Hawaii Department of Health
Clean Water Branch
919 Ala Moana Blvd., Room 301
Honolulu, HI 96814

Concentrated Animal Feeding Operation NPDES Inspection Report

Facility Name: Big Island Dairy

NPDES Permit No.: Not Permitted

Date and Time:	December 14, 2016	***Entry*:**	10:00 a.m.	***Exit*:**	4:45 p.m.
Weather:	Sunny with evidence of recent precipitation				
NPDES Permit No.	Not Permitted				
Facility Name:	Big Island Dairy				
Facility Address:	39-3308 Hawaii Belt Road; Hilo, Island of Hawaii, Hawaii 96720				
Tax Map Key (TMK):	TMK (3) 3-9-002:008				
Receiving Water(s):	Kaohaoha Gulch (Class 2, Inland Water) Alaialoa Gulch (Class 2, Inland Water) Kaula Gulch (Class 2, Inland Water)				
Facility Representatives:	Brad Duff (General Manager, Big Island Dairy)	(808) 895-3584			
	Riley Smith (Co-Owner/Dairy Manager, Big Island Dairy)	(808) 464-5016			
Inspectors:	Anthony D'Angelo (U.S. EPA Contractor, PG Environmental)	(303) 279-1778			
	Matthew Kurano (Enforcement Section, Hawaii Department of Health, Clean Water Branch)	(808) 586-4309			

Executive Summary:

Big Island Dairy (BID) is a commerical dairy operation on the Island of Hawaii, near the community of Ookala, northwest of Hilo. The purpose of the inspection was to understand and evaluate the dairy operations conducted at BID which may be subject to National Pollutant Discharge Elimination System (NPDES) regulations for concentrated animal feeding operations (CAFOs). Based on the mature dairy cow head count, full-time covered confinement practices and the potential for pollutants to discharge into nearby waters of U.S., BID may be classified as a large CAFO, a point source subject to NPDES regulations as stated in 40 CFR Part 122.

SECTION I – INTRODUCTION

Purpose of the Inspection

On December 14, 2016, I, Anthony D'Angelo, a U.S. Environmental Protection Agency (EPA) contractor with PG Environmental, along with Hawaii Department of Health – Clean Water Branch (HDOH) representative Matthew Kurano, conducted an inspection of the Big Island Dairy facility (hereinafter, BID or Facility) located near the community of Ookala, on the Island of Hawaii.

The purpose of the inspection was to understand and evaluate the dairy operations conducted at BID. National Pollutant Discharge Elimination System (NPDES) regulations for concentrated animal feeding operations (CAFOs) exist and are in effect and as such, the inspection focused on gathering information to assess the Facility's need to obtain a NPDES permit to achieve compliance with State and Federal law. Section 301(a) of the Clean Water Act (CWA) establishes statutory requirements for the discharge of pollutants from point sources to waters of the U.S. Under CWA Section 502(14) and its implementing regulations at 40 CFR Part 122, CAFOs are point source discharges. As specified in 40 CFR Part 122.23(c)(3), no operation may be designated as a CAFO until an inspector has conducted an on-site inspection of the facility, regardless of the size of the operation or the type of animals confined. This report identifies the observations made during the inspection pertaining to BID's potential designation as a CAFO and applicability to associated NPDES regulations. An annotated photograph log and associated figures are included as part of this report as appendices and are referenced as applicable.

Inspection Summary

Upon arriving at the BID main office at 10:00 a.m., Mr. Kurano and I met with two BID representatives, Riley Smith, Co-Owner/Dairy Manager and Brad Duff, General Manager (jointly referred to as BID Representatives). Mr. Kurano presented his credentials and explained the purpose of the inspection (refer to Photograph 1). Mr. Kurano provided background information to the BID Representatives regarding general NPDES regulations and the responsibilities of the HDOH to implement these regulations. The BID Representatives confirmed that the Facility was registered as a 2,000-head CAFO with the US Department of Agriculture (USDA). After approximately 45 minutes of general discussion regarding the Facility property, operations, recent/ongoing upgrades, and waste disposal practices, Mr. Duff accompanied Mr. Kurano and I on a general tour of the Facility. At the end of the Facility tour, at approximately 3:50 p.m., Mr. Kurano and I conducted a closing conference with Mr. Duff where we presented our preliminary observations about the Facility's possible need for NPDES coverage.

Information obtained and discussed during the opening conference, Facility tour, and closing conference are presented in the following inspection report sections.

Facility Description

BID is a commercial dairy farm that encompasses approximately 2,500 acres near the community of Ookala, northwest of Hilo, Hawaii. The Facility is bordered to the northeast (downgradient) by

Mamalahoa Highway (Highway 19) and extends south/southwest, climbing in elevation, for approximately 2.5 miles. The Facility ranges in elevation between approximately 500 feet above mean sea level (AMSL) along Mamalahoa Highway, to 2,000 feet AMSL near the property's south/southwest border with the Hilo Forest Reserve. The upgradient portions of the property are comprised primarily of pasturelands, with some low yield croplands. The mid-gradient portions of the property are comprised of dairy facilities, croplands, and pastureland, while the low gradient portions of the property are used solely as high yield croplands (refer to Figure 1 and Photograph 2). BID also owns and farms an offsite 160-acre cropland between Ookala and Hilo which is used to bolster its cow feed supplies. The offsite parcel was not visited as a component of this inspection.

The Facility was purchased in 2012 and has since expanded its operations. Dairy cows are bred, raised, and milked onsite. Currently, milk is hauled offsite to either Hilo or Honolulu for processing. The BID Representatives stated that since 2012, the Facility owners have been renovating the existing dairy facilities and constructing new dairy facilities including a main office building, two 1,000-head freestall barns, a milking barn, a manure composting building, supporting appurtenances, new feed storage stalls, a maintenance shop with aboveground fuel tanks, and a 2.5 million-gallon wastewater lagoon.

Existing dairy facilities are located northeast of the new facilities, and include a 380-head barn, old milking barn (now a livestock hospital), feed storage stalls, covered manure separation cells, and a 1 million-gallon wastewater lagoon (refer to Figures 1 and 2).

At the time of the inspection, BID was actively constructing a new building and preparing to install three new large aboveground dairy product storage silos (refer to Photograph 3). Of note, BID also has NPDES permit coverage for storm water discharges associated with construction activity, NPDES Permit No. HIS000224. Compliance with NPDES Permit No. HIS000224 was not evaluated as a component of this inspection. However, information previously provided to HDOH as part of NPDES Permit No. HIS000224 was reviewed prior to the inspection. The information reviewed included facility information detailing storm water drainage from the Facility.

Specifically, the permit information details that the Facility includes multiple drainage ways from the Huluuma section of the Hilo Forest Reserve which flow from the southwest to northeast through the Facility property, ultimately ending at the Pacific Ocean near the neighboring community of Ookala. NPDES Permit No. HIS000224 identifies three receiving waters (that at least have the potential to receive flow from the Facility's areas of disturbance associated with construction activities):

- Kaohaoha Gulch (Class 2, Inland Water)
- Alaialoa Gulch (Class 2, Inland Water)
- Kaula Gulch (Class 2, Inland Water)

Refer to Figure 3 of this inspection report for a *GoogleEarth* aerial image that depicts these three gulches using EPA's My Waters Mapper geospatial data layer (accessed on December 20, 2016; https://watersgeo.epa.gov/mwm/). Based on general site observations, it appears that the information

included in NPDES Permit No. HIS000224 is accurate and that the three inland waters listed above receive storm water flow from the BID property.

Mr. Duff explained that the property was historically a sugar cane plantation, and as such, many of the natural drainage ways that originally flowed through the property were previously channelized, diverted, or filled in by the plantation.

Receiving Waters

Kaohaoha Gulch flows through the center area of the property and due to its location, appeared to be the gulch most potentially impacted by CAFO operations. The gulch flows along the east side of the dairy operations area (i.e., cow barns, milking barn, hospital, lagoons) and low elevation irrigated croplands. A discharge from the Facility's wastewater lagoons would likely enter this gulch upon overflow (refer to Figures 2 and 3).

Alaialoa Gulch originates on property pastureland, near the manure composting building, and flows through irrigated croplands along Ookala Road. An inspection of the Facility by HDOH conducted during June/July 2014 was prompted from a public complaint regarding brown, manure-smelling water flowing in Alaialoa Gulch through Ookala. That inspection confirmed a discharge of manure-laden water into Alaialoa Gulch from the Facility's "airstrip" heifer sheds. At the time of this inspection (December 14, 2016), the Facility was no longer housing cows in the airstrip heifer sheds. However, storm water runoff from the Facility's manure composting building and upgradient areas of construction (e.g., new building) likely flow into Alaialoa Gulch (refer to Figure 3).

Kaula Gulch flows along the western perimeter of the property and, due to its location, appeared to be the gulch least likely to be impacted by CAFO operations (refer to Figure 3).

Livestock Management

At the time of the inspection, the Facility contained approximately 1,800 total cows, of which, 1,226 were identified as mature milking cows (not including dry cows). Mature milking cows are housed full-time in two newly constructed 1,000-cow freestall barns (upper and lower; refer to Photographs 4 and 5). While visiting the freestall barns, Mr. Duff identified the mechanically operated manure scraping systems that continuously scrape manure from the cow pen alleys into a central manure collection trough (refer to Photographs 6 through 8). The manure scraping systems were operational and, as such, manure accumulation in the cow pen alleys was minimal at the time of the inspection. The bedding present in the freestall barn cow pens consisted of composted manure solids recovered from the manure scraping system that was composted onsite at the manure composting building.

The 1,226 milking cows are milked in the newly constructed 60-cow milking barn attached to the BID main office (refer to Photograph 9). Mr. Duff explained that milking equipment is cleaned daily using a clean-in-place (CIP) system. Caustic detergent solution (chlorinated alkaline detergent) is first run through the system, followed by a low-foaming CIP acid solution for disinfection. During the Facility

tour, I observed multiple 55-gallon drums of caustic detergent and acid (incompatible chemicals) stored together on a pallet, outdoors without secondary containment (refer to Photographs 4 and 10). Milking cows are directed through a copper sulfate hoof bath when entering and exiting the milking barn to prevent spread of disease and bacteria in an area of high cow traffic (refer to Photograph 11). Milk product is stored in two 20,000-gallon milk silos. Well water used for general dairy operations is stored in a 17,000-gallon aboveground tank located adjacent to the milk silos.

Dry cows, heifers, and bulls are housed in the upgradient pasturelands of the property. Calves and injured cows are housed in the preexisting 380-head barn (refer to Photographs 12 and 13). The old milking barn located adjacent to the 380-head barn has been converted into the Facility's livestock hospital building.

The BID Representatives stated that mortalities are buried onsite. The mortality burial pit that was in use at the time of the inspection was located in an existing gulch located between the covered manure separation cells access roadway and the newly constructed 2.5 million-gallon lower wastewater lagoon (refer to Photograph 14). Mr. Duff stated that any storm water runoff that comes into contact with the open mortality burial pit would sheet flow into the lower lagoon.

Manure and Wastewater Storage and Disposal Practices

During the opening conference, the BID Representatives explained to Mr. Kurano and I that manure generated onsite is recovered and used to fertilize croplands or composted to make cow pen bedding. They confirmed that manure is not removed from the property, sold, or given away to the general public. Manure from each freestall barn gravity flows into a waste stream collection pit located at the manure composting building (refer to Photograph 15).

Process wastewaters from the milking barn include CIP wastewater, general spray down water, and copper sulfate hoof bath drag out; all of which flow to the manure composting building collection pit. Mr. Duff explained that wastewaters (including CIP wastewater) that will be generated from the Facility's new building operations will not be allowed to flow into the lagoon due to its' classification as an industrial process wastewater.

Calf pen alley flush water from the Facility's existing 380-head barn also gravity flows into this collection pit. Mr. Duff stated that the existing barn is now used solely to house calves and injured cows, and that it is flushed one to two times per day. Flush water is collected in a trough at the northeast end of the barn, and is piped into the manure composting building collection pit (refer to Photographs 12 and 13).

Two influent pipes convey wastes from the new and existing dairy facilities into the manure composting building collection pit, which is mechanically agitated to suspend manure solids (refer to Photograph 16). The contents of the collection pit are pumped into two manure solids gravity separation units which operate in series. Manure solids that are separated from the waste stream are conveyed via auger screw into two composting digester vessels (refer to Photograph 17). Composted manure on the backend of

the vessels is then mechanically conveyed into a covered composted manure stockpile stall (refer to Photograph 18). During the visit to the manure composting building, I observed a tractor actively loading a trailer with cow bedding (refer to Photograph 19).

While at the manure composting building, Mr. Duff identified a 3,500-gallon mobile tanker trailer he referred to as a "honeywagon" (refer to Photographs 15 and 20). He explained that BID was working on plans to direct flow from the manure composting building that would normally flow into the covered manure separation cells (and lagoons) into the honeywagon. This would allow for upgradient cropland irrigation and fertilization with manure-laden wastewater. Mr. Duff stated this plan will significantly reduce the amount of flow into the lagoons. Mr. Duff also stated that BID was constructing a concrete pad located north of the manure composting building, near the upper reach of Alaialoa Gulch to allow for the transfer of flow into the honeywagon (refer to Photograph 21). BID should be made aware that if the Facility is designated as a large CAFO needing NPDES permit coverage, by land applying manure and manure-laden water on these upgradient croplands, these croplands would then fall under areas of the property subject to CAFO NPDES regulations.

Filtrate removed from each manure solids gravity separator is returned to the manure composting building collection pit and is recycled through the system for additional solids removal. Liquid removed from the composting vessels flows into the Facility's existing covered manure separation cells, adjacent to the Facility's two lagoons. Overflow from the manure composting building collection pit also gravity flows into these separation cells (refer to Photographs 20 and 22). The waste stream entering the separation cells first flows into one of two primary cells (refer to Photograph 23). Manure is removed from the primary cells and, over time, moved up elevated cells to allow for manure solids/liquid separation and to promote drying. Separated liquid collects in the primary cells and flows out via two drain pipes (one at the back of each primary cell), into an earthen conveyance channel that flows into the southwest corner of the existing upper 1 million-gallon lagoon (refer to Photograph 24 and 25). This upper lagoon was referred to by Mr. Duff as the "green pond" due to the presence of a large floating vegetative mat on the surface of the lagoon.

At the time of the inspection, Mr. Kurano and I observed the large vegetative mat on the surface of the upper lagoon (refer to Photograph 25). Mr. Duff stated that the vegetative mat has been present since the property was purchased in 2012, and that it has prevented Facility personnel from accessing the lagoon or identifying the depth of accumulated solids. As such, Mr. Duff stated that the upper lagoon had not been cleaned since at least 2012, and that he was unaware of the depth of solids in the lagoon or the exact date of the last cleaning event. Mr. Kurano and I observed that the upper lagoon was not equipped with a depth marker at the time of the inspection.

At the time of the inspection, an access road that runs along the south side of the upper lagoon was inundated with what appeared to be lagoon water; therefore, the perimeter of the upper lagoon, including the berm between the upper and lower lagoons, as well as the east side of the lagoon that abuts Kaohaoha Gulch, were inaccessible. Mr. Duff stated that the only other access to the east side of

the upper lagoon was to hack through dense fields of guinea grass. Two connection pipes (west and east) convey flow from the upper lagoon directly into the west and east sides of the lower 2.5 million-gallon lagoon (refer to Photographs 26 and 27). Mr. Duff stated that the majority of flow enters the lower lagoon via the east connection pipe. Mr. Kurano and I observed that the lower lagoon did not contain a vegetative mat, was not equipped with a depth marker, and was close to capacity at the time of the inspection (refer to Photograph 28). Mr. Duff explained that the manure solids and wastewater contents of the lower lagoon are agitated using a floating agitator, then pumped out using a draw pump system, and then used in the Facility's cropland irrigation system (refer to Photographs 28 through 30). This irrigation system is used to irrigate the Facility's low elevation, high yielding croplands.

During the opening conference, I asked the BID Representatives if the newly constructed lower lagoon was lined and if it was equipped with an overflow spillway. The BID Representatives did not believe the lower lagoon contained a liner and were initially unaware if the lower lagoon contained a spillway. It should be noted that historical aerial imagery from August 2014 potentially shows a liner on the bottom of the lower lagoon; however, the presence of this liner was not confirmed during the inspection. Before visiting the lagoons, Mr. Duff informed Mr. Kurano and I that a dairy employee went down to the lower lagoon and confirmed that the southeast side of the lower lagoon contained an overflow spillway. We visited the overflow spillway of the lower lagoon and observed algae growth and standing water in the spillway (refer to Photographs 28, and 31 through 33). While standing on the overflow spillway, which was saturated and coated in unstable muck, I estimated the freeboard underneath the lagoon's overflow spillway at approximately twelve inches (refer to Photograph 34). Facing southeast from the overflow spillway, I observed a clear flow pathway down a heavily vegetated conveyance channel that flowed to the southeast (refer to Photographs 35 and 36). Based on aerial imagery, this conveyance channels flows directly into Kaohaoha Gulch, approximately 100 feet southeast of the lower lagoon overflow spillway (refer to Figures 1 through 3). I was unable to hike down the conveyance channel due to unstable mucky conditions and thick vegetation (refer to Photograph 36).

Mr. Duff stated that he did not believe the standing water present in the lower lagoon overflow spillway was from the lagoon, but from runoff from upgradient land from recent heavy rainfall. Mr. Kurano and I observed that the upper lagoon is located directly upgradient from the lower lagoon and overflow spillway. No determination could be made as to whether the lower lagoon had discharged over the spillway or not.

Cropland and Pastureland Management

As previously stated, the contents of the lower lagoon are used to irrigate and fertilize the Facility's low elevation, high yielding croplands. Additionally, Mr. Duff stated that the manure solids separated from the manure separation cell system are directly land applied on croplands as additional fertilizer. During the Facility tour, we visited the lower croplands to view the airstrip heifer sheds, low elevation irrigated croplands, and one of the retractable irrigation sprinkle systems (refer to Photograph 30).

During the opening conference, the BID Representatives explained an incident that occurred at the Facility in September 2016 in which a large rainstorm caused mud to slide down from recently plowed low elevation croplands and over Mamalahoa Highway (Highway 19). They stated that to prevent future slides from recently plowed croplands near the highway, BID was planning to plant a vegetated buffer of guinea grass along the downgradient (northeast) perimeter of the property. At the time of the inspection, the location of the proposed buffer was in corn crop production. The BID Representatives stated that if the plan to plant the buffer is finalized, it would be planted sometime during the first quarter of 2017, after the corn is harvested.

SECTION II – INSPECTION FINDINGS

The following section describes the overall findings that I identified during the inspection regarding the BID's potential status as a CAFO subject to NPDES regulations. The presentation of the following findings does not constitute a formal determination for NPDES permit coverage.

1. Based on the mature dairy cow animal unit threshold for CAFOs specified in 40 CFR 122.23(c)(2) (i.e., 700-mature milking cows), the Facility meets the definition of a large CAFO. At the time of the inspection, BID Representatives stated that 1,226 mature milking cows (not including dry cows), and approximately 1,800 total cows, were housed at the Facility. In addition, the 1,226 mature milking cows are housed full-time in the Facility's two 1,000-head freestall barns, and are not housed in a portion of the Facility that sustains croplands or pasturelands (refer to Photograph 4 through 6). During the inspection, the BID Representatives confirmed that BID was registered as a 2,000-head CAFO with the USDA. As a result of the observations made during the inspection, the Facility appears to meet the criteria for designation as a large CAFO.

2. During the inspection, I observed the potential for the Facility to discharge pollutants to Kaohaoha Gulch, an identified State water and water of the U.S. As part of the Facility tour, I inspected the new, lower 2.5 million-gallon wastewater lagoon, including its southeast overflow spillway (refer to Photographs 26 through 28, and 31 through 33). While standing on the overflow spillway, which was saturated and coated in unstable muck and standing water, I estimated the freeboard underneath the lagoon's overflow spillway at approximately twelve inches (refer to Photograph 34). The lower lagoon was not equipped with a depth marker. Facing southeast from the overflow spillway, I observed a clear flow pathway down a heavily vegetated conveyance channel that flowed from the lagoon to the southeast (refer to Photographs 35 and 36). Based on aerial imagery, this conveyance channel flows directly into Kaohaoha Gulch, approximately 100 feet southeast of the lower lagoon overflow spillway (refer to Figures 1 through 3).

   The lower lagoon (and associated overflow spillway) was constructed after the Facility was purchased by the BID owners in 2012. Aerial imagery prior to 2012 does not show the lower lagoon; however, imagery dated between November 2013 and August 2014 shows the construction of this

lagoon. The Facility's Comprehensive Nutrient Management Plan (CNMP) developed by the Natural Resource Conservation Service (NRCS) maintained on file with HDOH identifies this lower lagoon. However, the CNMP drawings for the lagoon (specified as 7 million-gallon capacity which differs than the 2.5 million-gallon volume capacity stated by the BID representatives) does not include details regarding an overflow spillway, nor does the CNMP identify a potential disposal method of lagoon wastewater as surface water discharge into Kaohaoha Gulch via an overflow spillway. Additionally, information on file with HDOH associated with NPDES Permit No. HIS000224 (for the construction of the lower lagoon) does not identify an overflow spillway for the lower lagoon. The exact as-built drawings of the lower lagoon and overflow spillway were not reviewed as a component of the inspection.

During the inspection, I observed algae growth and standing water in the lower lagoon's overflow spillway (refer to Photographs 32, 33, and 35). Mr. Duff stated that he did not believe that the standing water present in the lower lagoon overflow spillway was from the lagoon, but from storm water runoff from upgradient land caused by recent heavy rainfall. This was inconsistent with a statement made by the BID Representatives during the opening conference, when they stated that the lagoons do not receive storm water runoff. The upper lagoon is located directly upgradient from the lower lagoon and overflow spillway (refer to Photograph 27). As previously stated, Mr. Duff informed Mr. Kurano and I that a large floating vegetative mat on the surface of the upper lagoon prevented Facility employees from accessing the lagoon for cleaning, and as such, the upper lagoon had not been cleaned since the current owners purchased the Facility in 2012. At the time of the inspection, the upper lagoon was not equipped with a depth marker. Additionally, Mr. Duff stated that the majority of flow from the upper lagoon is transferred to the lower lagoon via the east connection pipe. At the time of the inspection, an access road that runs along the south side of the upper lagoon was inundated with water; therefore, the perimeter of the upper lagoon, including the east side of the lagoon that abuts Kaohaoha Gulch was inaccessible (refer to Photograph 25).

Additionally, the lower lagoon contained a floating agitator unit which was used to agitate and suspend manure solids in the lower lagoon prior to engaging the draw pumping system for irrigation (refer to Photograph 28). Due to the minimal freeboard in the lower lagoon, there exists a possibility of spillover from lagoon into the overflow spillway due to agitation activities that may occur near the overflow spillway.

Due to the following information that was obtained during the inspection, I observed the potential for pollutants from the Facility's CAFO operations to discharge offsite into Kaohaoha Gulch, a State water and water of the U.S.:

- Proximity of the upper and lower lagoons to Kaohaoha Gulch (refer to Figures 2 and 3),
- Presence of the lower lagoon overflow spillway and conveyance channel into Kaohaoha Gulch (refer to Photographs 31 through 36),
- Minimal freeboard available in the lower lagoon (refer to Photographs 31 through 34),

- Potential overloading of solids in the upper lagoon,
- Possibility of storm water runoff from upgradient areas entering the lagoons,
- Inaccessibility of the upper lagoon's east abutting side to Kaohaoha Gulch (refer to Photograph 25),
- Steep topography of the BID property, and
- High annual rainfall amount.

3. During the inspection, I observed a potential for pollutants from the Facility's manure composting operations to contaminate storm water runoff. The manure composting building is located near the origin of Alaialoa Gulch (refer to Figure 3). Storm water runoff from the manure composting building, and uncovered concrete cow bedding loading area appears to most likely flow into the upgradient reach of Alaialoa Gulch. As previously stated, during the visit to the manure composting building, I observed a tractor actively loading a trailer with cow bedding (refer to Photographs 15 through 19, and 21).

4. During the inspection, I observed chemical storage practices that may present hazardous conditions for Facility employees and livestock. Specifically, I observed multiple 55-gallon drums of caustic detergent and acid stored together on pallets, outdoors without secondary containment (refer to Photographs 4 and 10). After the inspection, I reviewed the Safety Data Sheets (SDSs) for the two CIP chemicals and verified that the chemicals were incompatible based on their pH: Solution® chlorinated alkaline detergent 11.5 standard pH units; CIP Acid Cleaner 2.4 standard pH units. Mr. Duff stated that due to a lack of storage space, surplus CIP chemicals are stored on wooden pallets outside each of the freestall barns. Due to the incompatibility of acids and bases, uncontained drums of the two CIP chemicals stored adjacent to each other can create environmental and health hazards in the event of a spill or leak. This concern is elevated due to the truck/tractor traffic at the freestall barns associated with feed and bedding operations.

5. During the inspection, I observed 4 bulk gasoline and diesel aboveground fuel storage tanks: 2 at the lower freestall barn and 2 at the maintenance building (refer to Photograph 4). Based on the approximate size of the aboveground storage tanks, it appeared that the Facility had the potential to store greater than 1,320 gallons of fuel onsite, and as such, may be subject to spill prevention control and countermeasure rule specified in 40 CFR Part 112.12. The Facility should ensure that the bulk fuel aboveground storage tanks are either a double-walled tank, or stored within secondary containment to minimize the possibility of a leak or spill.

SECTION III –APPENDICES

- Figures
- Photograph Log
- Inspection Report Certification

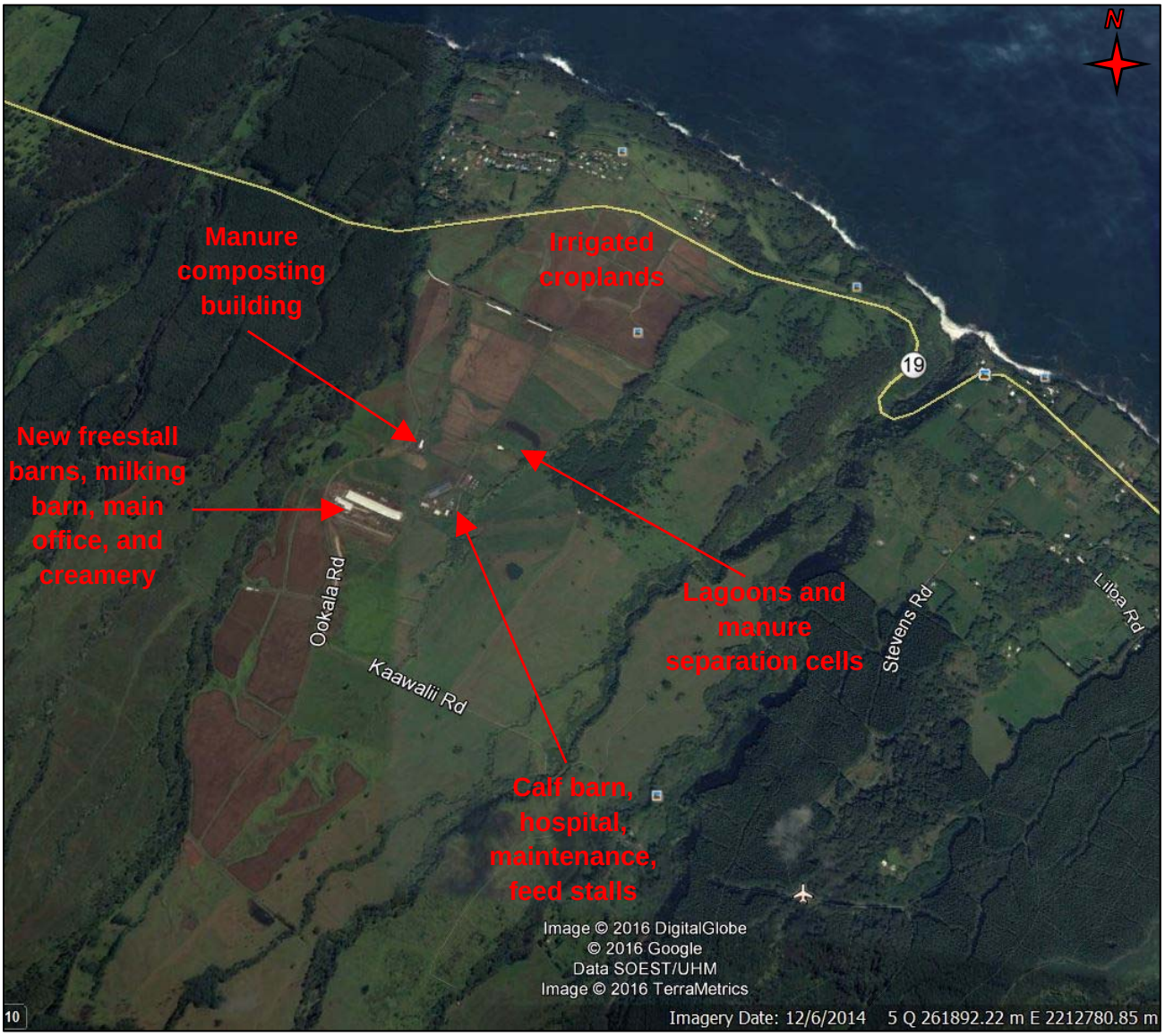


Figure 1. *GoogleEarth* aerial image of the BID Facility, imagery date December 6, 2014. The red arrows and callouts identify the various areas of the Facility visited during the inspection.

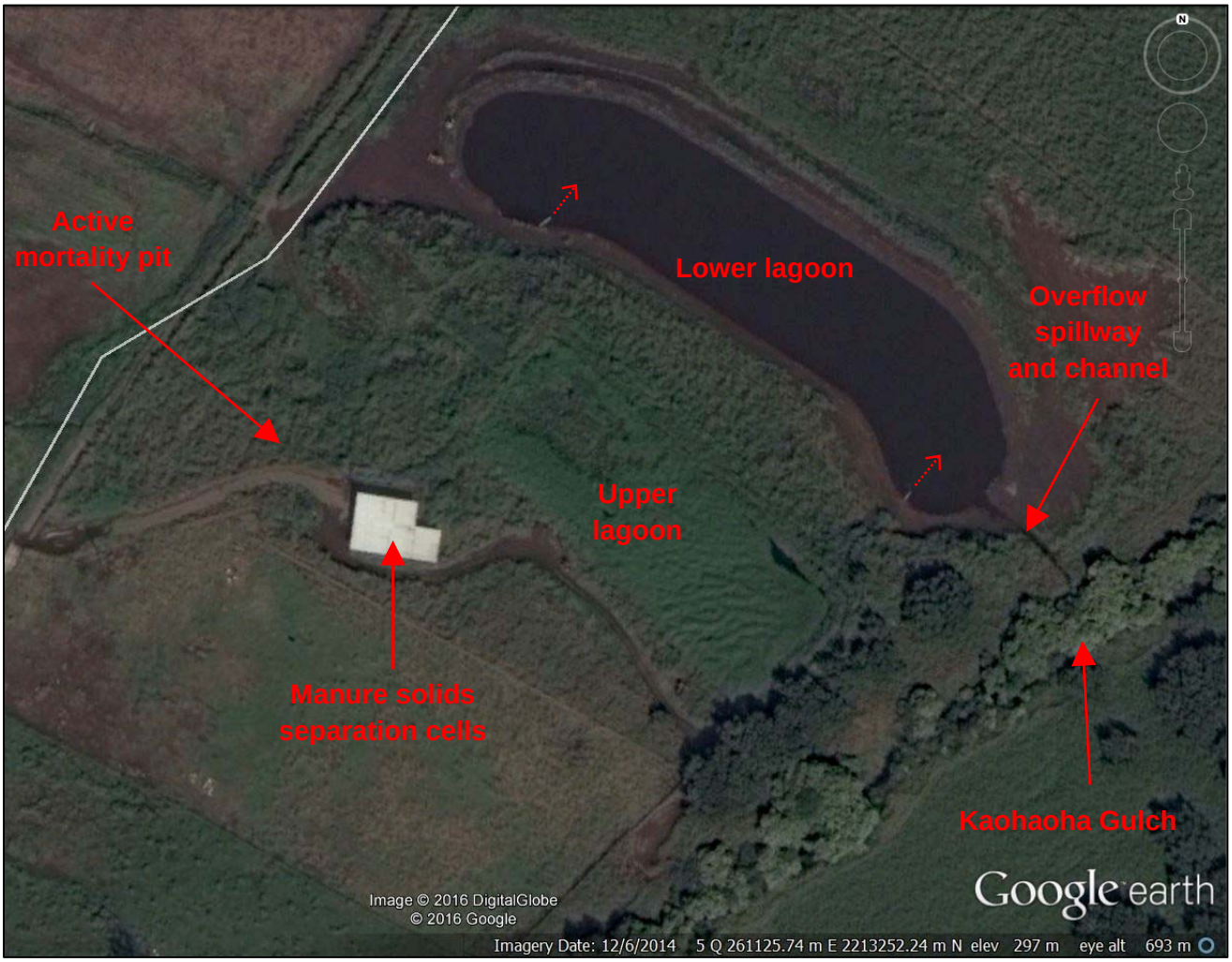


Figure 2. *GoogleEarth* aerial image of the BID manure separation cells and wastewater lagoons, imagery date December 6, 2014. The red arrows and callouts are approximate location estimations of Facility features observed during the inspection, decribed in the report, and shown in the Photograph Log.

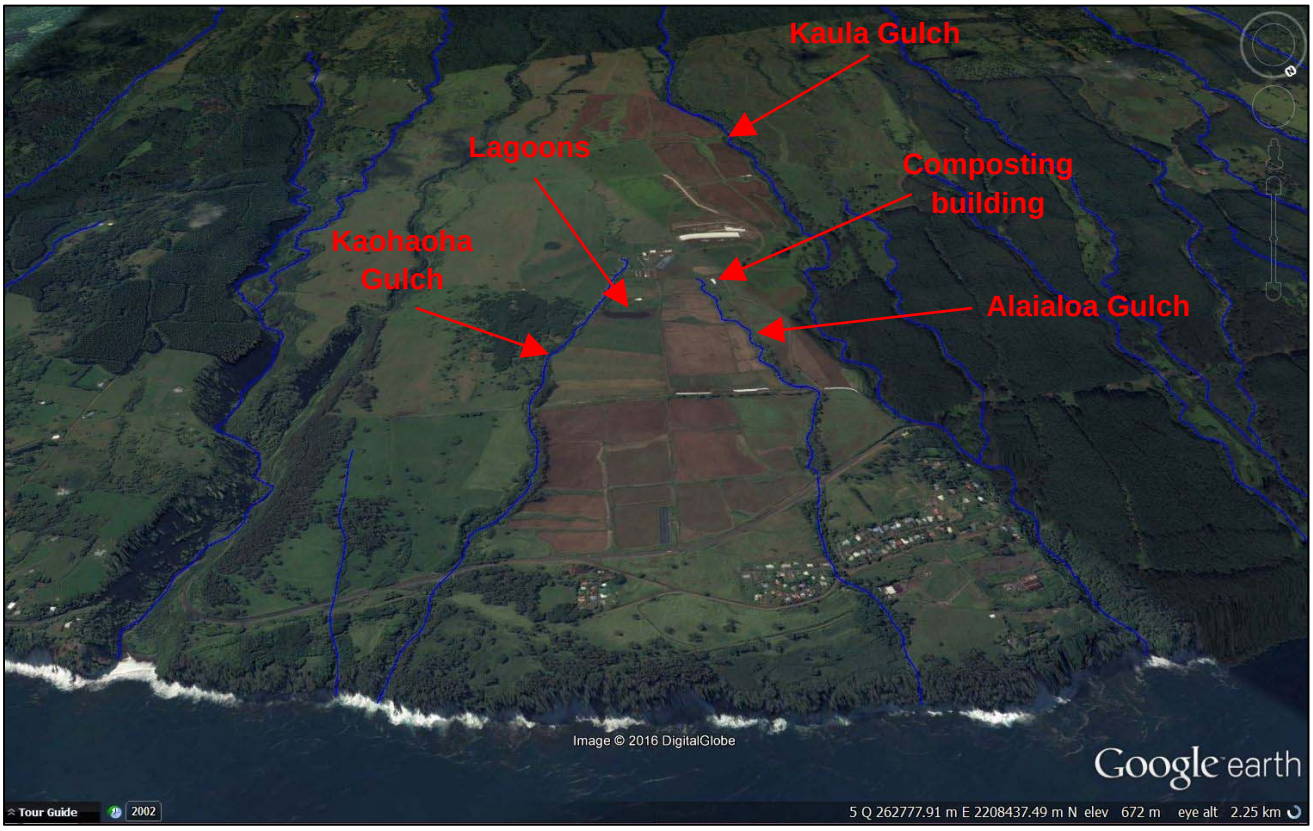


Figure 3. *GoogleEarth* aerial image, oriented southwest, of BID and Ookala, HI, imagery date December 6, 2014. The blue lines designate streams identified on the EPA My Waters Mapper application. The red arrows and callouts identify the Facility's main three receiving waters: Kaohaoha Gulch, Alaialoa Gulch, and Kaula Gulch, as well as the lagoons located adjacent to Kaohaoha Gulch and manure composting building near the origin of Alaialoa Gulch.

Photograph 1. Big Island Dairy main office sign. Photo by A. D'Angelo; 12/14/16.

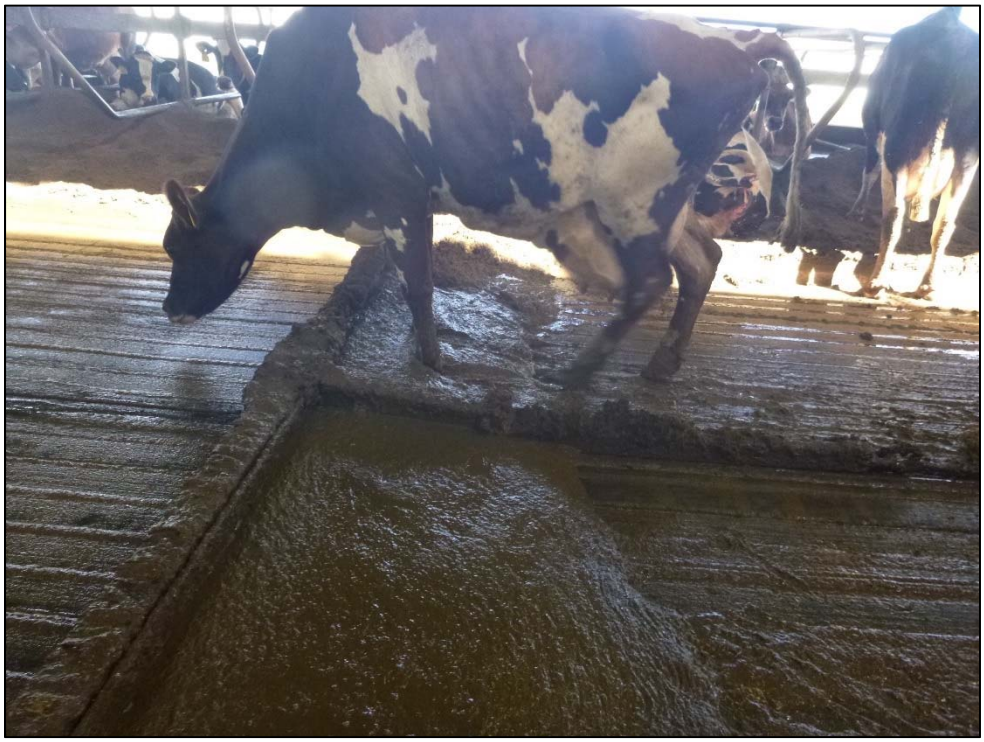
Photograph 2. BID map in main office identifying cropland and pasturelands, dairy facilities, manure composting building, and lagoons. Map oriented to the southeast. Photo by A. D'Angelo; 12/14/16.

Photograph 3. View of the Facility's new building that was under construction at the time of the inspection. Photo by A. D'Angelo; 12/14/16.

Photograph 4. View of the Facility's newly constructed lower 1,000-cow freestall barn. Note the bulk fuel tank and CIP chemicals. Photo by A. D'Angelo; 12/14/16.

Photograph 5. View down the central feeding alley of the lower 1,000-cow freestall barn. Photo by A. D'Angelo; 12/14/16.

Photograph 6. The cow pen alleys of the freestall barns contain mechanically operated manure scraping systems that scraped manure toward and into a collection trough in the center of each barn. The cow pens were lined with composted manure bedding that is made onsite using recovered manure solids. Photo by A. D'Angelo; 12/14/16.



Photograph 7. Close-up view of the freestall barn manure scraping system in action. Photo by A. D'Angelo; 12/14/16.

Photograph 8. View of the manure collection trough in the center of the lower freestall barn. The contents of the collection trough gravity flow into a collection pit located at the manure composting building, shown in Photographs 15 and 16. Photo by A. D'Angelo; 12/14/16.

Photograph 9. View of the milking floor inside the Facility's recently constructed milking barn. Photo by A. D'Angelo; 12/14/16.

Photograph 10. View of two 55-gallon drums of acid and two 55-gallon drums of caustic detergent used in the milking barn CIP system. The drums were stored outside, without overhead coverage or containment, and in close proximity to each other. Photo by A. D'Angelo; 12/14/16.

Photograph 11. View of the milking barn copper sulfate hoof bath. Photo by A. D'Angelo; 12/14/16.

Photograph 12. View of active flushing occurring in the 380-head calf barn. Photo by A. D'Angelo; 12/14/16.

Photograph 13. Flush water from the 380-head calf barn is captured in a collection trough located at the end of the barn and conveyed to the manure composting building collection pit, shown in Photographs 15 and 16. Photo by A. D'Angelo; 12/14/16.

Photograph 14. View, facing northeast, of the Facility's active mortality burial pit, which was located near the manure separation cells, in an existing gulch that drains into the lower lagoon. Photo by A. D'Angelo; 12/14/16.

Photograph 15. View of the Facility's manure composting building collection pit. Waste streams from the freestall barns, calf barn, and milking barn gravity flow into this collection pit. Note the honeywagon stored behind the collection pit. Photo by A. D'Angelo; 12/14/16.

Photograph 16. View of the manure composting building collection pit influent pipes. Photo by A. D'Angelo; 12/14/16.

Photograph 17. View of the Facility's manure composting building which included two manure separator units, and two composting digester vessels. Photo by A. D'Angelo; 12/14/16.

Photograph 18. A conveyer belt on the back end of the composting vessels conveys composted manure (i.e., cow bedding) into a covered stockpile stall. Photo by A. D'Angelo; 12/14/16.

Photograph 19. View of BID staff actively loading cow bedding from the covered bedding stockpile stall into a trailer. Photo by A. D'Angelo; 12/14/16.

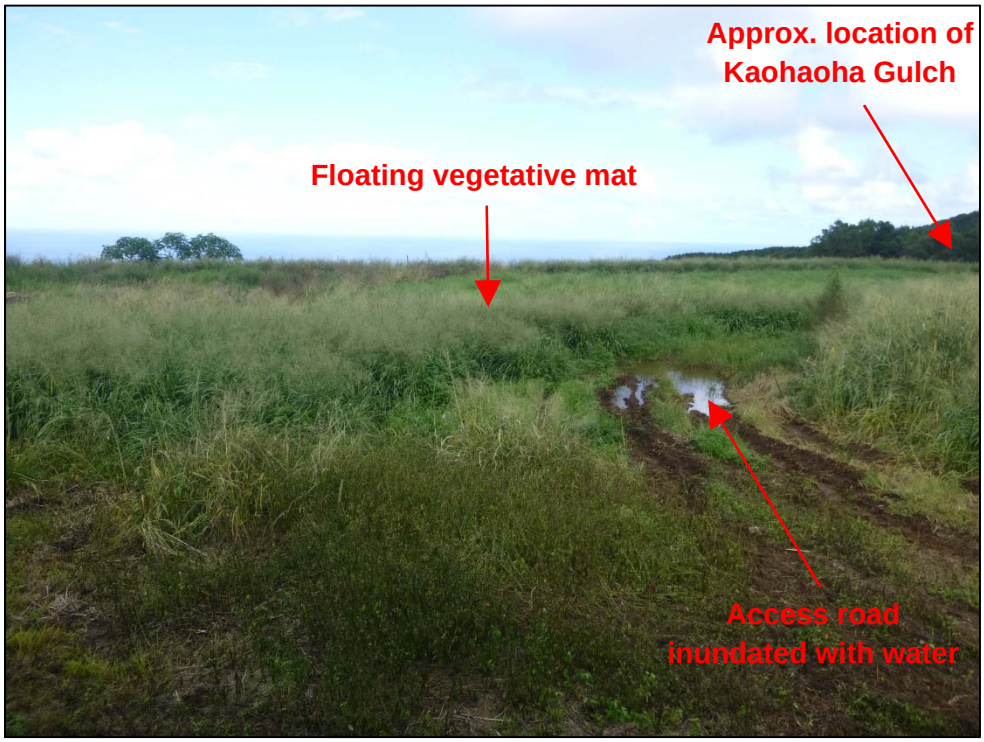
Photograph 20. View of the manure composting building collection pit overflow point. Overflow flows into the manure separation cells shown in Photographs 22 and 23. Note the honeywagon. Photo by A. D'Angelo; 12/14/16.

Photograph 21. View, facing north, of a disturbed area near Ookala Road. This area will be paved to store the honeywagon shown in Photographs 15 and 20. I observed a vegetated buffer between the disturbance and Alaialoa Gulch. Photo by A. D'Angelo; 12/14/16.

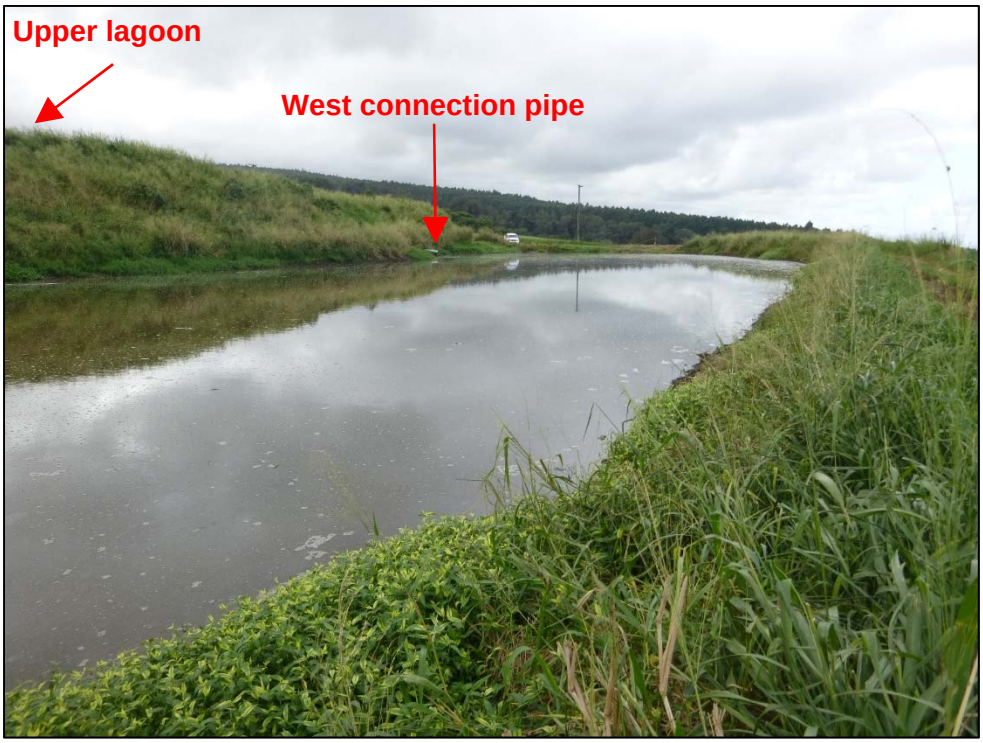
Photograph 22. View, facing east, of the Facility's manure solids separation cells located adjacent to the upper lagoon (refer to Figure 2). The uncovered cells on the left serve as the primary cells and liquid waste discharge points. Photo by A. D'Angelo; 12/14/16.

Photograph 23. View of flow from the manure composting collection pit entering the primary cells of the manure solids separation cells shown in Photograph 22. Photo by A. D'Angelo; 12/14/16.

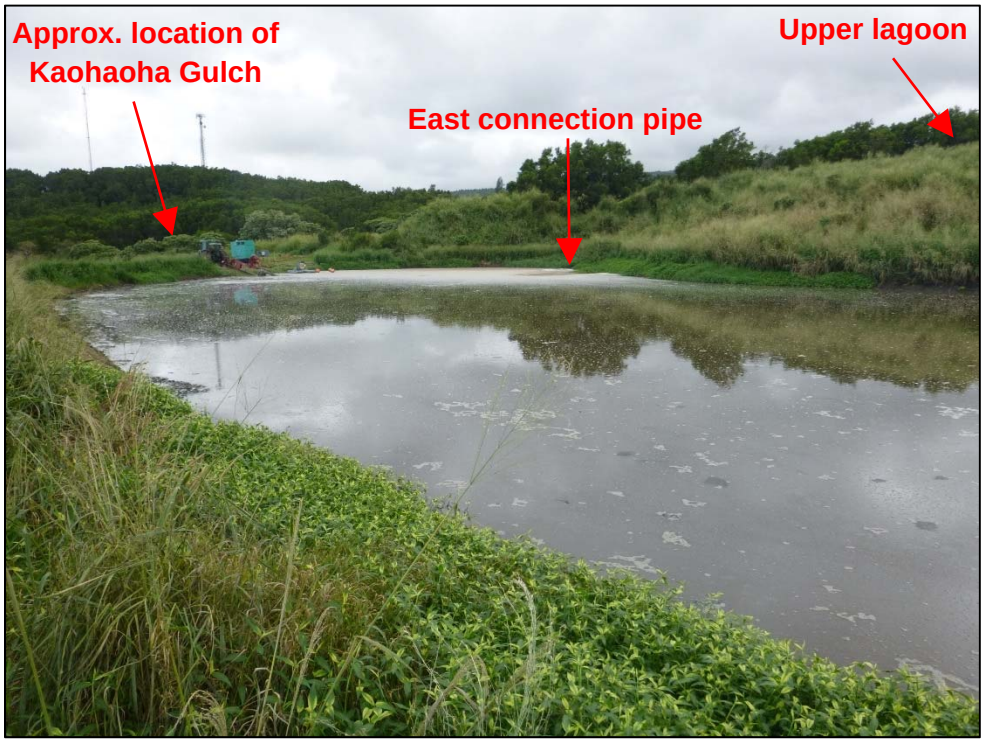
Photograph 24. View of the two pipes that drain separated liquid from the manure solids separation cells. Liquid from the cells surface flows, via an earthen conveyance channel, into the northwest side of the upper lagoon. Photo by A. D'Angelo; 12/14/16.



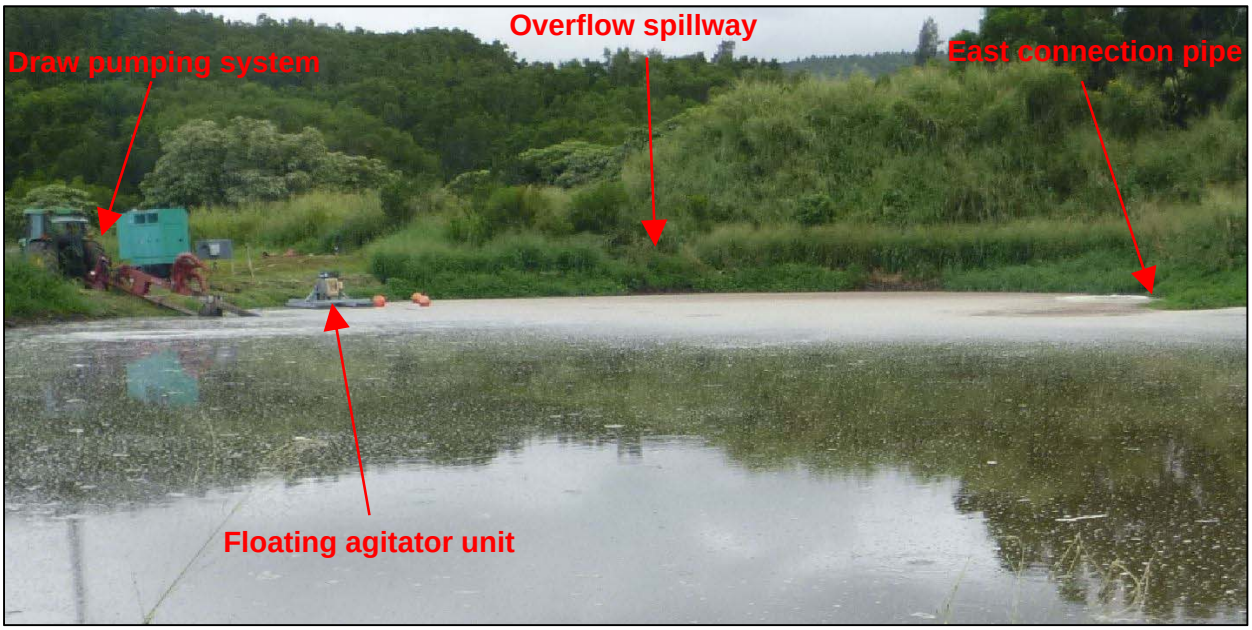
Photograph 25. View, facing east, of the upper lagoon which contained a floating vegetative mat. An access road along the south side of the lower lagoon was innundated with water. Photo by A. D'Angelo; 12/14/16.



Photograph 26. View, facing west, of the lower lagoon. The lagoon was near capacity at the time of the inspection and was not equipped with a depth marker. Photo by A. D'Angelo; 12/14/16.



Photograph 27. View, facing southeast, of the lower lagoon. I observed a floating agitator unit, draw pumping system, and overflow spillway on the southeast side of the lagoon. Photo by A. D'Angelo; 12/14/16.



Photograph 28. Zoomed-in version of Photograph 27, showing the floating agitator unit, draw pumping system, and overflow spillway of the lower lagoon. Photo by A. D'Angelo; 12/14/16.

Photograph 29. View of the draw pumping system hose connection point to the Facility's irrigation system. Photo by A. D'Angelo; 12/14/16.

Photograph 30. View of one of the Facility's retractable irrigation distribution equipment which receives flow from the lower lagoon draw pumping system. Photo by A. D'Angelo; 12/14/16.

Photograph 31. View, facing south, of the approximate location of the lower lagoon overflow spillway. Photo by A. D'Angelo; 12/14/16.

Photograph 32. View, facing southwest, of the lower lagoon overflow spillway. Note the presence of algae growth and standing water in the overflow spillway. Photo by A. D'Angelo; 12/14/16.

Photograph 33. View of algae growth and standing water in the lower lagoon overflow spillway. Photo by A. D'Angelo; 12/14/16.

Photograph 34. Standing on the lower lagoon overflow spillway,I estimated the freeboard of the lagoon at approximately twelve inches (note the notebook for reference). Photo by A. D'Angelo; 12/14/16.

Photograph 35. View, facing southeast from the lower lagoon overflow spillway, down the vegetated channel that connects the lagoon to Kaohaoha Gulch. Photo by A. D'Angelo; 12/14/16.

Photograph 36. The channel downgradient of the lower lagoon overflow spillway was heavily vegetated; however, I observed clear channelization and a flow pathway toward Kaohaoha Gulch. Photo by A. D'Angelo; 12/14/16.

Inspection Report Certification

I certify that the statements made in this inspection report are, to the best of my knowledge, a true and accurate representation of what was observed on December 14, 2016 at Big Island Dairy.

I certify that the thirty-six photographs (Photographs 1 through 36) described in the attached Photograph Log were taken by the undersigned and are a true, accurate, and unaltered representation of what was observed on December 14, 2016 at Big Island Dairy.

January 31, 2017

Anthony D'Angelo
U.S. EPA Contractor
PG Environmental