NRCB Natural Resources Conservation Board

Decision Summary RA20023

This document summarizes my reasons for issuing Authorization RA20023 under the *Agricultural Operation Practices Act* (AOPA). Additional reasons are in Technical Document RA20023. All decision documents and the full application are available on the Natural Resources Conservation Board (NRCB) website at www.nrcb.ca under Confined Feeding Operations (CFO)/CFO Search. My decision is based on the act and its regulations, the policies of the NRCB, the information contained in the application, and all other materials in the application file.

1. Background

On April 23, 2020, Adrianus VandenBroek (VandenBroek Farm) submitted a Part 1 application to the NRCB to construct a new earthen liquid manure storage (EMS) at an existing dairy CFO. The Part 2 application was submitted on May 11, 2020. On July 28, 2020, I deemed the application complete.

The proposed construction involves:

- Constructing an earthen liquid manure storage (EMS) (radius of 52 m x 5.3 m deep)
- Decommissioning the existing EMS (72 m x 51 m)

There is no proposed increase in livestock.

Under AOPA, this type of application requires an authorization. (This is one of several types of "permits" issued under AOPA. For an explanation of the different types and when each one applies, see www.nrcb.ca.)

a. Location

The existing CFO is located at NE 18-32-27 W4M in Mountain View County, roughly 20 km east of the Town of Olds. The terrain is relatively flat with a gentle slope to the southwest towards an intermittent drainage located about 542 m southwest of the CFO.

b. Existing permitted facilities

The CFO is currently permitted under NRCB Approval RA11051 and Authorization RA20003. These permits allow the construction and operation of a 500 milking cow (plus associated dries and replacements) CFO. The CFO's existing permitted facilities are listed in the Decision Summary RA11051 and Approval RA11051.

2. Notices to affected parties

Under section 21 of AOPA, notice of an authorization application must be provided to municipalities that are "affected" by the application. Section 5 of AOPA's Part 2 Matters Regulation lists the categories of municipalities that are affected parties. These categories include the municipality where the existing CFO is located. Under section 21(2) of the act, all affected municipalities are automatically also "directly affected" parties. The NRCB interprets section 21(3) as allowing affected municipalities to provide written submissions regarding whether the application meets the requirements of the regulations under the act. (See NRCB

Operational Policy 2016-7: *Approvals*, part 7.11.2.)

Mountain View County is both an affected and directly affected party because the proposed facilities are located within its boundaries.

On July 28, 2020, the NRCB emailed referral letters and a copy of the application to Mountain View County, Alberta Health Services (AHS), Alberta Environment and Parks (AEP), Alberta Agriculture and Forestry (AF), and Alberta Transportation (AT).

3. Responses from the municipality and referral agencies

I received responses from Mountain View County and AF. No response was received from AHS, AEP, and AT.

Ms. Peggy Grochmal, a permitting and development officer with planning and development services, provided a written response on behalf of Mountain View County. As noted in section 2, Mountain View County is a directly affected party.

Ms. Grochmal stated that the application to construct a new earthen manure storage with no increase in animal numbers was brought to, and accepted by, the Municipal Planning Commission. Her response indicated that the application is consistent with the county's municipal development plan (MDP). The application's consistency with Mountain View County's MDP is addressed in Appendix A, attached.

Ms. Grochmal also listed the setbacks required by Mountain View County's land use bylaw (LUB) and noted that the application appears to meet these setbacks.

Mr. Tom Pack responded on behalf of AF. He stated that he was in communication with the applicant and had no concerns with the application.

4. Environmental risk screening of existing and proposed facilities

When reviewing a new authorization application for an existing CFO, NRCB approval officers normally assess the CFO's existing buildings, structures, and other facilities, using the NRCB's environmental risk screening tool to determine the level of risk they pose to surface water and groundwater. This tool provides for a numeric scoring of risks, which can fall within either a low, moderate, or high risk range. (A complete description of this tool is available under CFO/Groundwater and Surface Water Protection on the NRCB website at www.nrcb.ca.) However, if those risks have previously been assessed, the approval officer will not conduct a new assessment unless site changes are identified that require a new assessment, or the assessment was done with a previous version of the risk screening tool and requires updating. See NRCB Operational Policy 2016-7: *Approvals*, part 8.13.

In this case, the risks posed by VandenBroek Farm's existing CFO facilities were assessed in 2011. According to this assessment, the facilities posed a low risk to surface water and groundwater except the existing EMS posed moderate risk to groundwater. Approval RA11051 addressed the risk posed by the EMS by requiring annual reporting through a leakage detection system and water well testing. Since this application is for the construction of a new EMS and subsequently the decommissioning of the existing EMS, the risk associated with this existing EMS will be essentially eliminated.

The circumstances have not changed since that assessment was done. As a result, a new assessment of the risks posed by the CFO's existing facilities is not required.

I also assessed the proposed new EMS, using the NRCB's risk screening tool, and determined that it poses a low risk to groundwater and surface water.

5. Other factors considered

The application meets all relevant AOPA requirements, with the terms and conditions summarized in part 6.

In addition, the proposed construction is consistent with the land use provisions of Mountain View County's municipal development plan and with Mountain View County's land use bylaw. (See Appendix A for a more detailed discussion of the county's planning requirements.)

With respect to the act's technical requirements, the proposed construction:

- Meets the required AOPA setbacks from all nearby residences (AOPA setbacks are known as the "minimum distance separation" requirements, or MDS)
- Meets the required AOPA setbacks from water wells, springs and common bodies of water
- Has sufficient means to control surface runoff of manure
- Meets AOPA groundwater protection requirements for the design of floors and liners of manure storage facilities

While assessing this application, I received technical assistance from Scott Cunningham, NRCB Environmental Specialist.

6. Terms and conditions

Authorization RA20023 permits the construction of the EMS.

Authorization RA20023 also contains terms that the NRCB generally includes in all AOPA authorizations, including terms stating that the applicant must follow AOPA requirements and must adhere to the project descriptions in their application and accompanying materials.

In addition to the terms described above, Authorization RA20023 includes conditions that:

- Set a deadline of December 31, 2023 for the approved construction to be completed
- Requires construction to cease and to contact the NRCB immediately if the water table is encountered during construction
- Require submission of an engineer's completion report confirming that it meets the proposed specifications
- Prohibit VandenBroek Farm from placing manure in the EMS until the facility has been inspected by the NRCB following its construction
- Require the existing EMS to be decommissioned

For an explanation of the reasons for these conditions, see Appendix B.

7. Conclusion

Authorization RA20023 is issued for the reasons provided above, in the attached appendices, and in Technical Document RA20023.

Authorization RA20023 should be read in conjunction with previously issued NRCB Approval RA11051 and Authorization RA20003, which remain in effect.

September 8, 2020

(Original signed)

Julie Wright
Approval Officer

Appendices:

A. Consistency with the municipal development plan
B. Explanation of conditions in Authorization RA20023

APPENDIX A: Consistency with the municipal development plan

Under section 22 of AOPA, an approval officer may approve an application for an authorization only if the approval officer finds that the application is consistent with the "land use provisions" of the applicable municipal development plan (MDP).

The NRCB interprets the term "land use provisions" as covering MDP policies that provide generic directions about the acceptability of various land uses in specific areas and that do not call for discretionary judgements relating to the acceptability of a given confined feeding operation (CFO) development. (See NRCB Operational Policy 2016-7: *Approvals*, part 8.2.5.) Under this interpretation, the term "land use provisions" also excludes MDP policies that impose procedural requirements. In addition, section 22(2.1) of the act precludes approval officers from considering MDP provisions "respecting tests or conditions related to the construction of or the site" of a CFO or manure storage facility, or regarding the land application of manure. (These types of MDP provisions are commonly referred to as MDP "tests or conditions.").

VandenBroek Farm's CFO is located in Mountain View County and is therefore subject to that county's MDP. Mountain View County adopted the latest revision to this plan on August 22, 2018, under Bylaw #09/12.

As relevant here, section 2.0 of the MDP provides a "growth management strategy" that is reflected in the land use map in Figure 3 of the MDP. The discussion in this section emphasizes that this strategy is "conceptual in nature" for purposes of determining "where certain types of development should and should not occur" within the county. However, this section explains that the land use designations on this map are just a "baseline"; development applications must still be reviewed on a "case by case, site-specific basis."

Because the land use designations in Figure 3 are not meant to be definitive, the MDP's "growth management strategy" based on these designations is not considered to be a "land use provision" and therefore is not relevant to my MDP consistency determination.

At any rate, VandenBroek Farm's CFO is within the "Agricultural Preservation Area" marked on Figure 3. Section 2 of the MDP explains that the "majority" of this area is subject to the "applicable Land Use Policies outlined in section 3.0 of the MDP…." (Figure 3 identifies a sub-part of this area as a "concentrated confined feeding operation" area. VandenBroek Farm's CFO is not in this concentrated CFO area. However, the MDP does not require that all CFOs be located in this concentrated CFO area.)

As relevant here, sub-section 3.3.15 precludes new CFOs within 1.6 km (1 mile) of any identified residential growth centre or urban centre shown in Figure 3. VandenBroek Farm's site is not for a new CFO. At any rate, the site of the CFO is not within this 1.6 km setback.

Sub-section 3.3.16 specifies that the setback for a new CFO from a business park will not be required. VandenBroek Farm's application is not near a setback for a business park nor for a new CFO.

Sub-section 3.3.17 states that applications for new or expanding CFOs "shall meet all Provincial standards." This sub-section likely isn't a "land use provision" and therefore is not relevant to my MDP consistency determination.

No other policies in section 3.0 preclude VandenBroek Farm's application. Therefore, their proposed EMS is an acceptable land use within the Agricultural Preservation Area of the MDP. Thus, the CFO is consistent with the MDP.

For these reasons, I conclude that the application is not inconsistent with the land use provisions of Mountain View County's MDP.

In my view, under sections 3.3.5, 3.3.14, 13.3.1 and 13.3.2, amongst others, Mountain View County's MDP provides a clear intent to adopt provisions from the land use bylaw # 16/18 (LUB). Following the NRCB Operational Policy 2016-7: *Approvals*, part 8.2.3, I also considered Mountain View County's LUB. Under that bylaw, the subject land is currently zoned as Agriculture. CFOs are not listed as permitted or discretionary use in this district. Section 9.5 of the LUB states that CFOs are regulated by the NRCB under provincial regulations, and are therefore exempt from municipal control under the land use bylaw.

Notwithstanding this statement, section 9.5.1 of the LUB lists several requirements for siting CFOs. Notably, sub-section 9.5.1 (a) states that CFO developments "shall be consistent with the land use provisions of the MDP." This CFO is not inconsistent with Mountain View County's MDP.

Of the LUB, Section 9.5.1 (b) states that the minimum distance separation (MDS) between a new or expanding CFO and multi-parcel residential development, any urban centre, school, or hospital should be (i) 800 m or (ii) the MDS as described in AOPA.

As written, this setback is irrelevant to my LUB consistency determination as it is "based on" or "directly modifies" AOPA's MDS requirement. See NRCB Operational Policy 2016-7: *Approvals*, part 8.2.5. Regardless, the CFO is not located near any of these developments and meets the minimum distance of separation setback requirement under AOPA.

APPENDIX B: Explanation of conditions in Authorization RA20023

Authorization RA20023 includes several conditions, discussed below:

a. Construction above the water table

Under section 9(2) of AOPA's Standards and Administration Regulation, the bottom of the liner of a manure storage facility (MSF) must be at least one metre above the water table "at the time of construction."

Based on this information, the proposed EMS does not meet the one metre requirement of section 9(2). However, because the height of the water table can vary over time, the lack of adequate depth to water table indicated in VandenBroek Farm's 2003 Leak Detection Report does not mean that there will be an inadequate depth at the time of construction. To address this variability and ensure that the depth requirement is met at the time of construction, a condition is included requiring applicant to cease construction and notify the NRCB immediately if the water table is encountered during construction.

b. Groundwater protection requirements

VandenBroek Farm proposes to construct the new EMS with a one metre thick compacted soil liner. Section 9 of AOPA's *Standards and Administration Regulation* specifies a maximum hydraulic conductivity for this type of liner in order to minimize leakage.

To demonstrate compliance with this standard, VandenBroek Farm provided lab measurements of the hydraulic conductivity of the materials that will be used to construct the compacted soil liner.

Lab measurements of hydraulic conductivity are made in a precisely controlled setting and are typically based on a small soil sample. Therefore, the NRCB generally multiplies lab-measured hydraulic conductivity values by a factor of 10 to reflect the potential variability in actual liner materials and conditions that can reasonably be expected to be achieved in the field.

Example: Hydraulic conductivity = k
Lab k = $1x10^{-9}$ cm/sec
Expected field k = 10 x ($1x10^{-9}$ cm/sec) = $1x10^{-8}$ cm/sec

The regulations provide that the actual hydraulic conductivity of a one metre thick compacted soil liner for a liquid MSF must not be more than 1 x 10^{-7} cm/sec.

NRCB Approvals Policy, Operational Policy 2016-7, section 8.7.2, requires approval officers to increase the lab measurements of hydraulic conductivity by one order of magnitude (a factor of 10) to estimate the actual (in field) hydraulic conductivity for proposed liners under section 9(6) of the Standards and Administration Regulation. This section states:

> *"However, lab measurements of a sample of material taken from the field are not considered an accurate representation of the actual field hydraulic conductivity values. This is because of the potential variability of soils, differences in compaction methods and variances in compaction."*

In this case, the lab measurement was 6.9 x 10^{-8} cm/sec. With the required ten-fold modification, the expected field value is 6.9 x 10^{-7} cm/sec. With the expected field level, the results would not meet the regulations of 1 x 10^{-7} cm/sec. However, Envirowest Engineering Inc.

(who completed soil testing and soil engineering work on behalf of VandenBroek Farm) recognize that this value did not meet the safety factor and addressed this shortfall by proposing additional construction requirements for the new EMS:

- *Excavation of material should be placed in three piles: a spoils pile (material that is evident to not be appropriate for a liner, such as sand or silt), a liner pile (material consistent with that tested for hydraulic conductivity), and a third pile for transition or outlier material.*
- *The liner and transition piles should be sampled for particle size (hydrometer) at a ratio of 1 sample per 150 m^3 (approximately 5 samples per lift), prior to installation.*
- *Each 0.15 m lift should be tested along the walls and base for moisture content and compaction following installation, prior to addition of the subsequent lift.*

As noted in part 5 above, while assessing this application, I received technical assistance from Scott Cunningham, NRCB Environmental Specialist. Mr. Cunningham stated in correspondence related to this application, that the proposed sampling of 1 sample per 150 m^3 to confirm if soil is suitable prior to its use in the liner and testing of each 0.15 m lift along the walls and base for moisture content and compaction after installation, prior to addition of subsequent lifts, is more testing than typical for a new EMS; and recommended I accept the above mentioned tests as "sufficient construction quality controls" where a factor of 10 adjustment to the hydraulic conductivity is not required. Mr. Cunningham also stated that he was of the opinion, that the level of construction quality control would address "…potential variability of soils, differences in compaction methods and variances in compaction." listed in section 8.7.2, NRCB Approvals Policy, Operational Policy 2016-7.

As such, I'm accepting Mr. Cunningham's recommendations to compare the lab k to regulation k (laboratory hydraulic conductivity of 0.69×10^{-7} cm/sec directly to the regulation requirement of 1×10^{-7} cm/sec) based on the construction protocols proposed by the engineer and have added conditions to this permit as described in section d below, requiring VandenBroek Farms to construct the new EMS in accordance with the proposed design and construction protocols, and to report on all the sampling and testing programs as proposed.

c. Construction deadline

VandenBroek Farm proposes to complete construction of the proposed new EMS by December 2023. This time-frame is considered to be reasonable for the proposed scope of work. The deadline of December 31, 2023 is included as a condition in Authorization RA20023.

d. Post-construction inspection and review

The NRCB's general practice is to include conditions in new permits to ensure that the new or expanded facilities are constructed according to the required design specifications. Accordingly, Authorization RA20023 includes a condition requiring the submission of a completion report, stamped by a professional engineer, certifying that the EMS has been constructed in accordance with the proposed design (prepared by Envirowest Engineering Inc. on May 5, 2020 including the amendment letter dated June 26, 2020, and part of application RA20023) including that the:

- Location is the same as proposed
- Inlet to the EMS is located in the lower quarter of the structure
- Constructed under the supervision of a professional engineer
- EMS dimensions, along with elevations above and below grade and side wall slopes are

the same as proposed
- Location of and testing results of moisture content and compaction, for each 0.15 m lift to be reported in the completion report
- Clay content of the soil used to construct the compacted soil liner must be included in the completion report and compared to the minimum 28% clay content proposed by Envirowest
- Sand and silt content of the soil used to construct the compacted soil liner must be included in the completion report
- Sand, silt and clay content are to be reported for each texture test as individual test results within the completion report

The NRCB routinely inspects newly constructed facilities to assess whether the facilities were constructed according to their required design specifications. To be effective, these inspections must occur before livestock or manure are placed in the newly constructed facilities. Authorization RA20023 includes a condition stating that VandenBroek Farm shall not place manure in the manure storage portions of the EMS until NRCB personnel have inspected it and confirmed in writing that it meets the authorization requirements.

e. Decommissioning of facilities

VandenBroek Farm proposes to decommission the existing EMS. A condition has been included in Authorization RA20023 requiring the facility to be decommissioned within a year of the completion of the proposed EMS in accordance with Technical Guideline Agdex 096-90, “Closure of Manure Storage Facilities Manure Collection Areas”. A worksheet documenting the decommissioning must be provided to the NRCB following the completion of this decommissioning.