3AF	C3 Annual herbaceous flooded
C3P	C3 Perennial
C3PN	C3 Perennial N-fixing
C4P	C4 Perennial

Soil Texture Classes

Abv	Description	Abv	Description
S	Sand	SCL	Sandy Clay Loam
LS	Loamy Sand	CL	Clay Loam
SL	Sandy Loam	SiCL	Silty Clay Loam
L	Loam	SC	Sandy Clay
SiL	Silt Loam	SiC	Silty Clay
Si	Silt	C	Clay

LRR x PC x CFG Limitations				
Emission Source	LRR	PC	CFG	Reviewer Comments
SOC	F, G, H, K, L, M, N, P	OrN	C4A	Both reviewers noted limited validation data for this combination. As such the use of this LRR x PC x CFG combination will be limited to project fields containing either CL or SiL soil types. Once model validation is expanded to include additional validation data for OrN x C4A or additional annual CFGs, then this limitation may be lifted.
N2O	F, G, H, K, L, M, N, P	OrN	C4A	Both reviewers noted limited validation data for this combination. As such the use of this LRR x PC x CFG combination will be limited to project fields containing either SiL or L soil types. Once model validation is expanded to include additional validation data for OrN x C4A or additional annual CFGs, then this limitation may be lifted.

Additional Comments on Model Usage	
Topic	Comments
Use of SYMFONI	The MVR mentions HabiTerre's use of the SYMFONI solution to improve predictions of SOC and N2O emission changes. Additional details of this approach are provided in Appendix A. Model reviewers have noted that use of SYMFONI has not been validated through this MVR.