# Management and Environmental Considerations When Siting and Managing Mortality Composting Facilities

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**What Farmer Educators Need to Know about Mortality Composting – Beyond the Basics**

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# Livestock Operations Considerations

- Manure Usually Considered
  - Collection
  - Storage
  - Utilization
- Often Overlooked, Facility
  - Siting
  - Layout
  - Management
- Potential Impact On
  - Environment
  - Neighbors
  - Farm Operations

# Proper Planning, Implementation, & Maintenance

- Mitigate Adverse Impacts
- Generate Positive Benefits
  - Environmental Protection
  - Neighbor Relations
  - Farm Operations

***Concepts Apply To Entire Farm Operation Which Includes Mortality Composting***

# Potential Mortality Composting Impact Areas

- Water Management
  - Plays a role in the transport of chemical, microorganism, particulate matter pollutants to receiving water
- Nuisance issues
  - Range in scale from minimally noticed to strongly objectionable. May impact farm only, or generate neighbor complaints.
- Farm working conditions and efficiencies
  - Relate to time effort and expense of mortality composting and addressing unintended consequences

# Potential Mortality Composting Impact Areas

- Water Management
- Nuisance Issues
- Farm Working Conditions And Efficiencies

***Interrelated, Changes To Address Concerns In One Area Often Affects Other Areas***

# General Approach To Addressing Concerns

- Careful Consideration
  - Selection
  - Implementation
  - Management
- Use Your Information Resources
  - This Presentation
  - Its References
  - Available Educations And Service Organizations
- Make, Implement, And Evaluate A Plan
  - Include
    - Info Sources
    - Knowledge Of Farm Conditions/Situations
    - Outside Input
  - Sketch Out The Farm If Needed

# Key Concepts

- Keep Clean Water Clean
- Manage Potential Pollutant Materials And Areas
- Treat Dirty Water
- Minimize Nuisance Conditions
- Keep Operation As Inconspicuous To The Public As Possible
- Make Management And Maintenance Part Of Daily Tasks

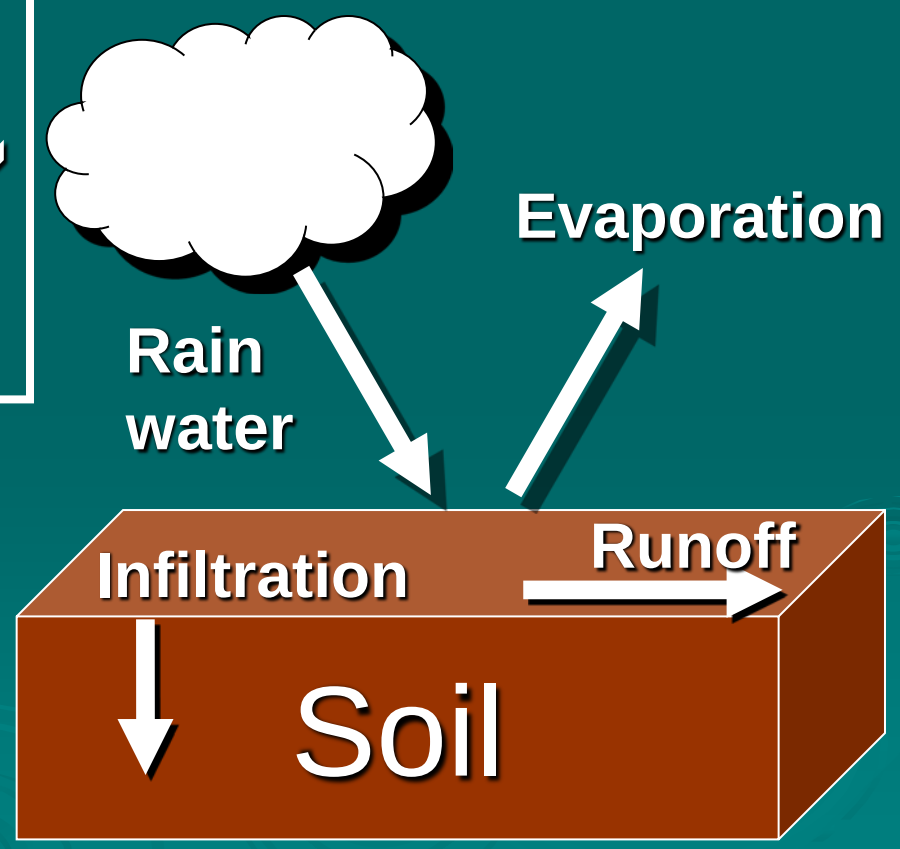
# Water Runoff Management

- Water Carries
  - Nutrients
  - Sediment
  - Microorganisms
- Raise concerns
  - Environmental
  - Human health
  - Animal health
- Increase mud
  - Traffic problems
  - Animal heath concerns

# Runoff Volumes

*Volume = (Rain - Infiltration - Evaporation) x Area*

| | |
|---|---|
| Rain ↓ | Volume ↓ |
| Area ↓ | |
| Infiltration ↑ | |
| Evaporation ↑ | |



# Runoff Examples

When Evaporation & Infiltration are zero
a 1 inch rain generates 0.62 gallons of runoff

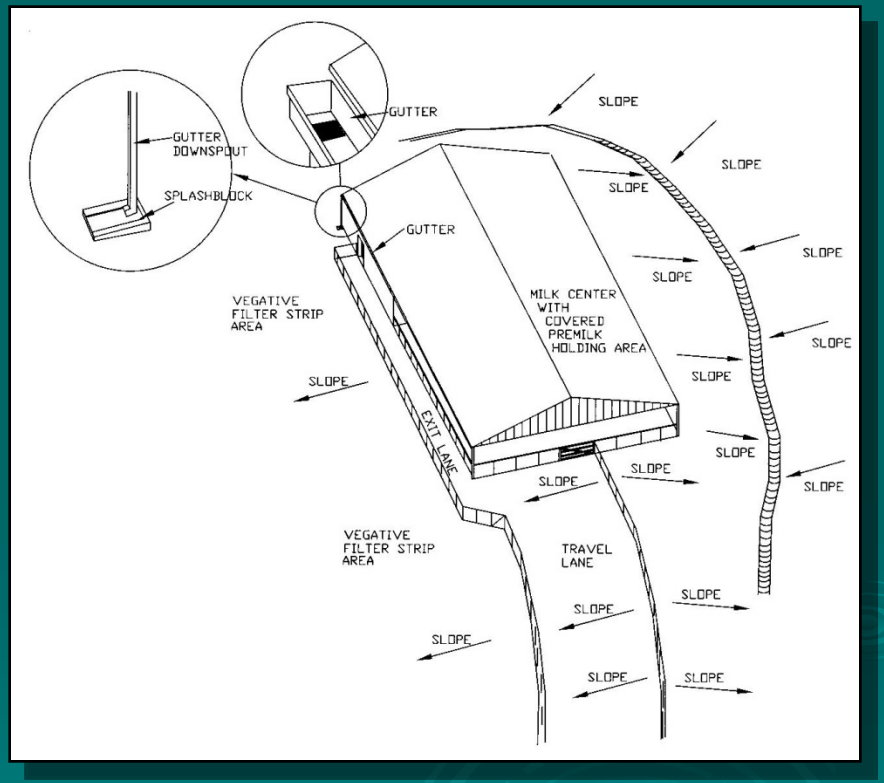
- Roof example
  - 1 inch rain
  - 25 ft x 100 ft roof
  - 2500 sqft area
  - 1,550 gal runoff
- Pasture example
  - 1 inch rain
  - ½ runs off
  - 1 ac pasture
  - 43,560 sqft
  - >13,000 gal runoff

# Runoff Management

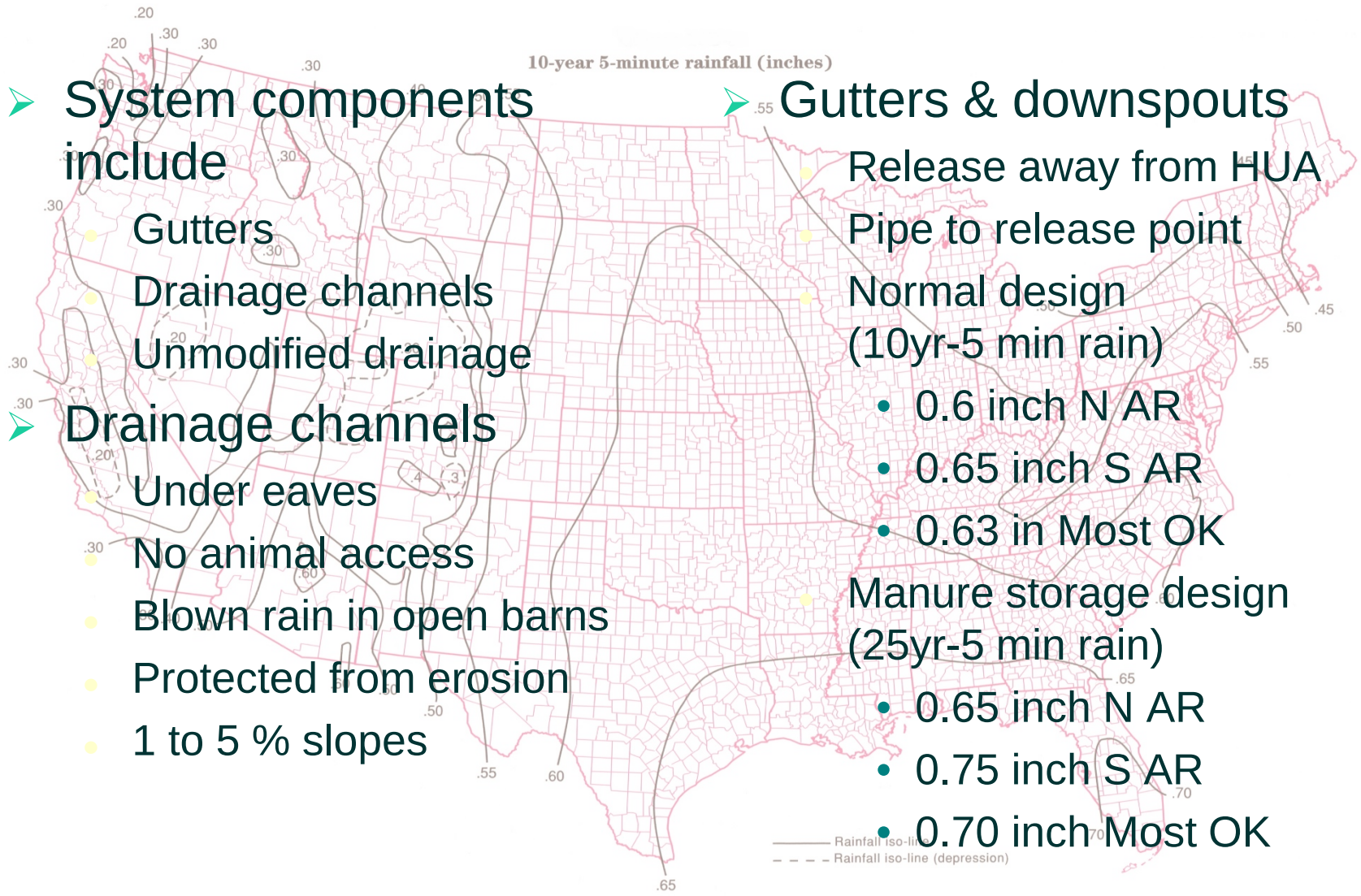
- Key concepts
  - Keep the clean water clean
  - Manage heavy use areas
  - Treat the runoff water

# Keep The Clean Water Clean

- Redirect flow of runoff
  - Roofed areas
  - Up-slope ground surface areas
- Not all runoff needs redirecting

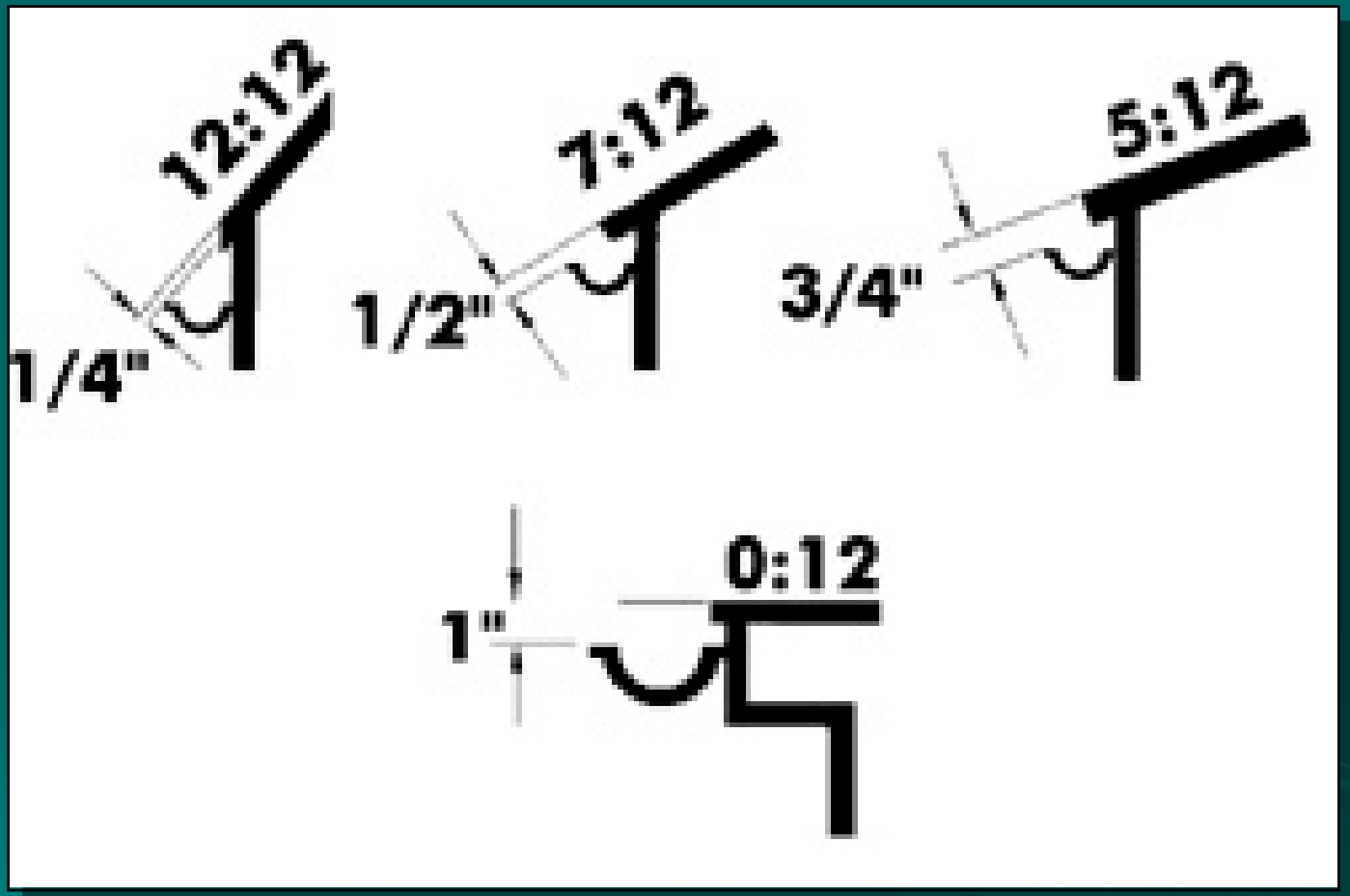


# Diverting Roof Runoff Water

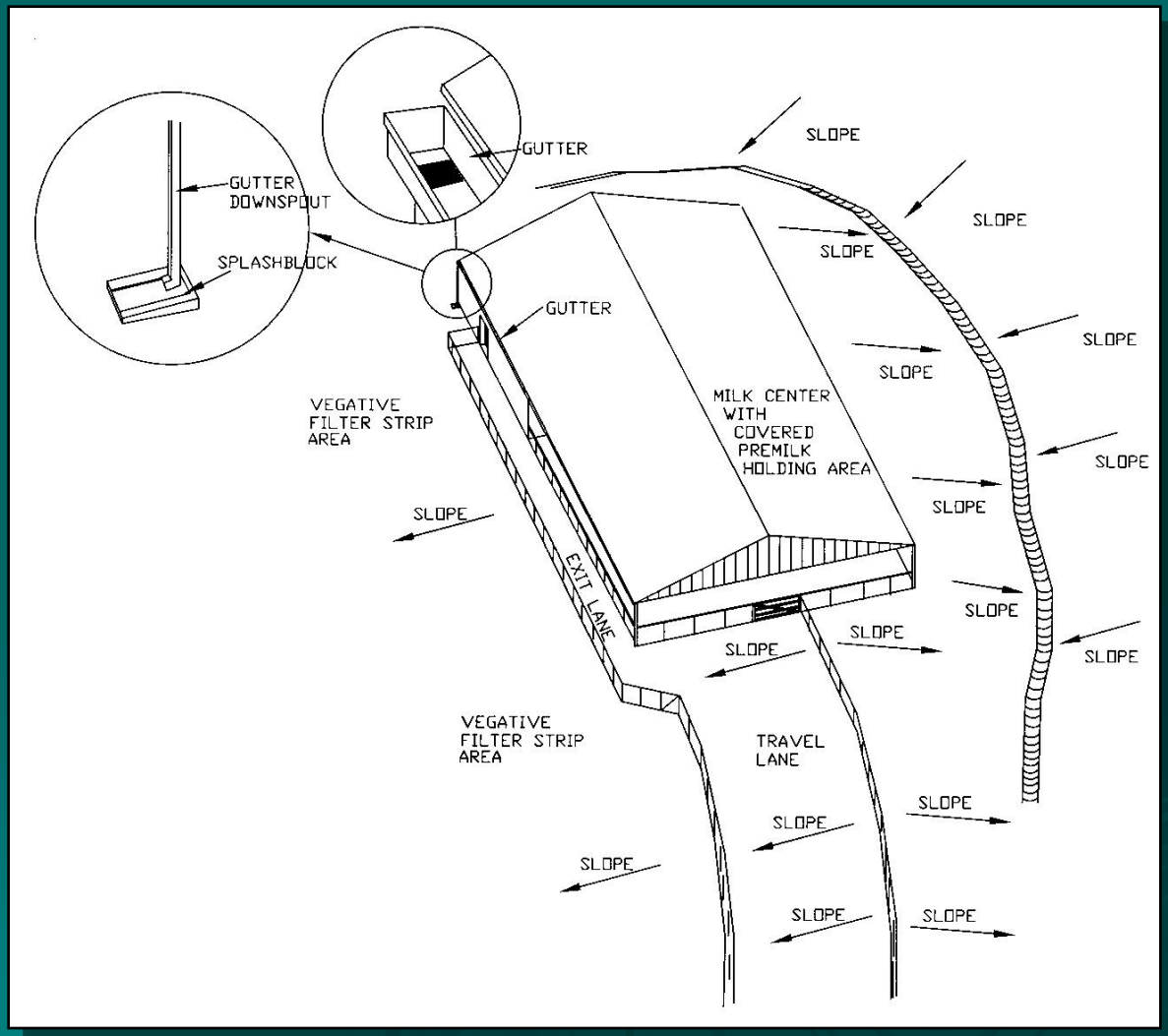



- System components include
  - Gutters
  - Drainage channels
  - Unmodified drainage
- Drainage channels
  - Under eaves
  - No animal access
  - Blown rain in open barns
  - Protected from erosion
  - 1 to 5 % slopes
- Gutters & downspouts
  - Release away from HUA
  - Pipe to release point
  - Normal design (10yr-5 min rain)
    - 0.6 inch N AR
    - 0.65 inch S AR
    - 0.63 in Most OK
  - Manure storage design (25yr-5 min rain)
    - 0.65 inch N AR
    - 0.75 inch S AR
    - 0.70 inch Most OK

# Avoiding Gutter Ice Damage



# Diverting Ground Surface Runoff Water



# Managing Potential Pollutant Materials And Areas

- Ideally Protected From Weather
- Roofs Often Not Practical Or Cost Effective For
  - Small Farms
  - In Frequent Mortality Farms
- May Be Required If Manure Is Used In Process
- For Outside Piles
  - Shaped To
    - Minimize Runoff
    - Material Saturation
- Maximize Vegetated Areas
- Minimize Non Vegetative Areas

# Managing Non Vegetated Heavy Use Areas

- Starts with good design
  - Not too large or too small
  - Consider animal and equipment movement
  - Runoff diversions
  - Proper drainage
  - Minimize flow length
- Options if needed
  - Gravel (with or without geotextile)
  - Concrete
  - Coal ash products
- Scraping frequency
  - Soil & gravel surfaces
    - Infrequently
    - Don’t remove base material
    - Maintain grades
    - Fill low spots
  - Concrete
    - Scrap as needed
  - Coal ash products
    - Occasionally as needed
    - Scrap lightly to protect surface

# Treating Runoff Water

Largely a matter of isolating and providing distance to let nature work

| Sensitive area | Minimum separation distance (feet) |
|---|---|
| Property line | 50-100 |
| Residence or business | 200-500 |
| Well or other potable water source | 100-200 |
| Surface water (wetlands, steams, ponds, lakes) | 100-200 |
| Subsurface drainage pipe or drainage ditch discharging to natural water course | 25 |
| Water table (seasonal high) | 2-5 |
| Bedrock | 2-5 |
| Note: Required minimal separation distances will depend on pertinent regulations or state/local practices. | |

Adapted from Rynk, R., et.al., On-Farm Composting Handbook. Publication NRAES-54. Northeast Regional Agricultural Engineering Service. https://www-mwps.sws.iastate.edu/catalog/home-acreages/farm-composting-handbook. Table 7.1 pg 65.

# Treating The Heavy Use Area Runoff

- In Addition To Distance
  - Water Collection And Land Application
    - Usually Best To Avoid Due To
      - Increased Costs
      - Increased Management
      - Likely Regulated
  - Designed Flow Over Vegetation (Filter Strips)
    - Sheet Flow Required
    - Existing Pasture Maybe Acceptable
    - Grading And Reseeding May Be Needed

# Nuisance Issue Management

- What Defines A Nuisance Depends On The Perspective Of Individual Making The Determination
- Perspective Defines
  - “Timely” Corrections
  - “Acceptable” Corrections
- “Unacceptable” situations
  - Poor neighbor relations
  - Complaints to the “regulators”
  - Regulatory visits

# Proper Nuisance Management Active Approaches

- Design For Needs/Preferences
- Manage Composting Process
- Don’t Store Mortality Compost ASAP
- Completely Surround Mortality With Carbon
  - Filter Odors
  - Absorb Water
- Predators/Carnivores
  - Indicate A Problem With Composting
  - Walls, Panels, Electric Fences

# Proper Nuisance Management Isolation Approaches

- Distance from neighbors
- Visual
  - Distance
  - Visual Barriers
    - Landscaping
      - Natural
      - Planted
    - Buildings
  - Visible but not noticeable

# Operational Considerations

- Design and build to
  - Match Mortality needs
  - Match site/location needs
  - Match regulatory/cost share requirements
  - Match operator preferences
- Adequate distance from other farm activities
- All weather access
- Easy access to water for composting

# Key Concepts

Summary

- Keep Clean Water Clean
- Manage Potential Pollutant Materials And Areas
- Treat Dirty Water
- Minimize Nuisance Conditions
- Keep Operation As Inconspicuous To The Public As Possible
- Make Management And Maintenance Part Of Daily Tasks

# Questions, Comments, Discussions

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