

Decision Summary RA19039

This document summarizes my reasons for issuing Approval RA19039 under the *Agricultural Operation Practices Act* (AOPA). Additional reasons are in Technical Document RA19039. 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 July 9, 2019, Lewisville Pork Farm Inc. (Lewisville Pork) submitted a Part 1 application to the NRCB to switch the existing swine CFO's manure collection and storage system from one with predominantly solid manure with some liquid manure, to an all liquid manure collection and storage system. On December 11, 2019 a request was filed and approved to extend the Part 2 submission deadline until June 9, 2020. The Part 2 application was submitted on April 14, 2020 and included proposed barn renovations and the construction of a new second earthen liquid manure storage (EMS). The second EMS will be filled from the existing EMS by a concrete lined spill way.

On April 23, 2020 I completed an inspection of the CFO as part of the application review process. As part of that inspection I noted that barn renovations were already under way and that the second EMS cell was already partially constructed. I advised the CFO's onsite representative that the partial construction of the EMS cell was unauthorized construction and that I would have to pass this matter on to an inspector with the NRCB.

On April 24, 2020 a NRCB inspector conducted a site inspection and determined that the partial construction of the second EMS cell was unauthorized construction. The inspector issued Compliance Directive 20-01 on April 30, 2020 which required Lewisville Pork and Bryan Perkins to take all necessary and appropriate measures to comply with AOPA and its regulations with respect to the second EMS, and to not continue construction or place manure in it until the CFO holds a permit under AOPA to do so.

The barn renovations are considered to be an improvement to the existing manure collection and storage liner in this case and not unauthorized construction.

On May 15, 2020, I deemed the application complete. The Part 2 application:

- Proposes to construct the second EMS to be 64 m x 76.4 m x 4.7 m deep
- Documents the renovation of barns 1-4 where a concrete liner was placed in the barns which previously had dirt floors. (A portion of barn 1 previously had a concrete floor/liner in approximately half of the barn and the remainder of the four barns had soil floors.)

The proposed switch from solid and liquid manure storages to all liquid manure storages is to simplify how manure is managed at the farm. The switch will also make cleaning of the barns easier for the CFO operator.

There is no proposed increase in livestock which means that this application would ordinarily be

treated as an authorization. Despite this, the switch from a predominantly solid manure storage system with some liquid manure storage to an all liquid manure management and storage system will result in a need for additional manure storage at the CFO on an annual basis. As noted in Technical Document RA19039 and in the *Manure Characteristics and Land Base Code (second edition)*, swine livestock in a liquid manure storage system typically require additional manure storage (and have a larger minimum distance separation setback requirement) than ones in a solid manure storage system.

For these reasons, I am treating the application as an approval. (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 CFO is located at NE 5-47-10 W4M in the Municipal District (MD) of Wainwright, roughly six kilometers northeast of the Hamlet of Kinsella, Alberta. The terrain of the CFO and surrounding properties is characterized by rolling hills that generally slope to the south.

b. Existing permitted facilities

The CFO holds a deemed permit which includes MD of Wainwright issued development permit 2001-47, issued February 21, 2002. The municipally issued permit allows for the construction and operation of a 4,000 head hog CFO with 40,000 square feet of barn space (four barns) and a 2.9 million gallon (earthen) manure storage (EMS). Despite this permit being issued after January 1, 2002, the application was filed on November 19, 2001. Because the development permit was issued as described in section 10 of the *Agricultural Operation Practices Amendment Act, 2001* – i.e. applied for prior to Jan. 1, 2002 but issued afterwards – I am treating this permit as part of a deemed permit for the CFO under section 18.1(1)(c) of AOPA.

Based on a review of available air photos of the CFO, two solid manure storage pads were historically present at the CFO. To determine if the pads are part of the deemed permit, I am completing a grandfathering determination for them in accordance with the requirements of Section 11 of the *Administration Procedures Regulation*. (I am cross appointed as an inspector and as an approval officer under AOPA for this and similar purposes). I note how section 11 allows me to waive public notice requirements typically required for a grandfathering determination provided that the livestock type and capacity of structures can be reliably determined based on air photos. I am of the opinion that the air photos and related documentation before me provide this reliability in this case.

Considering how these two solid manure storage pads were present in the earliest available air photo of the CFO, and in apparent use as manure collection areas or manure storage facilities, I am of the opinion that they were also constructed in or around the time that the other CFO facilities were constructed and should be part of the deemed permit.

Despite the above, I noted during my site visit that one of these pads was previously decommissioned. Further, the applicant has committed to cease using the remaining pad as a manure collection area or manure storage facility in application RA19039. The decommissioned pad is no longer considered a permitted manure collection area or manure storage facility. The other pad is considered to be closed in accordance with Technical Guideline Agdex 096-90 and is now an ancillary structure at the CFO (it is no longer permitted for use as a manure storage facility or manure collection area under the AOPA).

Since AOPA came into effect on January 1, 2002, the NRCB issued the CFO Approval RA10005M. The NRCB permit replaced municipal development permit 2001-47 and allows Lewisville Pork to construct and operate a 4,000 swine finisher CFO.

The CFO's permitted manure collection areas and manure storage facilities are listed in the appendix to Approval RA19039.

2. Notices to affected parties

Under section 19 of AOPA, the NRCB is required to notify (or direct the applicant to notify) all parties that are "affected" by an approval application. Section 5 of AOPA's Part 2 Matters Regulation defines "affected parties" as:

- the municipality where the CFO is or is to be located
- any other municipality whose boundary is within a specified distance from the CFO, depending on the size of the CFO
- all persons who own or reside on land within a specified distance from the CFO, depending on the size of the CFO

For this application, the distance is one mile. (The NRCB refers to this distance as the "affected party radius.")

Municipalities that are affected parties are defined by the act to be "directly affected" and are entitled to provide evidence and written submissions. The MD of Wainwright is an affected party (and therefore also a directly affected party) because the CFO is located within its boundaries. Beaver County is also an affected party because its boundary is adjacent to the CFO and within the one mile affected party radius.

All other parties who receive notice of the application may request to be considered "directly affected." Under NRCB policy, all individuals who own or reside on land within the affected party radius are presumed to be "directly affected" if they submit a written response to the notice within the prescribed timeline. See NRCB Operational Policy 2016-7: *Approvals*, part 6.2.

Under section 20 of the act, all directly affected parties are entitled to a reasonable opportunity to provide evidence and written submissions regarding the application.

All directly affected parties are also entitled to request an NRCB board review of the approval officer's decision on the approval application.

The NRCB published notice of the application in the Wainwright Star Edge News on May 15, 2020 and posted the full application on the NRCB website for public viewing. The NRCB also emailed referral letters and a copy of the complete application to the MD of Wainwright, Beaver County, Alberta Health Services (AHS), Alberta Environment and Parks (AEP), and Utility Right of Way interests – ATCO Gas and Pipelines Ltd., Iron Creek Gas Co-op Ltd., and ConocoPhillips Canada Operations Ltd. Twelve courtesy letters were sent to people identified by the MD of Wainwright as owning or residing on land within the affected party radius.

At the time the application was deemed complete, an oversight occurred and courtesy letters were not provided to residents within the affected party radius within Beaver County. Despite this oversight, the Star Edge News' distribution covers this area and the notice in the Star Edge News is the official public notice for the application.

3. Responses to the application

I received responses from the MD of Wainwright and Beaver County. No other responses to the application were received.

Ms. Kim Christensen, a development officer with the MD of Wainwright, provided a written response on behalf of the MD of Wainwright. As noted in section 2, the MD of Wainwright is a directly affected party.

Ms. Christensen stated that the application is in compliance with the MD of Wainwright's municipal development plan and land use bylaw. The application's consistency with MD of Wainwright's municipal development plan and land use bylaw, is addressed in Appendix A, attached.

Ms. Christensen also listed the setbacks required by MD of Wainwright's land use bylaw (LUB) of 40 m from the center of any municipal roads and noted that the application meets this setback.

I note that the proposed manure collection areas and manure storage facilities in this application meet the LUB's Agricultural District's side yard (6 m) and rear yard (7.5 m) setbacks.

Ms. Kim Vana, a development officer with Beaver County, provided a written response on behalf of Beaver County. That written response discussed the county's role in public notification of an AOPA application, how all adjacent land to the CFO within Beaver County are zoned for Agriculture, and that no development permits were issued for properties within the county adjacent to the CFO in the last 12 months. Her response did not raise opposition to the application.

In follow up correspondence with Ms. Vana, I informed her of the NRCB application and permitting process where applications of this nature receive public notice (in the Star Edge News in this case) which is equivalent to the county's public notification process.

I discussed the CFO location with the County and MD representatives to determine if there is an intermunicipal development plan which may apply to the site of this CFO. At this time, no such plan applies to the subject area.

4. Environmental risk screening of existing and proposed facilities

When reviewing new approval applications 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, 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 Lewisville Pork's existing CFO facilities were assessed in 2008. The assessment indicated that the potential risk to groundwater was low.

Since the 2008 risk assessment, a new version of the ERST was released. The new tool version considers risk to groundwater and surface water while the previous risk assessment only considered the risk to groundwater. For this reason, I assessed the risks posed by the CFO's existing facilities using the newest version of the ERST. My assessment found that all four barns, and the existing EMS cell all pose a low potential risk to groundwater. The barns pose a low potential risk to surface water while the existing EMS poses a moderate risk to surface water.

I also assessed potential risk to groundwater and surface water for the secondary EMS cell; it also poses a low potential risk to groundwater and a moderate potential risk to surface water.

Conditions will be added to the permit requiring the permit holder to construct a secondary containment (berm) between the EMSs and the slough (a common body of water) to their east.

5. Other factors considered

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

In addition, the second EMS cell and the alteration to the CFO's manure management system are consistent with the land use provisions of MD of Wainwright's municipal development plan and 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 CFO modifications:

- 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 springs
- Has sufficient means to control surface runoff of manure
- Meets AOPA's nutrient management requirements regarding the land application of manure
- Meets AOPA groundwater protection requirements for the design of floors and liners of manure storage facilities

I also determined that the second EMS cell is located within the required AOPA setback from an existing water well and a common body of water. However, as explained in Appendix C, I am prepared to issue a variance to the 100 m water well and the 30 m common body of water setback requirements due to location of the second EMS cell and the applicant's commitment to construct a secondary containment for it.

In addition, I assessed the effects of the proposed CFO modification on the environment. Consistent with NRCB policy, I presumed that these effects are acceptable because the application meets all of AOPA's technical requirements. No concerns were expressed by directly affected parties. I also presumed that the application's effects on the economy and community are acceptable, and that the proposed CFO modification is an appropriate use of land. Under NRCB policy, these presumptions are based on the application's consistency with the municipal development plan and land use bylaw, and nothing has rebutted these presumptions. (See NRCB Operational Policy 2016-7: *Approvals*, part 8.7.3.)

6. Terms and conditions

Approval RA19039 permits the construction of the second EMS cell and the switch from a predominant solid manure storage system to an all liquid manure storage system for the CFO.

Approval RA19039 also contains terms that the NRCB generally includes in all AOPA approvals, 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, Approval RA19039 includes conditions that:

- Set a deadline of October 30, 2021 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 annual inspections of the EMSs and the berm between them and the slough to their east
- Require submission of an engineer's completion report for the second EMS cell confirming that it meets the proposed specifications
- Require submission of an engineer's completion report for the berm located between the EMSs and the slough to their east confirming that it meets the proposed specifications
- Prohibit Lewisville Pork from placing manure in the second EMS cell until it has been inspected by the NRCB following its construction

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

a. Conditions carried forward from previously issued permits

For clarity, and pursuant to NRCB policy, I consolidated Approval RA10005M and the deemed permit with Approval RA19039 (see NRCB Operational Policy 2016-7: *Approvals*, part 10.5). Consolidating permits generally involves carrying forward all relevant terms and conditions in the existing permits into the new permit, with any necessary changes or deletions of those terms and conditions, and then cancelling all existing permits once the new permit is issued. This consolidation is carried out under section 23 of AOPA, which enables approval officers to amend AOPA permits on their own motion.

Therefore, in addition to containing the new terms and conditions summarized above, Approval RA19039 includes all existing terms and conditions from Approval RA10005M, except for condition two (discussed below). The deemed permit (excluding the conditions from municipal permit 2001-47 that were carried into Approval RA10005M) did not contain any conditions to carry forward.

Pursuant to section 23 of AOPA (approval officer amendments), I have determined that condition two from Approval RA10005M should be deleted and therefore are not carried forward to Approval RA19039. My reasons for deleting these conditions are provided in Appendix C.

I am also using this opportunity to clarify the type of livestock historically permitted at the CFO. The municipal development permit (2001-47) states a capacity of 4,000 head hogs. Approval RA10005M revised the permitted livestock to be 4,000 finishers. Swine finishers is not a livestock category in the *Part 2 Matters Regulation* under AOPA. Based on correspondence with the applicant, this CFO is a swine feeder operation (as in the regulation). For this reason, I am revising the type of permitted livestock at this CFO to be feeders not hogs or finishers. I am making this clarification amendment on my own motion, under section 23 of the AOPA.

7. Conclusion

Approval RA19039 is issued for the reasons provided above, in the attached appendices, and in Technical Document RA19039.

Approval RA10005M and the deemed permit are cancelled, unless Approval RA19039 is held invalid following a review and decision by the NRCB's board members or by a court, in which case Approval RA10005M and the deemed permit will remain in effect.

August 13, 2020

(Original Signed)
Jeff Froese
Approval Officer

Appendices:

- A. Consistency with the municipal development plan
- B. Variances for a water well and a common body of water
- C. Explanation of conditions in Approval RA19039

APPENDIX A: Consistency with the municipal development plan

Under section 20 of AOPA, an approval officer may approve an application for an approval 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 20(1.1) 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.”)

Lewisville Pork Farm Inc.’s (Lewisville Pork) CFO is located in the MD of Wainwright and is therefore subject to that county’s MDP. The MD of Wainwright adopted the latest revision to this plan on May 15, 2007, under Bylaw #1319.

Section one of the MDP relates to agriculture and confined feeding operations, its policies relevant to this application are discussed below:

Policy 1.1 states that most of the MD is designated as agricultural use area and directs the reader to Map 1 which indicates that the CFO and land surrounding it are part of the Agricultural Use Area. Policy 1.2 goes on to state that this area is to be conserved for agriculture and agriculture-related uses, for the most part. Policy 1.3 then states that the primary use of the agricultural use area is for extensive and intensive agricultural uses and for confined feeding operations.

I interpret these three policies to be land use provisions which the CFO does not conflict with based on the CFO’s location in Map 1 from the MDP.

Policy 1.4 states that the minimum parcel size for farming shall normally be a quarter section.

Under Operational Policy 2016-7: *Approvals*, part 8.2.5, I cannot consider discretionary or subjective land use provisions. I am of the opinion that this policy is a land use provision, but one that is of a discretionary and subjective in nature. This policy suggests, without providing guidance, there could be an exception to the normal. An exception would require substantial subjective evaluation of the merits of an individual development. Therefore I will not consider policy 1.4 as part of my MDP consistency determination.

Policy 1.8 states that CFOs and manure storage facilities (under the jurisdiction of the NRCB) must fully satisfy the requirements and regulations under the AOPA. This policy stresses the importance of the minimum distance separation (MDS) and land base requirements of AOPA.

I recognize that Lewisville Pork has partially constructed the second EMS without a permit (a violation of AOPA and its regulations). Despite this, Lewisville Pork has provided proof of how the partially constructed second EMS will meet the liner requirements of AOPA. In addition, both

the existing and partially constructed second EMS cells pose a moderate risk to surface water, which need to be addressed. The applicant has provided me with a plan to construct a berm between the EMS cells and the slough to the east of them which will direct runoff away from the slough. This is a method of meaningfully reducing the risk to surface water posed by these facilities.

As noted in Technical Document RA19039, and in this document, the CFO has adequate land base available for manure spreading. Also noted in both documents, the CFO meets the MDS requirement under AOPA.

Policy 1.9 states that CFOs requiring a registration or approval and that MSFs requiring an authorization shall not be allowed within 2.4 km of select features identified in Map 1.

Lewisville Pork's CFO is not located within the 2.4 km setback of any of the listed features.

For these reasons, I conclude that the application is consistent with the land use provisions of the MD of Wainwright's MDP. The MD's response to the application also supports this conclusion.

In my view, the text of the MD of Wainwright's MDP also provides a clear intent to adopt provisions from the land use bylaw (LUB), in parts 2.6, 2.7, 2.13, 2.16, 2.19, 2.20, 4.6, and 5.2. Following the NRCB Operational Policy 2016-7: *Approvals*, part 8.2.3, I also considered the MD's LUB (most recently amended on May 15, 2007 by Bylaw #1318). Under the LUB, the subject land is currently zoned as Agricultural District.

CFOs are not listed as permitted or discretionary land uses within the Agricultural District. The LUB provides further direction for CFOs in section 6.2.3 where CFOs (ones that require an approval, registration or authorization) under AOPA are exempted from the LUB.

Appendix B: Variances for a water well and a common body of water

According to the application, no water wells are located within 100 m of “proposed” and partially constructed second earthen liquid manure storage (EMS) and the closest surface water body is located 145 m from it. Based on information collected during a site visit, information provided by the applicant, and a review of scaled air photos, I have determined that one water well is located approximately 50 m from the second EMS. In addition, a slough, which is a common body of water (CBW), is located approximately 15 m from it.

Because of this proximity, the applicant’s second EMS conflicts with section 7(1) of the *Standards and Administration Regulation (SAR)* under AOPA, which prohibits the construction of manure storage facilities (MSF) or manure collection areas (MCA) within 100 metres of water wells and within 30 m of a common body of water (CBW).

The regulation allows approval officers to grant an exemption from this prohibition for proposed facilities but not for existing (or partially constructed but not permitted) ones. The regulation also makes it clear that the applicant has the burden of proving that an exemption is warranted.

As the regulation does not contemplate exemptions for existing facilities, I need to either deny the application or alternatively consider if a variance is warranted under AOPA’s section 17(1). It is my opinion that considering a variance is appropriate in this case. Section 17(1) allows a person to apply for a variance of a requirement in the regulations, and an approval officer may grant a variance if they hold the opinion that the variance provides the same or greater degree of protection and safety.

As part of the application process, the applicant has requested a variance to the CBW setback requirement. The applicant has committed to construct a secondary containment (berm) between the EMSs and the CBW which will direct surface water around the EMSs away from the CBW.

The applicant hasn’t expressly requested a variance for the second EMS to the water well located within 100 m of it. Despite this, the applicant has provided me specific photos of the water well in question, its proximity to the second EMS and the lay of the land between the two which is the information typically be required on an applicant’s behalf to consider if a variance is warranted. I am of the opinion that there is an implied request for a variance to the water well setback requirement, despite lack of use of specific terminology.

Approval officers must not grant variances or exemptions lightly or in the absence of substantive evidence they will produce equivalent levels of protection (see Decision 03-04, *AAA Cattle Ltd.* p 24). I will consider whether a variance is warranted to the water well and the CBW for the second EMS separately below.

Water well considerations

I have used the same tools to determine if a variance is warranted as what I would normally use to determine if an exemption is warranted. I consider the water well exemption framework (discussed below) as useful for assessing the degree of protection for the water well in relation to the second EMS. In this case I note that the risks of direct aquifer contamination from the second EMS is low if the MSF meets AOPA’s technical requirements to control runoff and leakage. I also assess whether water wells that are less than 100 metres from the MSF could act as conduits for aquifer contamination. The results of that assessment are discussed below.

Approval officers may presume that the risks of direct aquifer contamination from the MSF is low if the applicant's "proposed" MSF meets AOPA's technical requirements to control runoff and leakage. However, when determining whether a MSF provides an equivalent or greater protection as AOPA's technical requirements, approval officers also assess whether water wells that are less than 100 m from the MSF could act as conduits for aquifer contamination.

Approval officers assess the following factors to determine the risk of aquifer contamination via the water well:

- How the well was constructed
- Whether the well is being properly maintained
- The distance between the well and the proposed MSF
- The estimated water well pumping rate
- Whether the well is up- or down-gradient from the MSF and whether this gradient is a reasonable indication of the direction of surface and groundwater flow between the two structures

Based on information provided by the applicant and from the Alberta Environment and Parks (AEP) water well database, the water well located approximately 50 m south of the second EMS is likely ID # 1460080. This well is reported to have been installed in 2002 and has a perforated or screened zone from 46.9 m to 51.8 m below ground level across blue sandstone. This layer produces approximately 150 litres per minute of water that is reported to be used for domestic purposes. I note that in my conversations with the applicant, the water well is only used presently as a back up to the other water well onsite. The well's log identifies clay and shale layers from ground surface to 35.1 m below ground level. The well has a bentonite and cement seal from ground surface to 44.5 m below ground level (across the clay and shale layers). The well appeared to be in good condition and its casing was protected by a welded steel cage. The well is up-gradient of the CFO and MSF.

In addition, the NRCB has developed a "water well exemption screening tool," based on the factors listed above, to help approval officers assess the potential groundwater risks associated with a nearby water well. (A complete description of this tool is available under CFO/Groundwater and Surface Water Protection on the NRCB website at www.nrcb.ca.) This tool may help to determine the degree of protection of groundwater. This tool consists of a two-stage risk screening process; each stage provides a numeric risk "score" based on the information inputted into the tool. The first stage focuses on the well's construction. If the well scores less than 10 at this stage, the tool suggests granting a setback exemption for the subject facility. If the well scores above 28, the tool recommends denying the exemption. Scores between 10 and 28 require applying the second stage of the screening process, which focuses on the gradient and other factors bearing on the risk of manure runoff or leachate reaching the water well. If the risk score at this stage is over 20, the tool suggests denying the setback exemption to the subject well.

For the risk screening process described above, water well 1460080 scored eight in the first risk screening stage.

Based on the above information it is my assessment that varying the 100 m setback rule for the second EMS would offer the same degree of protection and safety as that provided for by the regulations for the following reasons:

- The second EMS and the CFO as a whole are located downgradient of the water well; any manure impacted runoff would be directed away from water well 1460080.
- There is a commitment in Application RA19039 to construct berms around the second EMS that will direct surface water around it away from the water well (and away from the CBW).
- In the unlikely event that any manure did leave the second EMS or the CFO as a whole, it is unlikely to migrate directly into the aquifer because of how the water well is constructed (with a casing and a bentonite and concrete seal across a substantial protective layer).

Common Body of Water Considerations

The NRCB does not have as predetermined process to determine if a variance is warranted for the proximity of a MSF to a common body of water. In lieu, I have used a similar but modified approach from the above (for water wells) to determine if a variance is warranted for the partially constructed second EMS's location relative to the slough (a CBW).

In this case, my test to determine the risk of CBW contamination via manure or manure impacted runoff from the MSF includes the following factors:

- The distance between the MSF and CBW
- Whether the MSF is up- or down-gradient from the CBW and whether this gradient is a reasonable indication of the direction of surface water flow between the two structures
- How the MSF and its runoff controls are or are to be constructed
- Whether the MSF and its runoff controls are or will be properly maintained
- The amount of (liquid) manure storage at the CFO
- The likelihood of an MSF overflow or related failure occurring

Based on information provided by the applicant and on my site observations, the CBW is located approximately 15 m east of the partially constructed second EMS. The CFO and the CBW are located in rolling hills, the land surrounding the second EMS appears to slope generally to the east or west. This will result in any runoff from the east side to the EMSs sloping towards the CBW. Despite this, the applicant has committed to construct berms along the east and south side of the EMSs that will force runoff to go to the west. The second EMS is to have a compacted soil liner that meets AOPA requirements. The proposed berm between it and the CBW will be constructed of the same material and in the same method as the second EMS. I am including a condition in the permit that requires the berm to be constructed to the same standard as the second EMS cell. That condition is discussed in the next appendix. Last, the required nine month liquid manure storage requirement for this CFO is 4,000 m³. The existing barns and old EMS afford approximately 6,500 m³ of storage when combined and the new EMS will provide an additional approximate 12,500 m³ storage. Provided that a CFO's liquid manure storages are properly managed, the CFO should be able to store approximately 3.5 years'-worth of liquid manure. Based on this, in my opinion, it is unlikely that there would be overflows or related failures.

Based on the above I am of the opinion that a variance is warranted for the 30 m setback to a CBW as the CFO and what it has proposed should offer the same degree of protection and safety as that provided for by the regulations.

APPENDIX C: Explanation of conditions in Approval RA19039

Approval RA19039 includes several conditions, discussed below. It also carries forward condition one and deletes condition two from Approval RA10005M (see section two of this appendix).

1. New conditions in Approval RA19039

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."

The bottom of the liner for the proposed and partially constructed second EMS is to be 2.3 m below ground while the water table was observed to be at a depth of 2.5 m below ground in a test pit. Despite this, a water table's depth can vary due to climatic conditions and between seasons.

Based on this information, it seems that the second EMS cell does not currently 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 Lewisville Pork's 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

Lewisville Pork proposes to finish construction of the second EMS cell 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, Lewisville Pork 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 = 1×10^{-9} cm/sec
 Expected field k = $10 \times (1 \times 10^{-9}$ cm/sec) = 1×10^{-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 1×10^{-7} cm/sec.

In this case, the lab measurement was 5.14×10^{-9} cm/sec. With the required ten-fold modification, the expected field value is 5.14×10^{-8} cm/sec. This expected value is below the maximum value in the regulations, and the liner is proposed to be one metre thick. Therefore, the proposed liner meets the hydraulic conductivity requirement in the regulations.

To provide additional assurance that the as-built second EMS adequately protects groundwater, Approval RA19039 includes a condition requiring Lewisville Pork to provide an engineer's completion report certifying that the second EMS was constructed with the same liner material as that used for hydraulic conductivity testing and that the second EMS was constructed according to the proposed procedures and design specifications.

c. Construction deadline

Lewisville Pork proposes to complete construction of the partially constructed EMS cell by October 30, 2020. This time-frame is not considered to be reasonable as poor climatic conditions or a limited availability of contractors may make this deadline un-achievable. The deadline of October 30, 2021 is included as a condition in Approval RA19039.

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, Approval RA19039 includes conditions requiring the submission of a completion report, stamped by a qualified engineer, certifying that the second EMS has been constructed in accordance with the proposed design including that the:

- location is the same as proposed
- horizontal and vertical dimensions, along with elevations above and below grade and side wall slopes are the same as proposed
- liner was constructed of the same liner material as what was submitted for hydraulic conductivity testing,
- liner was constructed in accordance with the specifications stated the documents prepared by DGH Engineering and part of application RA19039.

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. Approval RA19039 includes a condition stating that Lewisville Pork shall not place manure in the manure storage portions of the second EMS until NRCB personnel have inspected it and confirmed in writing that it meets the approval requirements.

e. Common body of water (surface water) protection requirements

As noted in Technical Document RA19039 and in this decision summary Lewisville Pork has committed to constructing a berm that will direct runoff from the EMS cells away from the slough (a common body of water) to the east of them. This berm:

- Is part of a variance request. That request was made as the partially constructed second EMS is located within the 30 m setback to common bodies of water and the berm will act to provide protection to the water body
- Will reduce the risk posed by the existing and partially constructed EMSs to surface water

Conditions will be added to the permit related to the berm:

i. Location of the berm

A condition will be included requiring Lewisville to construct the berm between the EMSs and the slough located to the east of them. The berm must be high and wide enough so that any potential overflows or runoff from them will be contained and directed away from the slough.

ii. Construction of the berm

Lewisville Pork is to provide an engineer's completion report certifying that the berm was constructed with the same liner material as that used for hydraulic conductivity testing and that it was constructed according to the DGH Engineering proposed procedures and design specifications stated in Application RA19039.

The NRCB routinely inspects newly constructed facilities to assess whether a facility was constructed according to its required design specifications. To be effective, the inspection must occur within a specified time line. Approval RA19039 includes a condition stating that the permit holder shall construct the berm for the EMSs and have NRCB personnel inspect it before the permit holder is allowed to place manure in the second EMS cell.

iii. Inspection and maintenance of the EMSs and the berm

A condition will be included requiring Lewisville Pork to annually inspect the EMSs and the berm located between them and the slough to their east by July 31. The EMSs and the berm must be protected from damage and maintained in working condition. All maintenance or repair work shall be completed as required and results of an inspection be completed annually. The results of the inspection and any completed or outstanding maintenance or repair work must be submitted in writing to the NRCB.

2. Conditions from Approval RA10005M

Condition one of Approval RA10005M relates to the "owner/operator" requirements for a leakage detection monitoring system at the CFO (which is presently suspended). Current AOPA permit conditions typically refer to "permit holders" not owner/operator as stated in Approval RA10005M. As such, this condition will be carried forward with minor revisions into the new approval.

Condition two of Approval RA10005M limits short-term increases of livestock at the CFO to ten percent. This condition's "short-term basis" is subjective and could be difficult to enforce. NRCB-issued permits generally do not include or carry forward conditions that are difficult to enforce as written. Under section 2.2.1 of the NRCB's *Amending Municipal Permit Conditions* policy (Operational Policy 2016-1), permit conditions that are unenforceable on their face can be removed.