Conservation Planning Activity (CPA 138)

Supporting Organic Transition

Bob Smith Farm

September, 2023

by Joe Rowland

Technical Service Provider | Carolina Farm Stewardship Association

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1. Cover Page

a. CPA Information

CPA Name (Number)	**Supporting Organic Transition (138)**
Land Use(s)	**Annual crops: Mixed vegetable crops**

b. Client Information

Client Name	**Bob Smith (Bob Smith Farm)**
Contract Number	**Environmental Quality Incentives Program (EQIP) 2018 1234A56789B**
Farm, Tract & Field Numbers	**Farm 1234 | Tract 12345 | Field 5**

c. Client Objectives

1. **Organic Transition**
2. **Address soil erosion and soil organic matter depletion that results tillage between crops and mechanical weed control; improve crop health by improving weed control.**

d. TSP Information

Name	**Joe Rowland**
Address	**1234 Main St.**
Phone Number	**704-575-4915**
Email	**joe@carolinafarmstewards.org**
TSP Number	**12-34567**
County of Service	**Cabarrus Co., North Carolina**

e. Statements and Signatures

I (Joe Rowland, TSP) certify the work completed and delivered for this CPA:

1. Complies with all applicable federal, state, tribal, and local laws and regulations.
2. The planned practices are based on NRCS Conservation Practice Standards (CPSs) in the state Field Office Technical Guide where the practices are to be implemented.
3. Is consistent with and meets the conservation goals and objectives for which the program contract was entered into by the participant.
4. Incorporates alternatives that are both cost-effective and appropriate to address the resource issue(s) and participant's objective(s).

TSP Signature: Date: 8/30/23

I (Bob Smith, Client) accept the completed CPA deliverables as thorough and satisfying my objectives.

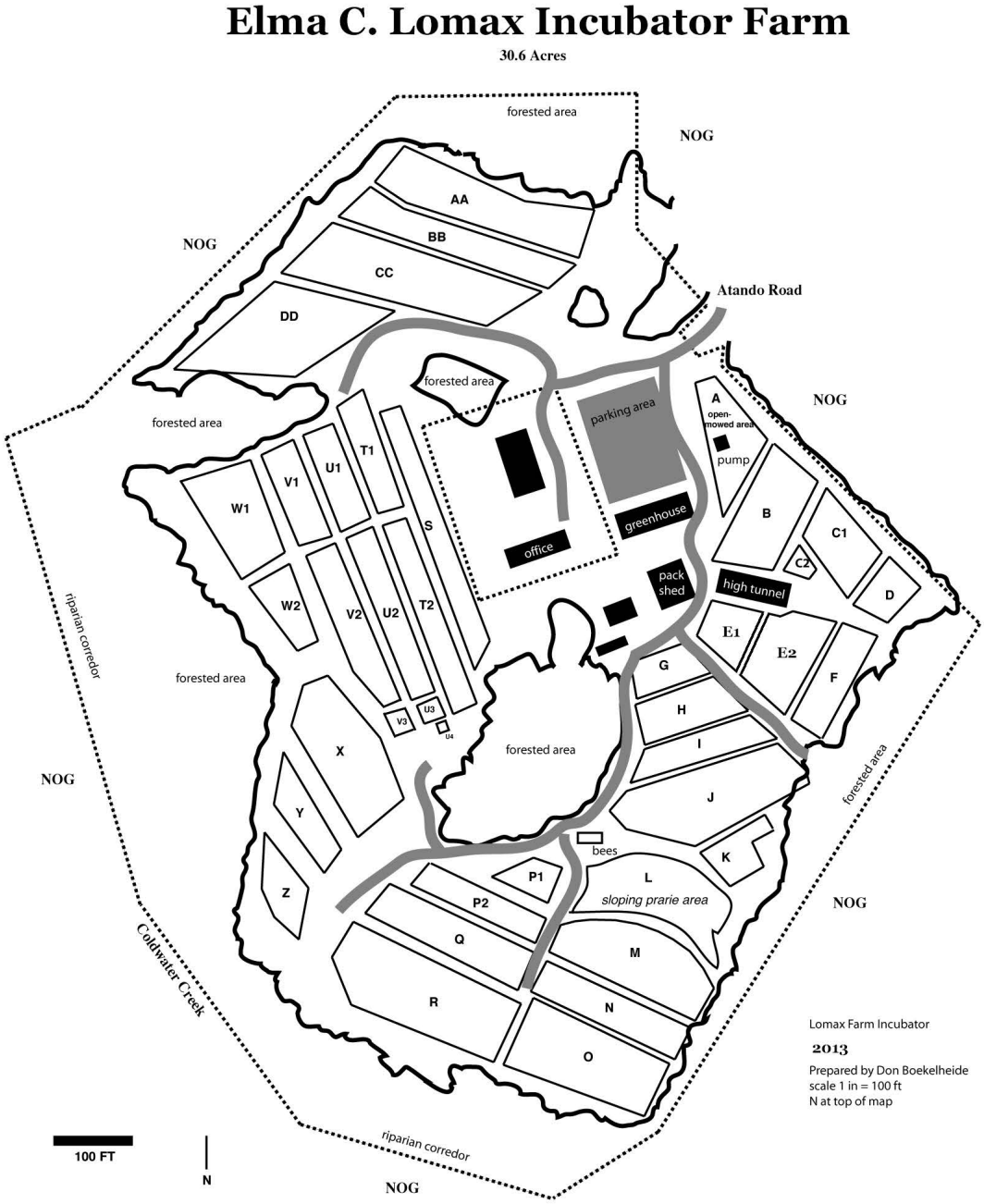
Client Signature: Date:

NRCS Signature: Date:

NRCS Title:

FIELD MAP

Bob Smith | 1234 Smith Rd., Smith, VA 12345 | Nottoway Co.
Piedmont Conservation District | Farm 2218 | Tract 12345 |
Property Total | 7 ac. in CPA138 Contract | 0.30 ac. in Production



Prepared by Joe Rowland,
TSP #12-34567
Sept 19, 2023

Organic System Plan Template

***Complete for Conservation Activity Plan for Transition to Organic – CAP 138**
Organic Production

Last Name(s)	First Name(s)	Farm/Ranch/Business Name	Date
Bob	Smith	Bob Smith	9/19/23

Forms Checklist	7 C.F.R. §§ 205.2 - 205.406

Please note that these forms are suggested templates; contact your certifier for approval of the forms you plan to use. Please provide thorough descriptions that reflect all your current and planned practices. The U.S. Department of Agriculture (USDA) organic regulations require Organic System Plans (OSPs) to be reviewed and updated annually. Whenever you anticipate a change in your operation's practices, procedures or materials, please update and resubmit the sections or pages that reflect that change. This Forms Checklist must be submitted along with your application, OSP, and all other forms indicated below.

*DESCRIPTION OF ORGANIC PRODUCTION

Please provide a brief, general description of your organic operation, including: crops or crop types and cropping systems; livestock raised and animal products; any handling activities related to your crop and livestock production; and type(s) of marketing and sales (contract, wholesale, direct marketing, etc.).

Bob Smith Farm is a 7 acre property located in Nottoway, Va., growing produce on .3ac consisting of field and high tunnel production. The farm grows kale, collards, sweet potatoes, spinach and tomatoes. They market their produce directly to consumers through farmers markets and wholesale outlets.

All applicants seeking organic certification, whether for crop and/or livestock production and/or handling, please complete these forms:

☒ Forms Checklist (this form)	☒ Application
☐ Affidavit	☒ Natural Resource Management
☒ Land Requirements Form +	☒ Map +
☐ Documentation of Prior Land Use	

Submit a Land Requirements Form with a Map and Documentation of prior land use for each farm, ranch or production location. Total number of locations/sets of forms: _____

☐ Fees (no template)	☐ Sales Report (no template)

Complete the OSP forms (sections) that best describe your organic operation. The Crop and Livestock Production Overviews, respectively, will guide your selection of forms. Check the box by each OSP form that you are submitting with your application for certification.

Crops (as applicable):

☒ Crop Production Overview	☒ Recordkeeping, Labeling, and Audit Trail
☒ Seed and Planting Stock	☐ Greenhouse Crop/Seedling Production
☒ Soil Management and Crop Rotation	☐ Compost and Manure Use/Production
☒ Pest, Disease, and Weed Management	☒ Crop Post-Harvest Handling

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☒ Prevention of Commingling and Contamination	
☒ Materials List	

Application **7 C.F.R. § 205.401**

a) *Applicant(s)
Bob Smith

b) *Farm, ranch, or business name
Bob Smith Farm

c) *Mailing address
1234 Smith Rd, Nottoway, VA 12345

d) *Physical address
1234 Smith Rd

e) *City	**f) *State**	**g) *Zip code**
Smith	VA	12345
h) *Primary phone no.	**i) *Alt. phone no.**	**j) *Fax no. (optional)**
123-456-7890		

smith@smith.com

k) *County(ies) where farm/ranch is located
Nottoway

l) *Organizational Structure/Legal Status:

☒ **Sole Proprietorship**	☐ **Legal Partnership**
☐ **S corporation**	☐ **Limited Liability Corporation**
☐ **Trust**	☐ **Non-Profit Organization**
☐ **Government/Public Agency**	☐ **Other (specify):**

m) *If a corporation, list the State of incorporation and name, if different than listed above:

n) *Name of the person(s) authorized to act on the applicant's behalf

o) *Address	**p) *Telephone number**

q) List the name(s) of any certifier(s) to which an application has been previously made, and date(s) of application: ☐ **none**

r) Outcome of the application submission(s)

s) If you have received any notification of noncompliance or denial of certification, please attach these with a description of actions taken to correct non-compliances, including evidence of correction. ☐ **Attached**
☐ **Not applicable**

t) This application must be accompanied by a completed OSP form that includes all organic production and handling activities for which you are seeking certification. ☐ **attached**

☐ **The signature below is from an authorized representative of the operation applying for certification.**

Signature of Applicant(s) _____ Date _____

SEND APPLICATION, OSP AND FEES TO: Certifier Name, Address, and Telephone Number
Note: All business information submitted or collected is confidential and exempt from public inspection and copying.

Organic System Plan Template

***Complete for Conservation Activity Plan for Transition to Organic – CAP 138**

Organic Production

Affirmations	**7 C.F.R. §§ 205.400, 205.401**

☒ I/We agree to comply with all applicable organic production and handling regulations as described in the final rule issued by the USDA Agricultural Marketing Service and codified in 7 C.F.R. Part 205.

☒ I/We agree to establish, implement, and update annually an OSP. I/We affirm that the attached OSP includes and accurately describes all aspects of my/our current organic operation.

☒ I/We will immediately notify our certifier of any change in my/our certified operation or portion of it that may affect its compliance with the Organic Foods Production Act of 1990 or the USDA organic regulations. I/We will submit an OSP update whenever changes are made, thus ensuring that the application/OSP consistently reflects my/our current organic operation.

☒ I/We have made/kept a copy of my/our application, OSP, and all applicable attachments and addenda.

☒ I/We understand that a certifier's acceptance of this form in no way implies granting of certification.

☒ I/We have reviewed the USDA organic regulations. I have asked the certifier for clarification of any points that were unclear to me so that I now understand them.

☒ I/We agree to comply with all applicable State and NOP production and handling standards as described in the final rule of the USDA Agricultural Marketing Service and codified in the USDA organic regulations at 7 C.F.R. Part 205.

☒ I/We will permit onsite inspections with complete access to the production or handling operation, including noncertified production and handling areas, structures and offices, by the certifier. I understand that my operation may be subject to announced and/or unannounced inspections and/or sampling for residues at any time as deemed appropriate to ensure compliance with the USDA organic regulations.

☒ I/We agree to maintain all records applicable to the organic operation for not less than five (5) years beyond their creation and to allow authorized representatives of the Secretary of the USDA, the applicable State organic program's governing State official, and the certifier access to such records during normal business hours for review and copying to determine compliance.

☒ I/We agree to immediately notify my/our certifier concerning any application, including drift, of a prohibited substance to any field, production unit, site, facility, livestock, or product that is part of an operation.

☒ I agree to submit applicable fees charged according to the fee schedule by the certifier.

☒ I/We affirm that all information in this application/OSP is true and accurate to the best of my/our knowledge.

_____

Signature of Applicant/Authorized Representative Date

Organic System Plan Template

***Complete for Conservation Activity Plan for Transition to Organic – CAP 138**
Organic Production

Submit completed forms, fees and supporting documents to your certifier.

*Land Requirements — 7 C.F.R. §§ 205.103, 205.202

This form describes a farm or production location for organic crop and/or livestock production and allows accompanying documentation to establish its eligibility for organic certification. Submit one copy of this Land Requirements form for each farm location (not for individual fields) that is non-adjacent to your other farmland or production locations, and/or has distinct land use history (different date of last prohibited materials use or different prior land manager, etc.).

☒ **This Land Requirements form describes all the land in my organic operation.**

☐ **Additional copies of this form are attached and describe other land within my operation.**

2.1 *LAND DESCRIPTION

Farm Name or Number Bob Smith Farm	**Area (acres) to be certified organic** Approx. 7 acres	
Parcel Location 1234 Smith Rd	**Field Numbers (for all fields)** 2 (NRCS-designated)	
City/Town Smith	**State & Zip Code** VA 12345	**County** Nottoway
Legal Description: Section/Township/Range or Assessor's Parcel Number		

2.2 *LAND MANAGEMENT — 7 C.F.R. § 205.202(a) and (b)

a) When did you begin managing this land? (mm/dd/yy) 10 years ago

b) What was the date of last use of prohibited materials?

☒ **Not applicable; no prohibited materials applied within last 3 years.**

c) What is your estimated harvest date of a certified organic crop from this land? June 2025

d) Describe, in general terms, how this land has been managed for the past three years: crops grown; fallow; pasture, etc.; organic or non-organic management; farming practices used.

Vegetable production on .3ac consisting of sweet potatoes, spinach, tomatoes, kale and collards in a traditional, tillage based system. Transitioning to no-till production with limited soil disturbance.

2.3 *LAND USE HISTORY DOCUMENTATION — 7 C.F.R. § 205.202

a) Check the type(s) of documentation attached that shows eligibility of this land for organic certification:

☐ **current organic certificate in my operation's name; continuing certification**
☐ **prior land manager affidavit** ☒ **field history form (available at inspection)**
☐ **copy of the organic certificate from a previous manager and associated documentation (profile with parcel address or location, maps) to show that this land has been continuously certified with no lapse in organic management up to the date of transfer of management**
☐ **other documentation that shows all materials used on this land and the date(s) they were used in the last three years (describe):**

Organic System Plan Template

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2.4 *MAPS **7 C.F.R. § 205.202(c)**

a) Attach Field Map(s). Provide an accurate map that shows each field included on the farm listed above. Show boundaries and area to be certified. The map should be 8 ½ x 11". This may be a county parcel map, Farm Service Agency map, aerial photograph, or a detailed hand-drawn map, as long as it is clearly readable when photocopied. This map must be current and dated. An updated (revised or new) map must be submitted whenever information on the map changes (field numbers, acres, buffers, adjoining land use, etc.)

The map attached includes the following:

- ☒ **field name(s)/number(s)**
- ☒ **north arrow**
- ☒ **adjoining land use(s)**
- ☒ **landmarks such as buildings, farm or public roads, railroad tracks**
- ☒ **area (acres)**
- ☒ **slope(s)**
- ☐ **buffers (if applicable)**
- ☐ **windbreaks, hedgerows or woodlands**

b) Attach a Farm Overview Map that shows the location of this farm and all other farm locations in your operation.

☐ **Attached** ☒ **Not applicable; one farm location only**

2.5 *BOUNDARIES, ADJACENT LAND USE AND BUFFER AREAS **7 C.F.R. § 205.202(c)**

a) Describe your farm borders and adjacent land use (organic farms, fallow fields, CRP land, wild lands, non-organic crop or livestock production, residential use, etc.)

Bordered by forest, residential (lawn) and roadside; no known risks

b) Describe the measures you take (management practices, communications and/or physical barriers) to prevent contamination by prohibited materials that are or may be applied to adjacent or nearby land (neighboring parcels or fields in split operations).

North: wooded; no known risks

South: Road

East: Residential (lawn)

West: Residential (lawn)

Natural buffers are in place based on the property layout. Wooded behind production areas and only residential (lawn) adjacent to production areas near East and West borders. Road creates a buffer to the South.

c) Describe buffer areas for each field/pasture that you maintain on your organic land to protect crops from contamination. Please specify whether you grow crops in the buffer area, and whether you plan to sell or represent them as organic. If you need more space, please attach a separate page. ☐ Buffer description attached. ☐ No areas of concern. ☒ See above for brief explanation**.**

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Organic Production

Natural Resource Management	7 C.F.R. §§ 205.2, 205.200, 205.203, 205.239, 205.240

Key regulations related to natural resource management:

§ 205.2 Definitions:
Organic production. A production system that is managed in accordance with the Act and regulations in this part to respond to site-specific conditions by integrating cultural, biological, and mechanical practices that foster cycling of resources, promote ecological balance, and conserve biodiversity.
Natural resources of the operation. The physical, hydrological, and biological features of a production operation, including soil, water, wetlands, woodlands, and wildlife.
§ 205.200: Production practices implemented in accordance with this subpart must maintain or improve the natural resources of the operation, including soil and water quality.
§ 205.203(a): The producer must select and implement tillage and cultivation practices that maintain or improve the physical, chemical, and biological condition of soil and minimize soil erosion.
§ 205.203(c): The producer must manage plant and animal materials to maintain or improve soil organic matter content in a manner that does not contribute to contamination of crops, soil, or water by plant nutrients, pathogenic organisms, heavy metals, or residues of prohibited substances.
§ 205.239(e): The producer of an organic livestock operation must manage manure in a manner that does not contribute to contamination of crops, soil, or water by plant nutrients, heavy metals, or pathogenic organisms and optimizes recycling of nutrients and must manage pastures and other outdoor access areas in a manner that does not put soil or water quality at risk.
§ 205.240(c)(8): The pasture plan shall include a description of the erosion control and protection of natural wetlands and riparian areas practices.

Organic standards specifically address soil (conservation and health) and water (conservation and quality; contamination prevention). As quoted above, the standards also include a general requirement to maintain or improve natural resources (soil, water, wetlands, woodlands and wildlife) by integrating cultural, biological and mechanical practices to foster cycling of resources, promote ecological balance, and conserve biodiversity. Organic production practices must maintain or improve their natural resources.

While natural resource management is a core organic standard, producer strategies will be specific to each site and type of production. Each operation's practices are adapted to the features of the land and local conditions, especially related to: soil (soil types, slope, risks of erosion, and overall health); water (position in the watershed, presence of water courses and riparian areas, and water usage); and wetlands, woodlands and wildlife (ecosystem type, biological diversity and habitat on and around the farm).

Organic farming practices can conserve soil, increase soil health, protect water and contribute to biological diversity within—and often beyond—its boundaries. On-farm practices may include: soil building to increase organic matter, humus, biological activity and diversity of soil organisms; inclusion of flowering plants, habitat or shelter for pollinators, insects, other arthropods, spiders, bats, raptors and other predators; control of specific non-native invasive species; establishment of grassed waterways or hedgerows to check erosion and foster habitat; watershed protection; habitat restoration; or efforts to promote wildlife migration corridors or conservation.

Update changes: Signature _____ Date _____

Organic System Plan Template

***Complete for Conservation Activity Plan for Transition CPA 138**

Crop Production

Last Name(s)	First Name(s)	Farm/Ranch/Business Name	Date
Bob Smith Farms	Bob	Smith	9/19/23

Crop Production

***Crop Production Overview** **7 C.F.R. § 205.2-205.406**

1. ***List all crops (or types of crops if your operation is highly diversified) you grow or harvest for which you are seeking organic certification. Include food and feed crops, pasture/forage, and wild crops.**

   Vegetable production on .3ac consisting of sweet potatoes, spinach, tomatoes, kale and collards in a no till production system.

2. ***Check the box that describes your operation's production systems:**
   ☒ **All organic production** ☐ **Organic and non-organic production**

3. ***Do you grow crops in soil?**
   ☐ **No** ☒ **Yes; please submit the following Crop OSP forms: Crop Rotation and Soil Management; Pest, Disease and Weed Management; Prevention of Contamination and Commingling; Recordkeeping, Labeling and Audit Trail.** ☒ **Attached (4 forms)**

4. ***Do you plant seeds, seedlings, or planting stock of any kind?**
   ☐ **No** ☒ **Yes; please submit the Seeds and Planting Stock form.** ☒ **Attached**

5. ***Do you use any off-farm input materials?**
   ☐ **No** ☒ **Yes; please submit the Materials List form.** ☒ **Attached**

6. ***Do you produce seedlings or crops in containers with planting medium, or grow crops in a greenhouse, coldframe or hoophouse?**
   ☒ **No** ☐ **Yes; please submit the Greenhouse Crop form.** ☐ **Attached**

7. ***Do you produce compost or use purchased compost?**
   ☒ **No** ☐ **Yes**

8. ***Do you use raw manure?**
   ☒ **No (no manure OR manure that has been sanitized by an approved process)** ☐ **Yes**

9. ***If Yes to either question 7 or 8, please submit a Compost and Manure form.** ☒ **Attached**

10. **Do you do any post-harvest handling of your crop products?**
    ☐ **No; skip to question 13.** ☒ **Yes; check all that apply, or describe, as appropriate.**

☐ **wash product with water**	☐ **cool product**	☐ **clean product**
☐ **sort/size product**	☐ **transport crops**	☐ **bag or package crops**
☐ **grade product**	☒ **store product**	☐ **dry product**

11. **If any of the above post-harvest activities are checked, please complete a Crop Post-Harvest Handling OSP to describe the post-harvest handling activities to be certified.** ☒ **Attached**

12. **Do you perform complex handling of crop products (change their essential form, e.g., cut, cook, etc.)?**
    ☒ **No** ☐ **Yes; list handling/processing activities below, and complete the appropriate Handler OSP Forms to become certified as an Organic Handler.** ☐ **Attached**

Update changes: Signature _____ Date _____

Organic System Plan Template

***Complete for Conservation Activity Plan for Transition CPA 138**

Crop Production

*Seed and Planting Stock — 7 C.F.R. § 205.204

***Check all boxes that describe what you use or plan to use:**

1. ***Seeds and Annual Planting Stock**
   - ☐ **not applicable; no seeds or annual planting stock used or planned for use**
   - ☒ **certified organic seed, purchase**
   - ☐ **certified organic seed, saved on farm (requires records)**
   - ☐ **certified organic planting stock (e.g., seed potatoes, sweet potato slips, garlic, strawberry crowns)**
   - ☒ **non-organic, untreated seed**
   - ☐ **non-organic, untreated planting stock for annual crops**

   If non-organic seed or planting stock is used, please complete question 2 below.

2. ***Seed or Planting Stock Treatments And Inoculants**
   - ☐ **not applicable; none used**
   - ☒ **inoculant**
   - ☐ **coating**
   - ☐ **pelletization**
   - ☐ **priming**
   - ☐ **fungicide or insecticide**
   - ☐ **disinfection**
   - ☐ **other (describe): _____**

   Please list specific treatments and inoculants:

   Rhizobium spp. for legumes

3. ***Annual Seedlings**
   - ☒ **not applicable; no annual seedlings grown or purchased**
   - ☐ **seedlings or transplants grown on farm. Please complete the Greenhouse OSP.** ☐ **Attached**
   - ☐ **purchased certified organic seedlings. List supplier and attach organic certificate.** ☐ **Attached**
   - ☐ **other (describe): _____**

4. ***Perennial Planting Stock (for crops grown as perennials, e.g., trees, shrubs, vines)**
   - ☒ **not applicable; no perennial planting stock is used**

5. ***Commercial Availability**
   - ☐ **not applicable; all seed and planting stock is certified organic**

   NOTE—If you use seed or planting stock that is not certified organic, describe how you determine whether an equivalent organic variety is commercially available, and describe any efforts you are making to source more organic seed/planting stock in the future.

   Contact or identify online at least 3 vendors to check for availability; purchase untreated conventional seed if organic options for specific variety is not available

Please have documentation available for inspection that shows the source(s), quantity, variety(ies) and organic status of seed and/or planting stock used, whether purchased or produced on the farm. If non-organic seed or planting stock is used, provide documentation of your search for equivalent varieties of organic seed or planting stock and reasons for commercial non-availability.

Update changes: Signature _____ Date _____

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Crop Production

***Soil Management and Crop Rotation**	**7 C.F.R. §§ 205.2, 205.203, 205.205**

1. ***What are the major practice components of your soil-building/crop nutrient management plan?**

☒ **crop rotation**	☐ **incorporation of crop residue**	☒ **green manures**
☒ **cover crops**	☐ **compost**	☐ **manure**
☒ **mined lime**	☒ **mulch**	☐ **soil inoculants**
☐ **biodynamic preparations**	☒ **fertilizer materials or blends**	☐ **other (describe):**

2. ***List all materials used or planned for use on your Materials List.**
☒ **All materials used or planned for use are listed on my Materials List.** ☐ **No materials are used.**

3. ***Describe your crop rotation plan(s), in general terms, including its main goals (soil organic matter; weed and pest management, nutrient management; erosion; biological diversity).** List the sequence and frequency of crops/plant families, cover crops, green manures or sod. If you use more than one basic rotation sequence, please describe each rotation you use. For perennial crops, describe management of ground cover, alley cropping, intercropping or hedgerows. Attach additional pages if necessary**.**

Crop rotation consists of kale, collards, spinach and sweet potatoes.

In the Benchmark Scenario (prior to adopting "low-till" practices), kale, collards is followed by sweet potatoes in the following year for a double crop (2-year rotation), and cover crops are not used. The Benchmark Scenario relies heavily on inter-row cultivation for weed control.

In the Planned Scenario (i.e., the adoption of "low-till" practices), kale, collars, spinach and sweet potatoes are rotated in a 3-year sequence, with cover crops employed during the off-season. Specifically, a winter cover crop mixture (cereal rye + crimson clover) precedes kale, collards, spinach, which is terminated by crimping or mowing to create a weed-suppressing mulch, into which sweet potatoes are no-till planted. After wheat/oat, a summer cover crop mixture (sorghum-sudangrass + sunn hemp) is planted, which precedes the next winter cover crop.

4. ***Describe, and indicate, as applicable, the issues/goals you address with your crop rotation and soil management practices.**

☒ **organic matter increase**	☒ **water availability**	☒ **water infiltration/drainage**
☒ **soil compaction or crusting**	☒ **soil structure**	☒ **water erosion**
☐ **wind erosion**	☐ **deficient nutrients**	☐ **excess nutrients**
☐ **salinity**	☐ **pH**	☒ **weed management**
☐ **pest management**	☐ **disease management**	
☐ **overall farm biodiversity**	☐ **other (describe):**	

5. ***Describe, and indicate, as applicable, how you monitor the effectiveness of your rotation and soil management plan?**

☒ **soil observation**	☒ **soil (nutrient) tests**	☐ **soil organic matter content**
☒ **crop observation**	☒ **crop yield comparison**	☐ **crop quality tests**
☐ **plant tissue tests**	☐ **microbiological tests**	☐ **other:**

6. ***When and how often (i.e., daily, weekly, monthly, yearly, as needed) do you do each type of monitoring? What monitoring records do you keep?**

Soil and crop observations: daily to weekly (visual); yield comparisons and soil testing: annually.

Update changes: Signature _____ Date _____

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***Complete for Conservation Activity Plan for Transition CPA 138**
Crop Production

***Pest, Disease and Weed Management & Monitoring**	**7 C.F.R. §§ 205.206, 202.600-602, 205.103**

1. ***Check the management practices you use to prevent crop pests, weeds, and diseases. Add the name of your significant (recurring or potentially problematic) diseases (fungus, bacteria, virus) and all pest types (insects, mites, birds, rodents, birds, deer, etc.). There is no need to name weeds individually.**

Pest prevention practice	Weeds	Pest	Diseases
Crop rotation	☒	☒	☒
Soil and crop nutrient management	☒	☒	☒
Cover crops/green manures/smother crops	☒	☒	☒
Diversified plantings/planting arrangements	☒	☒	☒
Sanitation measures to remove disease vectors, weed seeds, and pest habitat	☒	☒	☒
Selection of suitable species/growing location	☒	☒	☒
Disease/pest/weed resistant varieties	☒	☒	☒
Timing of planting	☒	☐	☐
Water/irrigation management	☐	☐	☐
Mechanical or physical means (e.g., hoeing, pruning, picking, vacuuming, etc.)	☒	☒	☐
Augment pest predators/parasites/beneficials	☐	☐	☐
Develop habitat for natural enemies	☐	☒	☒
Construct habitat for predators (e.g., raptor perches, owl or bat boxes, frog ponds, etc.)	☐	☐	☐
Nonsynthetic lures/traps/repellants	☐	☐	☐
Mechanical cultivation/tillage or handweeding	☒	☐	☐
Mulching with biodegradable materials	☐	☐	☐
Mowing or livestock grazing	☐	☐	☐
Flaming, heat, steam, or electrical	☐	☐	☐
Plastic or synthetic mulch/solarization	☐	☐	☐
Burning of crop residue (see questions below)	☐	☐	☐
Others (describe):	☐	☐	☐

Organic System Plan Template

***Complete for Conservation Activity Plan for Transition CPA 138**
Crop Production

2. ***Please list any pest, disease, or weed problems and practices not addressed in the table above.**

Problem weed, disease or pest (e.g, insect, mite, nematode, rodent, deer, etc.)	**Describe specific preventative practices (or materials) you use to control these pests.**
Weeds: annual weeds that are common in annual vegetable production; perennials weeds have yet to become problematic.	Weeds: annual weeds prevented by limiting weed seed production and via crop rotation to the extent possible; controlled mechanically. Planned use of cover crops for weed suppression.
Insect pests: Common insect pests in brassicas and solanaceous crops	Insect pests: Crop rotation (annual crops); biodiverse plantings (at field edges) as habitat for predators and parasitoids.
Diseases: No obvious signs of disease in crops.	Diseases: Crop rotation (annual crops) and use of disease-resistant cultivars.

3. ***If you use materials to manage pests (including natural botanical, mineral, or allowed synthetics), please list all of these on your Materials List. ☐ Listed ☒ No pest management materials used. Please describe the conditions under which you would use a material for pest management.**

4. ***Describe how and when you monitor the effectiveness of your pest management program, and whether you keep any monitoring records. Please have any records available for inspection.**

Effectiveness is monitored visually and through yield data; no records kept

5. ***Do you burn crop residues? ☒ No ☐ Yes; describe the crop, purpose, location and timing of burning.**

Update changes: Signature _____ Date _____

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Crop Production

Prevention of Commingling & Contamination	7 C.F.R. §§ 205.2, 205.201(a)(5), 205.202(c)

Describe the measures you take, including management practices and physical barriers, to minimize risks and prevent commingling or contact between organic and non-organic product, and contamination of organic product with substances prohibited in organic production and handling. Buffers must be "sufficient to prevent contamination."

***Irrigation Water**

1. ***Do you irrigate? ☐ No; skip to next section, Materials Storage. ☒ Yes; describe your irrigation system type and water source(s) (e.g., onsite well, spring, creek, river, pond, or name of irrigation district (municipal/county/regional)):**

   Irrigation is performed with the use of well water and a rain catchment system.

Materials Storage

2. Do you store any prohibited materials on farm? ☐ Yes ☒ No; skip to question 8.
3. If Yes, how do you clearly identify and separate allowed and prohibited materials?

***Equipment and Containers: Production, Application and Harvest**

4. ***Do you use (own/rent/contract) any equipment (seeders, fertilizer or pesticide applicators, harvest equipment or containers) that is also used for non-organic production?**
   ☒ No; all equipment is dedicated to organic. ☐ Yes; please maintain cleaning records for equipment that is also used for non-organic production. These will be reviewed at inspection.
5. ***Describe your harvest practices and list the equipment and containers used:**

   Crops are harvested with a combine and stored in grain bins. See 11, below, for clean out.

6. ***Do you use the service of custom applicators (pesticides, fertilizers, other) or harvesters?**
   ☒ No ☐ Yes; describe the service and how you monitor the prevention of contamination

_____

7. ***If any equipment or container is shared with non-organic products, describe how you prevent commingling and contamination.**

Organic System Plan Template

***Complete for Conservation Activity Plan for Transition CPA 138**

Crop Production

Transport

☐ Not applicable; crops/products are sold before transport

8. Please describe the containers, equipment and vehicles used to transport crops/products harvested from the field, and describe the destination:

   Plastic harvest totes covered with tarps as needed and transported trucks to and from the field and markets.

9. If any vehicle is shared with non-organic products, describe how you prevent commingling.

Product Storage

10. Check your crop/product storage practices.
    - ☐ no crop or product storage
    - ☒ store own product onsite (farm or production facility)
    - ☐ store product in a facility that is certified organic Please keep a copy of the organic certificate.
    - ☐ store product in a facility that is excluded per § 205.101 of the regulations (i.e., product remains in the same package or container and is not otherwise processed)

11. Describe crop(s) and type(s) of storage:

    Spinach, Kale, Collards are stored in a walk-in cooler. Tomatoes and sweet potatoes are stored in a dedicated room in the shed.

12. Please list all onsite storage areas that you manage, or contracted facilities with stand-alone certification.
    ☐ Not applicable; no crops are stored

Type of storage	Size/ Capacity	Location: onsite or other facility name	Crop(s) stored	Certifier (if contracted)
Walk-In Cooler	10’ x 12’	Shed	Crops that require or benefit from <40F storage	N/A
Cool Room	10’ x 20’	Shed	Crops that require or benefit from >40F storage	

13. If any storage area is shared with non-organic crops/products, describe how you prevent commingling and contamination. ☐ Not applicable; no storage is used for organic crops.

_____

***Treated Wood**

14. ***Is there any treated wood on the farm? ☐ Yes ☒ No; skip question 20.**
    If Yes, indicate the date of installation _____ (MM/DD/YY)

15. ***Describe how contact between treated wood and soil, crops, and livestock is avoided. ☒ NA**

_____

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Crop Production

Update changes: Signature _____ Date _____

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Crop Production

***Materials List** **7 C.F.R. §§ 205.203, 202.206, 202.600-606, 202.105**

1. ***List all materials (except seed and planting stock) you use or plan to use. If you need more space, please attach a list. ☐ List attached.**

	Product Name or Type	Manufacturer Supplier	Use/Type of Product	Restriction or Annotation	Third Party Verification**
Soil Fertility	Potassium Sulfate	Various	Fertilizer	None	OMRI
	Feather Meal (potential use)	Various	Fertilizer	None	OMRI
	Lime	Various	Soil amendment	None	OMRI

** Allowability of Materials may be established by an "EPA 'For Organic Production'" label, by the brand name listed on the Organic Materials Review Institute (OMRI) or Washington State Department of Agriculture List, or a list maintained or recognized by your certifier.

2. *☒ **Materials documentation available** ☐ **Not applicable; no materials used**
Please be prepared to review at your inspection: product labels, ingredient lists, invoices and other relevant documentation of materials purchase and application.

Update changes: Signature _____ Date _____

Organic System Plan Template

***Complete for Conservation Activity Plan for Transition CPA 138**
Crop Production

Recordkeeping, Audit Trail and Labeling	7 C.F.R. §§ 205.103, 205.201, 205.205, 205.300- 311

RECORDS KEPT

1. What types of records do you keep?

Indicate all that apply. In order to document practices described in your OSP, you will need all records available for inspection. Some records must be documents from other businesses (such as seed and input purchase receipts, suppliers' organic certificates, and soil or tissue test results). Others will be your own records of on-farm activities. You may design your own forms, or use/adapt templates or sample documentation forms available from the NOP, organic certifiers, or other sources, provided they include information needed to document compliant practices.

- ☒ Purchase or acquisition records for all inputs (e.g., receipts, delivery tags, custom applicator invoices)
- ☒ Input application records that show all materials applied to soil, water and crops (e.g., fertilizer and soil inputs, pest management materials and post-harvest handling), including product name/formulation and manufacturer, application date, rate or quantity, crop and location
- ☒ Seed, seedling, and planting stock, inoculant or seed treatments; seed-saving/propagation records; documentation of commercial non-availability of organic seed/non-GMO status of seed
- ☐ Copies of organic certificates from suppliers (i.e., organic seedling or transplant producers)
- ☒ Planting and/or field activity records that show crop rotation, including cover crops/green manures
- ☐ Observation records (i.e., field log, notes on calendar or maps)
- ☐ Manure use records showing interval between date of application and harvest date of crops grown for human consumption
- ☐ Compost production records (e.g., composting system, ingredients, C:N ratio, temperature, turnings)
- ☒ Monitoring records (e.g., soil or tissue tests, water tests, pest observation logs)
- ☒ Cleaning records (required if application or harvest equipment is not dedicated to organic)
- ☒ Harvest records (e.g., records showing location, crop, date harvested and transported from the field)
- ☒ Post-harvest activities (i.e., washing and grading product, bagging or boxing, etc.)
- ☒ Storage records (e.g., delivery/receiving tags showing facility location, crops, quantities, post-harvest activities and pest control)
- ☒ Shipping records (e.g., packing facility tags, delivery receipts, receiving documents, bills of lading)
- ☒ Sales records (e.g., invoices, purchase orders, grower statements, inventory lists)
- ☐ Others (describe):

2. The USDA organic regulations require that your recordkeeping system be adapted to your business, and fully disclose all activities and transactions of your operation. Please describe any plans you have to change or improve your recordkeeping system.

   No changes planned

3. Do you keep production, harvesting and handling records pertaining to organic agricultural products for at least five years after their creation? ☒ Yes ☐ No

Organic System Plan Template

***Complete for Conservation Activity Plan for Transition CPA 138**

Crop Production

LABELING AND AUDIT TRAIL

4. Under what name(s), label(s) or brand(s) do you market your products?

   Bob Smith Farm

5. What kinds of labeling do you use? Check all that apply:
   - ☒ No product labels used
   - ☐ Retail labels, such as printed boxes or bags, produce stickers, rubber bands or twist ties
   - ☐ Signage and written materials (Farmers Markets or Farm Stands, Web site, brochure, CSA newsletter, or other promotional materials)
   - ☐ Non-retail labeling for storage or shipping containers, such as bin or pallet tags.
     7 C.F.R. § 205.307(b) states, "Nonretail containers used to ship or store raw or processed agricultural product labeled as containing organic ingredients must display the production lot number of the product if applicable." If lot numbers are used, please complete question 6.

6. Describe your lot numbering system for non-retail packaging.
   - ☒ Not applicable; no non-retail packaging used

7. If you use a label, please provide copies of all organic product labels used.
   - ☒ Not applicable; no labeling used
   - ☐ Current label previously submitted to my certifier
   - ☐ New label(s) attached for review (labels must be approved before use)

8. Describe how your records can track your organic production from source (farm, field or production location) to final sale. Be prepared to demonstrate your recordkeeping system at inspection.

   Records track crops "from seed to sale," including receipt of purchase of seeds and materials, seed sowing and dates and locations, as well as harvest and sales information. Includes material application records.

Update changes: Signature _____ Date _____

Organic System Plan Template

***Complete for Conservation Activity Plan for Transition CPA 138**
Crop Production

***Compost and/or Manure Use and/or Production**	**7 C.F.R. § 205.203**

***MANURE**

1. ***Do you use uncomposted, raw or aged manure?** ☐ **Yes** ☒ **No; skip to question 4.**

2. ***If yes, check or describe how your use of raw manure complies with the USDA organic standards. Manure is:**
   - ☐ **Applied to land producing a crop not intended for human consumption**
   - ☐ **Incorporated at least 120 days before harvest of a crop whose edible portion may contact the soil surface or soil particles.**
   - ☐ **Incorporated at least 90 days before harvest of a crop whose edible portion does not directly contact the soil surface or soil particles**
   - ☐ **A pelletized manure product listed or documented to meet NOP requirements of heating at 150° F for one hour or 165° F with <12% moisture content, or other procedure compliant with NOP 5006 Guidance on Processed Animal Manures in Organic Crop Production.**
     Please be prepared to show records of manure use (locations used, crops grown, application and harvest dates).

3. ***If you use off-farm manure, describe its source(s) and livestock type and production practices (e.g., from caged layers, dairy barn cleanout and bedding, etc.):** N/A

***COMPOST**

4. ***Do you purchase or produce compost?** ☐ **Yes** ☒ **No; skip to question 11.**

5. ***Do you purchase compost?** ☒ **No** ☐ **Yes; include all composts on Materials List.**

6. ***If yes, how do you document compliance?**
   - ☐ **Purchase records of brand name compost on a list of allowed materials (e.g., OMRI or WSDA).**
   - ☐ **Letter from the compost supplier that compost was produced in compliance with the USDA organic regulations.**
   - ☐ **Other (describe):**

7. ***Do you produce compost?**
   - ☒ **No, no compost produced. Skip to question 10.**
   - ☐ **Yes, compost contains only plant materials (no manure or other animal materials).**
   - ☐ **Yes, compost contains plant and animal materials.**

8. ***If Yes, list all compost ingredients (including feedstocks, minerals, and inoculants, if applicable).**
   NA

9. ***If you produce compost that contains manure or other animal materials, describe your composting methods including temperatures reached, timelines for production, whether in-vessel, static pile, or windrow, and aeration methods.**
   NA

10. ***Do you maintain records for your compost production?** ☒ **No** ☐ **Yes; attach a sample record.** ☐ **Sample record attached**

Organic System Plan Template

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Crop Production

If compost production that includes manure as an ingredient does not comply with § 205.203(c)(2) of the USDA organic regulations or NOP 5021 Guidance on Compost and Vermicompost in Organic Crop Production, it must be considered raw manure. Please complete the section below.

***SOIL AND WATER QUALITY**

11. ***Describe how you manage manure and compost production to protect crops, soil and water (wells, aquifer, ponds or reservoirs, lakes, streams, etc.) from contamination by plant nutrients, heavy metals or pathogenic organisms (i.e., use of feeding pads; frequent manure removal, application and incorporation; stockpile manure/produce and store compost away from water/drainage areas; manure "applied" by grazing livestock; manure storage/composting on impermeable pads, or covered to prevent leaching, etc.).**

Update changes: Signature _____ Date _____

Organic System Plan Template

***Complete for Conservation Activity Plan for Transition CPA 138**

Crop Production

Crop Post-Harvest Handling	7 C.F.R. §§ 205.2, 205.270(a), 205.271

Use this Crop Post-Harvest Handling OSP to describe the activities to be included in your crop production certification. This form is intended for use by operations that handle only their own product and whose activities preserve the essential form of the product, such as washing, packing, cooling and storing produce, drying grain, and cleaning seed or preparing raw agricultural product for market or farm use.

Use Handler OSP forms if you handle crops or multiple-ingredient products not produced on your farm, or if your activities include complex handling activities, such as cooking, baking, curing, churning, separating, distilling, extracting, or manufacturing, canning, etc.

Please contact your certifier for clarity about which forms to use.

1. Describe the type(s) of post-harvest handling you do (e.g., grading, dry pack, wet packing, flume washing of vegetables, grain cleaning, etc.)

   Storage Only

2. What type(s) of crops are handled in your post-harvest handling facility?

   Tomato, Spinach, Sweet Potatoes, Kale, Collards

CLEANING AND SANITATION

3. Describe how you clean your post-harvest handling area, including any food contact surfaces.
   (a) List all materials you use or plan to use in the Materials List below. ☒ Listed
   (b) If you have a Standard Sanitation Operating Procedure (SSOP), you may attach a copy of the portion that covers equipment and organic food contact surfaces.
   ☐ Attached

   Dawn Dish Soap, Bleach

WATER USE

4. Do you use water to clean crops or food contact surfaces? ☐ Yes ☒ No; skip to question 9.
5. If yes, identify the water source _____ and indicate how it is used:
   ☐ to clean facility ☐ to clean food contact surfaces
   ☐ to wash product ☐ other (describe):

6. Do you add chlorine to wash water, dump tank, flume or other water that has direct food contact? ☐ Yes
   ☒ No; skip to question 9
   If yes, how do you provide for a potable water rinse after the agricultural crop has been in contact with water with added chlorine? Please describe what rate or concentration you use, your rinse procedures, and any testing or monitoring you do.

   Do you add any other material(s) to the water? ☒ No ☐ Yes; list materials you use in the Materials List below.
   ☐ Listed

Organic System Plan Template

***Complete for Conservation Activity Plan for Transition CPA 138**
Crop Production

***FACILITY PEST MANAGEMENT**

7. ***List recurrent or potential pest problems, including flying or crawling insects, rodents, birds, etc.**
   No pest problems

8. ***Describe the strategies you use or plan to use to prevent, manage or minimize pest problems in your fhandling facilities (wherever washing, packing, grading, cleaning, cooling and/or storage occurs).**
   See below

9. ***Indicate preventative (non-material) practices:**

☒ **sanitation measures**	☒ **elimination of pest habitat or breeding areas**
☒ **clean up spilled product**	☐ **temperature, humidity, and light control**
☒ **eliminate sources of food**	☒ **seal doors and windows**
☒ **screen windows and vents**	☐ **crack, crevice, and hole repair**
☐ **air curtains**	☐ **positive pressure**
☐ **inspect incoming product**	☒ **monitoring** ☐ **other (describe):**

10. ***Indicate mechanical or physical means of control, lures and repellants: N/A**

☐ **mechanical traps**	☐ **sticky traps**	☐ **pheromone traps**
☐ **electrocuters/bug zappers**	☐ **freezing**	☐ **heat treatment**
☐ **other (describe):**		

11. ***When and how do you monitor for pests in storage areas?**
    Monitored visually when in storage area

12. ***What pest management and monitoring records do you keep?**
    None

***MATERIALS**

13. ***List all materials you use or plan to use in your post-harvest handling and facility pest management in the table below. Include cleaners, sanitizers, fumigants, rodenticides (e.g., Vitamin D3 bait), ripeners, sprout inhibitors, growth regulators, oils, coloring agents, waxes, boric acid, diatomaceous earth, gases, and soap products.**

☒ **No materials used** ☐ **List of materials attached**

Substance or Product brand name	Manufacturer	Reason for use (specify pest and circumstances)	On National List? Y/N

Please be prepared to provide written justification at your inspection for the use of any materials that are not on the National List of Allowed Materials, and/or to document compliance with any annotations.

Update changes: Signature _____ Date _____

1. Natural Resource Inventory & Conservation Planning Process

General farm description:

Bob Smith Farm is a small-scale vegetable farm situated on approximately 7 acres in Nottoway Co., VA that uses organic practices and is seeking organic certification. Production takes place in both the field and high tunnel.

Previously installed or implemented conservation practices:

None known.

Equipment, technology & management practices:

Management practices: the producer is transitioning Field 5 (Tract 12275; approx. .30 ac.) to certified organic production, and therefore all management must comply with organic regulations. Production relies heavily on hand labor but also uses a small tractor for larger tasks.

The **Benchmark Scenario**, used as a reference point of comparison throughout this document, is cropland in transition to "traditional" organic production that relies heavily on tillage to manage weeds, incorporate crop residues and fertility products, and prepare seedbeds. The **Planned Scenario** is a reduced tillage organic production system (sometimes referred to "rotational organic no-till") that uses high-biomass cover crops to suppress weeds and enables no-till production. Equipment used in **Benchmark** and **Planned Scenarios** is similar – the same planting and harvesting equipment, as well as much of the same tillage and cultivation equipment, although tillage and cultivation equipment are used less in the Planned Scenario. The most important distinction between the Benchmark and Planned Scenarios is the use of two 'new' pieces of equipment under the Planned Scenario: a roller-crimper (or flail mower). The roller crimper (or flail mower) is used to terminate the high-biomass cover crops, which are grown to create a weed-suppressing mulch upon crimping (or mowing), and enable no-till establishment of vegetable crops in late spring. In the Planned Scenario, traditional inter-row cultivation is not used.

Fertility products used are minimal and approved for use in organic production. Legume cover crops will be used in the Planned Scenario to improve nitrogen supply to subsequent crops. Cover crop species include crimson clover (paired with cereal rye) which are fall-planted and precede summer crops.

Soils, climate & topography:

The soils in the planning area are primarily Appling fine sandy loam (85%), Worsham (3%).

Absolute slopes in the planning area are 2% to 6% (72' to 110' critical lengths). Slopes in the direction of crop rows are 72 to 110 critical lengths. Nottoway Co., VA receives 42" annual rainfall. Average highs during the warmest months of the year (June - Aug) are 86°F, and 46°F during the coolest months of the year (Dec - Feb). Average low during the winter months is 27°F and 67°F for the warmer months. This location is classified as winter hardiness zone 7a: average annual extreme minimum temperature is 0° to 10°F.

Environmentally sensitive areas in the planning area:

None known (see next about HEL designation)

Compliance with Highly Erodible Land (HEL) or Wetland determinations:

Not known

Federal, State, Tribal and Local Laws, Regulations, Policies and Their Associate Permit Requirements:

No knowledge of noncompliance.

Natural Resource Inventory:

Soil

i. *Gully erosion (classic & ephemeral): Gullies are created by the concentrated flow of water, generally in well-defined drainage ways. Classic gullies are larger and more permanent than ephemeral gullies; ephemeral gullies can be obscured by tillage, for example, whereas classic gullies can not.* ***STATUS: No resource concern observed****.*

ii. *Sheet & rill erosion: Less dramatic forms of erosion compared to gully erosion, sheet and rill-type erosion remove smaller amounts of soil more uniformly across a field. Rills are small channels (typically ranging from <1" wide and deep to several inches wide and deep).* ***STATUS: YES, resource concern observed.***

iii. *Subsidence: The loss of soil volume or depth due to the oxidation (i.e. degradation) of soil organic matter. This typically happens in soils that have a high proportion of organic matter. Generally, such soils are not present on farmland in the Southeastern U.S.* ***STATUS: No resource concern observed.***

iv. *Wind erosion: Removal of soil particles by wind instead of water.* ***STATUS: No resource concern observed****.*

v. *Aggregate instability (lack of soil structure): Soil structure (aggregation) is the extent to which soil particles are held together by roots and fungal hyphae, organic matter, and charges on clays and organic matter, and is negatively affected by tillage due to physical disturbance and the resulting organic matter breakdown. Symptoms include surface crusting, surface ponding, limited water-holding capacity, and platy or blocky surface soil texture.* ***STATUS: No resource concern observed (no surface crusting or ponding, or platy/blocky soil texture).*** *Conditions during site visit were dry, however, when visual assessment of aggregate instability is not ideal.*

vi. *Compaction: Soil compaction is the physical process of reducing micro- and macroscopic spaces between soil particles and aggregates (pores), leading to reductions in root ingrowth, water infiltration and drainage, and water-holding capacity. Compaction typically results from compression events when the soil is wet; compression events can be from the tires of farm equipment, livestock hooves, or human feet, but also repeated physical disturbance from tillage.* ***STATUS: No resource concern observed (no evidence such as ponding, stunted plant growth, or root growth limitation).***

vii. *Organic matter depletion: The balance of organic matter in soil is determined by 1) organic matter additions from living plants and other organisms (internal inputs), as well as from added organic matter from manure and mulches (external inputs), vs. 2) the natural process of of organic matter breakdown by soil microorganisms. Tillage and other forms of soil disturbance encourage the breakdown of organic matter by these microorganisms. In order to maintain or increase soil organic matter, the losses from decomposition must be made up for with additions from internal and external inputs.* ***STATUS: Yes, resource concern observed.***

viii. *Salts and other chemicals: Soil salinity results from the accumulation of water-soluble salts in soil, most often in drier areas where the loss of water from soil (from evaporation and evapotranspiration) exceeds precipitation. Saline soils are uncommon in the Southeastern U.S. Saline soils and high concentrations of other chemicals decrease plant productivity and soil function.* ***STATUS: No resource concern observed.***

ix. *Soil organism habitat loss or degradation: Habitat for soil organisms is simply the array of macro- and microscopic spaces between soil particles and/or within aggregates. Generally, the food source for the soil foodweb is organic matter, although a multitude of soil microorganisms are fed directly by plants via symbiotic relationships. The loss or degradation of this habitat happens when the soil is disturbed and/or the food supplied (again, in the form of organic matter) is inadequate to maintain the amount or diversity of microorganisms in soil. Thus, minimizing soil disturbance and maximizing plant coverage, biomass and diversity are essential for maintaining soil organism habitat at its best.* ***STATUS: No resource concern observed.***

Water

i. *Drifted Snow: Wind-blown snow accumulates around and over surface structures, which restricts access to humans or animals; or wind removes snow from desired location where it can be used to accumulate water.* ***STATUS: No resource concern observed.***

ii. *Ponding and Flooding: Water covering the land surface, along with saturated conditions below the surface, degrades natural resources, or restricts capability of land to support its intended use.* ***STATUS: No resource concern observed.***

iii. *Seasonal High Water Table: Ground water or a perched water table causing saturated conditions near the surface degrades water resources or restricts capability of land to support its intended use.* ***STATUS: No resource concern observed.***

iv. *Seeps: Sub-surface saturated flows that percolate slowly to the surface, degrades water resources, or restricts capability of land to support its intended use.* ***STATUS: No resource concern observed.***

v. *Groundwater Depletion: Underground water is used at a rate greater than aquifer recharge.* ***STATUS: No resource concern observed.***

vi. *Surface Water Depletion: Water from collected precipitation runoff, ponds, lakes, surface watercourses and reservoirs is used at a rate that is detrimental to ecological functions or other identified uses and threatens sustained availability of surface water.* ***STATUS: N/A: surface water is not used for irrigation.***

vii. *Inefficient Irrigation Water Use: Irrigation water is not stored, delivered, scheduled, and/or applied efficiently.* ***STATUS: No resource concern observed.***

viii. *Naturally Available Moisture Use: Natural precipitation is not optimally managed to support desired land use goals or ecological processes.* ***STATUS: No resource concern observed.***

ix. *Nutrients to Surface or Groundwater: Nutrients (organic and inorganic) stored, concentrated, or applied are transported to receiving surface waters or groundwater in quantities that degrade water quality and limit its use for intended purposes.* ***STATUS: No resource concern observed. Nutrient concentrations in organic fertility products are generally low, and are not considered to be a leaching or surface water threat.***

x. *Pathogens and Chemicals to Surface or Groundwater: Pathogens, pharmaceuticals, leachate, and chemicals from manure, biosolids or compost transported to receiving surface waters and groundwater in quantities that degrade water quality and limit*

uses. ***STATUS: No resource concern observed; manure is incorporated immediately after application to reduce potential transport to waterways.***

xi. *Pesticides to Surface or Groundwater: Pesticides are lost from their application area and transported to surface water sources and groundwater in quantities that degrade water quality and limit its use for intended purposes.* ***STATUS: No resource concern observed. No pesticides are used on the farm.***

xii. *Pollutants to Surface or Groundwater: Petroleum, heavy metals, and other chemical pollutants for on-farm use are lost from areas of concentration (handling, storage, or processing facilities and areas) to receiving surface waters or groundwater in quantities that degrade water quality and limit its use for intended purposes. This resource concern does not cover pathogens/manure, sediment (although sediment contaminated with petroleum, heavy metals, or other chemical pollutants would be covered), nor naturally occurring salts.* ***STATUS: No resource concern observed. Handling, storage and processing facilities for potential pollutants are not present on the farm.***

xiii. *Salts to Surface or Groundwater: Irrigation or rainfall runoff transports salts to receiving surface waters and groundwater in quantities that degrade water quality and limit use for intended purposes.* ***STATUS: No resource concern observed.***

xiv. *Sediment to Surface Water: Offsite transport of sediment to surface water degrades water quality and limits use for intended purposes.* ***STATUS: No resource concern observed.***

xv. *Elevated Water Temperature: Surface water temperatures exceed State/Federal standards in downstream receiving waters which limits its use for intended purposes.* ***STATUS: No resource concern observed.***

Air

i. *Emissions of Airborne Reactive Nitrogen: Emissions of airborne reactive nitrogen—ammonia and oxides of nitrogen—can negatively impact atmospheric chemistry, cause unwanted fertilization via deposition in sensitive ecosystems, and degrade regional visibility.* ***STATUS: No resource concern observed or expected.***

1. *Engine exhaust: Diesel engine(s) used to date are modern and meet EPA Tier 3 standards, to the best of the TSP's knowledge.*

2. *Open burning: No open burning.*

3. *Nitrogen fertilizer:* ***Feather Meal is incorporated into soil immediately after application to minimize ammonia and NO_x losses to the atmosphere.***

4. *Livestock: No livestock present.*

ii. *Emissions of Greenhouse Gases: Emissions of methane (CH_4), nitrous oxide (N_2O), and carbon dioxide (CO_2) increase atmospheric concentrations of greenhouse gasses.* ***STATUS: Yes, possible resource concern observed or expected.***

1. *Nitrogen fertilizer: Concentrated forms of urea are not used on the farm, minimizing microbial N_2O production.*

2. *Carbon stocks: CO_2 emissions from soil may be relatively high following intensive tillage, and therefore may be a resource concern. However, it is difficult to identify soil organic matter equilibrium without further testing, and CO_2 emissions from soil may not be elevated; this resource concern lacks a quantitative target and measurement method.*

3. *Methane from livestock: No livestock present.*

iii. *Objectionable Odors: Emissions of odorous compounds—volatile organic compounds (VOCs), ammonia, and odorous sulfur compounds—can cause nuisance conditions.* ***STATUS: No resource concern observed***

1. *Livestock: No livestock present.*

iv. *Emissions of Ozone Precursors: Emissions of ozone precursors—oxides of nitrogen (NOx) and volatile organic compounds (VOCs)—result in formation of ground-level ozone, which can have negative impacts to human, plant, and animal health.* ***STATUS: No resource concern observed***

1. *Engine exhaust: Diesel engine(s) used are modern and meet EPA Tier 3 standards, to the best of the TSP's knowledge.*

2. *Open burning: No open burning.*

3. *Pesticide VOCs: No pesticides used.*

4. *Livestock: No livestock present.*

v. *Emissions of Particulate Matter and Particulate Matter Precursors: Direct emissions of particulate matter (PM)—dust and smoke—as well as the formation of fine particulate matter in the atmosphere from other agricultural emissions—ammonia, oxides of nitrogen (NOx), and volatile organic compounds (VOCs)—can cause multiple negative environmental impacts.* ***STATUS: No resource concern observed***

1. *Engine exhaust: Diesel engine(s) used are modern and meet EPA Tier 3 standards, to the best of the TSP's knowledge.*

2. *Open burning: No open burning.*

3. *Pesticide drift: No pesticides used.*

4. *Nitrogen fertilizer:* ***Feather Meal is incorporated into soil immediately after application to minimize PM and PM precursors from nitrogen fertilizers****.*

5. *Dust from fields: No dust or PM issues observed.*

6. *Dust from unpaved roads: Unpaved roads are few and minimally used; no dust or PM issues observed.*

7. *Windblown dust: Field operations and size minimize potential for windblown dust; no windblown dust observed.*

8. *Confinement-based operations: N/A - no livestock are present in operations.*

Plants

i. *Plant Pest Pressure: Excessive damage to plant communities from pests such as undesired plants, insects, diseases, animals, soil borne pathogens, and nematodes. This concern addresses invasive plant, animal and insect species.* ***STATUS: No resource concern observed.***

ii. *Productivity and Health: Improper fertility, management, or plants not adapted to site negatively impact plant productivity, vigor, and/or quality.* ***STATUS: No resource concern observed.***

iii. *Structure and Composition: Plant communities have insufficient composition and structure to achieve ecological functions and management objectives. This resource concern includes degradation of wetland habitat, targeted ecosystems, or unique plant communities.* ***STATUS: No resource concern observed.***

iv. *Wildfire Hazard from Biomass Accumulation: The kinds and amounts of plant biomass create wildfire hazards that pose risks to human safety, structures, plants, animals, and air resources.* ***STATUS: No resource concern observed.***

Animals

i. *Aquatic Habitat for Fish and Other Organisms: Habitat requirements of identified fish and other organisms are inadequate.* ***STATUS: No concerns*** *- Aquatic habitat is not impacted by farming operations.*

ii. *Terrestrial Habitat for Wildlife and Invertebrates: Quantity, quality or connectivity of food, cover, space, shelter, and/or water is inadequate to meet requirements of identified terrestrial wildlife or invertebrate species.* ***STATUS: No concerns***

iii. *Feed and Forage Imbalance: Feed and forage quality or quantity is inadequate for nutritional needs and production goals of the kinds and classes of livestock.* ***STATUS: N/A*** *- no livestock present.*

iv. *Inadequate Livestock Shelter: Livestock lack adequate shelter from climatic conditions to meet basic needs.* ***STATUS: N/A*** *- no livestock present.*

v. *Inadequate Livestock Water (Quality, Quantity & Distribution): Quantity and quality of drinking water are insufficient to meet basic needs for the kind and class of livestock and improper distribution negatively impacts other resources.* ***STATUS: N/A*** *- no livestock present.*

Energy

i. *Energy Efficiency of Equipment and Facilities: Stationary equipment and facilities are using energy inefficiently.* ***STATUS: No resource concern observed.*** *Energy use appears to have been minimized (cost-effectively).*

ii. *Energy Efficiency of Farming Practices and Field Operations: Mobile on-farm, ranching, forestry, or field operations are using energy inefficiently.* ***STATUS: No resource concern observed.*** *Energy use appears to have been minimized (cost-effectively).*

Human Considerations

i. ***Human Considerations****: Potential societal, economic, and cultural resources and historic property factors under consideration.* ***STATUS: No concerns noted.***

Resource Assessment Tools & Results:

1. *Visual assessments were made for all Resource Concerns described above.*
2. *Input from Client was considered to support visual assessments or where appropriate.*

3. *Soil Erosion Estimation by RUSLE2: Summary is below; printouts follow this report.*

Table 1. *Soil erosion (tons/acre/year) and Soil Conditioning Index (SCI) were estimated using RUSLE2. Percent slope and critical length (ft) used in the analysis - which represent the worst case scenario - are shown. Red text indicates resource concerns.*

Location	Slope		Soil Type	Erosion (tons/acre/year)		Soil Conditioning Index	
	%	Critical Length		Bench-mark	Planned	Bench-mark	Planned
North Field	2.6	110’	Appling Fine Sandy Loam	13	2.9	-.84	.29
East Field	5.54	72’	Appling Fine Sandy Loam	23	4.9	-1.6	.075
West Field	2.96	100’	Appling Fine Sandy Loam	15	4.7	-.96	.0051
High Tunnel	3.18	90’	Appling Fine Sandy Loam	1.3	.41	.023	.37

See RUSLE2 Output following documentation of the conservation planning process

Conservation Planning Process

1. ***Identify Problems & Opportunities:*** *On-site assessment concluded that the transition to organic management will require significantly more soil disturbance compared to the conventional (herbicide-based) management that preceded it for many years. The increase in soil disturbance will lead to greater soil erosion and soil organic matter loss. With the development of organic no-till techniques over the last two decades, there is great opportunity to successfully transition to organic grain production without a significant loss of soil or organic matter. This is enabled almost entirely by the use of high biomass cover crops between cash crops.*

2. ***Determine Objectives:***

   On-site assessment and discussion with client identified two main objectives: 1) assist with organic transition, and 2) address soil erosion and soil organic matter depletion that results tillage between crops and mechanical weed control; improve crop health by improving weed control.

3. ***Inventory Resources:***

   Natural resources are inventoried above. In summary, soil erosion and soil organic matter loss are the identified resource concerns.

4. ***Analyze Resource Data:***

   *Natural resources were analyzed using RUSLE2, visually, and through discussion with the Client. See results above, "**Resource Assessment Tools & Results**"*

5. ***Formulate Alternatives:***

   a. *Alternative 1 (No-action alternative): current management activities are continued without intervention or improvement.*

   b. *Alternative 2: Use Cover Crop (340) to implement a high biomass cover crop paired with Mulching (484) to reduce tillage and improve nitrogen supply. High biomass cover crops paired with mulching enable the no-till establishment of vegetable crops in the spring and have season-long weed suppression, thereby eliminating the need for mechanical weed control.*

6. ***Evaluate Alternatives**:*

   a. *Alternative 1 – No-Action Alternative will lead to excessive soil erosion and organic matter loss over time; threatening long-term productivity.*

   b. *Alternative 2: High biomass cover cropping (Cover Crop 340) paired with landscape fabric (Mulching 484):*

      i. *Short-term effects of proposed practices:*

         Proposed low-till production system (Planned Scenario; Alternative 2), in the short-term, will lead to significant reduction in soil erosion and organic matter loss, which has resulted from intensive tillage (Benchmark Scenario). If soil nutrient-building practices are used, this is only a transient effect, and may take 3-5 years to reach a new equilibrium. During that time period, it may help to supplement with organic nitrogen fertilizer. See "Recommendations to avoid or mitigate negative effects on natural resources", below, for more information about nitrogen fertilizers.

      ii. *Long-term effects of proposed practices:*

         Proposed low-till production (Planned Scenario; Alternative 2) over the long-term will reduce soil erosion and organic matter loss significantly (compared to the Benchmark Scenario), and should provide stable yields after soil nutrient and soil microbial communities have reached a new equilibrium. Long-term soil erosion will lead to reduced crop health and

yields over time. Consistent yields enable business success through consistent revenue and profit margins.

iii. *<u>Effects on special environmental concerns</u> (from Resource Inventory):*

None known.

iv. *<u>Recommendations to avoid or mitigate negative effects on natural resources</u>:*

The combination of high biomass cover crops, including a legume to improve nitrogen supply, with a long-lasting mulch such as landscape fabric will help to protect natural resources by ensuring production success, thereby preventing use of intensive tillage for weed and nutrient management. ***The recommended production system is robust and reliable. However, attention should be paid to two management details****:*

- *Cover crops must be at the right growth stage to be terminated mechanically. Because crimson clover is easier to terminate than cereal rye, simply using cereal rye to determine termination timing is adequate.* ***The target growth stages for successful termination is reach late flowering to early seed development of rye****. After the emergence of the rye seed head in the spring, check the rye growth stage weekly until it reaches late flower to early seed development.*
  - *Attempting to terminate earlier may result in failed termination, which will ultimately delay successful termination and therefore delay crop establishment by several weeks.*
  - *Waiting to terminate later will reduce nitrogen available to the subsequent crop and the development of mature seed, which can become weedy that season or the next one.*
- ***Landscape fabric should be applied to cover nearly 100% of the field at crop establishment (seeding or transplanting)****, leaving only enough space between fabric pieces for crops to grow. Less exposed area gives weeds fewer places to grow.*
- *High biomass cover crops, especially those dominated by cereal rye, can make nitrogen less available to the subsequent crop during the first 1-3 years of implementing this practice. Generally, nitrogen supply is greater after this 1-3 year transition period once organic matter increases and the soil microbial community changes accordingly.* ***In order to ensure nitrogen supply to maintain crop yields, there are two considerations:***
  - *First, the use of* ***landscape fabric improves nitrogen supply to crops by speeding up the decomposition of the cover crop*** *residue left on the soil surface. Use of landscape fabric is highly*

recommended to maintain nitrogen supply to crops when implementing a high-biomass cover crop system.

- *Second, if crop performance is lower than expected,* ***consider applying supplemental nitrogen in-crop or before crop establishment****. See Table 1, below, for more information about organic nitrogen sources, and how quickly the organic nitrogen they contain is mineralized to plant-available inorganic nitrogen.*

Table 1. Nutrient content (percent N, P_2O_5 & K_2O) of various manures, composts, and non-synthetic fertilizers. The ratio of carbon to nitrogen (C:N) is shown because it relates to the rate at which organic N is decomposed (mineralized). Results of a 99-day incubation study are shown for net mineralization of organic N and total plant available N from select materials. Reproduced from carolinafarmstewards.org with permission.

Fertility source		Total Nutrient Content (%)			C:N	Nitrogen Content		Net min. Organic N (%) 99-days	Plant-available N (% of total) 99-days
		N	P_2O_5	K_2O		Organic (%)	Mineral (%)		
Manure	Cattle [c,e,f,g]	0.2 – 0.4	0.15	0.15	16 - 25	Limited data [g]	33 - 38	-	-
	Poultry [b,c]	4.2 ± 0.2	3	2	8.6 ± 0.3	83.1 ± 1.1	16.9 ± 1.1	27.9 ± 3.1	39.3 ± 2.5
	Swine [c,e,g]	0.25 - 0.4	0.3 - 0.45	0.15 - 0.35	Limited data [g]		56 - 62	-	-
Compost	Various feedstocks [b,c]	1.8 ± 0.3	0.5 - 1	1 - 2	26.7 ± 7.9	96.6 ± 1.0	3.4 ± 1.0	1.7 ± 0.6 [b]	4.1 ± 1.5 [b]
Animal by-product	Feather meal [a,d]	12 - 15.4	0	0	3.6	99	1	77.8	88.9
	Blood meal [a,c,d]	12 - 14.4	0 - 1.5	0 - 0.6	3.8	94	6	92.3	92.7
	Fish meal [a,c,d]	9 - 11.3	4	0	4.0	92	8	28.8	83.5
	Bone meal [a,d]	2 - 5.4	14	0	3.6	100	0	24.7	24.8
Plant-based	Alfalfa meal [a,d]	3	2	2	15.9	85	15	Immobilized: N tied up by soil microbiology	
	Cotton seed meal [a,c]	8.7	2.5	1.7	5.5	83	17	59.8	43.2
	Sunflower hull ash [d]	0	4	30 - 34	NA				
Mined	Sodium nitrate [a,h]	15 - 16	0	0	NA	0	100	NA	96
	Colloidal phosphate	0	20 - 25	0	NA				
	Potassium sulfate [d]	0	0	50 - 52					

Table 2 Footnotes:

[a] N content and mineralization values from Cassity-Duffey et al., (2020).

[b] *N content and mineralization values are the mean of 15 poultry manure samples and 11 compost samples analyzed by Cassity-Duffey et al., (2020). Standard error of means are shown after the ± symbol. Note that net mineralization and plant-available N for compost samples represents maximum potential values and likely over-estimates both metrics, as N was immobilized in 5 of the 11 compost samples; zeros were used for these immobilized samples.*

[c] *N, P_2O_5, and K_2O values taken from Penn State's Organic Crop Production Guide Table 5.11 (Beegle and Stehouwer, 2015), unless N values specified from Cassity-Duffey et al., (2020). Manure nutrient content values are highly variable; a narrow range of means is reported from different sources for simplicity.*

v. *Documentation: evaluation of the alternative's effects on the participant's land use, capital, labor, management, risk, profitability, and public health and safety*

1. *Land use: Land use does not change considerably under the Planned Scenario (Alternative 2), as it is still used for organic vegetable production. However, soil disturbance is reduced and the cropping sequence is modified, leading to less soil erosion and no organic matter loss.*

2. *Capital: Added expenses include 1) cover crop seed (crimson clover and cereal rye); 2) landscape fabric; 3) potentially more fertility sources to improve nitrogen supply to crops.*

3. *Labor: Labor is likely reduced in the Planned Scenario due to lower weed pressure.*

4. *Management: Management complexity increases somewhat under the Planned Scenario in that cover crops must be established and terminated in a timely manner, and landscape fabric must be applied and removed each year.*

5. *Risk: Risk under the Planned Scenario is expected to be low, given the relatively low purchase cost of materials, and that NRCS financial assistance will reduce the net cost of implementing the cover crop-based reduced-tillage system.*

6. *Profitability: Profitability should be approximately the same between the Benchmark and Planned Scenarios (Alternatives 1 & 2), although less time invested in weed control in the Planned Scenario may improve profitability.*

7. *Public health and safety: No known risks. See Resource Inventory for a health and safety risk assessment.*

8. ***Make Decisions**:*

c. Decision has been made to implement Cover Crop (340) and Mulching (484) to enable the reduction of tillage by crimping or mowing a high biomass winter cover crop prior to no-till planting summer vegetable crops.

2. Conservation Assistance Notes and Correspondence

a. Conservation Assistance Notes

i. Client Objectives:

1. Organic Transition
2. **Address soil erosion and soil organic matter depletion that results tillage between crops and mechanical weed control; improve crop health by improving weed control.**

ii. Client Interactions:

Date	Purpose	Results/Notes	Initials (TSP)
Jul. 1, 2022	Site visit planning	Site visit planning	JR
Jul.8, 2022	Site visit	Agreement to develop transition to organic plan (CPA138). Conservation efforts will focus on reducing soil erosion that has resulted from the change to an intensive tillage system. Present: Mark Dempsey & Donnie Woodlief (in person).	JR
June 1, 2023	Final follow up prior to submitting CPA138 to NRCS	Discussed final details about management and conservation plan specifications.	JR

3. Conservation Practice Summary

NRCS conservation practice	Cover Crop (340) Mulching (484)
Estimated amount planned or applied	Cover Crop (340): .30 ac. Mulching (484): .30 ac.
Brief description of the planned conservation practices	Cover Crop (340): Winter cover crops (cereal rye & crimson clover) to precede summer vegetable crops. Mulching (484): Landscape fabric to be applied after cover crop termination in the spring
Dates the planned practices are scheduled to be implemented	ASAP
Date practices were completed.	[TBD]

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Nottoway County, Virginia
Survey Area Data: Version 17, Aug 30, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: May 19, 2022—Jul 1, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Ag	Appling fine sandy loam, 2 to 7 percent slopes	4.7	89.2%
Ch	Cecil fine sandy loam, undulating phase	0.0	0.5%
Eh	Enon-Vance-Helena soils, eroded rolling	0.5	10.3%
Totals for Area of Interest		**5.2**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or

landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Nottoway County, Virginia

Ag—Appling fine sandy loam, 2 to 7 percent slopes

Map Unit Setting

National map unit symbol: 2t811
Elevation: 160 to 490 feet
Mean annual precipitation: 41 to 45 inches
Mean annual air temperature: 55 to 59 degrees F
Frost-free period: 190 to 210 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Appling and similar soils: 85 percent
Minor components: 3 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Appling

Setting

Landform: Interfluves
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from granite and gneiss

Typical profile

A - 0 to 8 inches: fine sandy loam
Bt1 - 8 to 15 inches: sandy clay loam
Bt2 - 15 to 20 inches: clay loam
Bt3 - 20 to 44 inches: clay
BCt - 44 to 52 inches: clay loam
C - 52 to 60 inches: loam

Properties and qualities

Slope: 2 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 9.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F136XY820GA - Acidic upland forest, moist
Hydric soil rating: No

Minor Components

Worsham

Percent of map unit: 3 percent
Landform: Interfluves
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Head slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Ch—Cecil fine sandy loam, undulating phase

Map Unit Setting

National map unit symbol: 42td
Elevation: 200 to 1,400 feet
Mean annual precipitation: 33 to 64 inches
Mean annual air temperature: 44 to 69 degrees F
Frost-free period: 160 to 191 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Cecil and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cecil

Setting

Landform: Hillslopes
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from granite and gneiss

Typical profile

H1 - 0 to 7 inches: fine sandy loam
H2 - 7 to 12 inches: sandy clay loam
H3 - 12 to 39 inches: clay
H4 - 39 to 47 inches: sandy clay loam

Properties and qualities

Slope: 2 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None

Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F136XY820GA - Acidic upland forest, moist
Hydric soil rating: No

Eh—Enon-Vance-Helena soils, eroded rolling

Map Unit Setting

National map unit symbol: 42tz
Elevation: 230 to 560 feet
Mean annual precipitation: 33 to 64 inches
Mean annual air temperature: 44 to 69 degrees F
Frost-free period: 160 to 191 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Enon and similar soils: 31 percent
Vance and similar soils: 29 percent
Helena and similar soils: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Enon

Setting

Landform: Hillslopes
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Mixed mafic residuum

Typical profile

H1 - 0 to 9 inches: fine sandy loam
H2 - 9 to 12 inches: gravelly sandy clay loam
H3 - 12 to 27 inches: clay
H4 - 27 to 40 inches: fine sandy loam

Properties and qualities

Slope: 7 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

Available water supply, 0 to 60 inches: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: F136XY720NC - Basic upland forest, moist
Hydric soil rating: No

Description of Vance

Setting

Landform: Hillslopes
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Mixed mafic residuum

Typical profile

H1 - 0 to 13 inches: fine sandy loam
H2 - 13 to 32 inches: clay
H3 - 32 to 42 inches: silt loam

Properties and qualities

Slope: 7 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: F136XY820GA - Acidic upland forest, moist
Hydric soil rating: No

Description of Helena

Setting

Landform: Hillslopes
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Mixed mafic residuum

Typical profile

H1 - 0 to 10 inches: fine sandy loam
H2 - 10 to 15 inches: sandy clay loam
H3 - 15 to 36 inches: clay
H4 - 36 to 48 inches: fine sandy loam

Properties and qualities

Slope: 7 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Ecological site: F136XY810SC - Acidic upland forest, seasonally wet
Hydric soil rating: No

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USDA NRCS
United States Department of Agriculture
Natural Resources Conservation Service

340 - Cover Crop
Implementation Requirements

Producer:	Bob Smith	**Project or Contract:**	1234567890
Location:	Nottoway Co., Va	**County:**	Nottoway
Farm Name:	Bob Smith Farm	**Tract Number:**	12345

Practice Location Map

(showing detailed aerial view of where practice is to be installed on farm/site, showing all major components, stationing, relative location to any landmarks, and survey benchmarks)

Index

Description of work:

NRCS Review Only

Designed By:	Joe Rowland	**Date:**	10/21/23
Checked By:		**Date:**	
Approved By:		**Date:**	

340 - Cover Crop
Implementation Requirements

The Practice Purpose(s):

- ☑ Reduce erosion from wind and water.
- ☑ Increase soil organic matter content.
- ☑ Capture and recycle or redistribute nutrients in the soil profile.
- ☑ Promote biological nitrogen fixation and reduce energy use.
- ☑ Increase biodiversity.
- ☑ Suppress weeds.
- ☑ Manage soil moisture.
- ☑ Minimize and reduce soil compaction.

Seeding and Management: *Fill in the following table with the appropriate cover crop information for each field.*

Field #	Acres	Species	Seeding rate (lbs/ac PLS*)	Seeding date range	Seeding method	Termination date or stage	Termination method
1-4	.3	Cereal Rye	12-20	Oct 1	Broadcast	April	Crimp/Flail
1-4	.3	Crimson Clover	55-75	Oct 1	Broadcast	April	Crimp/Flail

**To figure Pure Live Seed (PLS) rates, multiply the percent purity by the percent germination. Divide the seeding rate by the percent PLS to find the bulk seed needed per acre. For example: 98% purity X 60% germination = 0.588% PLS 10 lbs/acre X 0.588% PLS = 17 lbs/acre.*

340 - Cover Crop
Implementation Requirements

Soil Amendments, if needed. *Apply soil amendments prior to seedbed preparation or before seeding if a no-till drill is used.*

Field	N fertilizer needed (lbs/acre)	K20 fertilizer needed (lbs/acre)	P2O5 fertilizer needed (lbs/acre)
1-4	100-120	150-180	100

Additional specifications:

Based on Soil Tests

OPERATION AND MAINTENANCE

☑ Control growth of the cover crop to reduce competition from volunteer plants and shading.

☑ Control weeds in cover crops by mowing or by using other pest management techniques.

☑ Control soil moisture depletion by selecting water efficient plant species and terminating the cover crop before excessive transpiration.

☑ Evaluate the cover crop to determine if the cover crop is meeting the planned purpose(s). If the cover crop is not meeting the purpose(s) adjust the management, change the species of cover crop, or choose a different technology.

USDA NRCS Natural Resources Conservation Service

RUSLE2 Profile Erosion Calculation Record

Info:

File: profiles\Bob Smith New Prof EAST
Access Group: R2_NRCS_Fld_Office

Inputs:

Location	*Soil*	*Slope length (horiz)*	*Avg. slope steepness, %*
default	default	72	5.5

R Factor	*Annual precip*	*10-yr 24-hr rainfall*	*In Req area?*
200	240	3.0	No

Management	*Vegetation*	*Yield units*	*# yield units, #/ac*
managements\CMZ 66\c.Other Local Mgt Records\Bob Smith Farm New Mgmt EAST	vegetations\Potato, sweet	lbs	22000
managements\CMZ 66\c.Other Local Mgt Records\Bob Smith Farm New Mgmt EAST	vegetations\Clover, annual, fall cover crop, mid Sept seeded	pounds	750
managements\CMZ 66\c.Other Local Mgt Records\Bob Smith Farm New Mgmt EAST	vegetations\Kale	lbs	11000
managements\CMZ 66\c.Other Local Mgt Records\Bob Smith Farm New Mgmt EAST	vegetations\default	Bushels	200
managements\CMZ 66\c.Other Local Mgt Records\Bob Smith Farm New Mgmt EAST	vegetations\Potato, sweet	lbs	22000
managements\CMZ 66\c.Other Local Mgt Records\Bob Smith Farm New Mgmt EAST	vegetations\Rye and Hairy vetch, winter cover, mid south	lbs	5000
managements\CMZ 66\c.Other Local Mgt Records\Bob Smith Farm New Mgmt EAST	vegetations\Collard, greens	lbs	8900
managements\CMZ 66\c.Other Local Mgt Records\Bob Smith Farm New Mgmt EAST	vegetations\Rye, winter cover crop, mid Sept seeding	pounds	6000

Contouring	*Strips/barriers*	*Diversion/terrace, sediment basin*	*Subsurface drainage*	*Adjust res. burial level*	*General yield level*	*Rock cover, %*
a. rows up-and-down hill	(none)	(none)	(none)	Normal res. burial	Management set yield	0

Outputs:

T value	*Soil loss erod. portion*	*Detachment on slope*	*Soil loss for cons. plan*	*Sediment delivery*	*Net C factor*	*Net K factor*	*Crit. slope length*	*Surf. cover after planting, %*
3.0	4.9	4.9	4.9	4.9	0.056	0.70	72	

Date	*Operation*	*Vegetation*	*Surf. res. cov. after op, %*
4/1/1	Winter kill annual crop		93
4/1/1	Add mulch		93
4/1/1	Roller, crimp, covercrop		93
4/1/1	Add mulch		93
5/1/1	Planting, manual on 8 inch high beds	Potato, sweet	85
10/1/1	Planting, broadcast seeder	Clover, annual, fall cover crop, mid Sept seeded	61
2/1/2	Add mulch		46
2/1/2	Roller, crimp, covercrop		46
2/1/2	Planter, small veg seed on 8 inch high beds	Kale	46
5/1/2	Harvest, leafy veg.		24
5/1/2	Planting, broadcast seeder		24
5/1/2	Add mulch	Potato, sweet	24
5/1/2	Roller, crimp, covercrop		24
5/1/2	Planting, manual on 8 inch high beds		24
10/1/2	Harvest, hand pick multiple times		21
10/1/2	Planting, broadcast seeder	Rye and Hairy vetch, winter cover, mid south	21
5/1/3	Winter kill annual crop		99
5/1/3	Add mulch		99
5/1/3	Roller, crimp, covercrop		99
5/1/3	Add mulch		99
5/1/3	Planter, small veg seed on 8 inch high beds	Collard, greens	99
8/1/3	Harvest, hand pick multiple times		88
10/1/3	Planting, broadcast seeder	Rye, winter cover crop, mid Sept seeding	73
4/1/4	Winter kill annual crop		97
4/1/4	Add mulch		97
4/1/4	Roller, crimp, covercrop		97
4/1/4	Add mulch		97

FUEL USE EVALUATION:

Fuel type for entire run	*Equiv. diesel use for entire simulation*	*Energy use for entire simulation*	*Fuel cost for entire simulation, US$/ac*
(none)	3.54	491000	0

SCI and STIR Output

Soil conditioning index (SCI)	*SCI OM subfactor*	*SCI FO subfactor*	*SCI ER subfactor*	*Avg. annual slope STIR*	*Wind & irrigation-induced erosion for SCI, t/ac/yr*
0.075	-0.34	0.99	-0.93	1.1	0

The **SCI** is the **Soil Conditioning Index** rating. If the calculated index is a negative value, soil organic matter levels are predicted to decline under that production system. If the index is a positive value, soil organic matter levels are predicted to increase under that system.

The **STIR** value is the **Soil Tillage Intensity Rating**. It utilizes the speed, depth, surface disturbance percent and tillage type parameters to calculate a tillage intensity rating for the system used in growing a crop or a rotation. STIR ratings tend to show the differences in the degree of soil disturbance between systems. The kind, severity and number of ground disturbing passes are evaluated for the entire cropping rotation as shown in the management description.

USDA NRCS Natural Resources Conservation Service

RUSLE2 Profile Erosion Calculation Record

Info:

File: profiles\Bob Smith New Prof HT
Access Group: R2_NRCS_Fld_Office

Inputs:

Location	*Soil*	*Slope length (horiz)*	*Avg. slope steepness, %*
default	default	90	3.2

R Factor	*Annual precip*	*10-yr 24-hr rainfall*	*In Req area?*
200	240	3.0	No

Management	*Vegetation*	*Yield units*	*# yield units, #/ac*
managements\CMZ 66\c.Other Local Mgt Records\Bob Smith Farm New Mgmt HT	vegetations\Tomato, fresh mkt staked	cwt	300
managements\CMZ 66\c.Other Local Mgt Records\Bob Smith Farm New Mgmt HT	vegetations\Spinach	lbs	8100
managements\CMZ 66\c.Other Local Mgt Records\Bob Smith Farm New Mgmt HT	vegetations\Clover, annual, fall cover crop, mid Sept seeded	pounds	750
managements\CMZ 66\c.Other Local Mgt Records\Bob Smith Farm New Mgmt HT	vegetations\Spinach	lbs	8100
managements\CMZ 66\c.Other Local Mgt Records\Bob Smith Farm New Mgmt HT	vegetations\Tomato, fresh mkt staked	cwt	300
managements\CMZ 66\c.Other Local Mgt Records\Bob Smith Farm New Mgmt HT	vegetations\Rye and Hairy vetch, winter cover, mid south	lbs	5000
managements\CMZ 66\c.Other Local Mgt Records\Bob Smith Farm New Mgmt HT	vegetations\Spinach	lbs	8100
managements\CMZ 66\c.Other Local Mgt Records\Bob Smith Farm New Mgmt HT	vegetations\Rye, winter cover crop, mid Sept seeding	pounds	6000
managements\CMZ 66\c.Other Local Mgt Records\Bob Smith Farm New Mgmt HT	vegetations\Tomato, fresh mkt staked	cwt	300
managements\CMZ 66\c.Other Local Mgt Records\Bob Smith Farm New Mgmt HT	vegetations\Clover, annual, fall cover crop, mid Sept seeded	pounds	750

Contouring	*Strips/barriers*	*Diversion/terrace, sediment basin*	*Subsurface drainage*	*Adjust res. burial level*	*General yield level*	*Rock cover, %*
a. rows up-and-down hill	(none)	(none)	(none)	Normal res. burial	Management set yield	0

Outputs:

T value	*Soil loss erod. portion*	*Detachment on slope*	*Soil loss for cons. plan*	*Sediment delivery*	*Net C factor*	*Net K factor*	*Crit. slope length*	*Surf. cover after planting, %*
3.0	0.41	0.41	0.41	0.41	0.0069	0.70	90	

Date	*Operation*	*Vegetation*	*Surf. res. cov. after op, %*
4/1/1	Plastic hoop tunnel installation 100 percent cover		36
4/1/1	Add mulch		36
4/1/1	Roller, crimp, covercrop		36
4/1/1	Plastic mulch applicator 40 percent cover		36
4/1/1	Planting, no-til manually	Tomato, fresh mkt staked	36
6/1/1	Weed control, manual hoe		21
7/1/1	Harvest, hand pick multiple times		16
7/1/1	Planter, small veg seed on 8 inch high beds	Spinach	16
9/1/1	Weed control, manual hoe		34
10/1/1	Harvest, hand pick multiple times		39
10/1/1	Planting, broadcast seeder	Clover, annual, fall cover crop, mid Sept seeded	39
2/1/2	Roller, crimp, covercrop		71
2/1/2	Add mulch		71
2/1/2	Planting, no-til manually	Spinach	71
4/1/2	Weed control, manual hoe		44
5/1/2	Roller, crimp, covercrop		86
5/1/2	Add mulch		86
5/1/2	Planting, no-til manually	Tomato, fresh mkt staked	86
6/1/2	Weed control, manual hoe		63
10/1/2	Harvest, hand pick multiple times		34
10/1/2	Planting, broadcast seeder	Rye and Hairy vetch, winter cover, mid south	34
3/1/3	Winter kill annual crop		79
3/1/3	Add mulch		79
5/1/3	Harvest, hand pick multiple times		71
5/1/3	Kill crop		71
6/1/3	Weed control, manual hoe		43
7/1/3	Planting, no-til manually	Spinach	30
8/1/3	Harvest, hand pick multiple times		76
8/1/3	Add mulch		76
10/1/3	Planting, broadcast seeder	Rye, winter cover crop, mid Sept seeding	61
4/1/4	Winter kill annual crop		87
4/1/4	Add mulch		87
4/1/4	Roller, crimp, covercrop		87
4/1/4	Planting, no-til manually	Tomato, fresh mkt staked	87
5/1/4	Weed control, manual hoe		65
10/1/4	Harvest, hand pick multiple times		29
10/2/4	Planting, broadcast seeder	Clover, annual, fall cover crop, mid Sept seeded	90
10/2/4	Winter kill annual crop		90
10/2/4	Add mulch		90

FUEL USE EVALUATION:

Fuel type for entire run	*Equiv. diesel use for entire simulation*	*Energy use for entire simulation*	*Fuel cost for entire simulation, US$/ac*
(none)	4.52	627000	0

SCI and STIR Output

Soil conditioning index (SCI)	*SCI OM subfactor*	*SCI FO subfactor*	*SCI ER subfactor*	*Avg. annual slope STIR*	*Wind & irrigation-induced erosion for SCI, t/ac/yr*
0.37	-0.42	0.93	0.84	7.0	0

The **SCI** is the **Soil Conditioning Index** rating. If the calculated index is a negative value, soil organic matter levels are predicted to decline under that production system. If the index is a positive value, soil organic matter levels are predicted to increase under that system.

The **STIR** value is the **Soil Tillage Intensity Rating**. It utilizes the speed, depth, surface disturbance percent and tillage type parameters to calculate a tillage intensity rating for the system used in growing a crop or a rotation. STIR ratings tend to show the differences in the degree of soil disturbance between systems. The kind, severity and number of ground disturbing passes are evaluated for the entire cropping rotation as shown in the management description.

USDA NRCS Natural Resources Conservation Service

RUSLE2 Profile Erosion Calculation Record

Info:

File: profiles\Bob Smith New Prof NORTH
Access Group: R2_NRCS_Fld_Office

Inputs:

Location	*Soil*	*Slope length (horiz)*	*Avg. slope steepness, %*
default	default	110	2.6

R Factor	*Annual precip*	*10-yr 24-hr rainfall*	*In Req area?*
200	240	3.0	No

Management	*Vegetation*	*Yield units*	*# yield units, #/ac*
managements\CMZ 66\c.Other Local Mgt Records\Bob Smith Farm New Mgmt NORTH	vegetations\Potato, sweet	lbs	22000
managements\CMZ 66\c.Other Local Mgt Records\Bob Smith Farm New Mgmt NORTH	vegetations\Clover, annual, fall cover crop, mid Sept seeded	pounds	750
managements\CMZ 66\c.Other Local Mgt Records\Bob Smith Farm New Mgmt NORTH	vegetations\Kale	lbs	11000
managements\CMZ 66\c.Other Local Mgt Records\Bob Smith Farm New Mgmt NORTH	vegetations\default	Bushels	200
managements\CMZ 66\c.Other Local Mgt Records\Bob Smith Farm New Mgmt NORTH	vegetations\Potato, sweet	lbs	22000
managements\CMZ 66\c.Other Local Mgt Records\Bob Smith Farm New Mgmt NORTH	vegetations\Rye and Hairy vetch, winter cover, mid south	lbs	5000
managements\CMZ 66\c.Other Local Mgt Records\Bob Smith Farm New Mgmt NORTH	vegetations\Collard, greens	lbs	8900
managements\CMZ 66\c.Other Local Mgt Records\Bob Smith Farm New Mgmt NORTH	vegetations\Rye, winter cover crop, mid Sept seeding	pounds	6000

Contouring	*Strips/barriers*	*Diversion/terrace, sediment basin*	*Subsurface drainage*	*Adjust res. burial level*	*General yield level*	*Rock cover, %*
a. rows up-and-down hill	(none)	(none)	(none)	Normal res. burial	Management set yield	0

Outputs:

T value	*Soil loss erod. portion*	*Detachment on slope*	*Soil loss for cons. plan*	*Sediment delivery*	*Net C factor*	*Net K factor*	*Crit. slope length*	*Surf. cover after planting, %*
3.0	2.9	2.9	2.9	2.9	0.057	0.70	110	

Date	*Operation*	*Vegetation*	*Surf. res. cov. after op, %*
4/1/1	Winter kill annual crop		75
4/1/1	Add mulch		75
4/1/1	Roller, crimp, covercrop		75
4/1/1	Add mulch		75
5/1/1	Planting, manual on 8 inch high beds	Potato, sweet	64
10/1/1	Planting, broadcast seeder	Clover, annual, fall cover crop, mid Sept seeded	44
2/1/2	Winter kill annual crop		91
2/1/2	Add mulch		91
2/1/2	Roller, crimp, covercrop		91
2/1/2	Add mulch		91
2/1/2	Planting, manual on 8 inch high beds	Kale	91
5/1/2	Harvest, leafy veg.		89
5/1/2	Planting, broadcast seeder		89
5/1/2	Roller, crimp, covercrop	Potato, sweet	89
5/1/2	Add mulch		89
5/1/2	Planting, manual on 8 inch high beds		89
10/1/2	Planting, broadcast seeder	Rye and Hairy vetch, winter cover, mid south	64
3/1/3	Winter kill annual crop		97
3/1/3	Add mulch		97
3/1/3	Roller, crimp, covercrop		97
3/1/3	Add mulch		97
5/1/3	Planter, small veg seed on 8 inch high beds	Collard, greens	85
8/1/3	Harvest, hand pick multiple times		57
10/1/3	Planting, broadcast seeder	Rye, winter cover crop, mid Sept seeding	41
4/1/4	Winter kill annual crop		96
4/1/4	Add mulch		96
4/1/4	Roller, crimp, covercrop		96
4/1/4	Add mulch		96

FUEL USE EVALUATION:

Fuel type for entire run	*Equiv. diesel use for entire simulation*	*Energy use for entire simulation*	*Fuel cost for entire simulation, US$/ac*
(none)	2.83	393000	0

SCI and STIR Output

Soil conditioning index (SCI)	*SCI OM subfactor*	*SCI FO subfactor*	*SCI ER subfactor*	*Avg. annual slope STIR*	*Wind & irrigation-induced erosion for SCI, t/ac/yr*
0.24	-0.33	0.99	-0.14	1.1	0

The **SCI** is the **Soil Conditioning Index** rating. If the calculated index is a negative value, soil organic matter levels are predicted to decline under that production system. If the index is a positive value, soil organic matter levels are predicted to increase under that system.

The **STIR** value is the **Soil Tillage Intensity Rating**. It utilizes the speed, depth, surface disturbance percent and tillage type parameters to calculate a tillage intensity rating for the system used in growing a crop or a rotation. STIR ratings tend to show the differences in the degree of soil disturbance between systems. The kind, severity and number of ground disturbing passes are evaluated for the entire cropping rotation as shown in the management description.

RUSLE2 Profile Erosion Calculation Record

Info:

File: profiles\Bob Smith New Prof WEST
Access Group: R2_NRCS_Fld_Office

Inputs:

Location	*Soil*	*Slope length (horiz)*	*Avg. slope steepness, %*
default	default	100	3.0

R Factor	*Annual precip*	*10-yr 24-hr rainfall*	*In Req area?*
200	240	3.0	No

Management	*Vegetation*	*Yield units*	*# yield units, #/ac*
managements\CMZ 66\c.Other Local Mgt Records\Bob Smith Farm New Mgmt WEST	vegetations\Potato, sweet	lbs	22000
managements\CMZ 66\c.Other Local Mgt Records\Bob Smith Farm New Mgmt WEST	vegetations\Clover, annual, fall cover crop, mid Sept seeded	pounds	750
managements\CMZ 66\c.Other Local Mgt Records\Bob Smith Farm New Mgmt WEST	vegetations\Kale	lbs	11000
managements\CMZ 66\c.Other Local Mgt Records\Bob Smith Farm New Mgmt WEST	vegetations\Potato, sweet	lbs	22000
managements\CMZ 66\c.Other Local Mgt Records\Bob Smith Farm New Mgmt WEST	vegetations\Rye and Hairy vetch, winter cover, mid south	lbs	5000
managements\CMZ 66\c.Other Local Mgt Records\Bob Smith Farm New Mgmt WEST	vegetations\Collard, greens	lbs	8900
managements\CMZ 66\c.Other Local Mgt Records\Bob Smith Farm New Mgmt WEST	vegetations\Rye, winter cover crop, mid Sept seeding	pounds	6000

Contouring	*Strips/barriers*	*Diversion/terrace, sediment basin*	*Subsurface drainage*	*Adjust res. burial level*	*General yield level*	*Rock cover, %*
a. rows up-and-down hill	(none)	(none)	(none)	Normal res. burial	Management set yield	0

Outputs:

T value	*Soil loss erod. portion*	*Detachment on slope*	*Soil loss for cons. plan*	*Sediment delivery*	*Net C factor*	*Net K factor*	*Crit. slope length*	*Surf. cover after planting, %*
3.0	4.7	4.7	4.7	4.7	0.10	0.70	100	

Date	*Operation*	*Vegetation*	*Surf. res. cov. after op, %*
4/1/1	Roller, crimp, covercrop		13
4/1/1	Add mulch		13
5/1/1	Planting, manual on 8 inch high beds	Potato, sweet	9.8
10/1/1	Planting, broadcast seeder	Clover, annual, fall cover crop, mid Sept seeded	18
2/1/2	Winter kill annual crop		92
2/1/2	Add mulch		92
2/1/2	Roller, crimp, covercrop		92
2/1/2	Add mulch		92
2/1/2	Planter, small veg seed on 8 inch high beds	Kale	92
5/1/2	Harvest, leafy veg.		71
5/1/2	Shredder, flail or rotary		71
5/1/2	Planting, manual on 8 inch high beds	Potato, sweet	71
10/1/2	Planting, broadcast seeder	Rye and Hairy vetch, winter cover, mid south	47
3/1/3	Winter kill annual crop		90
3/1/3	Add mulch		90
3/1/3	Roller, crimp, covercrop		90
3/1/3	Add mulch		90
3/15/3	Planter, small veg seed on 8 inch high beds	Collard, greens	84
8/1/3	Harvest, hand pick multiple times		30
10/1/3	Planting, broadcast seeder	Rye, winter cover crop, mid Sept seeding	17
4/1/4	Winter kill annual crop		82
4/1/4	Add mulch		82

FUEL USE EVALUATION:

Fuel type for entire run	*Equiv. diesel use for entire simulation*	*Energy use for entire simulation*	*Fuel cost for entire simulation, US$/ac*
(none)	3.29	456000	0

SCI and STIR Output

Soil conditioning index (SCI)	*SCI OM subfactor*	*SCI FO subfactor*	*SCI ER subfactor*	*Avg. annual slope STIR*	*Wind & irrigation-induced erosion for SCI, t/ac/yr*
0.0051	-0.56	0.99	-0.83	0.98	0

The **SCI** is the **Soil Conditioning Index** rating. If the calculated index is a negative value, soil organic matter levels are predicted to decline under that production system. If the index is a positive value, soil organic matter levels are predicted to increase under that system.

The **STIR** value is the **Soil Tillage Intensity Rating**. It utilizes the speed, depth, surface disturbance percent and tillage type parameters to calculate a tillage intensity rating for the system used in growing a crop or a rotation. STIR ratings tend to show the differences in the degree of soil disturbance between systems. The kind, severity and number of ground disturbing passes are evaluated for the entire cropping rotation as shown in the management description.

USDA NRCS
United States Department of Agriculture
Natural Resources Conservation Service

Mulching

Virginia Conservation Practice Job Sheet 484

Definition
Applying plant residues or other suitable materials produced off site, to the land surface.

Purpose
- Conserve soil moisture
- Reduce energy use associated with irrigation
- Provide erosion control
- Facilitate the establishment of vegetative cover
- Improve soil health
- Reduce airborne particulates

Criteria
Select mulching material based on the purpose, site conditions and the material's availability.

Mulch materials shall consist of natural and/or artificial materials that of sufficient dimension (depth or thickness) and durability to achieve the intended purpose for the required time period.

Prior to mulching, the soil surface shall be prepared in order to achieve the desired purpose.

Apply the mulch material evenly, and if necessary, anchor to the soil. Use tackifiers, emulsions, pinning, netting, crimping or other acceptable methods as anchors if needed to hold the mulch in place for specified periods.

As a minimum, apply manufactured mulches according to the manufacturer's specifications.

Mulch material shall be of a quality to meet the intended purpose.

Specify any additional criteria below to meet the intended purpose and function of mulching for this site:

Green manure in the form of flailed or rolled/crimped cover crops will be used as mulch

Note: This summary does not address all requirements and considerations in the VA Mulching Conservation Practice Standard (Code 484). Consult the Conservation Practice Standard for further details.

Virginia Mulching – Practice Specifications & Certification			484
General Information			
Client:	Bob Smith	County:	Nottoway
Field Office:	Nottoway	Contract:	12345
Farm #:	12345	Tract #:	12345
Field # and acreage:	East, West, North, HT		

Clients Purpose(s) (check all that apply)

- ☑ Conserve soil moisture
- ☑ Reduce energy associated with irrigation
- ☑ Provide erosion control
- ☑ Facilitate the establishment of vegetative cover
- ☑ Improve soil health
- ☑ Reduce airborne particulates

Practice Specifications

- Purpose of mulch and duration needed: Weed suppression, May-Aug
- Type of mulch material used: Crop Residue, rye & clover
- The percent cover and/or thickness of mulch material: 90%, 2" deep
- Timing of application: Sown in Oct, Flail or crimp in April
- Site prep performed prior to mulching: Flail and drill cover into residue
- Method and type of anchoring used: N/A

Operation & Maintenance (O&M)

Carry out all of the following actions to ensure that the planned practice functions as intended after initial installation.

1. Inspect mulched areas periodically and reinstall or repair mulch as needed to accomplish intended purpose.
2. Evaluate the effectiveness of the mulch (application, amount of cover provided, durability, etc.) and adjust the management or type of mulch to better meet the intended purpose and site conditions.
3. Remove or incorporate mulch materials in a manner that is consistent with the intended purpose and site conditions.
4. Operate equipment near and on the site in a manner that will compromise the intended purpose of the mulch.
5. Prevent or repair any fire damage to the mulch material.
6. Properly collect and dispose of artificial mulch material after intended use.
7. Monitor and control undesirable weeds in mulched areas.

Operation & Maintenance (O&M) continued

Use this space as needed to provide any additional practical guidance necessary to achieve the desired function of the practice for the intended duration.

Planner Certification

The Mulching practice planned in this job sheet fulfills the minimum requirements of Virginia NRCS Conservation Practice Standard 484.

Signature	Title	Date
Joe Rowland Digitally signed by Joe Rowland Date: 2023.10.24 10:18:42 -04'00'	Organic Initiatives Coordinator	

Certification of Practice Completion

The Mulching practice planned in this job sheet has been completed and maintained according to Virginia NRCS specifications (indicate in Practice Specifications any changes to planned activities and acreage.)

Signature	Title	Date
Joe Rowland Digitally signed by Joe Rowland Date: 2023.10.24 10:19:13 -04'00'	Organic Initiatives Coordinator	10/21/23

If needed, an aerial view or a side view of the practice can be shown below. Other relevant information, complementary practices and measures, and additional specifications may be included.

Scale 1"= _____ ft. (N/A indicates sketch not to scale: grid size=1/2" by 1/2")

Additional Specifications and Notes:

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