

# Family Rail Terminal

JOINT VENTURE OPERATES ILLINOIS' SECOND LOOP TRACK LOADOUT OPERATION



**Northern Crossing LLC**  
Mendota, IL • 815-539-3040

**Founded:** 2004  
**Storage capacity:** 950,000 bushels at one location  
**Annual rail volume (anticipated):** 20-25 million bushels  
**Number of employees:** 10  
**Crops handled:** Corn  
**Services:** Grain handling and merchandising

**Key personnel:**

- Jeff Mauck, general manager
- Mike O'Donnell, rail operations mgr
- Tim Schmollinger, river operations manager

**Supplier List**

- Aeration system** ..... Alanco Environmental Mfg. Inc., North American Equipment Co. Inc.
- Bearing sensors** ..... 4B Components Ltd.
- Bucket elevators** ... The GSI Group
- Bulk weigh scale** ..... InterSystems
- Cleaner** ..... InterSystems Inc.
- Contractor** . Todd & Sargent Inc.
- Control system** ..... In-house
- Conveyors** ..... The GSI Group
- Distributor** ..... Hayes & Stolz
- Dust collection system** ..... Donaldson Torit
- Dust suppression system** ..... E.J. Heck & Sons Co.
- Elevator buckets** ..... Tapco Inc.
- Fall protection** ..... Fall Protection Systems Inc.
- Grain probe** ..... InterSystems Inc.
- Leg belting** ..... Scandura
- Level indicators** ..... Monitor Technologies LLC
- Manlift** .. Schumacher Elevator Co.
- Motion sensors** .... 4B Components
- Samplers** ..... InterSystems Inc.
- Truck scale** ... Rice Lake Weighing Systems



*A 110-car Burlington Northern Santa Fe shuttle train loads up at the new Northern Crossing LLC rail terminal outside of Mendota, IL. Photo courtesy of Fasco Mills Inc., one of two partners in the venture along with Archer Daniels Midland Co.*

In the grain business since the mid-1960s, Mendota, IL-based Fasco Mills Co. traditionally trucked what grain it didn't use in feed manufacturing to terminals on the Illinois River, some 15 miles to the south.

In recent years, however, the company's owners have noted a change in the methods of transporting grain to end users, says President Curt Zimmerman, who represents the third generation of his family to operate the company. *(Fasco Mills is celebrating its 70th year in business – for a brief history, see page 26.)*

“We operate a 25-car loader on the Canadian National/Illinois Central at Seward, IL, and we have witnessed the sustained benefit that rail capabilities have provided our customers in that area,” Zimmerman says. “The Burlington Northern Santa Fe Railroad (BNSF) wanted to establish an important new presence in Illinois, and together we identified Mendota as a prime location for a shuttle loader. The timing was right for the decision to build a new rail terminal.”

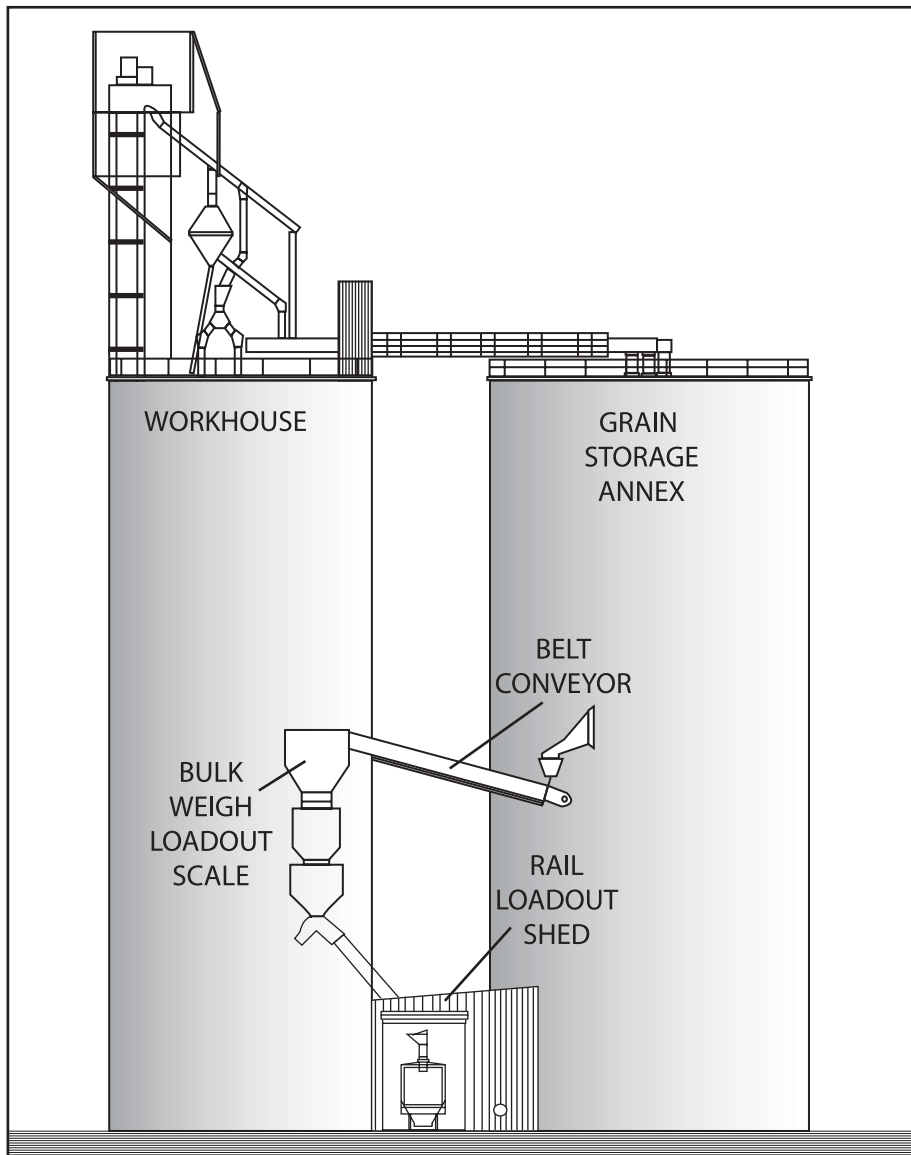
That 950,000-bushel, \$6.5 million terminal loaded its first train Feb. 10 at a site northeast of the interchange between Interstate 39 and U.S. Highway 34, about four miles east of Mendota. The facility features a 7,500-foot loop track, the second such track to be built at a grain facility in Illinois. (The first, featured in the January/February 2004 issue of *Grain Journal*, went into operation last year at Farmers Elevator Co. of Ransom, IL.)

The Mendota rail terminal, owned by Fasco Mills, is operated by Northern Crossing LLC, a joint venture between Fasco Mills and Archer Daniels Midland Co. (ADM), Decatur, IL. (The venture also operates ADM's Illinois River terminal at LaSalle, IL.)

“Recognizing the changes that were taking place in what once had been a predominantly river-delivery area, the two firms believed that a marriage of rail and river capabilities would provide grain agriculture in northern Illinois with the best of grain markets,” Zimmerman explains. “Fasco recognized the benefit of pairing with ADM, through improved economies of scale, better access to rail freight, potential for new rail markets in the United States and Mexico, and a physical presence on the Illinois River. ADM, in turn, preserved an important relationship with one of its larg



*Key personnel at Northern Crossing LLC; Fasco Mills President Curt Zimmerman (left) and General Manager Jeff Mauck. Photo by Ed Zdrojewski.*



*Illustration shows the two sections of the Northern Crossing rail terminal, with workhouse at left and storage annex at right. A 50,000-bph GSI inclined enclosed belt conveyor carries grain from the annex to an InterSystems bulk weigh loadout scale inside the slip, enabling operators to load 80 cars of a 110-car train before activating any legs. Illustration by Eric Bauman.*

est Illinois grain customers and gained participation in a well-situated rail terminal.”

### Contractor Selection

Fasco Mills selected the construction firm Todd & Sargent Inc., Ames, IA (515-232-0442) as the general contractor on the Northern Crossing terminal.

“Their design ideas were sound, and they showed us that they could build a high-volume concrete facility competitively,” Zimmerman says. “We benefited by using the designs they had developed for previous projects and incorporated many of our own ideas, which we feel improved upon what others had done.”

In particular, he says, the company

was impressed with a slipform concrete rail-loading terminal Todd & Sargent had built in Evansville, WI. “The biggest difference between our facility and the Evansville project is that their annex is perpendicular to the rail siding, while ours is parallel,” Zimmerman says. “This modification enables us to load nearly 80 cars of a 110-car train without starting an elevator leg.”

In addition to Todd & Sargent, Fasco Mills hired two Mendota-area contractors – Lee Excavating and Otterbach Excavating – to perform site preparation work and construct the rail bed. Trackmasters Inc., Silvis, IL (309-792-2432), constructed the loop track. Rich Zimmerman, who serves as

chairman of Fasco mills, designed the loop track and its layout.

Groundbreaking on the project took place in March 2003, with construction of the elevator beginning in May and of the loop track in September. The facility was substantially complete by January 2004.

### Concrete Structure

The slipform concrete elevator consists of four primary tanks, three interstice tanks, and one work tank directly above the bulk weigh loadout scale. The facility is divided into two sections, a workhouse structure to the south of the loop track and a longer-term grain storage annex to the north. A 150-foot covered rail loadout shed sits between the two sections.

The workhouse includes a pair of 133,000-bushel tanks standing 40 feet in diameter and 140 feet tall. These tanks, which have sloped floors, have no grain temperature monitoring systems or aeration, since they are designed for frequent turnover. They do have Monitor Technologies high-level indicators.

Two of the three interstices are intended for whole grain blending, while the third holds screenings.

The two big tanks in the annex hold 303,000 bushels each, standing 58 feet in diameter and 140 feet tall. Like their counterparts across the tracks, they have Monitor level indicators and no grain temperature monitoring.

However, they do have a minimum of 1/10 cfm per bushel of aeration through Tornum/PM Luft/KanalSystem floors sloped toward side discharges at 15 degrees. A pair of 60-hp and 30-hp Alanco centrifugal fans also provide air-assisted cleanout, eliminating the need for sweep augers or Bobcat doors. “As we developed plans for the facility, it was important to us that it be essentially self-cleaning and as user-friendly as possible,” Zimmerman says.

### Grain Handling

Today, many grain handling and processing facilities are controlled with a PLC. Northern Crossing chose the Rockwell (Allen-Bradley) DeviceNet platform, linking that system to the various sensing and control devices to form a network that controls inputs and outputs for the terminal.

The entire flow is visible and controllable from two video monitors located in the scale office and the rail loadout control room. A total of 400 input and output points make up this control system. Rich Zimmerman was responsible for the acquisition and implementation of the automation systems.

Incoming trucks are weighed on a 70-foot Rice Lake platform scale, under the control of a CompuWeigh GMS scale management system. An InterSystems probe samples trucks at the scale, delivering samples to a grading room in the adjacent office building.

From the scale, trucks deliver grain to an enclosed, above-ground, 1,300-bushel gravity pit. This pit is 9 feet above grade, allowing easy access to pit equipment and receiving leg boots for maintenance. The pit, which is divided into two sections, is equipped with a 19,500-cfm Donaldson baghouse dust control system and Dustop mineral oil application at the transition between pit and leg boot section.

The two sections of the pit empty into a pair of 20,000-bph GSI receiv-

ing legs, outfitted with two rows of 14x8 Tapco CCHD heavy-duty buckets on 9-inch centers, mounted on 31-inch Scandura belts. The legs are powered by 150-hp Marathon motors with SEW Eurodrive speed reducers.

One of the two legs can feed grain into a 22,000-bph InterSystems gravity cleaner or bypass the cleaner directly to a 6-hole Hayes & Stolz distributor serving the main workhouse.

The other leg deposits grain onto a series of 20,000-bph GSI drag conveyors, which carry grain out to the annex.

### Train Loading

The upper portions of the two main workhouse tanks empty by gravity directly into the upper garner of the bulk weigh scale to rail loadout. The rest of the grain in these tanks empties conventionally through discharges directly to the receiving legs.

Similarly, grain has two routes out of the annex tanks. The majority of grain empties by gravity onto an overhead 50,000-bph GSI enclosed belt conveyor, which carries it directly to the upper gar-

ners of the bulk weigh loadout system, which is inside the workhouse slip.

The rest of the grain empties through the KanalSystem discharge onto a below-grade 40,000-bph GSI belt conveyor, which takes grain back to the receiving legs.

The 50,000-bph InterSystems bulk weigh loadout scale is under the control of a CompuWeigh GMS-4000 controller. A trackside SmartRead II RF tag and wheel sensor system provides railcar ID numbers to the system, which determines the capacity of each railcar. General Manager Jeff Mauck comments that the system has loaded 110-car trains in under 10 hours.

A 150-foot Fall Protection Systems trolley-type system protects workers on top of railcars inside the loadout shed.

The loop track is outfitted with a combination of new and relay-quality 136-lb. rail capable of handling the BNSF's highest-capacity covered hopper cars. The installation utilizes concrete ties rather than the traditional wooden ones.

*Ed Zdrojewski, editor*

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# Slipform Concrete Annex

ADDING STORAGE SPACE MAKES RAIL TERMINAL MORE FLEXIBLE, SPEEDS TRAIN LOADING



*Cargill AgHorizons' rail-loading terminal at Emery, SD, with a new four-tank slipform concrete annex at left. Photos by Ed Zdrojewski.*

Since Cargill built a 700,000-bushel rail-loading terminal at Emery, SD in 1997, the facility has served well as a destination for winter wheat, corn, and soybeans grown in southeastern South Dakota and as a terminal for loading 110-car shuttle trains on the Burlington Northern Santa Fe.

The privately-held company wanted to make the Cargill AgHorizons elevator more flexible, however, says Operations Manager Dwight Berens. "We wanted more flexibility in

## SOUTH DAKOTA

Emery ★

**Cargill, Incorporated**  
Wayzata, MN • 952-742-7575

**Founded:** 1865  
**Annual earnings:** \$1.03 billion  
**Number of employees:** 101,000  
**Crops handled:** Corn, soybeans, wheat  
**Services:** Grain handling and merchandising

### Key Cargill AgHorizons personnel at Emery:

- Kurt Peterson, general manager, Upper Midwest elevators
- Dwight Berens, operations mgr.
- Tim Kleinsasser, farm marketer
- Christine Schmitt, customer solutions specialist
- Dave DeLay, agronomy/crops mgr.

### Supplier List

**Aeration fans** ..... Alanco Environmental Mfg.  
**Aeration system** ..... North American Equipment Co. Inc.  
**Bearing sensors** .... The Rolfes Co.  
**Bucket elevator** ..... The Essmueller Co.  
**Contractor** ... Todd & Sargent Inc.  
**Conveyors** .... The Essmueller Co., Schlager Inc.  
**Elevator buckets** ... Maxi-Lift Inc.  
**Engineering** Todd & Sargent Inc.  
**Gates** .... Sargent Metal Fabrication  
**Leg belting** ..... Goodyear Engineered Products  
**Millwright**... Todd & Sargent Inc.  
**Motion sensors** .... Electro-Sensors Inc.  
**Motors** ..... Toshiba International Corp.  
**Roof system** ..... Conklin  
**Slide gate monitors** Electro-Sensors Inc.  
**Speed reducers** ..... Falk Corp.

*New receiving pit and 20,000-bph Essmueller leg at right has boosted rail loadout capacity from 40,000 to 60,000 bph.*



*A series of sidedraw outlets allow grain to empty onto a series of Essmueller drag conveyors. When grain drops below the level of the sidedraws, it drops through air-assisted Kanalsystem floors.*

receiving multiple grains while loading shuttle trains, and we wanted some additional options for handling specialty grains such as waxy corn,” he says.

For that reason, Cargill in 2003 undertook the construction of a \$2.4 million, 540,000-bushel slipform concrete annex to the west of the main concrete workhouse. Not only has this provided the added flexibility, Berens comments, but it has also boosted the elevator’s rail-loading capacity from 40,000 to 60,000 bph.

The company selected Todd & Sargent Inc., Ames, IA (515-232-0442), as contractor on the project. “Cargill has rigorous safety and quality standards,” says Berens, “and Todd & Sargent is recognized as one of the leaders in the construction industry for service, safety, and quality.” Construction on the project went quickly, starting in late May and completed by late November.



### The Annex

The new annex consists of four slipform concrete tanks holding 135,000 bushels each and standing 40 feet in diameter and 133 feet tall.

These tanks are outfitted with sloped and channeled Tornum Kanalsystem floors, which utilize aeration for both grain quality management and final unloading. Aeration is provided by a pair of 25-hp Alanco centrifugal fans per tank at 1/5 cfm per bushel.

Tanks also are equipped hangar boxes for a future five-cable grain temperature monitoring systems.

Adjacent to the new annex is a 1,000-bushel mechanical receiving pit that feeds a 20,000-bph Essmueller leg. The leg is outfitted with 16x7 Maxi-Lift Tiger Tuff buckets mounted on a 17-inch Goodyear Pathfinder Supreme belt and Electro-Sensors speed switches.

At the top of the leg, grain is deposited onto one of two 20,000-bph drag conveyors. One reaches all four annex tanks. The other is a reversing conveyor that reaches two of the four annex tanks in one direction or the older concrete workhouse and rail loadout in the other.

The annex tanks have sidedraw outlets that empty onto a set of 20,000-bph Essmueller drag conveyors, which return grain to the new receiving leg, or through the Kanalsystem floor onto a 20,000-bph Schlager drag conveyor, which also goes to the new leg. Gates are equipped with Electro-Sensors slide gate monitors.

Berens comments that the addition of the new leg has allowed the Emery elevator to increase loadout capacity from 40,000 to 60,000 bph. “We can load a shuttle train now in 10 hours instead of 14,” he says.