

# McLanahan Dewatering Screens

Reducing Sand Inventory—Producing Cleaner, Drier Sand

Midwest Manure Summit  
Green Bay, WI

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## McLanahan Dewatering Screens

- History - Motivation
- What is a Dewatering Screen?
- How does it work?
- Benefits
- Results



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## History - Motivation



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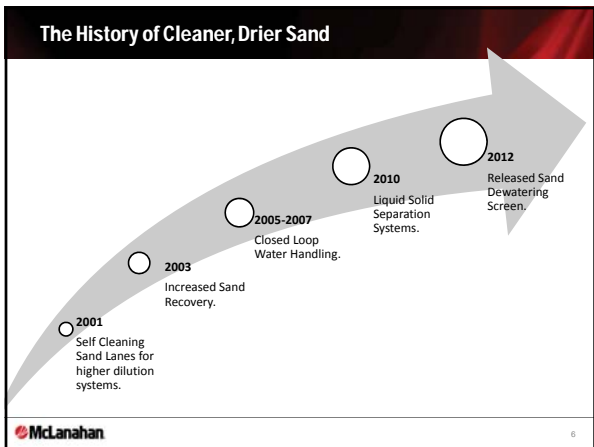
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**History - Motivation**

<p><b>Clean Sand</b> High Recovery</p> 	<p><b>Cleaner, Drier Sand</b> High Recovery</p> 
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→ Dewatering Screen



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**What is a Dewatering Screen?**

- Steel Frame
- Urethane Screen Panels
- Low Hp Vibratory Motors
- Rubber Buffers





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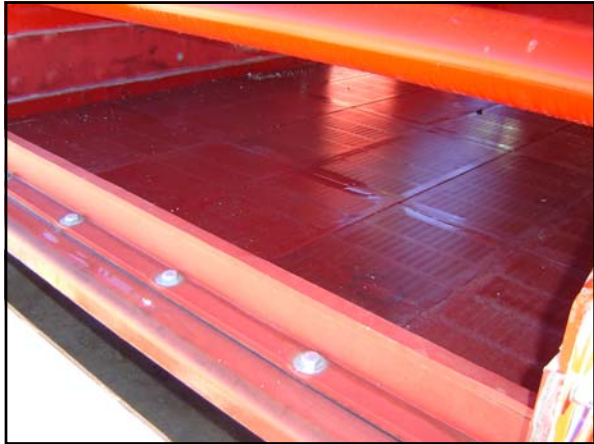
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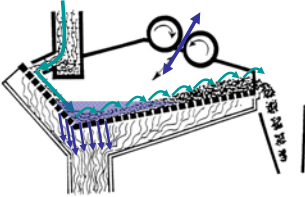
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**How it Works**

- 1 Slurry feeds onto steeply inclined screen surface to achieve rapid drainage
- 2 A pool of water forms in the valley as sand builds up on inclined surface
- 3 Linear motion throws solids uphill while water drains through panels
- 4 A discharge weir retards the transport of solids, creating a deep bed on the screen surface. This deep bed acts as a filter medium, allowing retention of material much finer than screen openings



The diagram illustrates the four-step process of the screen filter. It shows a cross-section of the inclined screen panels. Step 1 shows slurry entering from the top. Step 2 shows a pool of water forming in the valley between panels as sand builds up. Step 3 shows the screen moving linearly, throwing solids uphill and allowing water to drain through the panels. Step 4 shows a discharge weir at the bottom, creating a deep bed of material that acts as a filter medium.

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How it Works



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Benefits

- Drier Sand
- Cleaner Sand
- Less Sand Inventory
- Less Sand Maintenance
- Cleaner Cows

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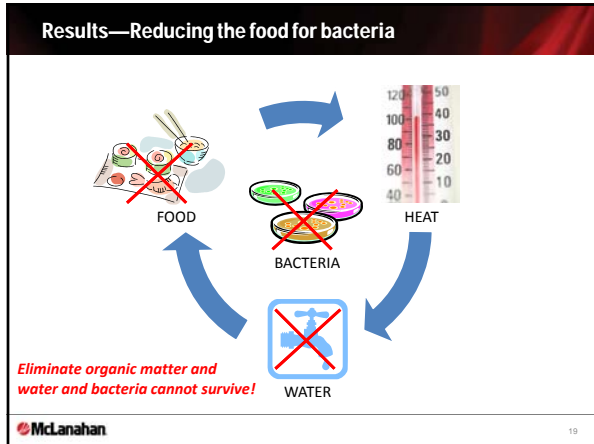
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### Results—Cleaner and drier sand

Sample	Type	Location	Moisture	Moisture Reduction	Organic Volatile Solids	Reduction VS (%)
Dairy #1	Scrape	Before VD6	20%		0.7%	
		After VD6	15%	-28%	0.3%	-53.0%
Dairy #2	Channel	Before VD6	20%		0.5%	
		After VD6	12%	-40%	0.1%	-76.1%
Dairy #3	Channel	Before VD6	19%		0.2%	
		After VD6	14%	-29%	0.1%	-52.4%
Dairy #4	Channel	Before VD6	18%		0.5%	
		After VD6	14%	-26%	0.1%	-81.1%
Dairy #5	Modified Sand Lane	Before VD6	19%		1.5%	
		After VD6	13%	-35%	0.2%	-88.2%
Dairy #6	Scrape	Before VD6	21%		3.5%	
		After VD6	14%	-32%	2.4%	-31.4%

**\*Moisture Reduction 26% to 40%**  
**\*Organic Mater Reduction 31% to 81%**

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### Results—Less water to manage

Assumptions	#	Units
Number of cows	1000	
Density of Sand	120	lb/ft3
Moisture of Sand, SMS Discharge	20	%
Moisture of Sand, Screen Discharge	15	%
Sand Usage	0.5	ft3/cow/day
Sand Recovery	90	%
<b>Results</b>		
Gallons of Water Removed per Day	380	Gallons
Gallons of Water Removed per Day per Cow	0.38	Gallons

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**Results--Minimize sand inventory**

Value of Sand Inventory for 1,000 cows

Days	Sand cost (\$/t)			
	\$6.00	\$8.00	\$10.00	\$12.00
Inventory				
3	\$450	\$600	\$750	\$900
5	\$750	\$1,000	\$1,250	\$1,500
7	\$1,050	\$1,400	\$1,750	\$2,100
10	\$1,500	\$2,000	\$2,500	\$3,000
14	\$2,100	\$2,800	\$3,500	\$4,200
30	\$4,500	\$6,000	\$7,500	\$9,000
60	\$9,000	\$12,000	\$15,000	\$18,000
90	\$13,500	\$18,000	\$22,500	\$27,000
180	\$27,000	\$36,000	\$45,000	\$54,000

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- Summary**
- Proven technology
  - Cleaner, drier sand
  - Enhance cow comfort
  - Reduce the cost of sand management
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**Contact Information**

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