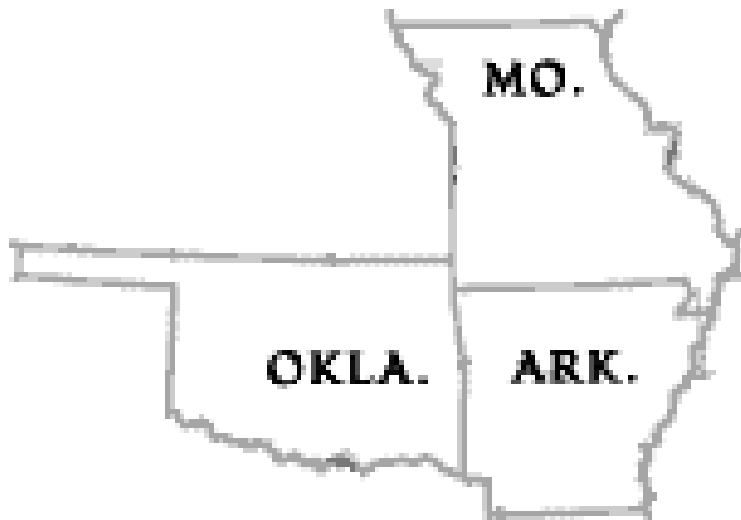


Noel MO Complex



Waste Recovery Program

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Noel MO Complex Basic Facts



- **Waste Recovery/ Reuse**

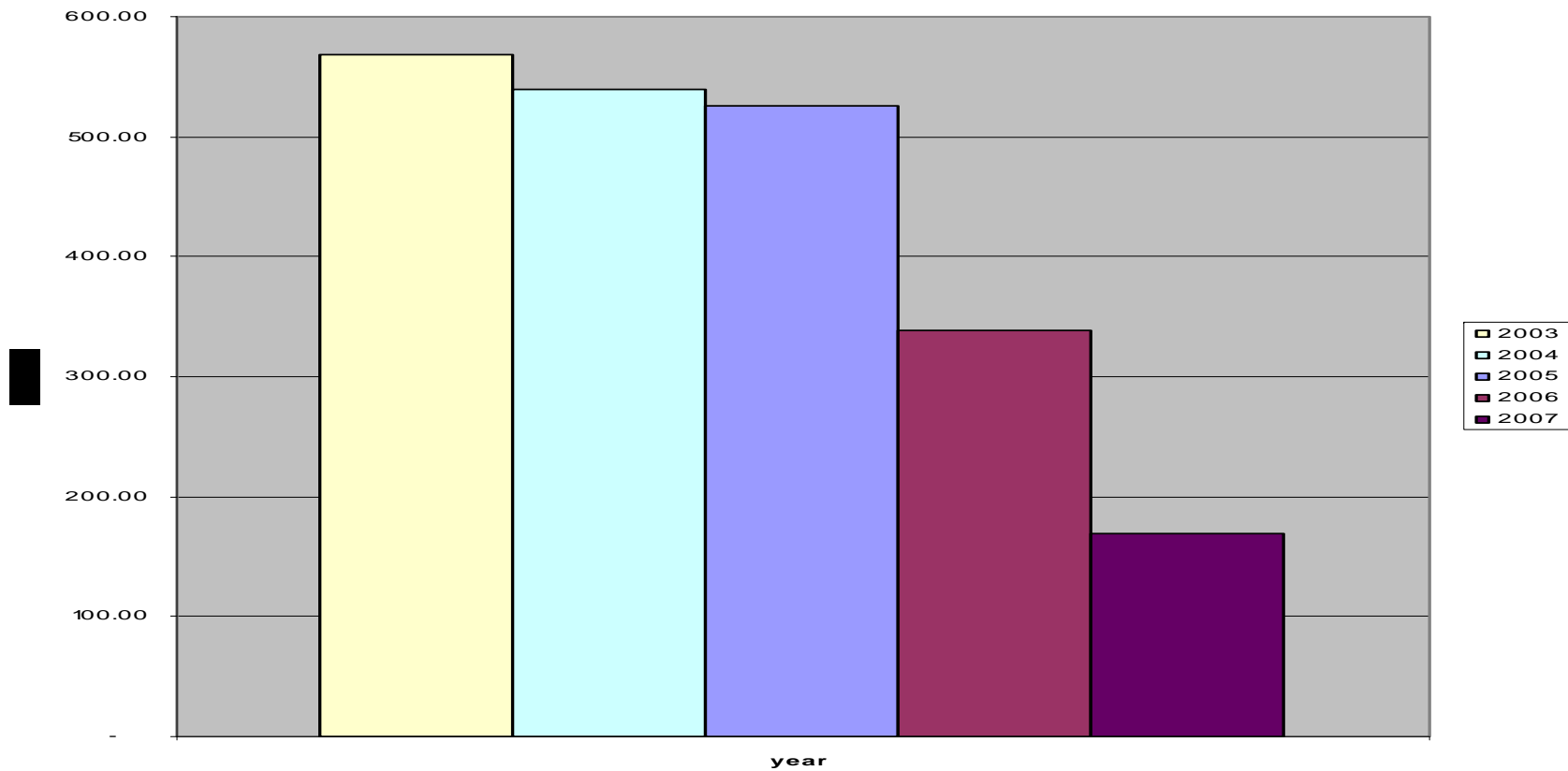
Purpose of the program was to reduce costs at the Noel complex

- Initial waste survey conducted in 2003
- Waste collection plan developed 2004
- Water conservation project 2004
- Bio-Gas Flare installed 2004
- EMS implementation 2005
- Tricanter program capital project 2005
- Recycling project 2006-2007
- Land Application reduction project 2008

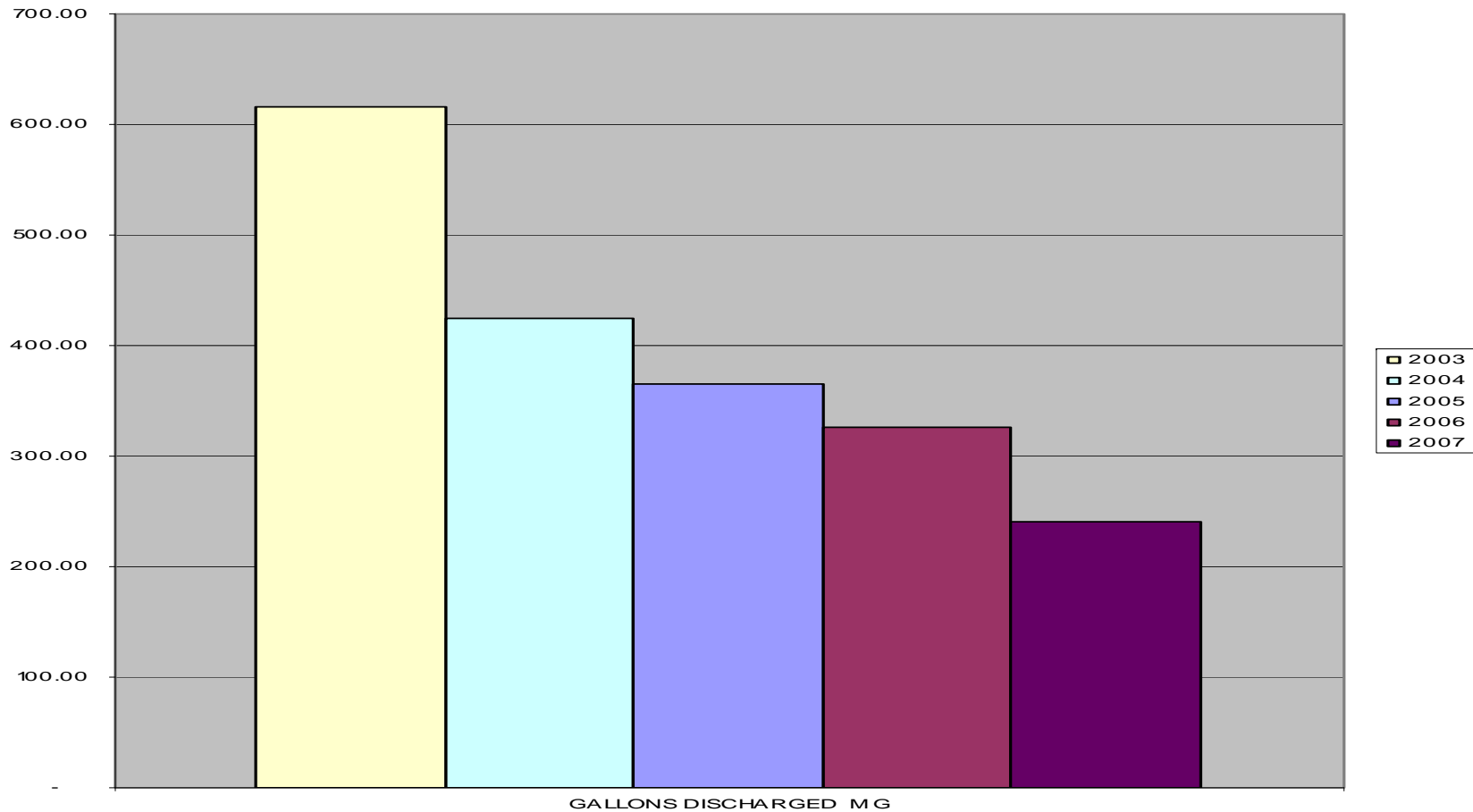
Noel MO Complex Basic Facts



Well water use



Noel MO Complex Basic Facts



Noel MO Complex Basic Facts



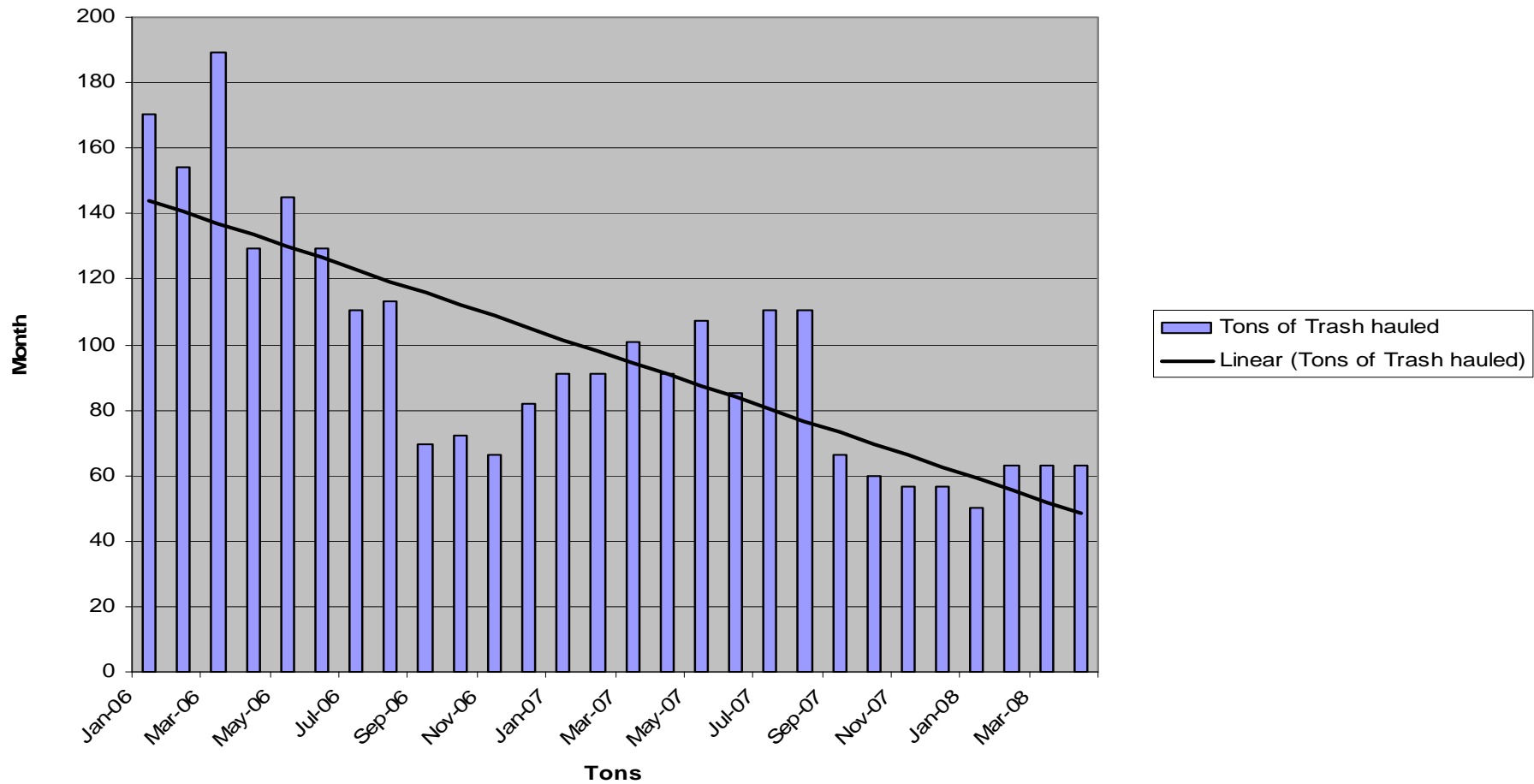
– Recycling

- 600,000 lbs. of cardboard in 2005
- 749,000 lbs. of cardboard in 2006
- 1,324,483lbs. of cardboard in 2007
- 629,450 lbs of Cardboard in 2008 to date
- 147,617 lbs of Plastic recycling 2007
- 196,080 lbs of plastic recycling 2008 to date
- Styrofoam recycling 2008

Noel MO Complex Basic Facts



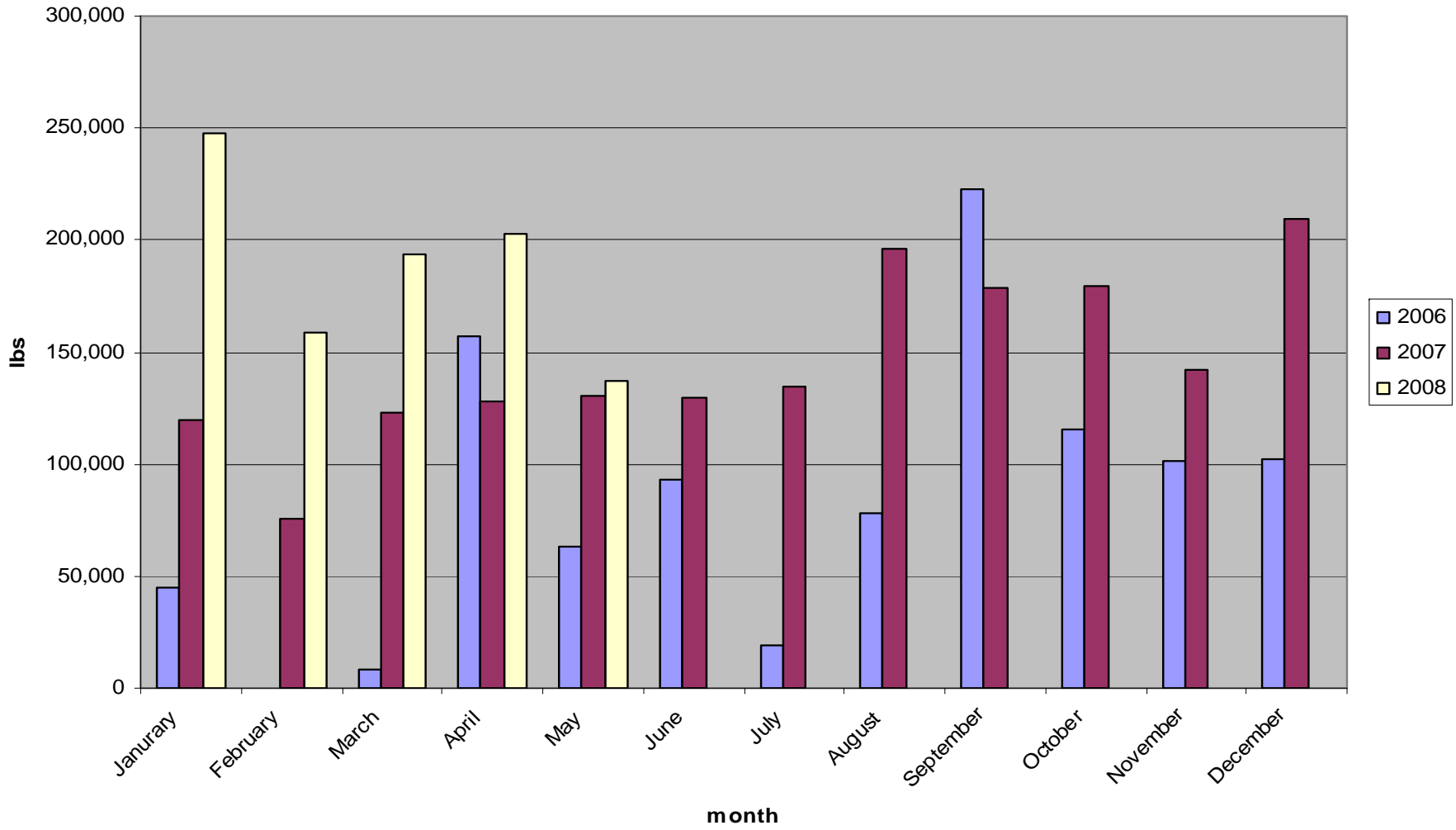
Total waste Hauled 2006-2008



Waste Recovery (recycling)



total lbs recycled by month



Noel MO Complex Basic Facts



Waste Recovery (recycling)

Recycling cardboard paper saved
2006-2008

Trees saved	22980
Crude oil saved	2704
Water gal saved	9,462,320
Electricity saved kwh	5,542,216
pounds removed air pollutants	81106
# of homes powered per year	69.8

plastic	
gallons of gasoline saved/ ton	35,403
KW hours/ ton	179,709
Steel	

Noel MO Complex Basic Facts



- Noel Tricanter project
 - NX418 B11-G Alfa Laval 3 Phase Decanter
 - NX418 B11-G 3 Phase is rated at 7,500 lbs. / hr.
 - Annual revenue generated –\$110,000-205,000
 - Annual Land application Savings-- \$201,500
 - Capital cost of equipment --\$325,800
 - Annual Maintenance cost –\$15,000-\$25000

Noel MO Complex Basic Facts



Noel MO Complex Basic Facts



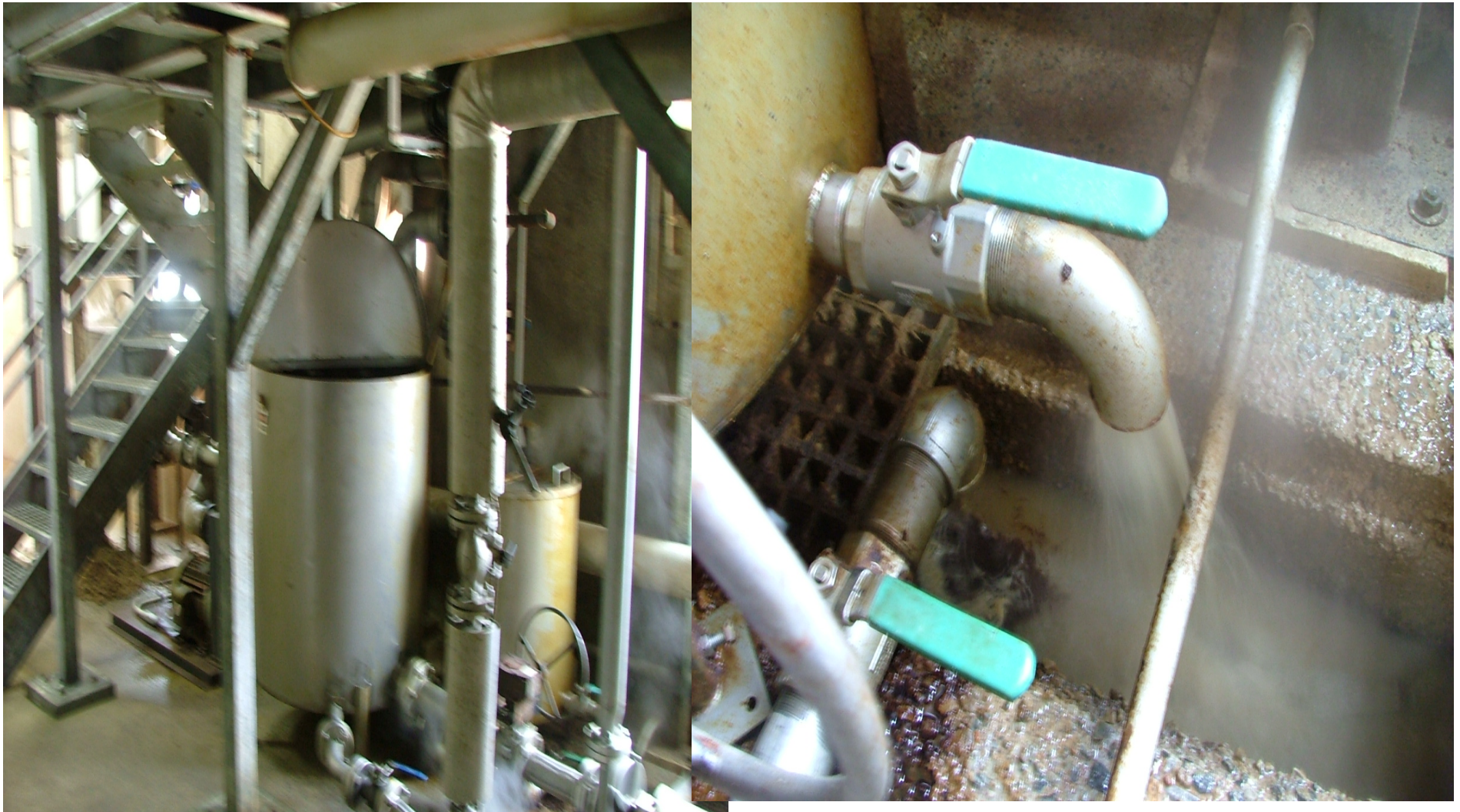
Noel MO Complex Basic Facts



Noel MO Complex Basic Facts



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Noel MO Complex Basic Facts



Noel MO Complex Basic Facts



Noel MO Complex Basic Facts



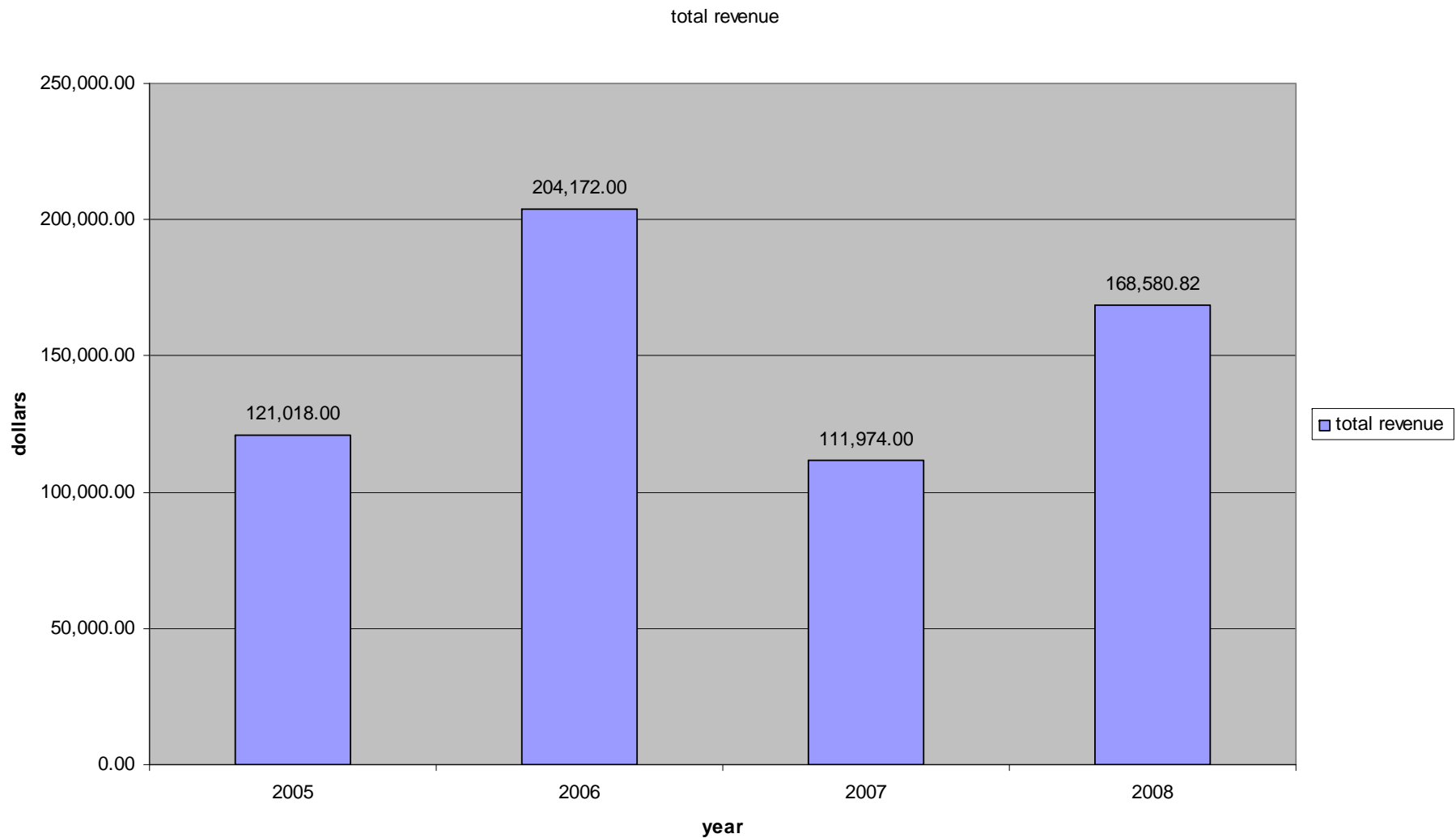
- Tricanter project
 - Pro's
 - Can use finished oil at either a feedmill or Bio Diesel
 - Small footprint
 - 1-2 year pay back on capital
 - Water chemistry
 - Solids
 - Con's
 - Maintenance
 - Training
 - Stick water
 - DAF variability
 - Water chemistry
 - odor

Noel MO Complex Basic Facts



- Water chemistry
 - **3-P**
 - Wet solids
 - Long process time (12-18 hours)
 - Low cost
 - DAF stability in warmer temps questionable
 - Lower oil volume produced
 - **H2-47G or PT-187 or WLB -200**
 - Wet / Dry solids
 - Medium process time (8-12 hours)
 - medium cost
 - DAF stability about 12 hours
 - Medium oil volume produced
 - **SMZ**
 - Dry solids
 - Fast process time (8 hours or less)
 - High cost
 - Can be recycled
 - DAF stability about 24-48 hours
 - Highest oil volume produced

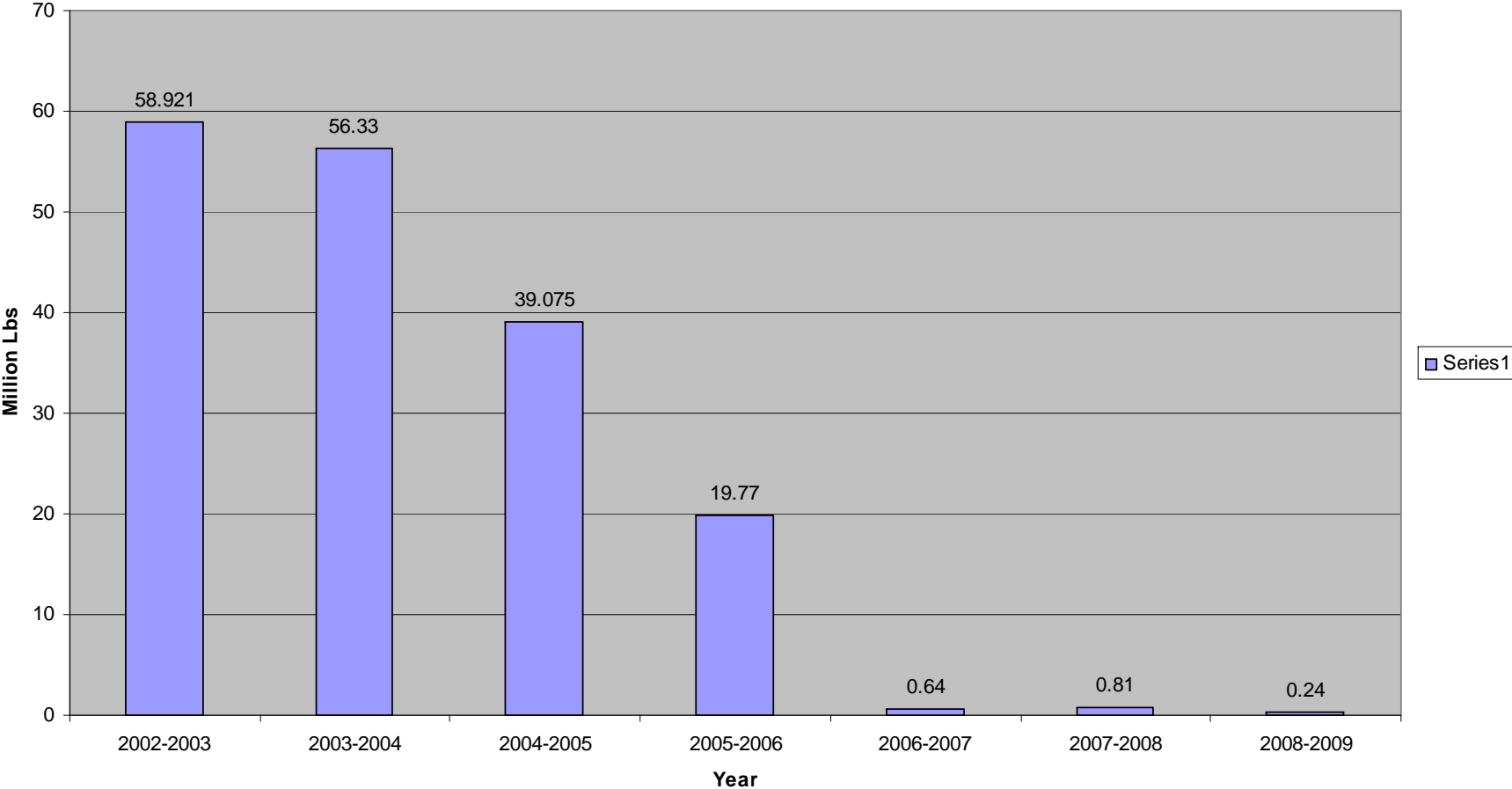
Noel MO Complex Basic Facts



Noel MO Complex Basic Facts



DAF land Applied



Noel MO Complex Basic Facts



SPR-207388

Product Code:

Date Sampled

April 15,2004 @ 12:00

Product Type: 98 - Unknown Feed Ingredient Type

Reviewed By: MORGANT

Comments: DAF MEAL

Ash	3.49 PERCENT
Calcium	0.59 PERCENT
Copper	41 PPM
Fat	15.33 PERCENT
Iron	3,282 PPM
Magnesium	0.07 PERCENT
Manganese	54 PPM
Moisture	57.17 PERCENT
Phosphorus	0.43 PERCENT
Potassium	0.02 PERCENT
Protein	20.94 PERCENT
Sodium	0.03 PERCENT
Zinc	167 PPM

SPR-207389

Product Code:

Date Sampled

April 15,2004 @ 12:00

Product Type: 98 - Unknown Feed Ingredient Type

Reviewed By: MORGANT


Comments: DAF MEAL

Ash	3.42 PERCENT
Calcium	0.64 PERCENT
Copper	47 PPM
Fat	16.51 PERCENT
Iron	3,307 PPM
Magnesium	0.07 PERCENT
Manganese	58 PPM
Moisture	53.77 PERCENT
Phosphorus	0.46 PERCENT
Potassium	0.02 PERCENT
Protein	22.82 PERCENT
Sodium	0.04 PERCENT
Zinc	165 PPM


Noel MO Complex Basic Facts

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A3 (AB80  3) Water Sampled: 02/04/08 18:00 Received: 02/06/08 17:03

Ammonia as N	41.7	0.060	0.030	mg/L	1	A8B1102	2/11/08 15:47	EPA 350.1	
Biochemical Oxygen Demand	20900	100	50.0	"	100	A8B0706	2/7/08 11:33	SM 5210B	Z
Phosphorus, Total as P	88.6	0.0200	0.0100	"	1	A8B0704	2/8/08 13:12	EPA 365.1	
Total Suspended Solids	15200	1.00	1.00	"	"	A8B0713	2/7/08 17:25	USGS I-3765-85	

C9 ( 613-07) Water Sampled: 02/06/08 14:40 Received: 02/06/08 17:03

Ammonia as N	44.5	0.060	0.030	mg/L	1	A8B1102	2/11/08 15:47	EPA 350.1	
Biochemical Oxygen Demand	16600	100	50.0	"	100	A8B0706	2/7/08 11:33	SM 5210B	
Phosphorus, Total as P	46.7	0.0200	0.0100	"	1	A8B0704	2/8/08 13:12	EPA 365.1	
Total Suspended Solids	8780	1.00	1.00	"	"	A8B0713	2/7/08 17:25	USGS I-3765-85	

Noel MO Complex Basic Facts

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- **Projects in Development**
 - Bio-Gas reuse in boilers (CIR in process).
 - Plumb Bio-gas to boilers to offset Natural gas costs
 - Current usage plant wide 150-155 MMCF
 - Bio-Gas production 40-50 MMCF
 - Cost savings @ 300,000 dollars annually
 - Land Application Reduction project
 - 7 plants
 - 100 loads of DAF weekly
 - Capital cost 3-6 million dollars
 - Annual return 8-10 million dollars
 - Noel Community Recycling Center to convert Styrofoam to reusable construction polymer.

Noel MO Complex Basic Facts



Savings land application
average charge \$625 per load

Rogers	625	10
Noel	775	0
ChQK	600	20
Monett	350	0
Berryville	700	20
GF	700	20
Berry St	625	10
	total	80

DAF lbs processed weekly 3,800,000

Weekly Land app savings	\$50,000.00
annual Land app savings	\$2,600,000.00
oil lbs/day	67,500
Annual lbs oil	17,550,000
dollars	\$6,142,500.00
Total savings (annual)	\$8,742,500.00

Noel MO Complex Basic Facts

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Capital cost For Land application reduction project

3-Phase system 20,000lbs per hour	892,000
3-Phase system 20,000lbs per hour	892,000
2- 8000 gallon receiving tank	222,000
2- Heat exchange units for DAF steam Spurge	221,000
1- dryer unit 20,000 lbs per hour	1,220,000
Air handling system and scrubber	1,580,000
Additional Engineering	125,000
Staffing (3 operators 2 maintenance)	156,000
Total Cost	5,308,000
DAF transportation Fee (internal)	1,625,000
Total savings/ revenue (annual)	8,742,500
1 st Year return to Tyson Foods	1,809,500

Noel MO Complex Basic Facts

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- Recognized for the following as a result of efforts
 - *2005 Environmental Protection Agency Region 7 Pollution Prevention Honorable Mention Award*
 - *2007 Environmental Protection Magazine Facility of the Year Honorable Mention Award*
 - *2005-2006-2007 Friends of the Elk River Water Improvement Association Founder Award*
 - *2007 US Poultry and Egg Association Clean Water Award first runner up*
 - *2006 and 2007 American Meat Institute Tier III Award*
 - *2007 American Meat Institute Environmental Achievement Award*
 - *2005, 2006, and 2007 Tyson Gold Environmental Award*