

# Farms for the Future

Hoover Family

Brook-Corner Holsteins

Transformation Team Case Study



# Hoover Family Brook-Corner Holsteins

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## Farm History and Executive Summary

Brook-Corner Holsteins, owned by Reid and Diane Hoover, is a 250 acre farm in a populated area of Lebanon County. The farm has been in the Hoover family for approximately 55 years; Reid and Diane purchased the farm 18 years ago. For their Transformation Team project, the Hoover family modernized their dairy to accommodate a growing herd and the inclusion of their children into the business. Prior to expansion, the family was milking approximately 160 cows, in shifts, in an older tie-stall barn that was not ideal for cow comfort, employee comfort, or business efficiency.

After completing a feasibility study which demonstrated herd expansion could be profitable for their business, the Hoovers built a new free stall barn and installed a Surge/ Westfalia double 12 parallel parlor, with vertical lift, that was completed in January 2012. Project plans also included a manure separator, with partial funding from Environmental Quality Incentive Program (EQIP), and a lined pit for manure storage. The Hoovers now use manure solids for bedding in the new free stall barn that accommodates approximately 275 cows.

Herd growth also dictated additional feed storage and calf and heifer accommodations. The Transformation Team helped the Hoovers explore their feed storage options, and ultimately recommended feed bunkers. In preparation for the eventual expansion, the Hoovers also built a new calf and heifer barn in 2010.

With their completed barn, the Hoovers realized improved cow comfort that resulted in more milk from their cows, within a few months. Stall size and bedding benefits also impacted cow comfort and profitability. The new barn includes a climate controlled computer system which adjusts fans and curtains and a sprinkler system for warm days.

Although the family doubled the number of cows that they milk, they only added a 15% to 20% increase in labor costs. They milk about 100 more cows, with the same amount of employees and in a shorter amount of time as compared to their old facility. Today, Reid and Diane have more available time to manage the business, complementing their daily labor requirements.



## Feasibility Plan

### Situation Overview:

- A. *Why did the farm need a feasibility study?* We needed a feasibility study because our lenders required it to consider lending us money for our new facility. Without completing the plan, the construction projects would not have received approval or funding from the bank.
- B. *Where did the farm turn for help in developing the plan?* To develop a feasibility study, we turned to Pennsylvania Farm Bureau for help.
- C. *What peripheral resource people did the team use to build the plan?* Within Farm Bureau, our major resource person was Lee Wenger.

### Challenges and Opportunities:

- D. *What challenges, if any, developed during the feasibility study process?* At the completion of the first draft of the study, it incorrectly reflected the number of cows that the farm planned in its expansion. We had to develop a second study, with updated cow numbers, for approval.
- E. *How did the team overcome those challenges?* After realizing the problem with the original study, we worked with Mr. Wenger to correctly reflect the planned expansion. When those changes were made, the study was more readily accepted by lenders and others on the Transformation Team. As this updated study was being completed, we learned to stay actively involved, to catch any further issues or misunderstandings.

### Actions:

- F. *What are the key components to the feasibility study?* The components included looking at the past history, current production and future plans for the farm. All facets of the farm, including cropping, milk production, internal herd growth, commodity prices and labor costs were considered for the study.
- G. *Approximately how much did the feasibility study cost?* Approximately \$3,000.

## Feasibility Plan...continued

### Results:

I. *How did the feasibility study help the farm move forward and make better decision?* At the completion of the study, we were given the green light to go ahead with our planned expansion and manure separator. If a feasibility study revealed that the expansion was not practical, the project would have ended.

J. *Did the feasibility study reveal any surprising information about various scenarios?* The study showed the impact of low and volatile milk prices and how the farm business would perform if prices dropped again, in the future. Different scenarios also gave a sense of payback schedule, if expansion costs increased or decreased for the project and business profitability.

K. *What might you have done differently in regards to the feasibility study?* The bank required a feasibility study to move forward. In hindsight, we should have pushed and considered more detail on feed costs with the planned number of cows. We were more focused on milk prices, and we probably should have focused on feed costs. Feed jumped dramatically in our first year. We had looked at very low milk price, but not very high input costs. It really impacts our cash flow.





## Modernization and Technology

### Situation Overview:

- A. *Detail the farm's reasoning behind the decision to pursue a modernization plan.* The current facilities at Brook-Corner Holsteins were out of date, with 20% to 25% overcrowding, due to a growing herd. There was interest from the next generation to continue the family farm.
- B. *List the key variables that impacted the decision to move ahead with the plan.*
- Children saw a future in dairy farming and wanted to return to the farm and enter the business.
  - The feasibility study indicated that it was possible to expand and remain profitable.
  - The farm could expand cow numbers via internal herd growth, rather than buying additional replacement heifers.
- C. *The following modernization areas apply to our farm and describe the incorporation of technology.*
- Young stock facilities – To improve labor efficiency, we built a slatted floor free-stall barn for our heifers several years ago. Since that barn has freestalls and headlocks, it has helped the heifers transition into the milking herd facilities which also has free stalls and headlocks. Anticipating our herd growth, we previously built new and expanded calf pens.
  - Milking cow facilities – Milking parlor with automatic take-off milkers and rapid exit lift gate. Plate cooler for milk cooling efficiency.
  - Manure management and storage – Installed a rubber lined pit for adequate storage.
  - Manure handling – Keystone gutter system with automatic scrapers and a manure separator. We now deep bed with the manure solids.
  - Feed storage – Added two 160' x 40' feed bunkers.
  - Renewable energy – Solar panels to heat hot water.
  - Bedding – Deep bedded manure solids.
  - Ventilation – Tunnel, cross curtains, fans, and sprinklers controlled by Vent-Genie automatic sensor.

### Challenges and Opportunities:

- D. *What were the different options the Transformation Team considered as they worked together to pursue this plan? Please describe.* The team suggested building a bunker on a flat surface, rather than continuing to use ag bags. This would improve the feed quality and also serve as a better return on investment, eliminating plastic bags.

The plan was complete, but the bunker wasn't in the plan. By building a bunker, we also needed a water

## Modernization and Technology...continued

run-off permit. We had to amend the plan to secure the necessary permit. While it always was on our minds, it wasn't included until the very end of the project.

E. *Did any barriers, or bottlenecks, occur during the project, and if yes, how did the team overcome those issues?* Yes. Property line insurance was a potential problem. A last minute demand for property line insurance by the bank, due to a new federal regulation, was resolved by the bank deciding not to require it. When we decided to go with bunkers, we were required to address potential leakage issues. The engineer and conservation district helped us come up with a workable plan that allowed us to proceed without delaying the project.

### Actions:

F. *How did the work done on a business plan or feasibility study impact the farm's final decisions?* The feasibility study added certainty and made the project more attractive to the bank. In addition, it allowed us to have confidence that our project would be successful.

G. *How long did the project take, start to finish?*

- Feasibility study – Spring 2010
- Initial site evaluation and engineering – November 2010
- Broke ground on the project – July 2011
- Moved cows into the new barn – January 25, 2012
- Project complete – March 2012
- Industry and Community Open House – July 6 and 7, 2012

### Results:

H. *How did the modernization and new technology change the business as it relates to profitability?* We noticed a difference in cow comfort that resulted in more milk from our cows, within a few months. Today, our pounds of milk per cow have gradually increased. Stall size and bedding benefits also impacted profitability. For ventilation, our new barn has a computer system that frequently adjusts the fans and curtains. There also is a sprinkler system for hot summer days. As a result of this project, our labor costs also have decreased.



## Modernization and Technology...continued

I. *Can the farm quantify labor savings, energy savings or environmental impact?*

- Labor savings: We doubled the number of cows we milked, and only added a 15% to 20% increase in labor costs. We are much more labor efficient. Regarding labor in the barn, we milk about 100 more cows, with the same amount of employees and in a shorter amount of time.
- Energy savings: Solar panels and energy efficient lights have reduced costs, although we are in a new facility, so it's difficult to compare to the old barn. Given the size of our construction project and technology additions, the electric bill seems reasonable, comparing old and new barns.
- Environmental impact: With this project, we now have a larger manure pit. With the old system, we were hauling manure more often, and not always when the ground was ready.
- Electric runs on a three-phase system which is more efficient and easier on motors. Since the old system and the new barn are so different, it is really hard to quantify exactly how much more efficient we are today.

J. *Did the modernization and new technology change management practices on the farm?* Yes. We now spend more time managing rather than working as farm labor.

K. *Have you learned anything that has influenced future decision making about technology or given you a new enthusiasm for some aspect of modernization?* Since the Transformation Team project, Brook-Corner Holsteins is more confident about investing in new technology, especially in the future. We also are excited about our solid separator, but we know there is more to learn. For dairy farmers, the biggest problem is often manure storage and the separator opens the door to new solutions.

L. *Has the farm shared the new facilities or technology (milking facilities, manure management, etc.) with others in the community? If yes, what was the response from the community?* We hosted two open houses in the summer of 2012 – an industry Open House, coordinated by the Center for Dairy Excellence (CDE), and a community Open House.

At the CDE Open House, several hundred interested people attended, touring our new facilities. They wanted to see the new technology and to learn if it was worth the cost to improve cow comfort.

At the community Open House, on a 100 degree day, more than 200 neighbors/friends showed up. Since the day was so hot, they were impressed with how cool the free stall barn stayed despite the soaring temperatures outside. Most drive by our farm every day, but had no idea what goes on in the dairy barns!





# Site Survey

## Situation Overview:

A. *How did the team analyze potential sites for construction?* The existing farm and barn layout left few options for our construction project. There was only one logical site for construction of the new free-stall barn.

B. *What variables did the team consider as they reviewed sites?* Setbacks from the other buildings, and placement of the manure storage were two variables we considered during the site survey. Retrofitting the current barn was an option, but we decided against it.

While retrofitting would have been a less expensive option, it would not have been the most user friendly system. Cow flow would not be ideal and ultimately, milking cows during a retrofit construction project would have been a nightmare. We were looking at the long term, and if we were going to do something, we needed to be happy with the facilities. Our banker would rather give us a loan and do it the right way, than be loaning money again in a few years. Building a new barn did increase our cow numbers for a better cash flow. If we had decided to retrofit, cow numbers would not have been as high.

## Challenges and Opportunities:

C. *During the site survey process, did the farm encounter any problems? Yes. If so, what were they?* The manure storage capacity became an issue during our project. Due to the larger capacity of the storage pit, the setback was increased to 200 feet, instead of the typical 100 feet. Thankfully, a neighbor signed a waiver release, provided by our engineer, that allowed for the additional 100 feet setback.

## Actions:

D. *How long, from start to finish, was the site survey process?* November 2009 to January 2011

E. *Approximately, how much did the site survey work cost?* Approximately \$7,200

## Results

F. *Can you provide a PDF of the condensed project blue print with your case study?* Yes. [The blueprint is included in the resources.](#)

## Permitting and Regulatory

### Situation Overview:

A. *What was the process the farm went through to prepare for necessary permits?* Team Ag, a consulting firm, guided us through the permitting process. The process included engineering with a series of permits. Randy Hoover was the contact for permitting and a member of our Transformation Team.

B. *Please list the necessary permits needed for your modernization and technology project. Please also include the approval agency (DEP, County Conservation District, or Township), time to receive permits and cost of permits.*

- Land Development and Storm Water Management Plan for Lebanon County - \$3,200\* for 7 months
- Erosion Control/Conservation District - \$3,200\* - 7 months
  - \*combined cost for two permits
- National Pollutant Discharge Elimination System (NPDES) Permit (for disturbing 5 or more acres)/Department of Environmental Protection (DEP) - Engineer's time - 7 months
- Manure Storage Certification/DEP - \$1,300 (see below) - 2 months
  - o Lebanon County Clean Water Fund - \$500
  - o Commonwealth of PA Clean Water Fund - \$800
- Nutrient Management/Conservation District - \$2,250\*\* - 2 months
- Odor Management Plan/DEP - \$2,250\*\* - 2 months
  - \*\*combined cost for the two permits
- Concentrated Animal Feeding Operation (CAFO) Permit/DEP - Lots of engineering costs - 5 months
- Building Permit/Lebanon County Planning - \$519 - approximately 1 month
- Township Approval - no cost - 1 month
- Water Quality Management Permit/State of PA - \$500 - 1 month
- Miscellaneous permitting related fees - \$4,230
- Lebanon County Planning - \$1,000
- Bolt Engineering (Leb. Co. Engineer) - \$2,285
- Bolt Engineering (Leb. Co. engineer) - \$500
- Lebanon County Recorder of Deeds - \$40
- Fee for public notice in newspaper - \$405

**Total permitting fees:** \$11,999 direct costs + indirect engineering costs

It is difficult to say how much time each permit required, but we started the process with the engineer in December 2009 and broke ground in July of 2011. Some of the permit times ran on a parallel track with each other.

## Permitting and Regulatory...continued

### Challenges and Opportunities:

C. *Were there setbacks during the permitting process?* Yes. There was a long period of time to learn if permits were approved by agencies. In addition, because of the size of the manure storage that we wanted for this project, we learned that it had to be at least 100 feet from our neighbors, with sign-off. By state law, it's actually 200 feet from neighboring property. Fortunately, our neighbors willingly agreed to the manure storage.

The project was classified as a Concentrated Animal Feeding Operation (CAFO) because we did not have enough acres per animal units. Before cattle could move into the new barn, we needed to have a CAFO permit. Securing that permit does not happen quickly, and we made the decision to keep moving forward with the project, on a parallel track with the CAFO permit process. It was possible that the CAFO permit could have been denied, and cattle would not have been allowed in the barn. We felt that Randy Hoover's relationship with key individuals helped successfully secure this necessary permit.

A final potential challenge was the bunkers, added in the final stages of the project. A permit was needed for water run-off, requiring us to amend our plan. Thankfully, the conservation office was willing to work with us on this new permit.

D. *Which permit was the most challenging to secure?* Storm water management was the most difficult permit for us to secure. The regulations changed after the project began and plans had to be redone to meet new permit requirements, adding time to the project. After the county conservation office notarized the plan, it was sent to the local South Annville Township supervisors. The township then hired an independent consultant to confirm that Team Ag followed current protocol. It was a very expensive process.

E. *How did you resolve those challenges?* The entire barn project was 10 acres; a bigger project footprint would have required additional regulation. Team Ag continued to keep checking and following up on the permits and resubmitted our plan to meet new regulations, as it related to the storm water management permit. In our opinion, it was important to be pro-active and patient to smooth out a potentially tense situation.

F. *What resources or resource people were used in addressing those challenges?* Randy Hoover helped with permitting and another Team Ag member was valuable in the CAFO permit process. After completing our new barn, we are confident that without an engineering firm, we would have been at a loss to keep the project moving forward.

### Results:

G. *Was the local township supportive of the permitting process?* Yes. South Annville Township was good to work with during the permitting process. The last step was county approval. We found the local township to be cooperative and pro-agriculture.

## Renewable Energy

### Situation Overview:

- A. *Please describe what technology was selected and why.* We incorporated a manure solid separator to provide a greater supply of bedding which increased cow comfort, reduced bedding costs and decreased the amount of manure spread on surrounding fields. We also installed solar panels to heat hot water in our new barn. It heats water to 150°. T-8 low energy lights also were installed, upon the recommendation of our electrician.
- B. *What were the expected results and actual results, in terms of the following?*
- Environmental benefits: Less manure spread on field could result in lower phosphorus levels in the soil; solar panels will decrease the amount of electricity purchased to heat hot water.
  - Farm benefits: Increase cow comfort, no need to purchase bedding and reduce electric costs.
  - Funding successes, failures and challenges: EQIP funds were secured for the separator and related construction costs. Federal grants were available for the solar panel project. Energy rebates were secured for low energy lights.
  - Permitting/regulatory success, failures and challenges: When we were seeking information on the successes of manure separators, it was difficult to find data, since it was a relatively new technology.

### Challenges and Opportunities:

- C. *What obstacles did the farm overcome while planning for the renewable energy project?* We like our manure separator, but it changed our management practices. Our somatic cell count was a little high, with mastitis incident issues, when we initially started using the separated solids as cow bedding.

### Actions

- D. *Timetable for the project?* Start Date: July 2011; Complete Date: January 2012
- E. *Final costs for the project?*
- Manure Separator – EQIP money was \$130,000 toward this project
    - o Separator – Cost \$45,000, and \$45,000 was funded through EQIP
    - o Pump system for separator and elevator away from separator was \$23,000
    - o Storage barn was \$61,700; \$45,000 of that cost was funded through EQIP
    - o Manure pit – Received an additional \$40,000 from EQIP funds to apply to the costs associated with the manure pit.
  - Solar panels – Federal grant covered \$42,000; we had an additional \$1,400 in costs above the grant and a \$150 annual maintenance fee.

## Renewable Energy...continued

### Results

F. *What was the cost benefit/return on investment of the option you pursued?* We didn't pay a lot for the solar panels because of the grant opportunity, and we've seen good results. We feel it was a win-win situation. The EQIP money certainly helped the cost equation for the separator and we like the cow comfort associated with separated solids as bedding. It also helped our nutrient management plan. Our farm is short on acres. With the separator, we can remove excess nutrients before we spread manure on our fields, which is a bonus.

G. *Is the final project meeting initial expectations? Yes. If not, when do you expect it to be functioning at 100%?* We had some initial problems with the separator pump. We changed to another style of pump and the system now functions as expected. The manufacturer today only installs our secondary style of pump with new projects.

H. *Have you shared the technology and learning experiences with other dairy farmers? Yes. If so, what was their response?* We hosted an Open House with the Center for Dairy Excellence in July 2012 and five other farm related tours, such as Holstein Clubs. We also host many individual dairymen, or dairy related businesses that bring clients, and most of those people want to specifically see the separator. They like what they see, and in fact, one farmer followed our blueprint for their new system.

I. *Is there a renewable project you chose not to pursue? If so, why not?* Yes. We decided not to pursue a larger scale solar panel operation. The payback was not as rewarding as described, so installing a few solar panels was a better option for our farm. We continue to explore a methane digester, as it is a system that also would fit at our farm.





## Conservation and Environmental Stewardship

### Situation Overview:

A. *How does this farm view their environmental responsibilities for both the farm and land? Please describe.* It's always been our belief that we need to be good stewards of our farm and land for the benefit of the next generation and our community.

B. *The following conservation and environmental best management practices (BMPs) have been incorporated into the farm the last 5 to 10 years:*

- Crop residue management
- No-till
- Conservation till
- Contour farming
- Contour strip cropping
- Conservation buffers
- Crop rotations
- Cover crops
- Grassed waterways
- Diversions
- Pasture and hayland plantings
- Stream bank protection
- Stream crossings
- Animal trails/Walkways
- Structure for water control
- Barnyard runoff controls/Heavy use area protection (i.e. Animal concentration areas)
- Water (manure) storages/Manure stacking
- Manure composter
- Animal mortality handling facility
- Milk house waste
- Roof runoff management
- Precision feeding/Feed management
- Agri-chemical handling facility

C. *Does the farm have a Nutrient Management Plan (NMP) or Manure Management Plan? Yes. Did this project change the way the farm handles animal manure? Please describe.* We tried to follow the guidelines for the amount of manure applied to our fields. Our manure handling has changed because of our separator system. We bed with separated solids and have less nutrients to spread on our fields, helping us meet our NMP requirements.

D. *Is manure applied in the winter months (generally December – February)? Is the manure applied in winter due to not enough storage or for other reasons such as timing, field conditions in spring, etc.? [if yes, for what particular reason(s):]* No liquid manure applied during the winter months. Some pen and bed pack is applied during the winter.

E. *Does the farm have a conservation plan or an agricultural erosion and sedimentation control plan? Yes. If yes, what are the key components?* Cover crops, crop rotation and no-till.

## Conservation and Environmental Stewardship...continued

F. *Was the farm a CAFO (Concentrated Animal Feeding Operation) or CAO (Concentrated Animal Operation) before the grant project? No. After? Before the grant, we were not a CAFO. With our increase in cow numbers during this project, we became a CAFO.*

G. *Did a farm expansion require the development of an Odor Management Plan and any odor management Best Management Practices? Yes. How did you become aware of these requirements? Did you find enough experience private sector planners to assist? Yes, we completed an odor management study to secure a permit. Everything we do on the farm was adequate and fulfilled the requirements. We now have a formal odor management plan. We didn't need to look for assistance, as Team Ag, a member of our Transformation Team, had expertise in this area.*

H. *If this project included new conservation or environmental changes, how did they impact farm profitability? Please describe. Although there are no dramatic increases our profitability, the implemented changes did require more time, such as maintaining grass strips and retention ponds, and more detailed record keeping.*

We previously did a little cover cropping, but we've increased our acres to grow more feed. It's helped our yields and decreased soil erosion during the winter months.

In addition to more cover cropping, we also practice more no-till on our fields. No-till has increased our farm profitability.

I. *Can the farm quantify the environmental impact of the project? Please describe. Our new manure pit, installed during this project, provides expanded holding capacity and the retention pond catches a large amount of run-off during heavy rain. In part because we can visually see those environmental differences, we feel we've made improvements that will benefit those around our farm.*

J. *What is the most significant environmental/conservation improvement made on this operation within the last five years, and what improvement(s) did it result in? No-till and cover cropping are the most significant conservation improvements we've made on this farm. Those practices have decreased erosion, and produced higher quality forages and better yields.*

## Animal Care and Comfort

### Situation Overview:

A. *Can you determine if cow comfort or care was limiting the productivity or profitability of your dairy operation? If yes, please list animal factor(s) that needed to be improved.* Stall size was a limiting factor, and cows per stall equated to an overcrowded facility. The cows were standing on concrete longer than we wanted because of the time it was taking to milk the entire herd. That affected the foot health (lameness) which also hurt productivity. Access to bunk space was also limited for the cows, which decreased feed intake.

B. *If you determined that cow comfort or care was a limiting factor, did you make structural and/or management changes to address the deficiencies? Please list structural and/or management changes.* With the new barn, the cows are not on concrete as long. There are sprinklers for summer cooling. Bedding with manure solids is better for cow comfort too. Cow flow also is improved and they are no longer standing in line too long to be milked.

We added fans and curtains that along with the sprinklers, are controlled by an automatic sensor. A cattle brush was installed in each pen, which is constantly being used by the cows.

Rubber belting was installed where the cows stand to eat. We added a permanent foot bath so that the cows use it more often, which contributes to improved foot health. Stall design and size has encouraged the cows to want to use them. We use deep bedding with manure solids which also increases stall usage and cow comfort.

Another project feature is a bed-pack barn, which was added to house up to 25 cows with special needs.

C. *What did you learn that would be of interest to the broader dairy community?* We have learned in a new way how cow comfort yields increased milk production. Production increased even greater than what we were anticipating when we started the project.

D. *What is your farm's approach to administration and documentation around the use of standard operating procedures (SOPs) for animal care?* There are no written SOPs, but they are verbally communicated to all employees. Our philosophy is to treat our cows respectfully and humanely. They are our livelihood, and for the cows to take care of us, we must take care of the cows. Working closely with our veterinarian also provides a solid sounding board on animal care issues.

E. *Have you enrolled in a formal animal care program? If so, what have you learned that's been beneficial to your operation?* Yes. We are enrolled in the Farmers Assuring Responsible Management (FARM) program.



# Risk Management

## Situation Overview:

A. *The following risk management tools applied to this farm before the grant:*

- Crop insurance – field crops
- Contract feed with a mill

B. *What new risk management tools did the farm pursue during, and after, the project? Please describe.* We investigated other options, but based on the markets, we decided it is not advantageous for us to contract our milk. With the new Farm Bill in place, we will continue to explore what becomes available to dairy farmers.

C. *Does the farm have a marketing plan? No, we do not have a marketing plan. Please describe.* There is no specific marketing plan except to ship all milk produced to Swiss Premium Dairy, with no contracting.

## Challenges and Opportunities:

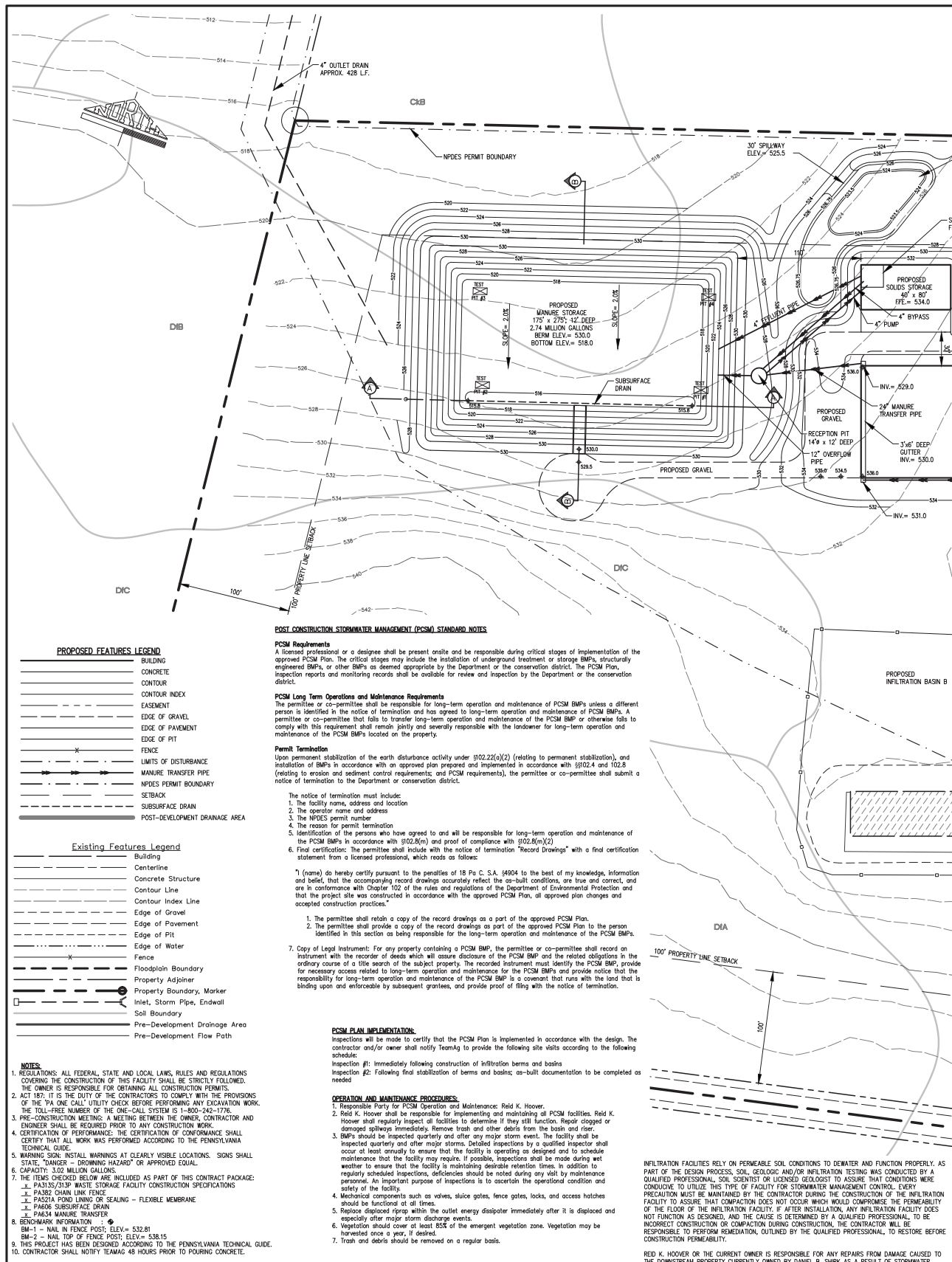
D. *If the farm incorporated new risk management plans into your business model, did you overcome any challenges to implementation? Please describe.* We met with Alan Zepp, Center for Dairy Excellence, and looked at our risk management possibilities and what the market offers, understanding there will be good and bad years.

## Actions:

E. *What communication was necessary with the farm's ag lender and what were their requirements for additional ag protection through risk management to move the project forward? Please describe.* Our ag lender is in favor of risk management procedures and programs. He recommended that we seek an outside market analysis to track the market and report back with pertinent information, on an as-needed basis.

# Resources and Contact Information

## Blueprints:







## Resources and Contact Information...continued

### Articles:

*Dairy Spot, The Mid-Atlantic Spot for Dairy*

<http://old.dairyspot.com/brook-corner-holsteins>

### Contacts:

Please call the Center for Dairy Excellence to make contact with any of these individuals or organizations to learn more about their role in successfully completing this project.

Randy Hoover, Team Ag

Lee Wenger, Pennsylvania Farm Bureau





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**Dairy**EXCELLENCE

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