

Agri-Mark, Inc. dba/Cabot Creamery Collection and Land Application System 2018 Inspection Report



PROJECT NO.

16-041

REVIEWED BY:

CG

PREPARED FOR:

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Executive Summary

On May 22, 2018, Stone Environmental Inc. (Stone) conducted a thorough inspection and evaluation of the collection and land application system for the dairy processing wastewater (DPWa) as per Agri-Mark, Inc. dba/ Cabot Creamery, Indirect Discharge Permit (IDP) #9-0043, January 12, 2016 Part II, Condition F2, I4(A). Overall, the operation, documentation, maintenance and land application of the DPWa was operating extremely well, in excellent condition, and performed in accordance with the conditions and requirements set forth in the IDP. Present during the entire inspection from Cabot was Aaron Page, Environmental Engineer (EE). Others present from Cabot during certain phases of the inspection were Dick Trucott, Marvin Colburn, and Ron Metevier. The inspection included following the DPWa from generation to land application, and a full document review. The inspection also included observing the land application of the DPWa on to two disposal fields. A couple of improvements were noted from last year's (2017) inspection:

1. Under the direction of the Cabot's Environmental Engineer, Aaron Page, Cabot installed a pH buffering system which provides continuous in-line metering, monitoring and buffering of the washwater pH. Additionally, a pH monitoring system was installed along with an automatic agitator inside of the newer storage tank.
2. As notified to the agency, the following cleaning chemicals were added; Passage (Floor Treatment) and Dry Bleach (Specialized cleaning agent). Sustain No. 464, Enhance, Hydriflux A No. 371, Iodosan No. 485, Ultrasurf and Security Floor Treatment previously reported are no longer in use at either facility.

Future improvements planned for 2018:

1. The older of the Washwater storage tanks installed in 1987 has maximized its lifecycle for its use and is scheduled to be replaced with new steel glass fused tank with built in corrosion protection this year. Construction on the new state of the art tank will start in June 2018.

This inspection found no compliance issues in the collection and land application system for Cabot's DPWa as per Agri-Mark, Inc. dba/ Cabot Creamery, Indirect Discharge Permit (IDP) #9-0043, January 12, 2016 Part II, Condition F2, I4(A). Stone has one recommendation regarding driver training. It is recommended that annual driver refresher training is provided on land application buffer distances outlined in Table 1 of the "*Vermont Guidelines for Land Application of Dairy Processing Wastes.*"

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Cover Photo: Cabot land application to an agricultural field, 2018. Taken by Kim Watson.

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1. Introduction

In accordance with Agri-Mark, Inc. dba/ Cabot Creamery, Indirect Discharge Permit (IDP) #9-0043, January 12, 2016 Part II, Condition F2, I4(A), Stone conducted a year 2018 inspection and evaluation of the collection and land application system for the dairy processing wastewater (DPWa) at their manufacturing facility, located in Cabot, Vermont. The evaluation and inspection were reviewed by Christine Gingras, P.E. of Stone and performed by Kim Watson, RQAP-GLP of Stone on Tuesday May 22, 2018. Present during the entire inspection from Cabot was Aaron Page, EE. Others interviewed and present from Cabot during certain phases of the inspection were Dick Trucott, Marvin Colburn, and Ron Metevier. The inspection was limited to the collection and land application system for the DPWa (IDP, Part II) and did not pertain to polished permeate disposal (IDP, Part I) or sanitary wastewater from the facilities. This report documents the objectives, criteria, procedures, findings, observations and recommendations of the inspection.

The DPWa that leaves the plant facility exits the manufacturing building and the cut-and-wrap building via floor drains and flows by gravity to a storage tank (capacity 4,500 gallons) under the pumping station located across the main road from the main Cabot facility. The DPWa is composed of a quantity of milk, whey spillage, cottage whey rinse water, and the water used to sanitize the trucks, CIP (clean-in-place) lines, and equipment. The pumping station has pumps in tandem and a backup power supply system, which allows for continued operation of the manufacturing facility in the event of temporary pump or grid power failure and an alarm system to alert personnel when the storage tank capacity is about to be exceeded. DPWa is pumped from the pumping station upslope by an underground pipeline to the pH buffer system that provides in-line metering, monitoring and buffering of the pH of the washwater and then proceeds to the two 100,000 gallon storage tanks, in parallel, located near the Waste Treatment Department garage. A continuous flow meter in the pump house is used to measure the volume of DPWa produced and pumped to the storage tanks. A digital meter in the loading shed records influent and effluent volumes sent to and from the storage tanks. The storage volumes are recorded daily on the washwater storage tank level form submitted in the monthly report using the digital read-out. From the tanks, the DPWa is gravity fed into disposal trucks and disposed of by diffuse land application and in manure pits. A digital flow meter located in the loading shed controls and records the volume transferred to the disposal vehicles. The vehicles used for land application are equipped with a high pressure spray nozzle (Big Gun) which distributes the DPWa to the approved disposal fields in a uniform manner.

The inspection of the collection and land application management system, which included review of Daily Journals record keeping, and daily wastewater production records concluded that the DPWa collection and dispersal operations performed by Cabot Creamery are functioning well, are accurately documented, and follow the conditions and requirements of the IDP, and associated procedures and guidelines. During the inspection Stone made a specific recommendation that during truck driver training that all drivers get refresher training on buffer distances outlined in Table 1 of the *“Vermont Guidelines for Land Application of Dairy Processing Wastes.”* Recommendations are outlined in Section 4 of this report.

2. Objectives

The objectives of the annual inspection were:

- To make a thorough inspection, evaluation, and report of the collection and land application system.
- To determine whether Cabot Creamery is complying with all monitoring, recordkeeping, record retention (archiving), and information requirements specified in IDP ID-9-0043-4A.

The inspection included the following:

- Examining the collection system and pump station(s) used to convey the dairy processing DPW_a from the production area to the storage tanks;
- Verifying the proper operation of the pump(s) and, if applicable, any alarm systems;
- Examining the tanks and containment structures as well as any leakage detection systems;
- Checking the calibration of flow meters used to determine the volume of DPW_a stored in the tanks or verifying, by the review of recent documentation (within the past two years), that the meters are properly calibrated within a 10% tolerance;
- Checking the equipment utilized to fill the spray trucks and observing the procedure utilized to fill the trucks;
- Observing the land application of dairy processing wastewater on disposal fields, and checking the proper operation of each truck's spray nozzle;
- Checking each vehicle's daily journal for compliance with the requirements of Condition E7; and,
- Noting any necessary repairs, maintenance and/or improvements that should be made to the land application system.

The performance standards or evaluation criteria for the inspection were based on the written IDP #ID-9-0043-4A including Attachment A-1, A-2, B or C, “Approved Disposal Fields” and “Approved Application Rates” and Attachment B “Listing of Manure Pits”. The criteria and procedures set forth in the *Vermont Guidelines for Land Application of Dairy Processing Wastes, August 14, 1990*.

2. General Observations

The inspection report is presented in the order of the system process at the wastewater garage area. The inspection was performed in a manner to follow the DPWa process from the truck loading area and garage to the pumping station to its origin in the cheese processing facility. The inspection included traveling with truck operators, observing land application of the washwater, and record keeping.

2.1. Collection System and Pump Station

The pumping station has two pumps and a backup power supply (generator) located next to the pump house. Both pumps were operational and working well according to the maintenance program. The main pump comes on when the water level reaches 3.5 feet in the tank and shuts off when the level drops back to 2 feet, with a flow rate of 230 gallons per minute. The second pump comes on when the water level reaches 4 feet and it shuts off when the level drops back to 2 feet; the rate increases to 310 gallons per minute with both pumps on. An alarm system is located at the pumping station, the processing facility, and at the storage tanks and goes off when the water depth in the tank reaches 4.5 feet. A continuous flow meter in the pump house measures the volume of DPWa produced and reads the gallon per minute of DPWa pumped out. The alarm systems are now connected to a new programmable logic controller (PLC) and human machine interface (HMI) which allows for continuous digital review of the washwater volumes and levels within the storage units. DPWa is pumped from the pumping station upslope, by an underground pipeline, to the pH buffering system and then on to two storage tanks (100,000 gallons each) located near the Waste Treatment Department garage.

Cabot Maintenance is responsible for documentation and maintenance of the pumps in the pumping station. A computerized system keeps and tracks all maintenance requests. The total daily volume of DPWa generated is recorded each morning from the digital flow meter located in the pump house and entered into a spreadsheet. The in-line flow meter was replaced on April 30, 2018 with a newly calibrated flow meter as documented in the maintenance program. The calibration certificate (Exhibit 1) for the actual meter was traceable to the specific meter in the pumping house and in the loading area and met the 10% tolerance criteria.

2.2. Tanks and Containment Structures

There are two tanks in parallel which can store a total of up to 200,000 gallons of washwater. The newer of the two tanks was installed in 2012 (steel glassed fused lined) and the older one in 1987. The tanks are set inside a lined pit, with a berm on all sides directing rain water to a drain in the center of the pit. This drain connects to the sump under the loading area that drains back to the pump station, which gets pumped back to the storage tanks. A pH monitoring system was installed along with an automatic agitator in the newer tank. (Exhibit 3) in 2017. The older tank having a life span of 50 years for potable water and 30 years for its use is scheduled to be replaced in 2018 with construction starting in June. It was determined after the manufacturer's inspection that the tank showed signs of corrosion and suggested the replacement. Also, the new tank will be of the same construction as the other tank and will include corrosion protection. The liquid levels in the storage tanks are

monitored digitally in the pump house using a PLC/HMI system. The DPWa is gravity fed into the disposal vehicles for land application.

2.3. Drivers, Disposal Vehicles and Loading Area (Shed)

Aaron Page, EE is the contact for regulatory operations in the IDP, and is identified as the Chief Operator of the wastewater system. He is the lead for system reporting, regulatory review and day-to-day operations. Rejean Pion is also identified as the Assistant Chief Operator and is a vehicle driver of one of the land application vehicles. Four other drivers hold a Grade I Operator license, so as to have qualified personnel available seven days per week. The DPWa storage tank levels are recorded twice daily on the “Wash Water Storage Tank Levels” form as required by the IDP (morning and evening) and are included in the Monthly Disposal Report using the digital system in the loading hut.

Cabot employs eight full time drivers and two part time drivers. All of the drivers have a Class A or B commercial driver’s license and have annual physicals for medical clearance as required under the Vermont Department of Transportation (DOT) regulations.

The Waste Treatment Department at Cabot maintains a fleet of six disposal vehicles adequate to properly dispose of DPWa through land application, including discharges to manure slurry pits as allowed by IDP Part II–Section D8. Each truck is red (includes Cabot’s phone number), is numbered (trucks, #406, #407, #408, #409, #410 and #411), and has a 4,000 gallon holding tank. Maintenance of the disposal vehicles is performed in-house. Maintenance records are kept on each of the vehicles and recorded in a maintenance log. All vehicles’ inspections were current. Each vehicle’s “Big Gun” high pressure spray nozzle was in good condition, clean and clear. DOT maintenance records were available in all vehicles. The records were filled out daily and signed by the driver. Daily Journals and standard operating procedure (SOP) manuals were available in every vehicle and reviewed during the inspection. The Daily Journals were compliant with the requirements of Condition I11 of the permit. Drivers were recording their observations at time of occurrence and included the actual groundwater levels next to the well IDs, and the actual pH of the washwater when taken.

The SOP manual available in every vehicle contained appropriate procedural documents including “*Vermont Land Application of Dairy Processing Wastewater*” and the procedure for determining depth to groundwater measurements. Also included in the manuals are site maps of every approved disposal field and overweight permits for the towns involved in the disposal program. The site maps of approved disposal fields provide details regarding the approved acreage for disposal (summer, fall or verified fields), location of observation wells, soil borings, water wells, buildings, slopes, distances and any limitations imposed upon that disposal field such as isolation distances, slope, soils and hydrogeology.

The DPWa is loaded into the disposal trucks by gravity through a controlled flow system within the truck loading area shed. The in-line Siemens flow meter was replaced with a calibrated meter on May 1, 2018 (Exhibit 2) and met the 10% tolerance criteria. A daily “Remaining Capacity Report” is printed from the Wastewater Management System and is available in the loading shed for the drivers. The Wastewater Management System records were up to date and accurate. The driver can control the amount loaded using an automated volume control and a manual control. A mirror is located on the top of the loading arm which provides a sight-line into the vehicle tank. Each driver is responsible for loading their vehicle and selecting a site for disposal based on the available “Remaining Capacity Report.” Each driver, also, had a “Capacity Report” in their vehicle.

2.4. Land Application to Approved Disposal Field and Manure Pit

Two land application trips were randomly selected for observation on May 22, 2018. Land applications were observed with driver with Marvin Colburn in truck #407 and Ron Metevier in truck #411. Drivers were interviewed during the inspection and the inspector accompanied the driver on the trip to the disposal locations (McCoy 71G and Kopecky -132B). The drivers chose a field from the capacity report, loaded their truck to capacity using the flow control system in the loading shed and traveled to the assigned field. There was no visible standing water in the fields with the exception of a new water drainage ditching system created by the farmer at Kopecky's field which meandered through the far end of the field. The driver recognized the ditching system and made sure that there was adequate distance (50') from the ditch which did contain a small amount of surface water. The driver stated that he needed to keep a distance of 30' from the ditch, however, the application guidelines stated 50' and he actually did provide for that buffer. Therefore, it is recommended that all drivers have an annual refresher on the stated distances in the application guidelines and the permit. The wind directions were checked so DPWa spray would not be carried off the spray sites. The DPWa was applied to the field, stationing the truck to set the gun to achieve a uniform application (Exhibit 3). The DPWa was sprayed from the vehicle and was moved slowly to cover the appropriate acreage (covering approximately 1/8 acre). The driver recorded the farm name, the field number, the field code, the truck route taken, and the start and stop times of disposal in the bound daily journal in the vehicle.

2.5. Data Input, Calculation, and Reporting

Aaron Page was interviewed regarding the input, calculation, and reporting of DPWa management data. Aaron Page enters field data from IDP Attachment A-2, B and C into the Wastewater Management System database regarding the landowner and address, usable acreages, application rates, seasonal gallons available for application, and description codes. Data entries are also performed by Rejean Pion and Marvin Colburn. Mr. Page ensures that the data in the Wash Water Data Management System is accurate and up to date.

Mr. Page, or his designee, enters the daily disposal data from the journals. The route reports are prepared by Mr. Page or his designee daily, prior to the start of the days applications. Mr. Page prepares the required regulatory reports to the State which are reviewed and signed off on by Marcel Gravel.

Monthly disposal reports are submitted as required under Part II—Condition I12 of the IDP and the March 2017 Monthly reports were available during the inspection. An annual report is submitted to the Secretary of the Agency of Natural Resources, per Part II—Condition I13.

According to Mr. Page there were no notices of violation in the last year. Mr. Page reported that there were a number of one-time-use fields used last year. The driver checklists for one-time-use fields are available in a binder organized alphabetically by farmer's last name on-site. As notified to the agency, the following cleaning chemicals were added; Passage (Floor Treatment) and Dry Bleach (Specialized cleaning agent). Sustain No. 464, Enhance, Hydriflux A No. 371, Iodosan No. 485, Ultrasurf and Security Floor Treatment previously reported is no longer in use at either facility.

2.6. Inspection Compliance Checklist

A completed Inspection Compliance Checklist is provided in Appendix A (Exhibit 4) of this report.

3. Findings and Recommendations

The collection and land application system for the DPWa is operating very well, is well documented, and within the terms and conditions set forth in Part II of the IDP. Operations management is adequate, well organized, and well-liked by the staff. The drivers were knowledgeable and competent, and understood the restrictions and limitations for land application as outlined in the permit and the state guidelines with the exception noted.

There were no findings generated as a result of the inspection which indicated compliance issues. However, a single recommendation/observation was made regarding driver training. It is recommended that annual a driver refresher training be provided on land application buffer distances outlined in Table 1 of the *“Vermont Guidelines for Land Application of Dairy Processing Wastes. August 1990.”*

Appendix A: Exhibits 1-4

SIEMENS MAGFLO® Verification Certificate

Customer:

Name Cabot Creamery
 Address 2887 Main Street
Cabot, VT 05647

Phone _____
 Email _____

MAGFLO® Identification:

TAG No./Name 0
 Sensor Code No. 7ME631
 Sensor Serial No. 084940H054 ✓
 Transmitter Code No. 7ME69101AA101BA0
 Transmitter Serial No. IXFN1220532
 Location Maintenance Shop

*Confirmed
 from
 5/22/15*

Results:

Verification file name or No. Maintenance Shop → Force main Wastewater
 Transmitter Passed Pump room
 Sensor Insulation Passed
 Magnetic Circuit Passed

Velocity		Current Output		Frequency Output		
Theoretical	Theoretical	Actual	Deviation	Theoretical	Actual	Deviation
0.5m/s	4.800mA	4.802mA	0.22%	0.500kHz	0.500kHz	0.00%
1.0m/s	5.600mA	5.599mA	-0.05%	1.000kHz	0.999kHz	-0.11%
3.0m/s	8.800mA	8.801mA	0.03%	3.000kHz	3.002kHz	0.07%

Current Output 4-20mA Frequency Output 0-10kHz

Transmitter Settings:

Basic Qmax. 500 000 US G /min
 Flow Direction Positive
 Low flow Cut-off 1.50%
 Empty Pipe OFF

Output Current Output ON (4-20mA)
 Time Constant 1.5 Sec.
 Relay Output Error Level
 Digital Output OFF
 Frequency Range N/A
 Time Constant N/A
 Volume/pulse 0.0 US G/p
 Pulse width 0.066 sec.
 Pulse polarity Positiv

Totalizer 1 value before test 581 29668516 US G
 Totalizer 1 value after test 590.16873448 US G
 Totalizer 2 value before test 0.02607907 US G
 Totalizer 2 value after test 0.02846982 US G
 Operating time in days 0

Sensor Details:

Size DN 150 6 IN
 Cal Factor 17 86133003
 Correction Factor 1.0
 Excitation Freq 7.5Hz

Vericator Details (083F5061)

Serial No N1F6220001
 Device No. 150031
 Software Version 1.40
 PC-Software Version 5.01
 Cal date 2016.02.09
 ReCal date 2017.02.09

Comments

These tests verify that the flowmeter is functioning within 2% deviation of the original test parameters
 Verification is traceable to National and International Standards.

Date and signature *Jason D Cady*
7-10-17

SIEMENS MAGFLO® Verification Certificate

Customer:		MAGFLO® Identification:	
Name	Cabot Creamery	TAG No./Name	0
Address	2887 Main Street	Sensor Code No.	7ME631
	Cabot, VT 05647	Sensor Serial No.	061940H082 *
Phone		Transmitter Code No.	7ME69101AA101BA0
Email		Transmitter Serial No.	IXFN1220532
		Location	Load Out

Confirmed by KBW 5/22/18

Results:

Verification file name or No. Load Out - wastewater loadout shack

Transmitter Passed

Sensor Insulation Passed

Magnetic Circuit Passed

Velocity	Current Output			Frequency Output		
	Theoretical	Actual	Deviation	Theoretical	Actual	Deviation
0.5m/s	4.800mA	4.799mA	-0.10%	0.500kHz	0.498kHz	-0.34%
1.0m/s	5.600mA	5.600mA	-0.02%	1.000kHz	0.999kHz	-0.09%
3.0m/s	8.800mA	8.802mA	0.04%	3.000kHz	3.002kHz	0.06%

Current Output 4-20mA Frequency Output 0-10kHz

Transmitter Settings:

Basic Qmax. 3000.00 US G /min
 Flow Direction Positive
 Low flow Cut-off 0.50%
 Empty Pipe OFF

Output Current Output ON (4-20mA)
 Time Constant 5.0 Sec.
 Relay Output Error Level

Digital Output Pulse
 Frequency Range N/A
 Time Constant N/A
 Volume/pulse 0.99999953 US G/p
 Pulse width 0.0041 sec.
 Pulse polarity Positiv

Totalizer 1 value before test 637.6049661 US G
 Totalizer 1 value after test 650.35868823 US G
 Totalizer 2 value before test 0.02846982 US G
 Totalizer 2 value after test 0.07341341 US G
 Operating time in days 0

Sensor Details:

Size DN 200 8 IN

Cal. Factor 31.11448669

Correction Factor 1.0

Excitation Freq. 3.75Hz

Vericator Details (083F5061)

Serial No. N1F6220001

Device No. 150031

Software Version 1.40

PC-Software Version 5.01

Cal. date 2016.02.09

ReCal. date 2017.02.09

Comments

These tests verify that the flowmeter is functioning within 2% deviation of the original test parameters.
 Verification is traceable to National and International Standards

Date and signature *Jason D Cadby*

7-10-17

EXHIBIT 3



Storage Tank 1: pH probe and Agitator, photo taken by Kim Watson, 5/22/2018



Land application, Field 71G. Photo taken by Kim Watson, 5/22/2018

GENERAL IDP INSPECTION-
CHECKLIST
May 2017



Auditor: Kim B. Watson, RQAP-GLP, Professional Engineer: Gabe Bolin, P.E. Stone Environmental, Inc.	Audit Date: May 22, 2018
Agri-Mark, Inc. dba Cabot Creamery, Cabot Creamery Facility, Cabot Vermont Indirect Discharge Permit Inspection	
Personnel Interviewed: AARON PAGE	
Regulatory Documents Compliance: IDP Permit No. ID-9-0043: January 12, 2016 VT Guidelines for Land Application of Dairy Processing Wastes	
Others:	

**WASTE PROCESS OPERATIONS – INDIRECT DISCHARGE OF DAIRY
PROCESSING WASTEWATER PROCESSING**

PART II , III – Type of Waste- Dairy Processing water: may contain, whey spillage, cottage (acid)whey, cottage rinse water, water used to clean the lines and equipment.

Indirect Discharge Permit Inspection Item

Question	REF/ Other	Y/N	Comments
1. examination of the collection system and pump station(s) used to convey the dairy processing wastewater from the production are to the storage tanks;	Section 14	Y	working well
2. verification of the proper operation of the pump(s) and, if applicable, any alarm systems;	✓	Y	alarm will sound - went off this year
3. examination of the tanks and containment structures as well as any leakage detection systems;	✓	Y	
4. checking the calibration of flow meters used to determine the volume of dairy processing wastewater stored in the tanks or verifying, by the review of recent documentation (within the past two years), that the meters are properly calibrated within a 10% tolerance;	✓	Y	
5. checking the equipment utilized			

GENERAL IDP INSPECTION-
CHECKLIST

May 2018



Question	REF/ Other	Y/N	Comments
to fill the spray trucks and observing the procedure utilized to fill the trucks:		Y	OBSERVATION HMI
6. observing the land application of dairy processing wastewater on disposal fields, and checking the proper operation of the each truck's spray nozzle;		Y	2 TRIPS ROAD SIDE #407 - MARVIN #411 - RON
7. checking each vehicle's daily journal for compliance with the requirements of Condition I11, (Daily Journal).		Y	ALL - WORKING WELL
8. noting any necessary repairs and maintenance and/or improvements that should be made to the land application system.			#410 gone for maintenance

COMMENTS:

Drivers 8 full time
2 part time

Marvin Colburn
Dick Trucott
Gerard Pion
Harvey Lyon
Reyan Pion
Luke Conley
Ron Metevier
Daryl Breitner (new)
(in trainer - buddy)

see new
maintenance
logs -
In line ph monitoring
system functioning
implemented 10/2017

application
taps
Marvin McCoy 71G
Metevier Kopecky 132B
(Note - distance to
surface water
Verbal - 30'
Actual - over 50'
Note refresher
training