

**Alameda County**  
**Manure Management Plan Guidelines for**  
**Commercial Equestrian Facilities**

1. Provide a map of project site showing all livestock areas, structures, roofed areas, manure storage area, wash rack(s), property lines, fencing, topography, waterways, drainage ways, water sources, and surfacing materials (base rock, bare soil, mats, fines pasture vegetation, etc.). Show measured setbacks to drainage ways and streams. Map shall be drawn at a minimum of 1"=40' and indicated name of preparer and date it was drawn.
2. Show and identify all drainage facilities, including roof gutters and down spouts, berms, ditches, culverts, curtain drains, retention/detention structures, etc.
3. Show and identify any area with slopes over 15%.
4. Identify how many head of livestock are kept in which areas. Identify types of livestock.
5. Describe procedures and frequency for collection, transport, storage, compost (if applicable and approved by the Alameda County Resource Conservation District), and disposition of manure. Describe measures to prevent rainfall and runoff from contacting manure.
6. For the manure storage facility, show a detailed (minimum of 1"=20') plan view and elevations, with dimensions. Describe materials. If temporary materials are used such as hay bales or soil berms, describe a maintenance and replacement plan.
7. Describe proposed methods to eliminate rainwater run-on and run-off such as: cover, roofing, berming to minimize percolation of urine, ammonia, soaps and nitrate into the soil and groundwater.
8. Describe any seasonal changes in the operation or use of different areas.
9. Specifically describe how the following requirements will be met:
  - a. Control drainage and implement other measures as necessary to minimize soil erosion and avoid contamination of rainwater and runoff by animal waste.
  - b. Keep animal waste and bare soil areas at least 50-100 feet from streams and 25 feet from drainage ways. If these setbacks cannot be maintained, implementation of other protective measures will be necessary as described by the inspector from the Environmental Health Service, Clean Water Program, Building/Grading or Planning Department.
10. If a County site inspection is performed on existing permitted facilities and any department determines that extensive site mitigation measures (i.e. erosion control engineering) are required, the renewal application may be postponed until the measures have been implemented

# MANURE MANAGEMENT WORKSHEET FOR EQUINE FACILITIES

## INTRODUCTION

### Worksheet Organization

This worksheet is organized to lead the applicant through the process of developing the manure management plan for their facility. Water quality objectives are stated (in boxes shaded in gray) along with some basic management considerations and measures. Next, questions are asked to prompt the applicant to consider each aspect of manure management (this worksheet is available electronically, so more spaces can be added to allow room for answering questions- only minimal space has been allowed here). Each facility is different because of varying site conditions, size and scope of operations, management activities, and site development goals and resources; this worksheet allows the applicant to explain their particular situation and decide what works best for them.

*The water quality protection objectives of Alameda County can be provided by the Clean Water Inspector, Marc Fournier, at 510-670-6210.*

### Worksheet Format

The worksheet is formatted to allow the applicant to move past aspects of manure management that do not apply to his/her situation. It allows short answers when appropriate, but some questions may require a more extensive explanation or diagrams on a separate piece of paper. The applicant will be responsible for asking for clarification or explanations for specific items that arise from filling out the worksheet, using the resources and assistance provided, and then providing an acceptable and complete plan

### Manure Management Measures

Manure management measures are methods and activities taken to collect, store, transport and use manure, especially in regard to providing natural resources protection. Examples include containing manure in bins, regularly scraping manure out of paddocks, and installing grass filter strips or grassed waterways to protect nearby watercourses. There are numerous cost-effective measures that can be used singly or in combination to help the landowner achieve economic, environmental, and site operations and management goals. The selection of a practice or practices with the "best fit", with reasonable economics, to solve the problem or improve conditions does require site evaluation. Detailed descriptions of such measures (also termed "practices") are beyond the scope of this worksheet.

The applicant may wish to consult informational materials in order to find out the options available and then determine the most suitable measures for their particular site and operation. Fact sheets and manuals are available that explain manure storage areas, composting, manure spreading, stormwater management, pasture and paddock management. The Alameda County Clean Water Program inspector and County planners can refer the applicant to information sources.

# MANURE MANAGEMENT WORKSHEET FOR EQUINE FACILITIES

**OBJECTIVE I. Stockpiled, accumulated, spread or stored manure will not contribute manure constituents to local waterways, bodies of water or groundwater.**

- Keep surface runoff (storm water) away from manure storage areas and other areas where manure is present.
- Keep manure storage areas away from drainages and water bodies
- Keep drainage from manure/spent shavings from percolating down into soil in areas where groundwater protection is a priority. Cover manure/spent shavings when it is saturated.
- Make access to storage areas convenient; size them adequately; have a contingency plan for when waste volume exceeds capacity.

## A. Manure Generation and Storage Area (MSA)

➤ 1. Using the calculations below, determine the total volume of manure wastes generated on your site.

a) \_\_\_\_\_ total number of horses X  $\begin{matrix} 40 \text{ lbs of manure only} \\ \text{-OR-} \\ 60 \text{ lbs of manure (if you mix} \\ \text{with wet bedding or shavings)} \end{matrix}$  = \_\_\_\_\_ TOTAL pounds of manure wastes generated on site per day

b)  $\frac{\text{_____ TOTAL pounds of manure wastes generated on site per day}}{62.4 \text{ lbs/ft}^3}$  =   A   TOTAL ft<sup>3</sup> of manure wastes generated per day

**Note:** If you have more than one manure storage area, use the above calculations for the number of horses that utilize each storage area. For example: out of 60 total horses, 20 horses utilize one storage area and will generate X amount of wastes and 40 utilize the other storage area and generate X amount of wastes per day.

➤ 2. Using the calculation below, determine the manure storage volume for each storage area.

\_\_\_\_\_ length of area (ft) X \_\_\_\_\_ width of area (ft) X \_\_\_\_\_ height of area (ft) =   B   TOTAL ft<sup>3</sup> of each storage area

➤ 3. Using the calculation below, determine the time holding capacity for each storage area. This is the MAXIMUM days you may hold the manure wastes in the storage area before it should be removed.

$\frac{\text{  B  }}{\text{  A  }}$  = \_\_\_\_\_ MAXIMUM time holding capacity of each storage area

➤ 4. How often are the following areas cleaned and by whom?

Stalls: \_\_\_\_\_ Paddocks \_\_\_\_\_

Turnouts: \_\_\_\_\_ Arenas? \_\_\_\_\_

5. Are the manure wastes hauled off the site?

Yes

Who hauls the wastes off site? \_\_\_\_\_

Where do the wastes go (receiving site, name, address, phone #) \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

Please provide a copy of the receipt and/or agreement you have with the hauler and receiving sites.

6. Describe your backup plan if hauler or receiving site is unavailable.

\_\_\_\_\_  
\_\_\_\_\_

7. Describe each manure storage area(s) (for example, dumpster with lid, concrete pad with sides, composting box). If you are using more than one type of storage area, describe each area.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

8. Are your manure storage areas clearly marked on your site plan?

Yes  → No  → (Update site plan)

9. Is there all-weather access? Yes  →

No  → (Describe contingency plan for loss of access due to weather, or to due to other causes [hauler unavailable, etc.]):

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

10. Do you stockpile manure/spent bedding in a constructed storage area (e.g., 3-sided bin) or in open piles on the ground?

No  →

Yes  → Describe size (dimensions-length, width, height) and capacity (in cubic yards)

How frequently is it emptied or cleared out? \_\_\_\_\_

What equipment do you use to empty or clear it out? \_\_\_\_\_

Is the storage area covered (roof)? No  Yes  → What are the roof dimensions?

Does the roof drain water away from the storage area? Yes  No

Is temporary cover (tarp) available for use when pile is approaching saturation?

Yes  No

➤ 11. Is the stockpiled manure/spent bedding hauled off site? No  → Yes  (see questions below)→

Who hauls it away? \_\_\_\_\_

How often? \_\_\_\_\_

Contingency plan if for any reason it can't be hauled out on schedule: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

➤ 12. Is the MSA located on an impervious (water can't drain down through it) surface such as concrete, asphalt or compacted rock?

Yes  → No  → (see questions below)

Is water table less than \_\_\_?(insert reasonable depth beyond which leaching is not a concern) **Note:** groundwater resource information is available, especially for areas of groundwater concern.

No  → Yes  → (see questions below)

Is groundwater protection a concern in the area? Yes  No

Are soils sandy or gravelly or clay soil that cracks deeply in dry months? Yes  No

Soil type (USDA Soil Classification and depth): \_\_\_\_\_

How will you ensure that liquid from manure pile will not leach downward into soil?

\_\_\_\_\_  
\_\_\_\_\_

➤ 13. Does water drain into or through the MSA?

No  → Yes  → (Describe plan to divert water away from the MSA):

\_\_\_\_\_  
\_\_\_\_\_

Where does this water drain to? \_\_\_\_\_

\_\_\_\_\_  
How is it conveyed (in a ditch, pipeline, etc.)? \_\_\_\_\_

➤ 14. Is the MSA on flat or nearly flat land? \_\_\_\_\_

Is the land slightly sloping \_\_\_\_\_

Moderately sloping terrain \_\_\_\_\_

Steeper than 10%? \_\_\_\_\_

☛ 15. Is there year round (all weather) access to the storage area?

Yes  → Describe: \_\_\_\_\_

No  → Describe contingency plan for period without access (i.e., disposal or storage at an alternate location): \_\_\_\_\_

☛ 16. Is MSA located within 50 feet (of the bank or edge of drainage) of any intermittent (no year-round flow) or any perennial (year-round flow) stream, waterway drainage way, spring, pond, creek or other water body?

No  → Yes  → How far? \_\_\_\_\_

☛ 17. Is there a grass filter strip (gently sloping ground, with primarily dense grass cover, to slow runoff flowing through it and trap particles of manure or soil) between the MSA and the drainage way? Yes  No

Describe different slope, soil and vegetation conditions between the MSA and the drainage way:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

☛ 18. Do you have other plans to store manure/spent shavings?

No  → Yes  → Describe: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**B. Spreading Manure/Spent Shavings On Site**

**➤ 1. Do you plan to spread manure/spent shavings on site?**

No  → (Go to C)      Yes  → (Describe Location):

Slope of land where manure is to be spread:

Flat to nearly flat

Gently sloping

Moderately sloping

Steeper: \_\_\_\_\_

What type of crop or other vegetation is present where manure will be spread?

\_\_\_\_\_

Frequency (how many times will manure be spread per year?) \_\_\_\_\_

Method of spreading (equipment used) \_\_\_\_\_

Will you be discing manure/ spent shavings into the soil? \_\_\_\_\_

How thick of a layer will you apply? \_\_\_\_\_

**➤ 2. Are you spreading spent shavings within 50 feet of any perennial waterway, drainage way, spring, pond, creek, well, or other water body (check distances)?**

No  → (Go to I.B.4)      Yes  → Is there a grass filter strip (gently sloping ground, primarily dense grass cover, to slow runoff flowing through it and trap particles of manure or soil) between the land spread upon and the drainage way or water body?

Yes  → How wide? \_\_\_\_\_

What is the slope, soil, and vegetation condition in the filter strip? \_\_\_\_\_

\_\_\_\_\_

No  → Describe plan to manage water drainage from land area where spreading will take place: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**➤ 3. Describe contingency plan if storage area capacity is exceeded before manure can be spread:**

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**➤ 4. Does the ratio of horses to acres of spreading area exceed 2 horses per 10 acres?**

No  → (I have no more than 2 horses per 10 acres of land to spread on) → (Go to I.C.5)

Yes  → (I have more than 2 horses per 10 acres of land to spread on)

How many horses? \_\_\_\_\_

☛ 5. Is area of manure spreading shown on site plan map?

Yes  → (Go to I.B.6) No  → (Update site plan)

☛ 6. For how many years has manure been spread in the same location?

### C. Open Air Paddock Areas

☛ 1. Do you plan to maintain horses in open air (unroofed/uncovered) areas such as stalls, paddocks, turnouts, corrals, pipe pens, etc?

No  → (Go to Objective II) Yes

☛ 2. How often are paddocks, corrals, arenas, etc. cleaned?

With what equipment? \_\_\_\_\_  
\_\_\_\_\_

☛ 3. Are the paddocks, corrals, arenas etc. on flat or nearly (1-3% slope?)

Flat to nearly flat

Gently sloping

Moderately sloping terrain

Steeper: \_\_\_\_\_

☛ 4. Is there surfacing material applied to these areas? Yes  No

What kind in each area? \_\_\_\_\_

☛ 5. Does water puddle or pond during and after storms?

No  → Yes  → Describe plan to prevent puddled water in paddock areas:

\_\_\_\_\_  
\_\_\_\_\_

☛ 6. Is paddock area located within 50 feet of any intermittent or any perennial stream, waterway, drainage way, spring, pond, creek or other water body?

No  → Yes  → Is there a grass filter strip between paddock and drainage way to trap manure and soil particles?

Yes  → How wide? \_\_\_\_\_

Shown on site plan map? Yes  No

What is the slope, soil, and vegetation condition:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

No  → Describe measures to prevent manure/soil particles from entering waterways:

\_\_\_\_\_  
\_\_\_\_\_



**7. Does water drain into/ through the paddock area?**

No  → Yes  → Describe plan to divert water away from paddock area:

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Where does this water drain to? \_\_\_\_\_

How is it conveyed (in a ditch, pipeline, etc)? \_\_\_\_\_

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**8. Does water run off paddock areas?**

No  → Yes  →

Does it drain to a drainage way, seasonal waterway, a year round waterway or other water body?:

No  → (Go to Objective II) Yes  → Describe plan to control water drainage from paddock area:

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Where does this water drain to? How is it conveyed (ditch, pipeline etc.)?

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**9. Does your site plan show drainage plan? Yes  → (Go to Objective II)**

No  → (Update site plan)

**Objective II: Keep waste waters from horse facilities out of drainage ways, storm drains, other bodies of water, and groundwater.**

- Minimize the volume of wastewater produced
- Drain waste water into septic systems, sewer systems or vegetated filter strips for treatment
- Avoid discharging waste water directly into storm drains, drainages, creeks, ponds.

**A. Horse Wash Areas**

➤ 1. Do you have designated horse wash areas at your facility? Yes  No

➤ 2. Is the horse wash facility at your site located within 50 feet of any intermittent waterway or any perennial waterway, drainage way, creek, pond (check distances)?

No  → Yes  → How close? \_\_\_\_\_

➤ 3. Does the wash area have a hard surface with a drain?

No  → Yes  → Describe Surface: \_\_\_\_\_

\_\_\_\_\_

➤ 4. Where is the water discharged to? \_\_\_\_\_

Is it discharged to a grass filter strip? No  → Yes  → How wide? \_\_\_\_\_

Describe soil, slope and vegetation in the filter strip: \_\_\_\_\_

\_\_\_\_\_

➤ 5. Does the horse wash area drain to a sewer or septic system?

No  → Yes  → What is the approximate volume of water discharged?

\_\_\_\_\_

➤ 6. Do you practice other wastewater management practices?

No  → Yes  → Describe:

\_\_\_\_\_

\_\_\_\_\_

➤ 7. Is horse wash area and wastewater management shown on your site plan (map)?

Yes  → No  → (Update site plan)

## B. Stall Washing

### 1. Do you wash indoor stalls?

No  → (Go to Objective III)      Yes  → If indoor stalls (with solid flooring, not soil or other permeable surface material) are washed out with water containing soap or other chemicals, where does the resulting dirty water drain? \_\_\_\_\_

What is the plan for treating the dirty water? \_\_\_\_\_

How often is stall washing done? For what reasons? \_\_\_\_\_

**Objective III: Keep grazing horses from overgrazing (denuding) pastures, eroding creek banks and damaging riparian (streamside) vegetation.**

- Maintain a minimum height of 4" of grass on pastures (can be dry grass at end of season) to protect soil from erosion and to maintain plant vigor.
- Fence horses out of creeks and ponds when possible; provide other sources of drinking water
- Practice rotational grazing; divide up pastures and move horses from one to another to allow pastures to rest and recover
- Confine horses in paddocks when pastures are wet or when forage is no longer available in pastures
- Develop water sources to attract horses to remote portions of pastures.
- Manage weeds

**Note:** in this worksheet pastures are considered to be areas where grass is grown for forage for horses and maintained to prevent erosion; pastures are distinguishable from paddocks because paddocks are smaller in size and considered confinement areas with little or no vegetative cover.

**1. Do horses graze in pastures located on your property?**

No  → (Go to Objective IV)      Yes  → Are pastures shown on site plan map?

Do you have at least 10 acres of pasture for each horse?

Yes  → (Go to Objective IV)      No  → I have more than 1 horse per 10 acres of pasture

**2. Do you board horses that are kept in pastures full time ("pasture horses") that do not have access to stall or a paddock?    No     Yes  → How many horses?**

Size of pastures

**3. Do the horses have direct, unlimited access to drainage ways, stream channels or ponds?**

Yes     No

Are your stream/pond banks fenced to limit access?    Yes     No

**4. Do you have more than one pasture?    No     Yes  →**

Do you practice rotational grazing?    Yes     No

Do you irrigate any of your pastures?    Yes     No

**5. Are horses removed from pastures when necessary to protect pastures from erosion and damage to grass?    No     Yes  → When pasture soils are wet?    Yes     No**

Are horses removed from pastures after grass has been grazed down to a minimum of 4"?

Yes     No

Other ways you protect soils and grass from erosion or compaction: \_\_\_\_\_

**6. Do you confine horses to paddocks or turnout areas in order to protect pastures from excessive trampling?    Yes     No**

**7. Other pasture management measures or practices that you use to protect your pastures from erosion? \_\_\_\_\_**

**8. Do you manage your pastures to limit or control weeds?    ?    Yes     No**

**Objective IV: Keep hazardous materials from tractor/vehicle maintenance and farm chemicals from carrying into local waterways.**

**A. Equipment Maintenance**

➤ 1. Do you perform tractor, equipment or vehicle maintenance or store maintenance supplies or fuel and oil?

No  → (Go to Objective IV.B)      Yes  → Are the work and storage areas on an impermeable surface?

Yes  → Describe storage area surface: \_\_\_\_\_

\_\_\_\_\_

No  → Describe practices to control pollutants from draining to waterways or leaching into soil:

\_\_\_\_\_

➤ 2. Are the work and storage areas covered?

Yes  → Describe: \_\_\_\_\_

\_\_\_\_\_

No  → Describe practices to control pollutants from draining to waterways or leaching into soil:

\_\_\_\_\_

➤ 3. Does your site plan show work and storage areas?

Yes  →      No  → (Update site plan)

**B. Farm Chemicals and Paint**

➤ 1. Do you use farm chemicals for pest control or fertilizer or store paint or other hazardous materials?

No  → Worksheet complete      Yes  → Is the storage area on an impermeable surface?

Yes  → Describe: \_\_\_\_\_

\_\_\_\_\_

No  → Describe practices to control pollutants from draining to waterways or leaching into soil:

\_\_\_\_\_

**➤ 2. Is the storage area covered?**

**Yes**  → Describe: \_\_\_\_\_

\_\_\_\_\_

**No**  → Describe practices to control pollutants from draining to waterways or leaching into soil:

\_\_\_\_\_

\_\_\_\_\_

**➤ 3. Does your site plan show storage area for farm chemicals and paint?**

**Yes**  → Worksheet complete      **No**  → (*Update site plan*)

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