STORMWATER PLAN

Illinois General NPDES Permit

IL0074705

Prepared for:

Elmwood Farms, L.L.C. (Facility Operator)

Hill Crest Dairy, L.L.C. (Facility Owner)

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INTRODUCTION

On May 1, 2002 a Consent Order was approved by the Tenth Judicial Circuit Court Peoria, IL as case No. 01 CH 76 as agreed to by the Illinois EPA, Illinois Attorney General, and Hill Crest Dairy, LLC (fka New Horizons Dairy, LLC, Inwood Dairy). This plan has been prepared pursuant to the compliance section of this Consent Order as one of several required plans.

The purpose of this plan is to outline measures and operational controls or practices that the Dairy facility will use to prevent stormwater pollution.

Facility Description

A Site Layout Plan is attached showing the existing facility and anticipated additional facilities. Elmwood Farms, L.L.C. (fka Hill Crest Dairy, L.L.C., New Horizons Dairy, LLC, Inwood Dairy) is currently a 1610 cow milking facility. Dry cows and new stock (heifers) are raised off site.

The dairy facility is operated and managed by Elmwood Farms. Manure Systems and handling is managed by Jordan Spackman under the supervision of Sam Dilsaver.

The facility consists of three roofed freestall barns, a special needs, holding pen, and parlor(s). Waste is scraped from the barns to a 24" dia. PVC pipe where it flows by gravity to a collection tank. From the collection tank the manure is pumped to a plug-flow, heated mesophillic digester. Following digestion, solids are separated prior to the lagoon for storage of liquids. Screw press solids separators are installed in a concrete solids stacking area. Solids are approximately 65% to 70% moisture content and sold or land applied by the dairy facility. The lagoon has an operation and management plan for pumping and sludge removal which includes monitoring of sludge accumulations so as not to infringe upon the treatment volume.

Waste from the parlor is washed down to the holding pens by hosing. The main holding pen is then partially flushed with recycled plate cooler water to a catch gutter and flows by gravity to the 24" dia. pipe that bypass the collection tank and goes directly to the lagoon unless extra dilution water is needed. A manual valve enables the change of flow through digester of the holding pen water.

The future capacity of the facility is planned for 1970 cows as follows.

- 1 Freestall (Approved for Construction) with 360 stalls
- 2 Freestalls (w/ lean-to's) with 585 stalls each
- 1 Freestall with 400 stalls
- 1 Special Needs area with 40 stalls
- 1 single 8 Special Needs Parlor
- 1 double 24 Parlor

All surface water is diverted away from or around the facility. Stormwater which falls on roofs and other "clean" areas not outlined below as "dirty" are directed to one of two existing stormwater detention basins located at both the Northwest and Southeast corners of the facility. See attached Farmstead Plan.

Measures and Practices/Operational Controls

1. The roof water from the barns and the clean areas between the barns and south of the southern most freestall barn is being detained by a small berm between the buildings. Surface inlets and storm water pipes with valves are located up gradient of these berms to collect the storm water and transfer it into the Northwest detention basin (Stormwater Basin #1). Sanitary risers are located on the roadside of the berms and collect runoff from the driveways and feed pushout areas at the west end of the freestall barns.
2. The runoff from the west field is being diverted around the south side of the lagoon. An earthen berm and swale with an approximate 0.5% slope along the north and east side of the ditch at the west property line south of the buildings. The berm and swale extend along the ditch from the west corner (300' northwest of the commodity shed) to a point approximately 150' south of the commodity shed where the ditch slope increases to approximately 2% and is hydraulically sufficient. The commodity shed roof water is directed into the ditch as well.
3. Most of the area south of the silage bunkers has been cleaned up so that clean surface water is diverted to the ditch south of the bunker and around the south side of the lagoon. This area is kept clean by placing an earth berm or swale along the south side of the bunker from the commodity shed to the lagoon so it captures and transfers silage leachate to the lagoon as shown on the drawings via a pipe into the lagoon.
4. Various areas of the lagoon berm and outside slopes as well as drainage areas and all clean water areas permanent grass cover has been established and will be maintained.
5. Concrete has been poured along the sides of the freestall buildings and transfer alleys increasing their height to approximately 17" in order to keep all manure out of all clean areas.
6. Lean-to's have been installed on the south side of freestall #2 (E2) and north side of freestall barn #3 (E3). The lean to additions consist of an 8.5' addition plus an additional 3' roof overhang. Under the lean-to-addition are freestalls which are approximately 18" higher than the scrape alley to prevent release of manure. During construction, the earth berms between the buildings were cut back 8.5' to allow for the additional barn/lean-to width. However, after construction, the berms were extended to the sidewall of the barn/lean-to so as to keep clean water and potential dirty water separate.
7. The lot on the north side of Freestall barn #1 (E1) has been removed from service and permanent grass cover has been established so that this area can be approved by IEPA to be a "clean area". A surface inlet and storm water pipe shall transfer "clean" water from up gradient of an earthen berm to the storm water northwest detention basin (Stormwater Basin #1). The existing sanitary riser shall be located on the roadside of the berms and collect runoff from the driveways and feed pushout areas at the west end of the freestall barn #1 (E1).
8. Dirty areas that may contain contaminated storm water have been graded so that water will be diverted away from "clean" storm water connector pipes (e.g., west driveway near push out feed areas).

9. The manure collection tank (E8) located at the SW corner of Freestall barn #3 (E3) does not receive storm water (contaminated or not). Contaminated storm water is directed to the lift station and pumped into the lagoon.
10. Permanent grass cover around the access roads, buildings, lagoons, etc. shall be maintained by mowing. Bare spots or any disturbed areas shall be reseeded and maintained to prevent erosion and present a good appearance.
11. The roof water from the barn #3 (E3) and the clean areas between the digester (E7) and Transfer lane (E16) is being detained by a small berm south of solids stacking area (E9) and diverted to two "clean" water surface inlets and storm water pipe located each side (North & South) of the solids stacking area (E9). This berm to collects the storm water and discharge it into the Northwest detention basin (Stormwater Basin #1). A sanitary riser is located on the roadside of the berm and collects runoff from the west driveway and solids stacking area (E9).

All manure and process waste water will be contained and not allowed to enter "clean" storm water areas. A summary of "dirty" wastewater areas is as follows:

"Dirty" Waste Water Areas

1. West driveway
2. East gutter/cow transfer lane (E16)
3. All buildings interior transfer alleys and other areas where cows have access (E1, E2, E3, E4, E5, E6, E10, E16)
4. Silage bunkers, Feed storage and mixing areas (E13)
5. Manure separation and solids storage area (E9).
6. Washbay (E14)
7. Lagoon (E12)

Please refer to Attached Illinois Manure Management Planner (IMMP) Forms 3-B and 3-C for stormwater controls with locations noted on the Farmstead Plan.

Storm Water Pollution Prevention Plan

Form 3-B

Y	N	NA	Map Legend*	Physical Structures
☒	☐	☐	3B-1-E12	**Collection basins**—Permanent structures in which large spills or contaminated storm water is contained and stored before cleanup or treatment. Collection basins are designed to receive spills, leaks, etc., and to prevent pollutants from being released into the environment. Collection basins can receive and contain materials from many locations across a facility.
☒	☐	☐	3B-2	**Curbing**—A barrier that surrounds an area of concern. Unlike diking, curbing is unable to contain large spills and is usually implemented on a small-scale basis. However, curbing is common at many facilities and in small areas where liquids are handled and transferred.
☒	☐	☐	3B-3	**Containment diking**—Containment dikes are temporary or permanent earth or concrete berms or retaining walls that are designed to hold spills. Diking can be used at any facility, but is most common for controlling large spills or releases from liquid storage and transfer areas. Diking can provide one of the best protective measures against the contamination of storm water because it surrounds the area of concern and keeps spilled materials separated from the storm water outside of the diked area.
☒	☐	☐	3B-4	**Diversions**—A diversion is a channel constructed across the slope, generally with a supporting ridge on the lower side, for the purpose of changing the direction of flow of storm water.
☒	☐	☐	3B-5	**Dry extended detention ponds**—Dry extended detention ponds (a.k.a. dry ponds, extended detention basins, detention ponds, extended detention ponds) are basins whose outlets have been designed to detain the storm water runoff from a water quality design storm for some minimum time (e.g., 24 hours) to allow particles and associated pollutants to settle. Unlike wet ponds, these facilities do not have a large permanent pool. However, they are often designed with small pools at the inlet and outlet of the basin. They can also be used to provide flood control by including additional flood detention storage.
☒	☐	☐	3B-6	**Wet ponds**—Wet ponds (a.k.a. storm water ponds, retention ponds, wet extended detention ponds) are constructed basins that have a permanent pool of water throughout the year (or at least throughout the wet season). Ponds treat incoming storm water runoff by settling and algal uptake. The primary removal mechanism is settling as storm water runoff resides in this pool, and pollutant uptake, particularly of nutrients, also occurs through biological activity in the pond.
☐	☐	☒	3B-7	**Infiltration basin**—An infiltration basin is a shallow impoundment that is designed to infiltrate storm water into the ground water. This practice is believed to have a high pollutant removal efficiency and can help recharge the ground water, thus restoring low flows to stream systems.
☐	☐	☒	3B-8	**Infiltration trench**—An infiltration trench (a.k.a. infiltration galley) is a rock-filled trench with no outlet that receives storm water runoff. Storm water runoff passes through some combination of pretreatment measures, such as a swale and detention basin, and into the trench. There, runoff is stored in the void space between the stones and infiltrates through the bottom and into the soil matrix. The primary pollutant removal mechanism of this practice is filtering through the soil.
☐	☐	☒	3B-9	**Storm water wetland**—Storm water wetlands (a.k.a. constructed wetlands) are structural practices similar to wet ponds that incorporate wetland plants into the design. As storm water runoff flows through the wetland, pollutant removal is achieved through settling and biological uptake within the practice. Storm water wetlands are designed specifically for the purpose of treating storm water runoff, and typically have less biodiversity than natural wetlands in terms of both plant and animal life.

☒	☐	☐	3B-10	**Grassed waterways/swales**—A series of vegetated, open channel management practices designed specifically to treat and attenuate storm water runoff for a specified water quality volume. As storm water runoff flows through these channels, it is treated through filtering by the vegetation in the channel, filtering through a subsoil matrix, and/or infiltration into the underlying soils. Variations of the grassed swale include the grassed channel, dry swale, and wet swale.
☐	☐	☒	3B-11	**Grassed filter strip**—Grassed filter strips (vegetated filter strips, filter strips, and grassed filters) are vegetated surfaces that are designed to treat sheet flow from adjacent surfaces. Filter strips function by slowing runoff velocities and filtering out sediment and other pollutants, and by providing some infiltration into underlying soils.
☒	☐	☐	3B-12	**Catch basin**—A catch basin (a.k.a. storm drain inlet, curb inlet) is an inlet to the storm drain system that typically includes a grate or curb inlet and a sump to capture sediment, debris, and associated pollutants. They are also used in combined sewer overflow (CSO) watersheds to capture floatables and settle some solids. Catch basins act as pretreatment for other treatment practices by capturing large sediments.
☐	☐	☒	3B-13	**In-line storage**—In-line storage refers to a number of practices designed to use the storage within the storm drain system to detain flows. Storage is achieved by placing devices in the storm drain system to restrict the rate of flow. Devices can slow the rate of flow by backing up flow, as in the case of a dam or weir, or through the use of vortex valves, devices that reduce flow rates by creating a helical flow path in the structure.
☐	☐	☐	3B-14	**Other practices**

* Mark the map legend codes on facility/production area maps where appropriate.

Facility/Production Area Storm Water Pollution Prevention Plan

Form 3-C

Mark those BMP's listed below that are applicable to any part of your operation.

Y	N	NA	Map Legend	Management/Operational Practices
				Diversions (Terrace–like structures can also function as diversions.)
☐	☐	☒		Temporary diversions are used only where the drainage area is less than 5 acres.
☐	☒	☐		Diversions that are part of a pollution abatement system have a minimum capacity for the peak discharge from a 10-year frequency, 24-hour duration storm.
☒	☐	☐		Diversions designed to protect areas such as buildings, roads, and animal waste management systems have a minimum capacity for the peak discharge from a storm frequency consistent with the hazard involved but not less than a 25-year frequency, 24-hour duration storm. Freeboard is not less than 0.3 ft.
☒	☐	☐		The location of a diversion and outlet is in compliance with applicable state drainage and water conveyance laws.** Diversions do not outlet on public roads, highways, or other public utility, or the written approval of the appropriate authorities has been obtained.
☐	☐	☒		Where movement of sediment into the channel can be a problem, the design includes extra capacity for sediment or periodic removal; and where applicable, such sediment removal is outlined in the operation and maintenance plan.
☒	☐	☐		The outlet conveys runoff to a point where outflow will not cause damage.
☒	☐	☐		Periodic inspections, especially immediately following significant storms, are performed. Damaged components of the diversion are promptly repaired or replaced as necessary.
☒	☐	☐		Diversion capacity, ridge height, and outlet elevations are maintained, especially where high sediment yielding areas are in the drainage area above the diversion.
☒	☐	☐		Each inlet for underground outlets is kept clean and sediment buildup redistributed so that the inlet is at the lowest point.
☐	☐	☒		Sediment is redistributed as necessary to maintain the capacity of the diversion.
☒	☐	☐		Vegetation on diversions is maintained and trees and brush controlled by hand, chemical and/or mechanical means.
☒	☐	☐		Machinery is kept away from steep sloped ridges. Equipment operators are informed of all potential hazards.
	☐	☒	3C-1	**Hazardous materials storage**—Proper storage of hazardous materials. Practices such as covering hazardous materials, or even storing them properly, can have dramatic impacts.
☒	☐	☐	3C-2	**Fueling areas**—Absorbent used for fueling areas will be packaged in small bags for convenient use and small drums will be available for storage. Absorbent materials will not be washed down the floor drain or into the storm sewer.

☒	☐	☐	3C-3	**Chemical spills**—Emergency spill containment and cleanup kits will be located at the facility site. The contents of the kit will be appropriate to the type and quantities of chemical or goods stored at the facility.
☐	☐	☒	3C-4	**Other practices** (describe)

** See *Illinois Drainage Law Part 1* on the Workbook CD for details on landowner rights and responsibilities regarding drainage.

Diversion - NRCS Practice Standard Code 362, Roof Runoff Structure - NRCS Practice Standard Code 558