
2016 Pollution Source Control Inspections at Commercial Animal Handling and Composting Facilities

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Submitted by:

Snohomish County- Surface Water Management Division
Public Works Department

Authors: Bob Bernhard, Sean Hare and Brittany Baugher

Table of Contents

Executive summary.....	3
1.0 Introduction.....	5
1.1 Background.....	5
1.2 Best Management Practices.....	6
2.0 Project implementation.....	7
2.1 Coordination and Notification.....	7
2.2 Inspection Inventory.....	7
3.0 Results.....	9
3.1 Inspections Completed.....	9
3.1.1 Facilities Inspected.....	9
3.1.2 Facilities Not Inspected.....	9
3.2 Non-compliant Facilities.....	10
3.3 Compliant Facilities.....	10
3.3.1 Non-livestock Facilities.....	10
3.3.2 Livestock Facilities.....	11
4.0 Discussion.....	13
4.1 Animal Waste Management BMPs.....	13
4.1.1 Composting.....	13
4.1.2 Offsite Disposal.....	14
4.1.3 Manure Spreading.....	16
4.2 Livestock Management BMPs.....	16
4.3 Suggested Actions.....	17
4.3.1 Commercial Animal Handling BMPs.....	17
4.3.2 Policy and Inventory Management.....	20
5.0 Conclusion.....	23
References.....	25
Appendix 1. Primary BMPs Inspected.....	27
Appendix 2. Pre-Inspection Letter.....	29

EXECUTIVE SUMMARY

As a requirement of Snohomish County's National Pollutant Discharge Elimination System (NPDES) municipal stormwater permit, the Surface Water Management Division (SWM) implemented a project to inspect qualifying facilities for sources of fecal coliform pollution. Qualifying facilities included commercial animal handling operations—such as kennels, groomers, veterinary centers, and equestrian operations— and commercial composting facilities located in water quality impaired watersheds with fecal coliform total maximum daily loads (TMDLs). Within Snohomish County, the watersheds included the Stillaguamish River, Snohomish River, North Creek, Swamp Creek and Little Bear Creek.

The objective of the project was to verify the implementation of best management practices (BMPs) at qualifying facilities in order to eliminate and prevent illicit discharges of fecal coliform and associated pollutants to the county's municipal storm sewer system (MS4) and fecal coliform impaired surface waters. As required by Snohomish County Code 7.53.120, "any person storing or using materials containing contaminants in any manner that may result in a prohibited discharge shall implement the source control BMPs described in Volume 4, Chapter 2 of the *Snohomish County Drainage Manual* (Drainage Manual)". Additional BMPs for specific activities (e.g., commercial animal handling areas) or land uses are listed in Chapter 3 of the Drainage Manual. The failure to implement BMPs can result in non-compliance, which if not addressed, may be handled through progressive enforcement measures. SWM focused primarily on animal waste management practices, animal access to surface water, condition of animal holding areas, and proximity of onsite activities to county storm drain systems and surface waters.

Prior to facility inspections, SWM took measures to inform and involve the agricultural community with the project required by the county's NPDES permit. SWM collaborated with the Snohomish Conservation District to establish a referral program for facilities requiring additional assistance. SWM also met with and informed the Snohomish County Agricultural Advisory Board about the project. Facilities received pre-inspection letters from SWM requesting a site visit to assess BMPs used to control sources of fecal coliform and associated pollutants.

SWM inspected 99 facilities for fecal coliform source control BMPs. The facilities were comprised of approximately 50 percent equestrian operations, 30 percent kennel and grooming operations, and 20 percent veterinarian, composting or other livestock operations (alpaca, mink and packing company). Approximately 95 percent of the inspected facilities were utilizing BMPs to prevent fecal coliform and associated pollutants from entering the county's storm drain system and nearby surface waters.

SWM inspectors observed 6 BMP deficiencies among the 6 non-compliant facilities. The most frequently encountered deficiency was the practice of stockpiling animal waste (manure and stable waste) in a manner that created a high potential for runoff to discharge to the county's storm drain system or surface waters during rain events. All 42 non-livestock facilities were found to be compliant with applicable fecal coliform source control

BMPs. The majority of the 57 livestock facilities inspected were also found to be compliant. Although the majority of the livestock facilities were compliant (51/57; 90 percent), two-thirds of the facilities (38/57) were lacking one or more BMPs—such as cover and/or containment for manure piles exposed to stormwater. However, it was determined that the deficient BMPs did not create a potential for illicit discharges to the county’s storm drain system or surface waters.

BMPs in the county’s Drainage Manual list necessary actions required to maintain compliance with the Snohomish County Code, but the interpretation and implementation of applicable BMPs was not consistent amongst the public. A revision of the Drainage Manual’s commercial animal handling areas BMPs—incorporating standards created by agricultural agencies (e.g., USDA’s National Resources Conservation Service) and pertinent Snohomish County code (e.g., SCC 30.62A – Wetlands, Fish and Wildlife Habitat Conservation Areas)—could clarify whether compliance with the Snohomish County Code is being achieved as well as decrease the potential for illicit discharges. Suggested sections of BMP revision include stockpiling materials, animal exclusion, buffers and livestock density.

During the project SWM learned of several barriers that prevented business owners from implementing BMPs including: costs associated with building a compost or manure containment structure, off-site hauling of animal waste, access to a manure spreader, and installation of animal exclusion fencing. Many of these barriers were cited by smaller commercial equestrian operations trying to sustain business while competing with larger, more lucrative boarding operations. Manure management represents a significant concern throughout unincorporated Snohomish County. This issue extends beyond commercial animal handling facilities and likely includes hundreds of residential hobby farms around the county. Snohomish County and the agricultural community should continue to collaborate on implementing efforts that aim to: increase outreach and education, improve manure management techniques and explore more options for proper offsite waste disposal.

1.0 INTRODUCTION

1.1 Background

As a requirement¹ of Snohomish County’s National Pollutant Discharge Elimination System municipal stormwater permit (NPDES permit), the Surface Water Management (SWM) Division implemented a project to inspect qualifying facilities for sources of fecal coliform² pollution. Qualifying facilities included commercial animal handling operations and composting facilities located in water quality impaired watersheds with fecal coliform total maximum daily loads (TMDLs)³ and that contribute runoff to the county’s municipal storm sewer system (MS4). Within Snohomish County, the watersheds included the Stillaguamish River, Snohomish River, North Creek, Swamp Creek and Little Bear Creek (Figure 1).

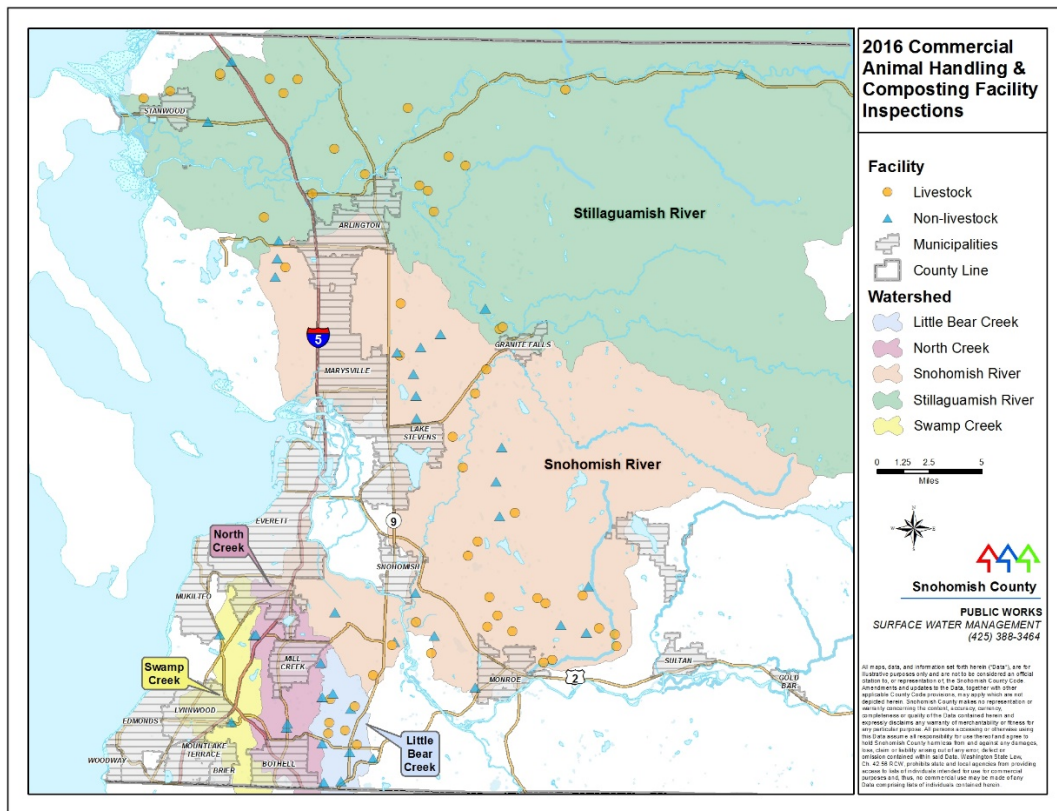


Figure 1. Facilities inspected in watersheds with fecal coliform total maximum daily loads

¹ Appendix 2 of the 2013-2018 NPDES Phase I Municipal Stormwater Permit (Ecology, 2012)

² Fecal coliform are a group of bacteria found in the feces of warm-blooded animals (e.g., people, livestock and wildlife). The bacteria, often existing along with disease-causing bacteria and viruses, serves as an indicator for the presence of potential pathogens.

³ A TMDL is the maximum amount (load) of pollutant allowed to enter a waterbody in order for the waterbody to meet and continue to meet water quality standards.

The objective of the project was to verify the implementation of best management practices (BMPs) at qualifying facilities in order to eliminate and prevent illicit discharges of fecal coliform and associated pollutants to the county's storm drain system and fecal coliform impaired surface waters. Per the 2013-2018 NPDES permit, all qualifying facilities were to be inspected⁴ by August 1st, 2016. A similar project was completed in 2010 for the county's 2007-2012 NPDES permit. Commercial animal handling and composting operations were inspected in the Snohomish River, North Creek and Swamp Creek watersheds to ensure the implementation of fecal coliform source control BMPs. Such inspections were not required in the Stillaguamish River and Little Bear Creek watersheds for the previous NPDES permit (Ecology, 2007).

1.2 Best Management Practices

Activities and byproducts from animal handling operations and composting facilities generate pollutants that, if not properly managed, have the potential to contaminate storm drain systems and nearby surface waters. Stormwater runoff contaminated by animal waste (manure) can supplement existing populations of fecal coliform in storm drain systems and surface waters while the addition of nutrients and suspended solids may further stimulate growth of the bacteria. By implementing BMPs, required and enforced by Snohomish County Code⁵, the potential for such illicit discharges are lessened. Applicable BMPs can be found in Volume 4 of the Drainage Manual (Snohomish County, 2016). SWM focused primarily on animal waste management practices, animal access to surface water, condition of animal holding areas, and proximity of onsite activities to county storm drain systems and surface waters. The primary BMPs inspected during site visits can be found in Appendix 1.

⁴ Facilities that did not grant permission to inspect (i.e., denial) or where access was not obtained (e.g., fenced property, posted no trespassing signage, and no contact information) were recorded as such.

⁵ Water Pollution Control Code, Chapter 7.53.020 SCC...owners, occupants and operators of real property must effectively implement all known, available and reasonable methods of treatment and control of discharges from their real property, consistent with the county's Drainage Manual, RCW 90.48.260, the Clean Water Act, and the county's Phase 1 NPDES municipal stormwater permit.

2.0 PROJECT IMPLEMENTATION

2.1 Coordination and Notification

Prior to facility inspections, SWM took measures to inform and involve the agricultural community with the project required by the county's NPDES permit. SWM collaborated with the Snohomish Conservation District⁶ to establish a referral program. During site visits SWM inspectors informed facility owners and operators of the services the Snohomish Conservation District provides. If issues of non-compliance arose owners had the option to work with the Snohomish Conservation District—in addition to or in lieu of working with SWM inspectors—to achieve compliance. Regardless of whom facility owners and operators worked with to address non-compliant issues, SWM staff verified final compliance by means of a final source control inspection.

During the development of the referral program Snohomish Conservation District staff trained SWM inspectors on BMPs that address livestock management. Applicable livestock BMPs included but were not limited to: designating a sacrificial area to corral livestock when pastures or paddocks cannot be grazed; rotating livestock amongst paddocks to deter overgrazing; installing gutters and downspouts on livestock shelters and barns to prevent the formation of mud; removing manure from paddocks; storing animal waste away from surface waters and storm drain systems; and installing exclusionary fences to prevent livestock from accessing stream banks and riparian habitats (Snohomish Conservation District, 2012).

SWM also met with and informed the Snohomish County Agricultural Advisory Board⁷ about the project prior to its implementation. A status update was delivered to the Agricultural Advisory Board midway through the project implementation, and a final report will be presented to the board in late 2017 or early 2018.

2.2 Inspection Inventory

Specified by the NPDES permit, qualifying facilities were operations associated with Standard Industrial Codes 074 and 075—such as kennels, groomers, veterinary centers, and equestrian operations—as well as composting operations defined by Washington Administrative Code (WAC)⁸. Dairies and non-dairy permitted concentrated animal

⁶ The Snohomish Conservation District is a non-regulatory subdivision of state government that works with farmers, urban, suburban and rural landowners on a voluntary basis in order to promote and encourage conservation and responsible use of natural resources.

⁷ The Snohomish County Agricultural Advisory Board is an advisory board to the county council, Planning Commission, Hearing Examiner and other county staff. The 11 member board—representing sectors such as drainage and flood control, dairy, nursery, livestock and the equine industry—serves to support and reinforce the county's agricultural preservation plan.

⁸ WAC, Chapter 173-350-200: Solid Waste Handling Standards, Composting Facilities (Washington Administrative Code, 2003)

feeding operations were not included in the inventory. Through a memorandum of understanding created with the Washington State Department of Ecology, the Washington State Department of Agriculture is authorized for implementing water quality activities under Chapter 90.48 RCW (Water Pollution Control) and Chapter 90.64 RCW (Dairy Nutrient Management) (WSDA and Ecology, 2011). An inventory of 261 qualifying facilities was generated using data obtained from the Washington State Department of Revenue State Business Records database, Snohomish County's kennel license program and pollution source control business inspection database, and the Snohomish Health District's permitted composting facilities.

SWM mailed the facilities pre-inspection letters (Appendix 2) requesting a site visit to assess BMPs used to control sources of fecal coliform and associated pollutants. In order to observe businesses in their daily routine, SWM does not customarily provide a written notice prior to a pollution source control inspection. However, due to the logistics of inspecting the facilities, often located in more distant areas of the county, the facilities received a pre-inspection letter. SWM received several responses from the pre-inspection letters, resulting in the removal of 49 facilities from the inspection inventory. Facilities were removed from the inspection inventory for the following reasons: the facility was not responsible for sources of fecal coliform bacteria pollution—such as a relief veterinarian or mobile equine acupuncturist (33/49; 67 percent); the facility was no longer in operation (12/49; 24 percent); the facility moved and no longer operated within the selected watersheds (2/49; 4 percent); or the identified facility was not a commercial operation—such as a hobby farm filing with the Department of Revenue for tax reasons (2/49; 4 percent).

3.0 RESULTS

3.1 Inspections Completed

3.1.1 Facilities Inspected

Of the 261 qualifying facilities identified, SWM inspected 99 facilities (38 percent) for fecal coliform source control BMPs. The inspected facilities were comprised of approximately 50 percent equestrian operations, 30 percent kennel and grooming operations, and 20 percent veterinarian, composting or other livestock operations (alpaca, mink and packing company). The potential to pollute was determined by evaluating a variety of factors—such as site topography, location of nearby surface waters, proximity to the county’s storm drain system, and existing site operations. Approximately 95 percent of the inspected facilities were utilizing BMPs to prevent fecal coliform and associated pollutants from entering the county’s MS4 and nearby surface waters.

Six facilities were determined to be non-compliant for failing to implement necessary BMPs. The non-compliant facilities—5 equestrian operations and 1 packing company—were notified of their deficiencies through warning letters. The facilities have or are currently working with SWM inspectors or the Snohomish Conservation District to achieve compliance. Per the NPDES permit, a reinspection of all non-compliant facilities must be completed a minimum of every three years. However, through the progressive enforcement measures established in the Snohomish County Water Pollution Control Code (SCC 7.53) it is likely a resolve will be achieved much earlier.

3.1.2 Facilities Not Inspected

SWM was unable to inspect 20 facilities for legal reasons. Facility owners or operators denied permission to conduct an inspection at 3 facilities. Access to the remaining 17 facilities was not attained because the owner or operator did not respond to SWM’s pre-inspection letter and the property was gated or displayed signage for restricted access. If there was an accessible entry, a flyer (door hanger) was left at the property requesting the facility owner or operator to contact the county to schedule an inspection. Inspectors tried various methods of correspondence—letters, door hangers, phone calls and email—to contact businesses when access was limited. Additional attempts to inspect the 17 facilities will be made before the expiration of the county’s current NPDES permit (July 31, 2018). The 3 facilities that denied permission to inspect will be mailed information on Snohomish County’s Water Pollution Control Code (SCC 7.53) and required BMP implementation. More than half of the qualifying facilities (142/261; 54 percent) were determined to be exempt from the project requirements. Approximately 20 percent of the exempt facilities were removed from the inspection inventory as a result of the pre-inspection letter with the remaining facilities deemed exempt through site visits.

3.2 Non-compliant Facilities

SWM inspectors observed 6 BMP deficiencies among the non-compliant facilities. The most frequently encountered deficiency was the practice of stockpiling animal waste (manure and stable waste) in a manner that created a high potential for runoff to discharge to the county's storm drain system or surface waters during rain events. Listed below in decreasing order of occurrence are the deficient BMPs from the *Snohomish County Drainage Manual, Volume IV*.

1. Chapter 2.3 - When exposed to stormwater, cover and contain stockpiled materials, which includes but is not limited to manure or soils, such that contamination of storm drainage conveyance systems or water of the state is prevented.
2. Chapter 3.2 - If animals are kept in unpaved and uncovered areas, the ground must either have vegetative cover or some other type of ground cover such as mulch.
3. Chapter 2.3 – Store materials in areas sloping to dead end sumps or other sufficient containment areas away from storm drain systems or surface waters.
4. Chapter 3.2 – Regularly sweep and clean animal keeping areas to collect and properly dispose of droppings, uneaten food, and other potential stormwater contaminants.
5. Chapter 2.3 – Convey any contaminated stormwater to a wet pond, settling pond, swale media filter or other treatment system approved by a federal, state or local agency.
6. Chapter 3.2 – Surround the area where animals are kept by a fence or other means that prevents animals from moving away from the controlled area where BMPs are used.

3.3 Compliant Facilities

3.3.1 Non-livestock Facilities

The 99 facilities inspected for fecal coliform source control BMPs were either livestock or non-livestock operations. The 42 non-livestock facilities included kennels (24/42; 57 percent), groomers (5/42; 12 percent), veterinary (8/42; 19 percent) and composting operations (5/42; 12 percent). All of the non-livestock facilities were found to be compliant with applicable fecal coliform source control BMPs. The kennels, groomers and veterinary centers disposed of their animal waste per Snohomish Health District's Sanitary Code: Chapter 3.1, XVII – Animal Waste Handling⁹ (Snohomish Health District, 2004). Animal feces were bagged and disposed of in a garbage receptacles. Plumbed animal

⁹ Chapter 3.1, XVII.C.2 – Animal Waste Handling: Pet waste disposal. Certain pet wastes, such as cat or dog excrement, shall be stored and disposed of in a manner, such as burial or bagging and placement into containers, which does not create a public nuisance or pollute surface waters of the state. These pet wastes may be disposed of into the sanitary sewer if the system is served by a sewer treatment facility that has approved acceptance of such wastes. Pet waste shall not be disposed of in a domestic on-site sewage system.

holding pens and runs were connected to onsite sewage systems or sanitary sewer to treat discharges of washwater and animal urine while screening out feces for disposal as solid waste.

Commercial composting operations are permitted and inspected by the Snohomish Health District, often several times a year. Requirements of the permit include: a graded or curbed compost pad to collect leachate; a leachate conveyance system and holding structure, and a stormwater management plan with a stormwater run-on prevention system, WAC 173-350-220 (Washington Administrative Code, 2003). The permit requirements greatly reduce the potential for illicit discharges that would contribute to a fecal coliform water quality impairment. If the Snohomish Health District observes an illicit discharge during an inspection, a referral is made to the Department of Ecology. SWM inspectors found the facilities to be compliant with BMP requirements in the county's Drainage Manual.

3.3.2 Livestock Facilities

The majority of the 57 livestock facilities inspected were equestrian operations (53/57; 93 percent) with the remaining facilities (4/57; 7 percent) consisting of an alpaca farm, a feed store with a variety of farm animals (i.e., chickens, goats), a mink farm and a packing company. Although 90 percent (51/57) of the livestock facilities were compliant two-thirds of the facilities (38/57) were lacking one or more BMPs. However, it was determined that the deficient BMPs did not create a potential for illicit discharges to the county's storm drain system or surface water.

4.0 DISCUSSION

4.1 Animal Waste Management BMPs

Animal waste management was the primary issue observed at livestock facilities and it is likely the primary issue of concern for non-commercial farms as well. Animal waste should be covered and contained to prevent runoff and leachate from discharging to the county's storm drain system and nearby surface waters. Based on specifications from the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS), the Snohomish Conservation District has estimated costs for an animal waste storage structure—with a concrete pad, roof and retaining walls—to range from \$5,000 to over \$40,000, depending upon the number of livestock being managed. The potentially prohibitive price may be one explanation why approximately 75 percent of the livestock facilities (43/57) were lacking cover for their animal waste and 45 percent (25/57) were lacking containment.

Regardless of how animal waste is stored, it should only be done so temporarily. Letting animal waste accumulate to an unmanageable size will only make future efforts to reduce the waste more daunting. Options for animal waste management include: composting for horticultural and agricultural use, disposing waste offsite at a landfill or composting facility, or applying the waste to fields with a manure spreader. When discussed with facility owners and operators, each of the management options had its challenges.

4.1.1 Composting

Composting can reduce the volume of animal waste by as much as 85 percent and facilitate the removal of excess nutrients (USDA, 2007a). However, in order to effectively compost animal waste in a timely matter a facility must dedicate labor and capital to manage the material. Composting—actively or passively—was the most encountered method for animal waste management at livestock facilities (33/57; 58 percent), but most of the facilities did not dedicate adequate resources for thorough composting.

4.1.1.1 Active Composting

Of the 33 facilities that were composting, only 6 (18 percent) were actively composting their animal waste by managing levels of oxygen, moisture and temperature for aerobic decomposition. A structure with a cover, walls and a concrete pad is ideal for composting. A cover helps maintain proper moisture conditions for the compost pile. Too much water during our rainy winter months or too little water during our drier summer months can greatly affect the performance of composting a manure pile (pile) (USDA, n.d.). Walls and a concrete pad are favorable for several reasons. By containing the pile within walls a sufficiently sized pile can be achieved within a small footprint. If a pile is too small it will not reach elevated temperatures necessary to kill pathogens and weed seeds (USDA, 2007a; USDA 2007b). Most facilities aerate their compost pile by mixing the composting material with a tractor or similar machinery. A structure's walls and pad help contain the

pile while it is being turned by heavy machinery. Lastly, walls and a concrete pad help prevent runoff and leachate from discharging to the county's storm drain system and nearby surface waters. Most of the facilities that were actively composting their animal waste were doing so within a structure (4/6; 67 percent).

4.1.1.2 Passive Composting

While having a composting structure with a cover, walls and concrete pad is ideal, it was not typically observed during inspections. The majority of the livestock facilities that composted their animal waste did so passively (27/33; 81 percent), often in open fields without cover. Passive composting can be an effective method as long as the piles are small enough to allow the passive movement of air through the pile, although a periodic mixing of the materials is needed to restore porosity essential for aerobic conditions (USDA, 2010). The majority of the passive compost piles were not regularly turned for aeration nor were they managed for necessary moisture levels. The moisture content of uncovered piles fluctuates throughout the year, greatly affecting the decomposition rate of the animal waste. During the rainy season when moisture is too high, the reduced porosity of the pile is not favorable for aerobic conditions, while during the dry season, if not supplied with water, excessive drying can halt decomposition (USDA, 2007b; USDA, 2010).

As a result of an oxygen deficient environment, anaerobic microorganisms breakdown the organic matter but at a much slower pace than aerobic microorganisms—up to one year under anaerobic conditions compared to months under aerobic conditions (USDA, 2010). Methane gas¹⁰ and other noxious odors are produced as a result of anaerobic breakdown (USDA, 2007b). Additionally, under anaerobic conditions, the compost pile will not reach temperatures high enough to kill pathogens and weed seeds that may have been transmitted in animal waste (USDA, 2007a). When the composted material is used at a later date, pathogens and weed seeds may proliferate.

Most facility owners and operators that passively composted their animal waste did so due to a lack of capital required to build a compost structure and labor to actively manage the pile. Although 16 facilities did not cover their animal waste and 12 facilities did not contain their animal waste, the majority of the facilities (30/33; 91 percent) that were passively composting were found to be compliant. The piles were located far enough from the county's storm drain system and surface waters to not create a potential for discharge during rain events. Of the 6 non-compliant facilities (see 3.2), 3 were passively composting their animal waste in close proximity to the county's storm drain system or a surface water without adequate cover or containment.

4.1.2 Offsite Disposal

Approximately 42 percent of the livestock facilities (24/57) have their animal waste (stable waste and/or manure) taken offsite to a solid waste facility, a horticultural operations or an agricultural operation. Most facilities that have their waste taken offsite to a solid waste

¹⁰ Methane, a greenhouse gas, is more than twenty times more detrimental to the environment than carbon dioxide—a byproduct of aerobic decomposition (USDA, 2007b).

facility (16/24; 67 percent) utilize a waste management service where a large bin—usually 10 cubic yards or larger—contains the animal waste onsite until it is serviced by the provider and emptied offsite. The size of the bin and the frequency of service is dependent upon the number of livestock being managed, but typically the service can cost upwards of \$500 per month. Although the waste bins are not usually covered, any leachate that is formed is contained within the bin and is transported offsite along with the animal waste.

One-third of the facilities (8/24; 33 percent) haul their animal waste offsite themselves, and most dispose of the waste at horticultural or agricultural businesses. The self-transport of animal waste often results in more trips due to smaller load capacities, thereby increasing the potential for spillage of animal waste on route. Half of the facilities (4/8; 50 percent) that haul their own animal waste store it onsite without containment while three-quarters (6/8; 75 percent) of the facilities do not use cover. If a cover was used it would keep the animal waste drier, making it easier to haul offsite by putting less stress on equipment.

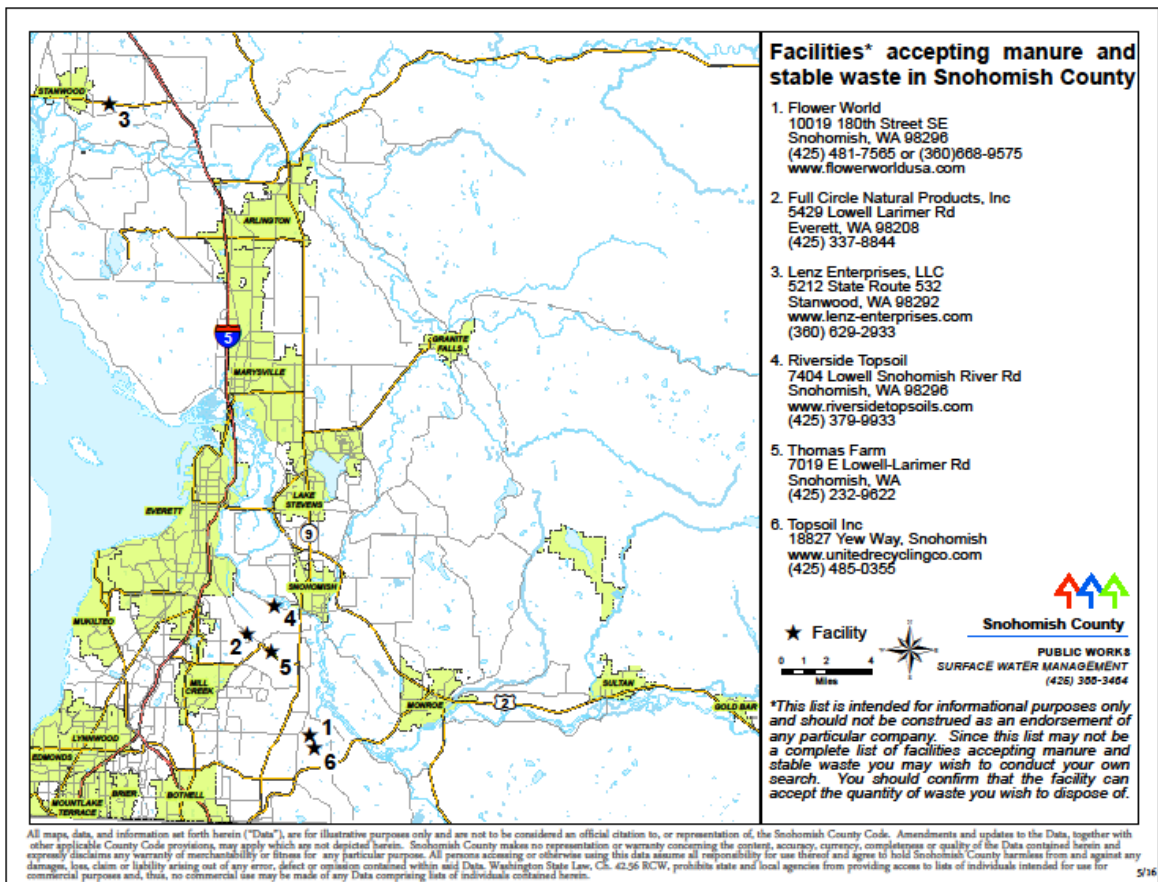


Figure 2. Known facilities accepting manure and stable waste within Snohomish County

Cost and proximity were the main deterrents mentioned by owners and operators of livestock facilities that do not dispose of their animal waste offsite. The majority of the livestock facilities that managed their animal waste onsite were equestrian operations (30/33; 90 percent). Due to competitive pricing and increasing costs of resources (e.g., shavings for horse stalls), most of the facilities operated on limited budgets. Owners and operators stressed that budgeting for offsite disposal would cause financial hardship. A couple of equestrian operations mentioned they had considered hauling their animal waste to a solid waste facility, but the lack of facilities that accept animal waste in central, eastern and northern Snohomish County halted their efforts (Figure 2).

4.1.3 Manure Spreading

More than half of the livestock facilities (33/57) manage their animal waste onsite, yet less than a quarter of these facilities (8/33) apply their manure to their pastures. When applied correctly, manure provides nutrients and organic matter that improves soil aeration and the ability for soil to retain moisture. Facility owners and operators expressed an interest in spreading manure to their pastures but most were unable to purchase a spreader—approximately \$1,000 to over \$6,000. The Snohomish Conservation Districts owns two manure spreaders which they loan to the public. However, the narrow window to apply manure during the growing season (April – October) and the long waiting list to borrow a spreader are discouraging to facilities. If a facility opts to spread its manure, facilities with excess animal waste and limited surface area (facility size) need to seek supplemental animal waste management.

4.2 Livestock Management BMPs

Although animal waste management was the predominant issue encountered, deficiencies for drainage, ground cover and animal exclusion were also observed. Half of the non-compliant facilities (3/6) contaminated their stormwater runoff through contact with animal waste or muddy animal holding areas. When contaminated runoff discharges to the county's storm drain system or nearby surface water, an illicit discharge occurs. Roof drains near animal holding areas and waste piles should infiltrate the ground to reduce the volume of stormwater runoff. If the infiltration of roof drains is not permissible, drains should be diverted away from potential sources of fecal coliform pollution (USDA, 2014a). By placing animal holding areas and waste piles in locations that slope away from storm drain systems and surface waters, the potential for an illicit discharge is greatly reduced.

To further prevent the contamination of stormwater runoff from animal holding areas, the ground must either have vegetative cover or some other type of ground cover such as mulch. Without adequate ground cover, livestock can generate mud often mixed with manure. Stormwater runoff contaminated with mud and manure can deliver a suite of pollutants beneficial for fecal coliform populations in surface waters. Mud may provide necessary nutrients for fecal coliform growth while increased suspended solids provide additional surface area for fecal coliform to grow on. As a result of increased suspended solids (turbidity) light attenuation increases, reducing mortality rates of fecal coliform from ultraviolet light exposure (Alkan et al., 1995; Selvakumar et al., 2007). Lastly, the

discharge of stormwater contaminated with fecal matter supplements existing bacterial populations in the surface water. Although the potential to generate contaminated stormwater runoff is lessened when animal holding areas are regularly cleaned of animal waste, any runoff produced should be conveyed to a wet pond, settling pond, swale media filter or other approved treatment system.

The deficiencies above—animal waste management, drainage and ground cover—utilized contaminated stormwater runoff to produce an illicit discharge to the county’s storm drain system or surface water. At one facility a high potential for illicit discharge existed due to the lack of adequate animal exclusion from a surface water. Preventing or limiting access of livestock to surface waters decreases the potential for loading of sediment and manure.

4.3 Suggested Actions

Through the implementation of the project SWM identified issues that if addressed could benefit the public, the government and the environment. Issues include inventory management through licensing, contradictory policies between government agencies and clarification of Snohomish County Code requirements. These issues resulted in four suggested actions related to commercial animal handling BMPs and two actions regarding policy and inventory management.

4.3.1 Commercial Animal Handling BMPs

BMPs in the county’s Drainage Manual list necessary actions required to maintain compliance with the Snohomish County Code, but the interpretation and implementation of applicable BMPs was not consistent amongst the public. A revision of the Drainage Manual’s commercial animal handling areas BMPs—incorporating standards created by agricultural agencies (e.g., USDA’s National Resources Conservation Service) and pertinent Snohomish County code (e.g., SCC 30.62A – Wetlands, Fish and Wildlife Habitat Conservation Areas)—could clarify whether compliance with Snohomish County Code is being achieved as well as decrease the potential for illicit discharges.

4.3.1.1 Stockpiling Materials

Issue:

The primary BMP deficiency encountered involved the practice of stockpiling animal waste. In Volume 4, Chapter 2.3 of the Drainage Manual it states that *“when exposed to stormwater, cover and contain stockpiled materials, which includes but is not limited to manure or soils, such that contamination of storm drainage conveyance systems or waters of the state is prevented.”* Further in Chapter 2.3 it mentions to *“store materials in areas sloping to dead end sumps or other sufficient containment areas away from storm drain systems or surface waters.”* All 6 non-compliant facilities—10 percent of all livestock facilities inspected—failed to contain and/or cover their animal waste in a manner that prevents stormwater runoff from discharging to the county’s storm drain system or surface water.

Factors—such as topography, ground cover and proximity to a water body—are considered when evaluating one’s potential to illicitly discharge to the county’s storm drain system or waters of the state (e.g., surface and ground water).

Action:

Revising commercial animal handling areas BMPs to include a defined minimum distance (or setback) from an animal waste storage area to a county storm drain system or surface water would lessen the uncertainty of compliance with Snohomish County Code. The minimum distance for a setback would be dependent upon factors such as topography, surrounding vegetation and uphill sources of stormwater runoff. The revised BMPs should also contain language regarding the diversion of surface flows (e.g., stormwater runoff, wastewater discharge) and roof runoff away from animal waste storage areas.

To further reduce the potential for an illicit discharge, a BMP prohibiting animal waste storage within a defined buffer to a critical area (i.e., wetlands, fish and wildlife conservation areas, aquifer recharge areas, and special flood hazard areas) should be included.

Additionally, the county may wish to consider developing separate BMPs for short term storage of piles (less than 180 days). The USDA developed standards for such a practice, Short Term Storage of Animal Waste and By-Products (USDA, 2014b) which includes standards for vegetative buffers, setbacks, depth to seasonal high water, cover and a plan map.

4.3.1.2 Animal Exclusion

Issue:

Illicit discharges to the county’s storm drain system and surface water—either from contaminated stormwater runoff or direct access by livestock—would be lessened by revising BMPs to include minimum distances for fencing and vegetated buffers. Currently, Volume 4, Chapter 3.2 of the Drainage Manual requires commercial animal handling areas to “surround the area where animals are kept by a fence or other means that prevents animals from moving away from the controlled area where BMPs are used.” The language of the BMP applies to animal holding areas and grazing areas. Perhaps the listing of the areas, as examples, may help the public better understand the requirements.

Action:

Livestock access to surface waters should be minimized in order to preserve water quality. The preferred watering option is to use domestic water or water pumped from an aquatic area. The USDA developed standards to convey water for use by livestock; Livestock Pipeline (USDA, 2011a). Facilities adjacent fish bearing streams or surface waters with nutrient or total suspended solids impairments should be required to implement the BMP, while facilities not located next to such a waterbody should only be encouraged to implement the BMP. If access to a surface water is sought, it should be limited to crossings and watering points where BMPs have been implemented following USDA standards,

Stream Crossings (USDA, 2011b). All other access points along the length of the surface water should be prevented, either by use of fence or livestock impenetrable vegetation.

4.3.1.3 Buffers

Issue:

The creation of an animal holding area is beneficial for many reasons, foremost it concentrates pollutions sources (e.g., manure, mud) for easier management and prevents overgrazing of pastures which could lead to erosion. Management of animal holding areas includes practices required by the Drainage Manual, Volume 4, Chapter 3.2 such as to “regularly sweep and clean animal keeping areas to collect and properly dispose of droppings, uneaten food, and other potential stormwater contaminants; and if animals are kept in unpaved and uncovered areas, the ground must either have vegetative cover or some other type of ground cover such as mulch.” If an animal holding area is near a county storm drain system or surface water there is a high potential for an illicit discharge if BMPs are not implemented routinely.

Action:

To prevent illicit discharges, buffers should be established around the perimeter of animal holding areas, thus allowing pollutants to infiltrate before they can reach the county’s storm drain system or surface water. The width of the buffer would be dependent upon factors such as slope downhill of the animal holding area and proximity to nearby storm drain systems and surface waters.

Issue:

Improperly managed grazing areas adjacent to the county’s storm drain system or surface waters create a potential for illicit discharges during rain events.

Action:

A vegetative buffer between grazing areas and the county’s storm drain system and surface waters would greatly reduce the potential for an illicit discharge of pollutants (e.g., fecal coliform, mud/sediment, fertilizers). The required buffer width would be dependent upon factors such as proximity to storm drain systems and surface waters, topography and existing vegetation within the buffer zone. The vegetative buffer would be preserved through the installation of a permanent fence or other means (e.g., dense mature vegetation) that restricts access by livestock. The USDA established standards that effectively reduce sedimentation offsite and protect water quality by establishing permanent vegetation along the perimeter of the field (USDA, 2016). The county should consider incorporating similar practices in the Drainage Manual.

4.3.1.4 Livestock Density

Issue:

The density of livestock at a facility can influence the implementation and effectiveness of BMPs. On average, a horse weighing between 900-1,300 pounds can produce 42-68 pounds of waste (manure and urine) and 8-15 pounds of spoiled bedding per day. The waste equates to approximately 20-40 cubic yards of waste/horse/year (Krogmann et al.,

2006). If a facility manages their animal waste onsite and the density of livestock per acre is high, the potential for an illicit discharge is greater than that of an operation with a smaller livestock density.

During the inspections some equestrian operations appeared to be operating past their capacity. One facility had approximately 60 horses on 10 acres of land. After years of mismanagement the animal waste pile measured approximately 100 feet by 175 feet by 4.5 feet, approximately 2,900 cubic yards. The waste generated was almost enough to fill an Olympic-size swimming pool. Luckily the animal waste was not located near a county storm drain system or surface water, but this may not always be the case.

Action:

A BMP defining permissible livestock densities (number of livestock per acre) could help reduce the potential for illicit discharges to a county storm drain system or surface water. A facility would calculate their livestock density from the areas that are utilized by the livestock—such as stables, arenas and pastures. Driveways, residential structures, garages and other areas not utilized by the livestock would not be used to calculate the livestock density. A facility could operate above their livestock density if a farm plan is developed with the Snohomish Conservation District and kept on file with SWM’s business inspection program.

4.3.2 Policy and Inventory Management

In order for the county to interact with the business community it is essential to have accurate records of businesses providing services within the county’s jurisdiction. Additionally, the county must ensure that policies applicable to the public are not conflictive.

4.3.2.1 Domestic Animal Waste

Issue:

During pre-inspection review of applicable codes it was discovered that the Snohomish Health District Sanitary Code, Chapter 3.1, Section XVII.C.2 (Snohomish Health District, 2004) lists burial of pet waste as an acceptable practice of waste disposal. Snohomish County strongly discourages the burial of pet waste due to the potential to impact surface and ground water quality. The preferred method of pet waste disposal is to bag—or double bag when necessary—the pet waste and dispose of it in a garbage receptacle. However, current policy of Snohomish County’s Solid Waste Division is to limit the disposal of pet waste to a maximum of 10 pounds per waste load (Snohomish County, 2017). If a household or business has more than one pet it is most likely producing more than 10 pounds of waste requiring disposal. To be compliant with the Solid Waste Division’s policy, the household or business would need to seek alternative means for pet waste disposal—such as burial.

Action:

It is recommended that both parties be consulted about their policies and practices that can potentially impact surface water quality.

4.3.2.2 Inspection Inventory

Issue:

The inspection inventory was generated using data from a variety of resources: Washington State Department of Revenue (DOR) State Business Records database, the county's kennel license program and pollution source control business inspection database, and the Snohomish Health District's permitted composting facilities. The majority of the facilities were identified using DOR data (180/261; 71 percent). While the DOR produced a list of qualifying facilities expeditiously, some of the records were not current (i.e., closed business) or not accurate (e.g., non-commercial operation registered for tax exemptions or filed incorrect business type), 15/180 (8 percent) and 20/180 (11 percent), respectively. Of the 75 facilities identified through the county's database 15 percent (11/75) were no longer operational.

Action:

Currently, Snohomish County issues licenses to commercial kennel, shelter and grooming operations and few other select business types. In order to improve the inventory list for all businesses operating within unincorporated Snohomish County the county could consider a broader licensing program. Commercial operations would apply for a license annually, providing information to the county such as business type, contact and address. The inventory could be used not only for inspection purposes but also to identify specific businesses that would benefit from outreach and educational materials—such as mobile painting operations, landscapers, and animal handling facilities.

5.0 CONCLUSION

The county focused on working closely with facilities to understand their operations and provide technical assistance on BMP implementation. Ninety-five percent of facilities inspected were implementing BMPs protective of surface water quality. However, many of the facilities could improve their current practices by implementing additional BMPs that may offer more protection for surface water quality. A revision of the commercial animal handling areas BMPs—incorporating standards created by agricultural agencies (e.g., USDA’s National Resources Conservation Service) and pertinent Snohomish County code (e.g., SCC 30.62A – Wetlands, Fish and Wildlife Habitat Conservation Areas)—could clarify whether compliance with the Snohomish County Code is being achieved as well as decrease the potential for illicit discharges.

During this effort, SWM learned of several barriers that prevented business owners from implementing BMPs including: costs associated with building a compost or manure containment structure, off-site hauling of animal waste, access to a manure spreader, and installation of animal exclusion fencing. Many of these barriers were cited by smaller commercial equestrian operations trying to sustain business while competing with larger, more lucrative boarding operations. Manure management represents a significant concern throughout unincorporated Snohomish County. This issue extends beyond commercial animal handling facilities and likely includes hundreds of residential hobby farms around the county. Snohomish County and the agricultural community should continue to collaborate on implementing efforts that aim to: increase outreach and education, improve manure management techniques and explore more options for proper offsite waste disposal.

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APPENDIX 1. PRIMARY BMPS INSPECTED

Chapter 2.1 - Prohibited Discharge Elimination

- Do not hose down pollutants from any area to the storm drain or receiving water (surface waters).
- Do not discharge liquid or solid waste (including manure) to surface waters or storm drains which discharge to surface waters.
- Do not connect floor drains in potential pollutant source areas to storm drains or surface waters.

Chapter 2.2 - Spill Response and Reporting

- Dispose of waste in a manner consistent with Snohomish Health District Sanitary Code 3.1 and all other federal, state or local regulations for disposal of solid or hazardous waste.

Chapter 2.3 - Pollution Prevention in Outside Storage Areas

- Where feasible, store potential stormwater pollutant material inside a building or under a cover and/or containment.
- When exposed to stormwater, cover and contain stockpiled materials, which includes but is not limited to manure or soils, such that contamination of storm drainage conveyance system or water of the state is prevented.
- Convey any contaminated stormwater to a wet pond, settling pond, swale media filter or other treatment system approved by a federal, state or local agency.
- Cover dumpsters, or keep them under cover such as a lean-to, to prevent entry of stormwater. Replace or repair leaking garbage dumpsters including lids.
- Store materials in areas sloping to dead end sumps or other sufficient containment area away from storm drain systems or surface waters.

Chapter 2.4 - Pollution Prevention in Outside Work Areas

- Where feasible, store potential stormwater pollutant material inside a building or under a cover and/or containment.
- Apply pesticides and fertilizers (manure) in a manner that will not result in stormwater contamination. Do not apply immediately before or during a rainstorm.
- Dispose of collected material in a manner consistent with Snohomish Health District Sanitary Code Chapter 3.1 and all other federal, state and local regulations regarding disposal of solid waste, to prevent stormwater pollution.

Chapter 2.5 - Source Control BMP Inspection/Maintenance

- Conduct and document site inspections quarterly.
- Repair or replace all source control BMPs that are damaged or otherwise not functioning, or that are inadequate to contain or prevent prohibited discharges.

Chapter 2.6 - Management

- Site owners, operators, or managers will assign responsibility to one or more staff for implementation of all applicable BMPs in the Snohomish County Drainage Manual, plus implementation of any other BMPs required by Chapter 7.53 or other Snohomish County codes.
- Hold regularly-scheduled meetings to review the overall operation of BMPs. These may be incorporated into other employee meetings.

APPENDIX 1. PRIMARY BMPS INSPECTED (CONTINUED)

- Train all team members in the operation, maintenance and inspections of BMPs
- Chapter 3.2 - Required BMPs for Commercial Animal Handling Areas
- Regularly sweep and clean animal keeping areas to collect and properly dispose of droppings, uneaten food, and other potential stormwater contaminants.
 - Do not hose down to storm drains or to receiving water those areas that contain potential stormwater contaminants.
 - Do not allow any washwaters to be discharged to storm drains or to receiving water without proper treatment.
 - If animals are kept in unpaved and uncovered areas, the ground must either have vegetative cover or some other type of ground cover such as mulch.
 - Surround the area where animals are kept by a fence or other means that prevents animals from moving away from the controlled area where BMPs are used.
 - Contact the Snohomish Conservation District for more information (425) 335-5634, <http://snohomishcd.org>
- Chapter 3.10 - Required BMPs for Landscaping and Lawn/Vegetation Management at Commercial Sites
- Do not dispose of collected vegetation into waterways or storm drainage systems.
 - Properly trained persons should apply all fertilizers. At commercial and industrial facilities fertilizers should not be applied to grass swales, filter strips or buffer areas that drain to sensitive water bodies unless approved by Snohomish County.
- Chapter 4.2 - Recommended BMPs for Commercial Animal Handling Areas
- Prevent stormwater run-on and contact with manure or soils from facility roofs by infiltrating roof drains or using low impact development techniques as identified in the Puget Sound Partnership Technical Guidance Manual available at http://www.psp.wa.gov/our_work/stormwater/lid/lid_manual.htm, or the Natural Resource Soil and Conservation Technical guidance manual available by calling the Snohomish Conservation District at (425) 335-5634. Be aware that implementing measures in these guidance manuals may require obtaining building permits subject to land use code review. To determine if permits are required or land use code apply, call Snohomish County Planning and Development Services at (425) 388-3311.
- Chapter 4.10 - Recommended BMPs for Landscaping and Lawn/Vegetation Management at Commercial Sites
- Use mulch or other erosion control measures when soils are exposed for more than one week during the dry season or two days during the rainy season.

APPENDIX 2. PRE-INSPECTION LETTER

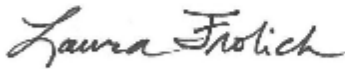
<p>_____</p> <p>Date</p> <p>Property Owner Business Name Street Address City, WA XXXXXX</p> <p>RE: Pollution Control Site Visit Notification</p> <p>Dear Property Owner/Operator:</p> <p>As part of Snohomish County's ongoing goal to improve water quality in local creeks, rivers, and Puget Sound, we seek to perform a site visit at your commercial property, so that we can discuss with you practices related to animal waste storage, handling and disposal. You should expect a Pollution Prevention Specialist to visit your commercial site between May 1 and August 1, 2016. We are partnering with the Snohomish Conservation District to ensure the County meets its water quality permit obligations required under the <i>Clean Water Act</i>, with as little impact to your business enterprise as possible. We recognize your role in protecting our water resources and hope to validate your ongoing efforts.</p> <p>By August 1, 2016 Snohomish County is required to evaluate commercial animal handling sites and commercial composting facilities to ensure implementation of best management practices (BMPs) and to evaluate site compliance for water quality protection. Qualifying properties perform animal handling and/or composting activities and are located in drainage basins with high concentrations of bacteria (Stillaguamish River, Snohomish River (lower tributaries), North Creek, Swamp Creek, and Little Bear Creek). Your property has been identified as meeting the qualifying criteria. Commercial animal handling facilities include veterinary services, pet care, commercial kennels, animal boarding, and animal slaughtering.</p> <p>During our site visit, we will evaluate your operational practices that have the potential to impact water quality and discuss required BMPs that ensure pollution prevention. If desired, after our site visit we can connect you with the Snohomish Conservation District, who can provide additional services and technical assistance. Site visits are expected to last approximately one hour and are at no cost to the owner/operator. To prepare for your site visit you may consider: identifying surface water features on or adjacent to your property (streams, rivers, and roadside ditches); reviewing the attached list of BMPs from the Snohomish County <i>Drainage Manual: Volume IV - Source Control BMPs</i>; and evaluating your specific animal/pet waste storage and disposal practices.</p> <p>The Pollution Source Control Program is a requirement of the County's municipal stormwater permit, which is issued by the Washington State Department of Ecology and is mandated by the federal National Pollutant Discharge Elimination System program. In effect since 2009, the Pollution Source Control Program's objective is to control and prevent water pollution from commercial, industrial and certain agricultural properties by ensuring the implementation of BMPs. Using the Snohomish County <i>Drainage Manual: Volume IV-Source Control BMPs</i>, Pollution Prevention Specialists provide technical assistance,</p>	 <p>Snohomish County Public Works Surface Water Management</p> <p>3000 Rockefeller Ave., M/S 607 Everett, WA 98201-4046 (425) 388-3464 www.snoco.org</p> <p>Dave Somers County Executive</p>
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APPENDIX 2. PRE-INSPECTION LETTER (CONTINUED)

perform follow up site inspections and work closely with business owners to encourage the use of BMPs. The Snohomish County's *Water Pollution Control Code* (SCC 7.53), requires the use of BMPs and therefore non-compliant sites are subject to code enforcement. As a regulated county, state and federal agencies expect us to use our regulatory mechanisms when necessary, yet prior to any code enforcements actions we work diligently with the public in order to achieve compliance. This program's success is founded on generating awareness that leads to voluntary compliance from business owners.

We value your agricultural enterprise's contribution to Snohomish County and appreciate your willingness to protect water resources. Thank you for your time and active participation in these efforts. If you have any questions, concerns or would like to learn more about our program please contact me. We look forward to working with you to accomplish our water resource protection goals.

Sincerely,



Laura Frolich
Public Works Supervisor III-Drainage Systems
Snohomish County Public Works-Surface Water Management
(425) 388-6691

Snohomish Conservation District: (425) 335-5634.

NOTE: *If you operate a mobile business and your operations do not involve any aspect of animal waste management or you feel you have received this letter in error, please contact Laura Frolich.*

APPENDIX 2. PRE-INSPECTION LETTER (CONTINUED)

Snohomish County Drainage Manual: Volume IV, Chapter 3
Source Control BMPs Required For Specific Activities or Land Uses
www.snohomishcountywa.gov/1130/Drainage-Manual

Chapter 3.2 BMPs for Commercial Animal Handling Areas

Description of Pollutant Sources

Animals at racetracks, kennels, fenced pens, veterinarians, and businesses that provide boarding services for horses, dogs, cats, etc., can generate pollutants from the following activities: manure deposits, animal washing, grazing and any other animal handling activity that could contaminate stormwater. Pollutants can include coliform bacteria, nutrients, and total suspended solids.

Source Control BMPs

- Regularly sweep and clean animal keeping areas to collect and properly dispose of droppings, uneaten food, and other potential stormwater contaminants
- Do not hose down to storm drains or to receiving water those areas that contain potential stormwater contaminants
- Do not allow any washwaters to be discharged to storm drains or to receiving water without proper treatment
- If animals are kept in unpaved and uncovered areas, the ground must either have vegetative cover or some other type of ground cover such as mulch
- Surround the area where animals are kept by a fence or other means that prevents animals from moving away from the controlled area where BMPs are used.

Chapter 3.3 BMPs for Commercial Composting

Description of Pollutant Sources

Commercial compost facilities, operating outside without cover, require large areas to decompose wastes and other feedstocks. These facilities should be designed to separate stormwater from leachate (i.e., industrial wastewater) to the greatest extent possible. When stormwater is allowed to contact any active composting areas, including waste receiving and processing areas, it becomes leachate. Pollutants in leachate include nutrients, biochemical oxygen demand (BOD), organics, coliform bacteria, acidic pH, color, and suspended solids. Stormwater at a compost facility consists of runoff from areas that are not associated with active processing and curing, such as product storage areas, vehicle maintenance areas, and access roads.

Source Control BMPs

- Train employees to ensure that the compost feedstocks do not contain dangerous wastes, regulated under Chapter 173-303 WAC or hazardous products of a similar nature, or solid wastes that are not beneficial to the composting process.
- Develop a plan of operations if required in accordance with NPDES permit or State Waste Discharge permit.
- Store finished compost in a manner to prevent contamination of stormwater.

NOTE: Discharge of leachate from a compost facility will require a State Waste Discharge Permit or NPDES permit from Ecology, depending on the disposal method chosen for managing leachate at the facility. An additional alternative, zero discharge, is possible by containing all leachate from the facility (in tanks or ponds) or preventing production of leachate (by composting under a roof or in an enclosed building). Chapter 7.53 SCC states that full implementation of all BMPs required by an NPDES industrial stormwater permit or State Waste Discharge Permit shall constitute compliance with that code chapter.

The BMPs listed above are a sample of applicable BMPs; additional BMPs can be found in the *Snohomish County Drainage Manual, Volume 4*. BMPs from the USDA Field Office Technical Guide and the Washington State Department of Ecology *Stormwater Management Manual for Western Washington* may be substituted for applicable BMPs from the *Snohomish County Drainage Manual*, if determined to be equivalent by the Director of Public Works or their designee.