

Relocation of Livestock Facilities Planning Guide

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This publication was developed to assist producers in identifying the environmental risks associated with their current livestock facilities, helping them determine how to mitigate the risks and steps to consider when relocating facilities.

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Introduction

When settlers arrived on the Prairies in the late 19th century, they required homesteads that would provide the basic necessities for life. As a result, most of our original farm sites were established near water to provide access to water, food, transportation routes and protection from the elements. Many of these sites are still functioning farms today.



Homesteads were established near water and have been expanded over the years.

For many livestock operations, expansion has occurred gradually, on or close to the original homestead location. In addition, public awareness and scientific understanding of the potential risk to water associated with livestock production has increased. Similarly, producers and resource managers have recognized the importance of maintaining healthy landscapes and watersheds. Today, a much greater emphasis is placed on proper design, siting and management of livestock facilities to mitigate environmental impacts.

In some cases, the environmental risks associated with livestock facilities may be minimized by implementing practices such as farmyard runoff control, extending the grazing period, in-field livestock feeding and other grazing or riparian stewardship practices. In other cases, the most appropriate method to minimize impact may be to relocate the livestock facility away from the water.



Runoff control structures can be implemented to minimize environmental risks

The first step in determining the best approach for addressing risks associated with a site will be to conduct a site assessment. By evaluating the site and current

management practices, it can be determined if a change in management will effectively eliminate the risk or if structural changes are needed.

Water includes water sources such as dugouts, wells, canals and springs, as well as surface water bodies such as lakes, sloughs, rivers, creeks, etc.

Relocating a poorly placed livestock facility provides significant benefits to the farm operation, downstream water users and the broader watershed. Benefits can include improved herd health, improved water quality, reduced stream bank degradation, improved riparian function and improved public perception. In addition to environmental and production benefits, most producers who have relocated livestock facilities indicate that working with new or upgraded facilities can result in improved operational efficiencies.



A site assessment is the best approach for evaluating the site.

This publication will assist you in assessing and understanding the risks of your current site. It provides mitigation options that consider legislative requirements, planning and design of upgraded facilities and construction requirements to relocate your facility or reclaim old sites.



Upgrading facilities can result in improved operational efficiencies.

Section 1 – Current Site Assessment

Understanding the inherent risks of the current facility's location is the first step to determine if relocation is necessary. A complete assessment will identify if minor changes or a major overhaul of the existing site is necessary if the risk can be managed through minor site changes or changes in management practices. Alternatively, there may be production reasons to improve or relocate a facility. By completing an environmental risk assessment of the old site and the new site, informed decisions can be made to improve your business.

Addressing the risks in the existing livestock confinement facility can be done in a variety of ways and over a period of time. The approach should fit the specific needs of the management style and needs of the operation, the economic situation, the location and any current and future production needs. Options could include changes to management practices within the existing footprint, removal of a portion of the facility that is high risk rebuilding or relocating the entire facility. By considering the feasibility of all options, one can determine which option would be most beneficial from an economic, operational, production and environmental basis. For more information on mitigation options, see Section 2.

A risk assessment considers the potential environmental risks at a livestock facility. It identifies who or what will be affected by exposure to the hazard and the pathway from the source to the end user or location (receptor).

Factors to consider when evaluating a site are:

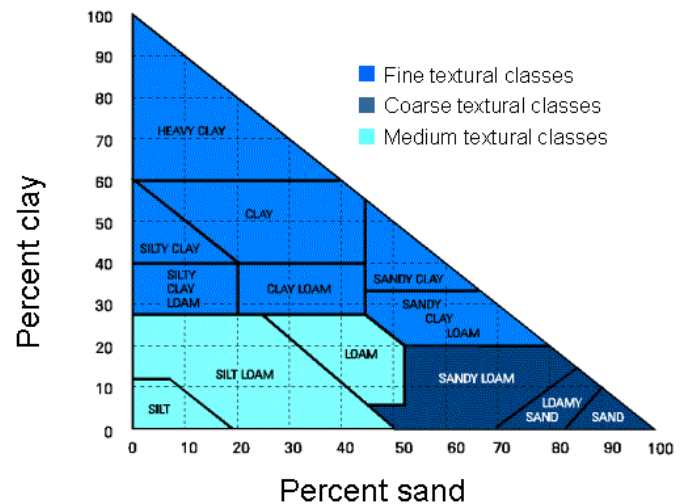
Location

- Proximity of the facilities to water, wildlife habitat, shorelines and riparian areas.
- Frequency and severity of flooding.
- Slope of the site –In general, runoff and erosion risk increases as slope grade increases. The overall risk of the site will depend on proximity to surface water.
- Presence of wells, seeps or springs within or downslope of the facility.



The grade and length of slope are natural risks for runoff and soil erosion.

- Soil texture is the relative coarseness or fineness of soil particles. It determines the ease and speed with which water and contaminants will move into the soil, affect both the surface runoff and erosion potential, as well as the infiltration rate and the water holding capacity.



Soil texture triangle.

- Subsurface conditions – Coarse subsoil will increase the movement of water and manure downward. The risk increases with the presence of shallow aquifers. Alternatively, compacted subsoil or solonchic soils will reduce the amount of water that can infiltrate the soil increasing the surface runoff.
- High snow load will increase the site runoff. The risk posed by the runoff will depend on precipitation and the proximity to water.
- The presence and effectiveness of surface water runoff and runoff control structures (e.g. ditches, berms, eaves troughs, retention ponds).

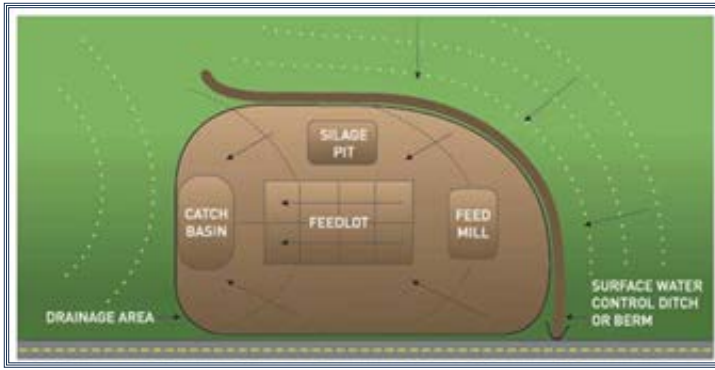


Illustration of location of control ditch or berm.

Operational and Production Considerations

- Shelter, housing and maternity requirements.
- Are there any health concerns that are related to the facility?
- Access to and size of feed bunks and feed storage.



Access to and the size of feed bunks should be considered when relocating facilities.

- How the manure is collected, stored and handled.
- Bedding practices.
- Feed waste and bedding accumulation in and around the facilities.
- The accessibility of the site (e.g. loading and unloading areas for farm machinery and cattle trailers). Is it adequately sized for the equipment currently or potentially being used?
- Age of facility and the use of the site, including intensity and duration (consider animal numbers and the type and size of equipment used).
- Animal handling processing requirements including animal flow within or between facilities and pasture.
- Utilities availability (e.g. water, electricity, all weather access, etc.).
- Future production or expansion plans.

Impact on Others

- Impact on neighbours - odour, noise and dust may be of concern.
- Recreational and downstream licensed users.
- Public perceptions, visibility and condition of site.

Depending on your location, provincial specialists or local extension staff are available to help you access technical information about soil and water resources on your site. They can help to interpret maps (hydrology, topographical, etc.) and they have access to various types of imagery



Consider how your facility looks to others.

that may be useful in assessing the potential risks at your current livestock facilities, as well as any potential future sites being considered for development. The extension staff can also help with accessing, interpreting or connecting you with experts on local bylaws and regulations. Staff may also identify funding support programs that can assist with adoption of mitigating practices, site redesign, relocation and decommissioning.

Tools to help with the assessment:

- Aerial photos are an excellent visual tool to help identify distances between your livestock facility and water or sensitive areas. They can also help illustrate the flow of water through the watershed—an important component in understanding the relationship between your facility and neighbours.
- Water well reports can help identify subsurface conditions and proximity to source aquifers.
- Soil survey information can assist with soil risk evaluation.
- Other mapping resources such as soil characteristics topographical maps or rainfall potential, etc. are also available.

- Refer to provincial specialists and or private consultants to help you access and interpret technical or regulatory requirements.



Aerial photos are an excellent tool.

For more information on assessing your livestock facility, contact a Confined Feeding Operation (CFO) Specialist by contacting the Ag-Info Centre at 310-3276 in Alberta or the Agriculture Knowledge Centre at 1-866-457-2377 in Saskatchewan. More resources are also listed in the appendix.

Section 2 - Mitigation

Through the adoption of beneficial management practices (BMPs) it may be possible to mitigate or eliminate environmental impacts of a facility to the extent that relocation may not be necessary. The mitigation options will depend on the site, current management practices and the level and type of risk at the site.

Full consideration must be given to municipal, provincial and federal law. Mitigation options must meet regulatory standards including runoff and water quality. If they don't, then partial or total relocation maybe the only option to address the site risk. If relocation is not possible, then decommissioning must be considered.

Source	Pathways	Receptors
eg.	eg.	
Manure/ Nutrients	Overland	Surface Water
	Subsurface	Shallow groundwater
	Soil	Aquifers

Mitigation Options or Considerations

Monitoring

Monitoring is done to determine if the facility is affecting ground or surface water quality. Water quality monitoring programs are usually costly, require greater effort than people normally expect and the results need to be properly interpreted. Alternatives to the traditional approach of measuring water quality are a stream and riparian health assessment from a biological perspective. This may be of value to assess the relative health of a site and the impacts of current management practices.



Monitoring water quality.

Water control structures

Run-on and runoff control systems are often included in the design and construction of new facilities and they can often be added to existing facilities to protect water sources. These are usually a set of physical structures such as upstream dikes and ditches to direct clean water around the facility, or a holding pond or catch basin to capture and prevent water contaminated with manure from leaving the site. Some jurisdictions may require these structures to be designed by an engineer and undergo a permitting process to ensure that design and function meet regulated requirements. These structures may not be suitable options for some locations as their effectiveness and suitability at a site depend upon topographic and geologic conditions.



Holding pond for control of runoff.

Partial closure or relocation

Partial closure or relocation of the old facility may need to be considered. Abandoning or decommissioning the high risk parts of the facility may allow the facility to achieve

sufficient separation distance to water, make room for runoff control facilities, or eliminate the contribution from this high risk area.

Vegetative buffers or runoff controls

These are generally grassed structures that are designed and built to filter runoff water from a facility and protect surface water and other sensitive receptors. These controls are designed to improve water quality by removing contaminants through sedimentation, plant uptake and other biological processes. Vegetative buffers do not work properly when the ground is frozen or the vegetative cover is inactive (i.e. winter and spring) and they work best to address runoff in the growing season.

Sizing and designing these structures is another challenge. They are usually designed to handle runoff from a specific size of storm or event. Large storm events can overwhelm the system, reducing its effectiveness. Vegetative buffers need to be managed and cleaned out to remove the captured nutrients, or they become the sources of excess nutrients. As a result the regulatory acceptance of these structures can be a challenge. They are more likely to be effective when the impacted water stays on site, for example directed into a cropped field.



Healthy riparian area.

Changes to the receptor

It may be possible to move or alter the receptor instead of relocating the source – for example, through stream diversion. This option is common with industries where facilities occupy a very large surface area (for example, mining or oil and gas), but are less common in agriculture. Regulatory approval will be required for these types of alterations, especially if the stream is identified as a fish-bearing water body. This solution has a high cost and visibility associated with it.

Operational changes

Changes in how you manage your livestock and the facility may be sufficient to reduce or eliminate the inherent risk of the site. For example, changing to a pasture or field feeding system instead of feeding in corrals will help reduce the risk of manure accumulation at a corral site. In-field feeding systems and fields need to be evaluated to determine the risk for runoff impacts, but they can be a very effective way to distribute nutrients farther from the water or receptor and help with improving pasture or field fertility.

Section 3 - Steps to Consider in Relocating

Considerations

Relocation of a livestock facility can be a significant expense. Evaluate the cost and benefit of relocating the facility against mitigating the impacts of the existing site. When making a comparison, consider both infrastructure and resource considerations impacted by the decision.

Maintaining old systems is an ongoing maintenance cost, whereas investment in new facilities is a capital expense. If the existing facility is at the end of its useful life, then new infrastructure may be worthwhile. However, if you or your family plan to continue operating for only a limited time, the capital investment may not be returned. Alternatively, if you plan on operating for many more years, existing infrastructure may be insufficient if the operation grows in size over time.

There may be inadequate power supply to serve an expansion, and costs associated with upgrading or replacing may favour a new site. The existing water supply may not be of acceptable quality or adequate quantity to serve the existing need or an expansion. There must be sufficient room in either the existing or proposed site



Surveying.

to allow equipment traffic. Road infrastructure must be adequate to service your facility now and into the future. For example, consider all-weather roads, bed width, primary weight and safety.

Access to resources can be better at one location as compared to another. Relocating may either ease labor concerns or make it harder for employees to get to work. A different location may have better access to lands for manure spreading or mortality disposal; alternatively, the proposed site may increase the difficulty of either practice.

Complaints by neighbours can have a very real impact on your business. The existing site may be more (or less) acceptable to neighbours than the proposed location. Give consideration to how relocation will be practically accomplished. It is necessary to continue to raise livestock at the existing facility while the proposed facility is established. However, revenue may not support two operations at the same time. Contractors and consultants may not be immediately available and it may be likely necessary to plan far in advance. There also may be regulatory restrictions on the proposed site that are not applicable to the existing location.

Many if not all of these considerations may come into play when making the final decision on whether to employ mitigation measures, redesign a part of the facility or relocate the whole facility.

Steps to Consider in a Relocation Project

Relocation may include the whole facility or may be directed at specific areas that are an environmental risk. This section will identify services you may wish to secure to help complete the relocation. When considering a relocation project, it is important to remember that each situation will be unique. Each project may not involve all of the following steps, nor may each step be carried out to the extent in which it is presented here. However, these steps will assist you to view your operation with a critical eye and help you develop a plan that best suits your farm.

Step 1: Assess your needs

Once you have assessed the site (Section 1), determine what changes or additions to the facility are required to meet the needs of the production system. Initial concepts and ideas for new or modified facilities should be discussed and a number of options should be considered.

Step 2: Review applicable legislation and identify approval/permit/license requirements

Know all the regulatory requirements that may apply to the project in your province. Other jurisdictions (federal, provincial and municipal) will regulate different aspects of the siting of livestock operations in relation to roadways, neighbours and water allocation.

Provincial legislation

Alberta: In Alberta, the siting of livestock facilities is legislated by the *Agricultural Operation Practices Act*. Depending on the type of facility, you may or may not require a permit. Confined feeding operations (CFOs) that exceed the threshold number for a specified livestock type will require a permit. CFOs that are below threshold numbers and seasonal feeding and bedding sites do not require a permit but will need to follow the regulations. As well, CFOs under threshold numbers may have municipal regulations to follow.

Saskatchewan: In Saskatchewan, livestock facility relocations may require an approval issued under the authority of *The Agricultural Operations Act*. The Act and associated regulations are often applicable to both feedlot and cow-calf facilities.

Federal legislation

Federal legislation may be applicable, depending on the nature of the work. Federal legislation considerations include:

- *Federal Fisheries Act*
- *Species at Risk Act*
- *Navigable Waters Protection Act*
- *Historical Resources Act*

Municipal regulations

It is best to contact your local municipality.

While it is the responsibility of the landowner to comply with federal, provincial and municipal regulations, provincial specialists can provide guidance. Various regulations and programs apply to each situation and will determine the facility development, construction and decommissioning requirements. There can be costs associated with obtaining approvals, permits and licenses for your project.

Step 3: Site assessment and preliminary project design

Now that the risks have been assessed with the new site, the needs of your production system are outlined and you have communicated with the local authorities to ensure all regulations will be met, you should begin developing the preliminary design. Technical advice and pre-construction technical services and information that may be beneficial include:



Topographic drawing with contour lines.

- Conceptual plans, drawings or air photos including what pens should be removed, added or modified,
- Agronomic advice on facility set-up and operation,
- Engineering advice on facility set-up and operation,
- Topographic survey of the proposed site,
- Hydrologic analysis,
- Geo-technical soils investigation (test holes, hydraulic conductivity, soil suitability for construction, etc.) and
- Earthwork quantity calculations.

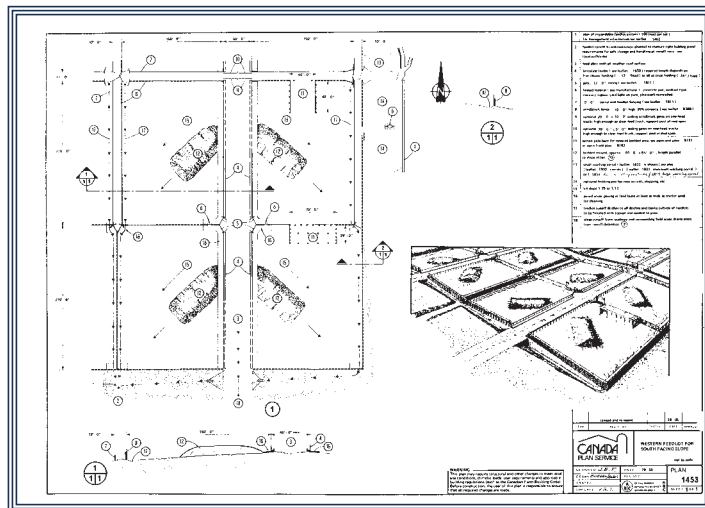
There may be technical or engineering requirements that are needed for a permit application.

Take time to plan and design the facility carefully

A set of preliminary drawings should be developed to illustrate layout of buildings, pens, access roads, water supplies, run-on and runoff control, on-farm infrastructure and other features. These drawings provide a “vision” of what the new facility will look like and help to illustrate how all the components will work together.

Design Tips:

- Simple designs work best!
- Sketch out many different design options and consider different approaches to the handling of animals, manure, feed, etc.
- Enlist the input from other producers or friends to get new ideas or suggestions on design options.
- Go back to basics—rectangular pens accessed by a central alleyway are one of the easiest and most effective designs to work with.
- A single row of rectangular pens is easier to manage than a double row if space allows.
- Consider orientation of the pens and handling system with respect to topography, exposure to sunlight and prevailing wind direction.
- Allow space to expand in the future—even though you may not have plans to expand your operation right now, it’s smart to allow sufficient space to add on a few extra pens, livestock management, feed management, equipment or staffing facilities in the future should they be required.
- Seek expert advice and technical assistance, where available, to help plan and develop the project and obtain necessary permits. An outside eye often brings a fresh perspective and can see things that may otherwise be overlooked.



An example of a feedlot design.

Drainage Tips:

- Use natural topography as an advantage. Examine the drainage patterns and enhance the potential site with constructed ditches, berms and holding ponds or recontouring.
- Facilities with multiple pens should avoid directing runoff water from one pen into another; it is best to move the runoff out of the pens and along a drainage channel.
- When necessary, re-arrange or remove existing infrastructure (pens, drains, shelter, buildings and watering stations) to allow improved function and drainage of new pens.
- Ensure water (precipitation/snow melt) originating outside the animal facility is diverted away from the facility to reduce the volume of runoff that flows through the pens.
- Runoff should be retained within a collection area such as a holding pond or catch basin. The excavated material from ditches or a catch basin may be used to build up pens or berms around the facility.
- Strip away the topsoil and ensure there is an elevated clay base with adequate slope for the pens. This will increase the longevity of the pen floor. Topsoil left in place makes for wet, muddy pens and is a situation that should be avoided if possible. However, pen floors always require regular and consistent maintenance.
- Plan access roads. If they cross a drainage ditch, a culvert should be installed to keep the water flowing to the catch basin. Be aware that culverts have a tendency to plug.



Holding pond construction.

Infrastructure tips:

- Plan temporary or permanent fencing to keep cattle out of runoff control ditches and holding ponds. This will reduce the maintenance required on these structures and allows them to continue functioning properly over the long term.
- Use natural wooded areas to your advantage. You can't beat the protection it provides, as long as it is protected from direct cattle access.
- Locate your pens away from shelterbelts and treed areas to prevent snow accumulation in the pens. Observe snow accumulation patterns around the trees and plan the pen's location accordingly. Less snow in the pens mean less runoff in the spring and reduces the potential for winter pen cleaning.
- Plan to use old pens and sheds until the new facility is completely finished. Unexpected delays due to weather, contractor and material availability, and other farm commitments could significantly postpone project completion. You don't want to be without a place to tend to your animals.
- The water supply and availability of electricity are important components of most livestock facilities. The cost of incorporating these utilities can be expensive and should be carefully considered.

Step 4: Final project design

Moving from preliminary plans to a final design usually requires additional planning and technical advice, as well as the modification of preliminary plans, especially for large projects. In cases where legislative requirements need to be met, input may be required from technical specialists, authorities issuing permits, professional consultants or engineers and/or contractors.

Creating a detailed budget plan may save you money

- Ask for quotes from all suppliers to provide cost estimates.
- Use the Budget Estimate Worksheet (Appendix A) to help develop a project budget.
- Consider new management systems that can help reduce capital costs, such as investing in portable infrastructure rather than permanent. There are numerous options for remote watering systems, portable windbreaks, feed bunks, fences and shelter.
- Relocation project costs vary significantly depending on the scope of the project (they can range anywhere from \$15 to \$2,000 per head). Costs will depend on the amount of infrastructure involved in the move, how much work can be done in house, how much of the existing building materials can be recycled, the availability of utilities, etc.
- Check with local agencies about programs (federal, provincial or non-government organizations) that may be available to provide partial funding or technical expertise to the project.

Step 5: Site layout and construction

Producers may choose to do all or a portion of the work themselves, or hire contractors to complete building construction, electrical, plumbing and earthwork. Additional services, particularly for larger projects, may be required, including:

- Layout surveys that identify location markers, cut and fill stakes; and
- Quality-control supervision and guidance of earthwork to meet standards and achieve final project design.



Survey the site.

Step 6: Cleaning up the old site

From an environmental perspective, clean-up of the old site is just as important as constructing the new site. Steps to consider:

Remove all manure

One of the first steps to take after relocating the animals is to remove as much manure as possible from the original site. Pens and bedding areas should be scraped down to the soil surface. If old manure packs are not removed, they continue to act as a source of nutrients that can be subject to leaching or runoff for years to come.

Remove infrastructure

While the original site may no longer be used for livestock, situations inevitably arise where it may be necessary to use the “extra” pens and facility for livestock again. In most cases, these might be temporary solutions to address specific issues such as quarantining a sick animal or housing bulls during the winter. Sometimes these “temporary” solutions can easily become a permanent practice and thwart attempts to make a positive change to the operation.

It is reasonable to retain buildings or shelters that are in good condition and use them as alternate storage. However, other infrastructure that can continue to contribute to the confinement of animals, such as gates, pen material, windbreaks, water bowls, handling facilities, feed bunks or feeders, should be removed. Aesthetically, a properly decommissioned site will have a clean, well-managed appearance.

Decommission wells no longer used

Wells provide direct pathways for chemicals, bacteria and nutrients to enter groundwater sources. In addition, wells that are no longer in use pose a serious safety hazard for children, pets, livestock and even farm machinery.

- If the well is not currently in use, but it may be used in the future, ensure the well is properly capped so that no foreign materials can enter the well. The well cap should be watertight and securely fastened to reduce the risk of potential groundwater contamination.
- If the well is to be abandoned completely, have the well decommissioned properly. There are programs that will subsidize costs associated with decommissioning abandoned wells.



Bentonite seal in a decommissioned well.

Establish plant cover at the former site

It is important to establish plant cover on the site as soon as possible to take up the excess nutrients. Even after the manure has been removed, nitrogen levels remain high beneath the pens. The rapid establishment of vegetation, even weeds (but preferably forage species), will minimize soil erosion in bare areas and reduce or eliminate nutrient transport to water. The sooner a vegetative cover is established, the sooner nutrients in the soil will be used by the plants. At some sites, plant-available nitrogen may have leached deeper into the soil profile. Using deep-rooted legumes and grasses can help utilize the leached nutrients. It is important that the vegetation is harvested from the site to remove nutrients those plants have taken up so that they do not accumulate at the site or are still exposed to runoff water flow.

The soil beneath decommissioned pen areas may be compacted from many years of use. To improve plant establishment, you may need to break up the compacted layer to prepare a good seed bed.

Section 4 - Producer Profiles

Jack and Kim Hextall, Hextall Livestock, Grenfell, Saskatchewan

Since 1882, six generations of the Hextall family have farmed near Pipestone Creek, just south of Grenfell. Through hard work, a commitment to innovation, and a pride for what they do and why they do it, the farm now encompasses 22 quarters of land.

Jack Hextall and his wife, Kim, the current owners of the farm, raise approximately 300 head of cattle and do enough cropping to feed their livestock, with some left over to sell.

Having always been active in the community, Jack was involved in the development of Pipestone Feeders about 10 years ago. Plans for the feedlot prompted questions from the public about environmental stewardship, which motivated Jack to take a look at the environmental effects of his own farm.

Jack knew the importance of being a steward of the land. His livelihood depended on it, and having healthy soil and water would be essential if the farm wanted to operate for

another six generations. After doing some research, he found several useful resources through the Saskatchewan Ministry of Agriculture. “We wanted to be compliant with the *Agricultural Operations Act* and practice good stewardship,” Jack explained.

Through its *Agricultural Operations Act* and other resources, the Saskatchewan Ministry of Agriculture has made environmental stewardship a priority. The Act encourages producers to follow sound management practices while preserving the land and environment for future generations.

After learning more about the Ministry’s dedication to such measures, Jack took a look at the stewardship practices of his own operation. What he found wasn’t quite as encouraging as he would have liked. The layout of the Hextall farm naturally allowed runoff water to mix with the nearby creek, meaning it could impact wildlife and natural riparian areas.

Once Jack and Kim had discovered how much of an environmental effect their runoff could be having, they once again enlisted the help of the Saskatchewan Ministry of Agriculture. Soil samples were collected in four areas of the yard; due to the land being clay-based, it was determined that it would be suitable for berms to be created to direct runoff water to a holding and evaporation area.

Based on that information, Jack and Kim developed an Environmental Farm Plan. Upon completion of the plan they received 50 per cent of the funding for their project through the Canada-Saskatchewan Farm Stewardship Program, a *Growing Forward 2* program designed to provide eligible producers with financial assistance to implement beneficial management practices to help maintain or improve the quality of soil, water, air or biodiversity resources.

This program, along with others, aids Saskatchewan’s agriculture industry in reducing its environmental footprint. Such measures are important for the livelihood and well-being of members of both the agriculture industry and the public as a whole.

The Hextalls worked with a surveyor and the Ministry of Agriculture to develop the new layout of the operation. The team made environmental stewardship a priority in this planning stage. “We worked with the natural lay of the land to put in the drainage,” Jack said.

The project was completed in 2005. Today, Jack and Kim can see the difference that the project has made. A berm surrounds the corral area of the farm, allowing runoff water to drain into nearby holding ponds instead of the creek.

Jack said he’s quite happy with how the project turned out. He’s also proud to have completed a project that will make a positive difference in the years to come. Future

generations of the Hextall family will be able to better manage their farm, and the operation will no longer be an environmental risk factor for the land surrounding it.

“We’re more aware of how we run the operation now,” he said. “We follow the permits and practice good stewardship.”



Berm to direct runoff water.

Michael and Michelle Fleury, McKague, Saskatchewan

For Michael and Michelle Fleury, the decision to relocate their cattle facilities came down to two factors: protecting both the environment and ground water quality.

“We didn’t want to have a negative environmental impact,” Michelle said. “Drainage was definitely an issue, even in terms of farm safety.”

The Fleurys run a cow-calf operation and last year rented out nearly 600 acres of land for cropping. They currently have about 50 cow-calf pairs.

They purchased their farm in 2002. At the time, the corrals were located just west of the house on a portion of land that was primarily composed of sand. When snow melted in the spring, water would run through the corrals, down to a permanent water body north of the yard and, eventually, out into bigger waterways.

“The corrals were set up there generations ago as the previous owners grew their family operation, but there are better options now,” said Michelle.

In 2012, Michelle and Michael decided that something on their farm needed to change. They needed to address their drainage issue, for the sake of both the environment and the well-being of their farm.

They began by looking into the Government of Saskatchewan’s Farm Stewardship Program, which offers financial assistance to farm owners who undertake work

to maintain or improve the quality of soil, water, air and biodiversity. The program encourages farm owners to adopt management practices that are of benefit to the agriculture industry, the environment and the public. By doing so, farmers are able to preserve the environment, their land for future generations, as well as public support.

Because of the program's dedication to environmental stewardship and farm safety, the couple felt it was a good fit for them.

During the application process, Michael and Michelle received plenty of assistance from their local watershed authority. "They were instrumental," Michelle said, "and the whole process was very manageable."

After looking at the unique aspects of their farm, the Fleurys decided their best course of action would be to relocate their corrals. A soil investigation was completed which showed that the northwest quarter of the farm would be the best option. The land in that area isn't as sandy as the land where the corrals were originally built; it has a higher percentage of clay and other compounds.

Once their Environmental Farm Plan was approved, the Fleurys were able to begin the physical portion of the relocation process. The new corrals were built and designed to be the same size as the old ones; the Farm Stewardship Program requires any relocation facilities to take up the same size or smaller footprint as the original facilities did. Once the new corrals were built, the old facilities were deconstructed.

Michael and Michelle have been quite happy with the results of the project. So far, it has allowed them to better manage their operation, better manage manure and establish a new year-round watering source.

"We love the change," Michelle said. "The relocation will allow our operation to expand in a more environmentally sound manner in the future."

Like the other projects undertaken as part of the Farm Stewardship Program, the Fleurys' farm upholds the values of environmental responsibility and preserving the land. With the help of projects like theirs, Saskatchewan's agriculture industry will continue to operate in a safe and responsible manner that benefits the province as a whole.



Relocating corrals to reduce runoff.

Jerry Hofer, President and Minister, Standoff Hutterian Brethren, Fort Macleod, Alberta

Jerry Hofer, President and Minister of the Standoff Hutterian Brethren, and other members of the colony have a commitment to the land they have farmed for nearly a century. The colony's land base, near both the Waterton and Belly Rivers, was established in 1918. They recognize the historical and cultural significance of the area and the importance of being good land stewards.

The colony currently farms 12,000 acres and rents an additional 8,000 acres on the nearby Blood Reserve. The operation consists of oilseed, grain and pulse cropping, cattle ranching, cattle feeding and dairy, hog, poultry and sheep production.

The Standoff Hutterian Brethren realizes that healthy soil and water are important to keeping the farm productive. The land has supported the colony for many years and to ensure its continued success and future sustainability, innovations that preserve the land must continue to occur. An example of this was their early adoption of the Alberta Environmental Farm Plan (AEFP), which today includes regular updates to the colony's existing plan. They also continue to work with both Alberta Agriculture and Forestry (AF) and the Natural Resources Conservation Board (NRCB) staff to ensure compliance with the *Agricultural Operation Practices Act (AOPA)*.

Prior to completing their AEFP, members of the colony recognized drawbacks to the existing sheep facility. The original site along the Waterton River was selected because it offered protection from the weather for the livestock, as well as provided a reliable water source. The facility was built in 1918, with the barns being added in 1945 and replaced in 1995. With the close proximity to the river and a flood event in the mid-1990s, erosion of the river bank has started to impact the facility. After

completing the AEFPP, several risks were identified. One was the concern of the facility's runoff entering the river and affecting water quality.

The facility's current sheep capacity is 550 head. The sheep carry out two main functions: weed control and a source of food. The current facility is three metres from the river bank and is subjected to runoff each year. The colony follows AOPA regulation by removing all of the manure from the site prior to spring. Realizing that the sheep facilities needed to be improved, the colony worked with AF and NRCB approval staff to develop a plan that met the goal of production and maintained the quality of the natural resources.

Being adjacent to the Waterton River, Jerry realized the site was in a sensitive area and it would be best to move to a location that would facilitate improved manure handling options, improve herd welfare and allow future expansion of the sheep herd. Following discussions with both the local AF Confined Feeding Operation (CFO) Specialist and the NRCB Approvals officer, it was agreed that it would be best to move the sheep facility away from the river. They selected a preliminary site one kilometer from the existing site and over 90 metres higher in elevation, greatly reducing the risk of runoff to the river.

Now that a new site was selected, it was important to find funds to make it happen. This is where *Growing Forward 2* came in. The CFO Stewardship program helps Alberta livestock operations assess their potential risk to water quality and provide funds to make improvements to minimize that risk, while benefitting their business and the environment. Jerry said the application was very easy to do, with excellent assistance from AF staff. The program assisted by helping pay for a consultant to complete the geotechnical investigation, which identified a naturally occurring clay layer. This layer limits soil infiltration of the runoff and improved manure storage, which provides more options to handle manure in an environmentally safe manner.

With the approved NRCB permit for the new site, construction started in the fall of 2014. Contractors were hired for the engineering design, and installation of the concrete, power and water at the site. The colony did the site preparation and will complete the barn construction, pasture establishment and fencing by the fall of 2015. Environmentally, the new facility reduces the risk of impact to both surface water and groundwater. The new facilities will also improve animal welfare and offers safer working conditions. It will allow the colony to expand sheep numbers following the NRCB approval. Once the new facility becomes operational, the colony plans to remove the barns and fences from the old sheep facility.

The colony can take great pride in that the new facility will

be operated in an environmentally sound manner and be productive for many years to come. Future generations of the Standoff Hutterian Brethren will be able to run their operation while remembering their history, the cultural significance of the area and being stewards of the land.



Old site next to the river.



New site moved away from the river.

Producer Profile Michael and Dirma Roseboom Valleynook Dairy – Rimbey Alberta

Michael and Dirma Roseboom operate Valleynook Dairy.

In March of 2012 Michael Roseboom was fed up with a problem. He had acquired a “grandfathered dairy” with environmental challenges. Run-on from the fields to the north came through his dairy site every year, making his corrals a wet mucky mess. Making things worse – the original lagoon had been constructed in a seasonal water way.

Spring was something Michael dreaded as he was always fighting to protect his lagoon, contain his manure and keep

his cows dry and healthy. He tried installing culverts, to direct water around the lagoon, but the volume was just too great, and the culvert ended up washing out. He tried pumping water from one side around the lagoon, but again the volume was too great and the pump would run-non-stop for days on end.

When asked why he chose to move the lagoon he said “I knew that the lagoon was a problem and that I could manage it myself. But what if, for an unforeseen reason, I am no longer around? The next person would have a big problem. Now-a-days banks want to only finance farms with proper permits and this farm would never get one because of the high risk to the environment. By changing it to a proper lagoon with proper permits we are farming for the future.”

In Alberta, operations that existed prior to January 1, 2002 are deemed to have a permit and can continue to operate as a grandfathered site – provided they do not pose a risk to the environment. Michael knew he had a problem and chose to self-report to the Natural Resources Conservation Board (NRCB)

This decision brought NRCB Approval Officers into the picture. Working with Michael they identified a number of parties who would be interested in this project, in addition to the NRCB, the county and Alberta Environment and Parks (AEP) would need to be consulted about any changes to water leaving the property. Depending on what choices were made, the county road and culvert could be affected. AEP would need to ensure there would be no negative impacts on neighbours resulting from changes in run-off. There was also a good chance that the On Farm Growing Forward Stewardship Program could assist with grant funding.

NRCB introduced Michael to the local Confined Feeding Operation Specialist with Alberta Agriculture and Forestry who would help navigate the NRCB Permit process, grant process and facilitate communication with Lacombe County and AEP.

Together Michael and AF worked to ensure his plan met the current standards under the *Agricultural Operation Practices Act* and any county or AEP concerns.

After much planning Michael constructed two water runs to collect run-on water and redirect it back into the original channel. This meant that additional culverts were not required and there was no change to the volume of water that left his property, satisfying both the County and AEP.

“One of the biggest challenges I had was where to go with the water and how to make it affordable”

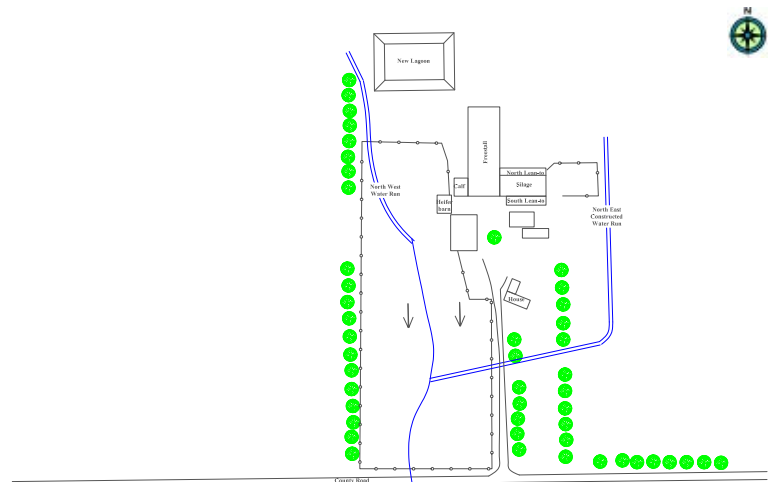
The lagoon was relocated on higher ground and built larger, allowing better control of manure application timing and

with a liner that met the current AOPA requirements. Michael also took this opportunity to replace the existing barn with a modern freestall barn.

The final product for Michael is an operation which has been updated and is more environmentally and economically sustainable.



Pre-existing site conditions



Changes to improve Run-on and run-off from

Constructing two water runs to collect water and redirect it back into the original channel has eliminated runoff from entering the pens.

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Appendix A: Budget Estimate Worksheet – Livestock Facility Relocation

Use this worksheet to help estimate the cost to relocate your livestock facility

Disclaimer: This worksheet is a tool intended to assist with planning and budgeting a livestock facility relocation project. While every effort has been taken to ensure the information is complete and accurate, this sheet should not be considered the final word on all expected project costs. Producers should seek the advice of technical professionals who can assist with detailed planning and estimates for a specific project.

	Option 1	Option 2
Section A – Engineering and Permits	\$	\$
Provincial or municipal permits required (e.g. building, electrical, excavation, etc.)	\$	\$
Site survey, soil sampling and analysis, design, drawings	\$	\$
Other	\$	\$
Sub-Total: Section A – Engineering and Permits	\$	\$
Section B – Earthwork		
Site preparation (e.g. topsoil removal)	\$	\$
Hauling of material to the site (e.g. gravel, clay)	\$	\$
Construction of runoff control works (e.g. ditches, berms, collection ponds)	\$	\$
Access lane development	\$	\$
Development of feed storage area	\$	\$
Pen surface development (e.g. sloping and grading)	\$	\$
Culverts and geo-synthetic materials	\$	\$
Other	\$	\$
Sub-Total: Section B – Earthwork	\$	\$
Section C – Utilities		
Electricity (hydro/solar/other) installation at site	\$	\$
Electrical trenching, wiring and hook-up for buildings, lights and water bowls	\$	\$
Other	\$	\$
Sub-Total: Section C – Utilities	\$	\$
Section D – Buildings		
Pole Sheds and Similar Structures		
a) Total square footage proposed _____ square feet		
b) Average cost per square foot \$ _____ per square foot		
Sub-Total: Pole Sheds and Similar Structures (a x b)	\$	\$
Fully Enclosed Buildings (Heated)		
a) Total square footage proposed _____ square feet		
b) Average cost per square foot \$ _____ per square foot		
Sub-Total: Fully Enclosed Buildings (Heated) (a x b)	\$	\$
Fully Enclosed Buildings (Not Heated)		
a) Total square footage proposed _____ square feet		
b) Average cost per square foot \$ _____ per square foot		
Sub-Total: Fully Enclosed Buildings (Not Heated) (a x b)	\$	\$
Calf Shelters		
a) Number of shelters required _____		
b) Cost per shelter \$ _____		
Sub-Total: Calf Shelters (a x b)	\$	\$
Other		

Appendix A (continued):

	Option 1	Option 2
Sub-Total: Section D – Buildings	\$	\$
Section E – Corral and Wind Fence		
Permanent Fences/Corrals		
Total length of fence required _____ feet		
Cost per foot \$ _____		
Sub-Total: Permanent Fences/Corrals	\$	\$
Temporary or Portable Fences/Corral		
Total length of fence required _____ feet		
Cost per foot \$ _____		
Sub-Total: Temporary or Portable Fences/Corral	\$	\$
Temporary or Portable Wind Break		
Total length of wind break required _____ feet		
Cost per foot \$ _____		
Sub-Total: Temporary or Portable Wind Break	\$	\$
Permanent Wind Fence		
Total length of fence required _____ feet		
Cost per foot \$ _____		
Sub-Total: Permanent Wind Fence	\$	\$
Gates	\$	\$
Other	\$	\$
Sub-Total: Section E – Corral and Wind Fence	\$	\$
Section F – Water		
Watering Sites		
a(i) Trough or water bowl \$ _____		
a(ii) Concrete base \$ _____		
a(iii) Hook up and installation \$ _____		
Total Cost Per Watering Site (a(i)+a(ii)+a(iii)) \$ _____		
b) Total number of water sites required _____		
Sub-Total: Watering Sites (a x b)	\$	\$
Water Distribution		
Estimated length of trenching and pipe required _____ feet		
Trenching cost \$ _____ per foot		
Pipe cost \$ _____ per foot		
Valves, fittings, etc. \$ _____ per foot		
Sub-Total: Water Distribution	\$	\$
Water Source Development		
Well development \$ _____		
Pumphouse construction \$ _____		
Dugout development \$ _____		
Sub-Total: Water Source Development	\$	\$
Other		
Sub-Total: Section F – Water	\$	\$
Section G – Handling System		
Pre-fabricated equipment to be purchased (e.g. head gate, chute, steel panels)	\$	\$

	Option 1	Option 2
Sorting pens, alleyways, etc.	\$	\$
Gates	\$	\$
Other	\$	\$
Sub-Total: Section G – Handling System	\$	\$
Section H - Feeders		
Pre-fabricated equipment to be purchased (e.g. feed barns)	\$	\$
Alley feeders to be constructed	\$	\$
Other	\$	\$
Sub-Total: Section H – Feeders	\$	\$
Section I - Decommissioning		
Labour, seed, equipment use and rental	\$	\$
Other	\$	\$
Sub-Total: Section I – Decommissioning	\$	\$
Summary		
Sub-Total: Section A – Engineering and Permits	\$	\$
Sub-Total: Section B – Earthwork	\$	\$
Sub-Total: Section C – Utilities	\$	\$
Sub-Total: Section D – Buildings	\$	\$
Sub-Total: Section E – Corral and Wind Fence	\$	\$
Sub-Total: Section F – Water	\$	\$
Sub-Total: Section G – Handling System	\$	\$
Sub-Total: Section H – Feeders	\$	\$
Sub-Total: Section I – Decommissioning	\$	\$
Other	\$	\$
Total Cost of Construction (Add Sub-Totals: Sections A-I)	\$	\$

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Appendix B

For More Information – Resource List

Alberta

Alberta Agriculture and Forestry (AF)

Website: www.agriculture.ab.ca

Alberta Ag-Info Centre: 310-3276

Ask to speak to a Confined Feeding Operation Extension (CFO) Specialist. They provide technical expertise to livestock producers.

AF Publications/Resources

Website: www.agriculture.ab.ca

For copies of this publication or any of the Agdex resources in Alberta contact the Publications Office at 1-800-292-5697.

- *Agricultural Operation Practices Act*
- Alberta Feedlot Management Guide
- Alberta Feedlot Management Guide: Facilities & Environment
- Alberta Soil Information Viewer
- Beneficial Management Practices – Environmental Manual for Livestock Producers in Alberta (Agdex 400/28-2)
- Corrals for Handling Beef Cattle (Agdex 420/723-1)
- Farm Structures and Plans
- Managing Feedlot Run-off to Protect Water Quality (Agdex 576-3)
- Manure Management
- Nutrient Management Planning Guide (For information on soil texture, structure and slope) – (Agdex400/28-3)
- Odour Management Plan for Livestock Producers (Agdex 092-1)
- Shelterbelts for Livestock Farms in Alberta (Agdex 400/092-1)
- Shelterbelts for Livestock Farms in Alberta - Planning, Planting & Maintenance (Agdex 400/092-2)
- Waterwells that Last Generations (Agdex 716(a10))
- Wintering Site Assessment and Design Tool

Alberta Environment and Parks

- Water Well Information Database
aep.alberta.ca/water/reports-data/alberta-water-well-information-database/default.aspx

Natural Resources Conservation Board

www.nrcb.ca

Saskatchewan

Saskatchewan Ministry of Agriculture

Website: www.agriculture.gov.sk.ca

Agriculture Knowledge Centre at 1-866-457-2377

Publications/Resources

For copies of this publication or any of the resources in Saskatchewan, contact the Agriculture Knowledge Centre at 1-866-457-2377.

- The Regulation of Intensive Livestock Operations in Saskatchewan
- *The Agricultural Operations Act*
- The Agricultural Operations Regulations
- Beef Backgrounding Facilities
- Beef Cattle Housing and Feedlot Facilities
- Holding Pond Site Selection and Design
- Locating Manure Stockpiles

Saskatchewan Water Well Database - <https://gis.wsask.ca/>

Saskatchewan Airphoto Imagery - <http://www.flysask.ca/>

Saskatchewan Groundwater Maps - <https://www.wsask.ca/Water-Info/Ground-Water/Mapping/>

Canada Plan Service

A network of agricultural engineers and livestock specialists develop publications with detailed construction and management plans.

<http://www.cps.gov.on.ca/english/frameindex.htm>

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