Cost Reduction

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Agenda

- Drying Aggregate
- Heating stored asphalt cement
- Electrical Power
- Trucking
- NAPA as your resource
- Questions?

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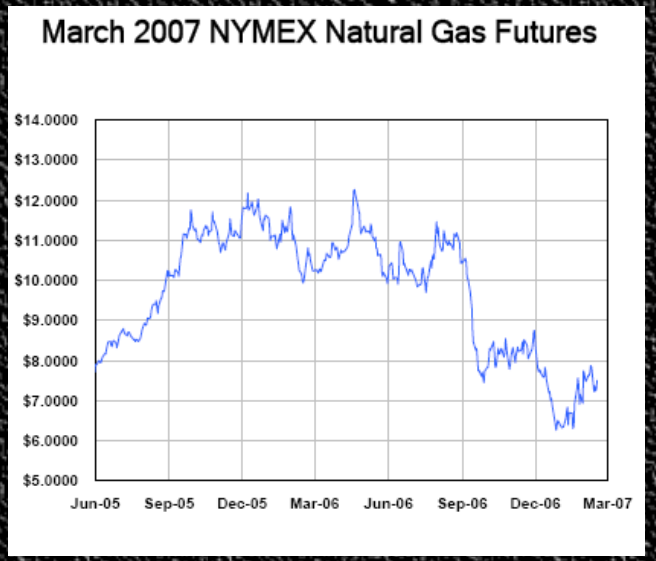
Energy Cost have gone up
Time to re-evaluate payback



Those over 400Kw could
See a 30% increase in price

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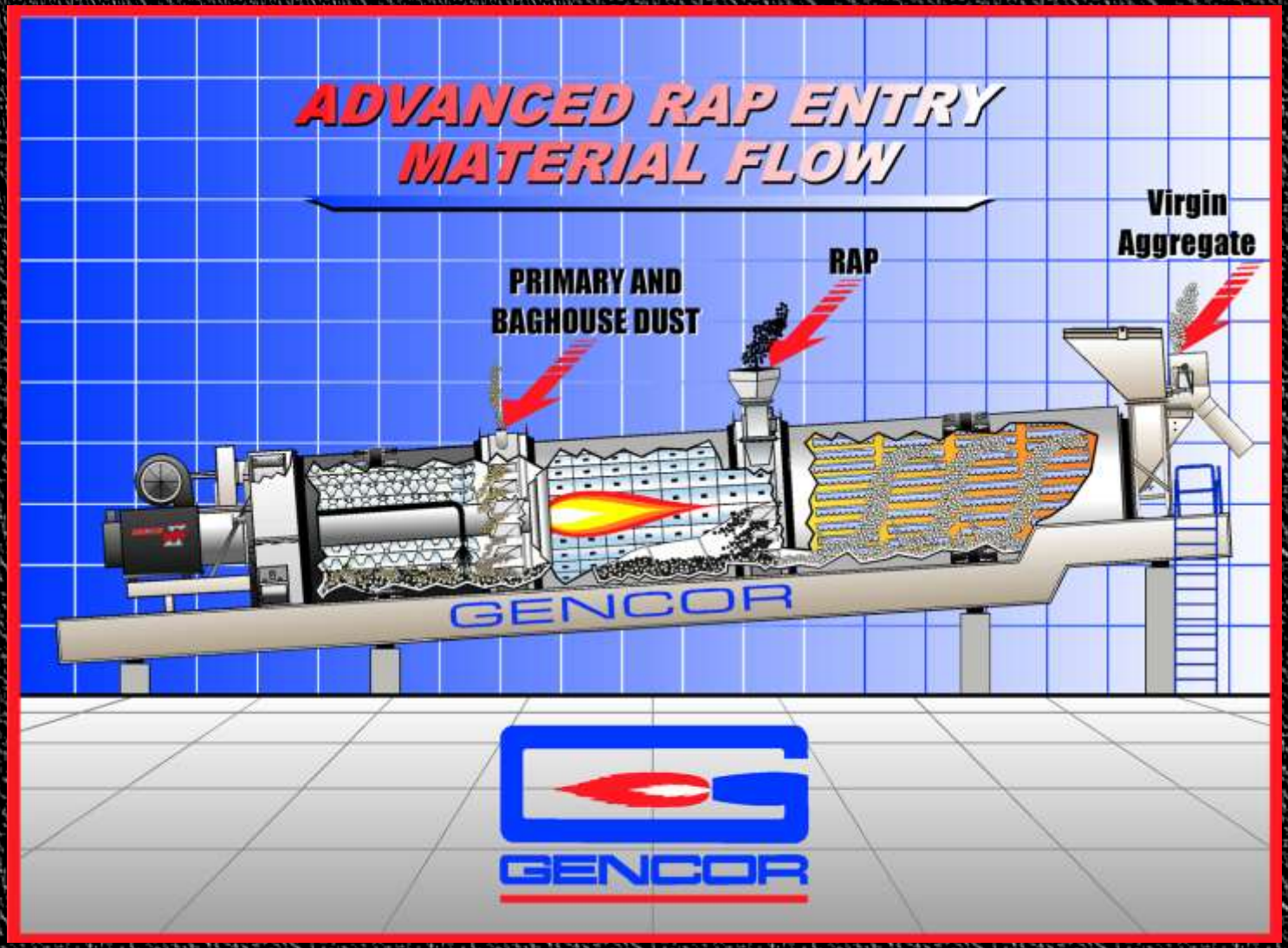

How can we reduce our drying cost?

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Here are a few ideas

- Reduce Aggregate Moisture
- Insulating Dryer Shell / surface
- Reduce Exit Gas Temperature
  - Replace worn flights
- Reduce Mix Temperature
- Use Alternate Fuels

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How can we reduce the moisture in our stock piles?

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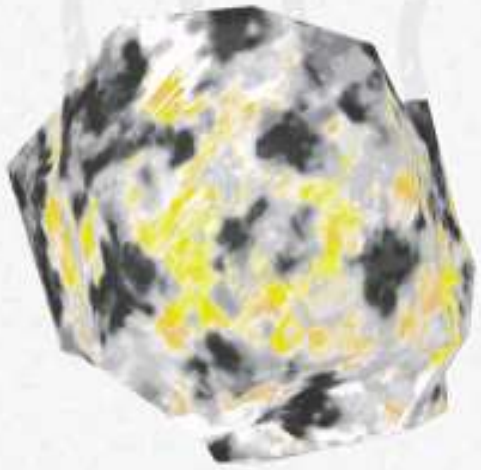
The Drying Process

MOISTURE REMOVAL



HEATING AGGREGATE

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REMOVE MOISTURE
(250°F STACK)

HEAT ROCK
TO 300°F

MOISTURE		
7%	1.12 gal. / ton	0.83 gal. / ton
6%	0.96 gal. / ton	0.83 gal. / ton
5%	0.80 gal. / ton	0.83 gal. / ton
4%	0.64 gal. / ton	0.83 gal. / ton

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Production — 400 Tph..... 10 hours = 4,000 Tpd

Moisture — 7%.....28 Tph water = 56,000 lb. = 6,747 gal. / hr.
= 67,470 gal. / day or 11.25 Transport Loads / Day

Moisture — 6%.....24 Tph water = 48,000 lb. = 5,783 gal. / hr.
= 57,830 gal. / day or 9.64 Transport Loads / Day

Moisture — 5%.....20 Tph water = 40,000 lb. = 4,819 gal. / hr.
= 48,190 gal. / day or 8.03 Transport Loads / Day

Moisture — 4%.....16 Tph water = 32,000 lb. = 3,855 gal. / hr.
= 38,550 gal. / day or 6.42 Transport Loads / Day

Fig. 6A WATER EVAPORATION REQUIRED

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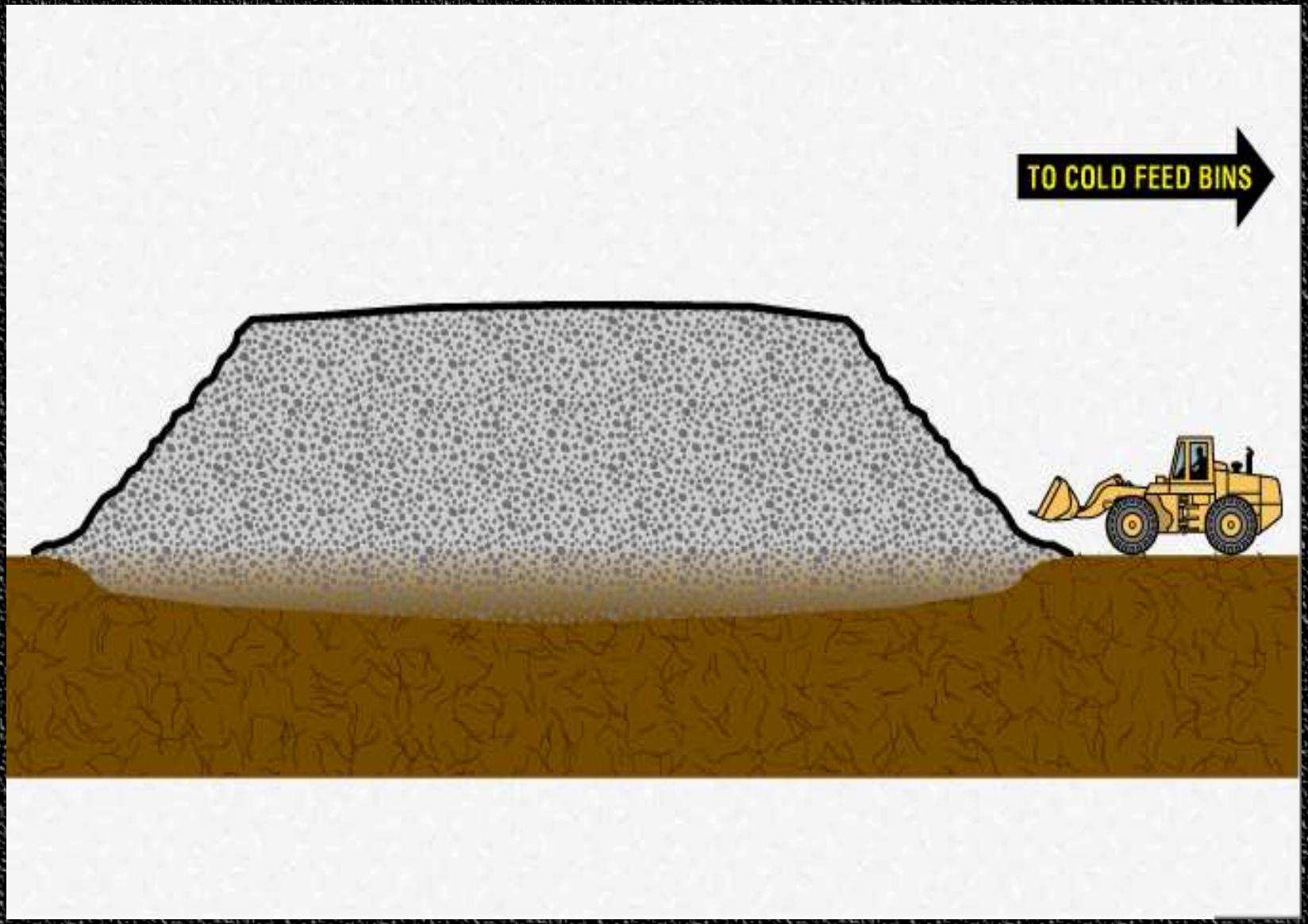

Material sinks into the ground under unpaved stockpiles

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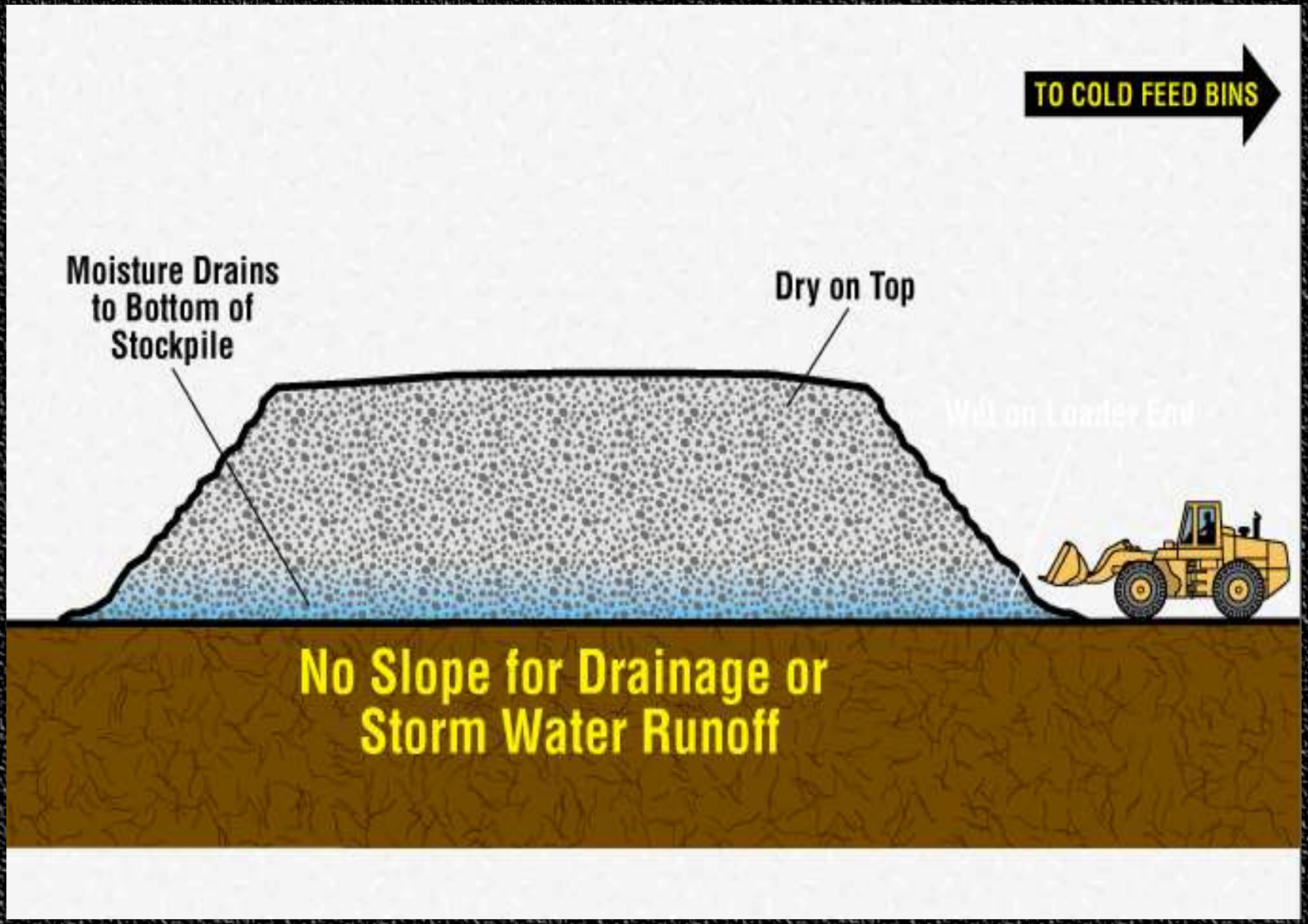

Unsloped stockpiles hold water

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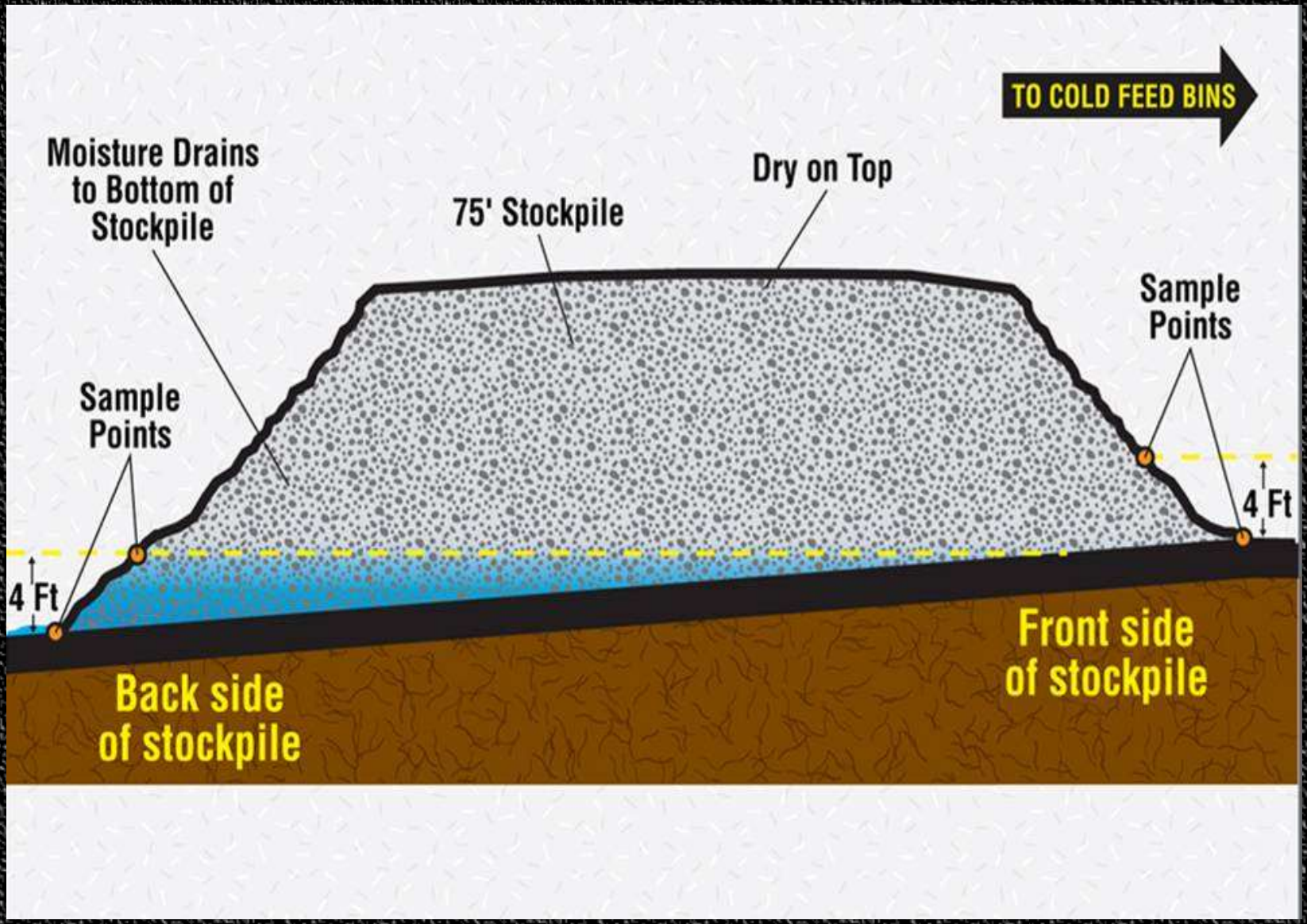

Stockpiles with ideal 6 percent slope

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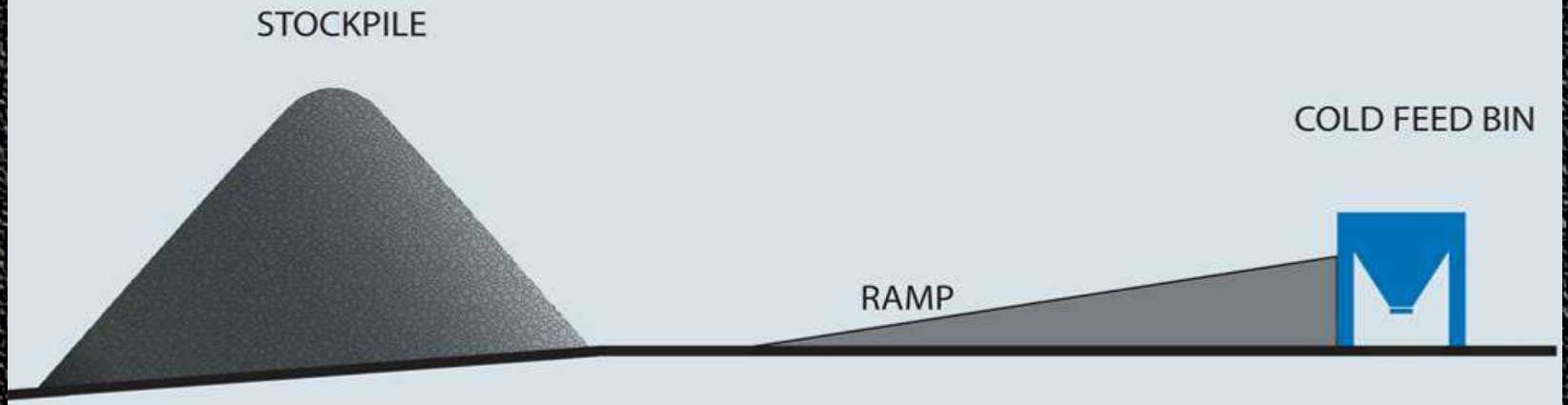
INCORRECT



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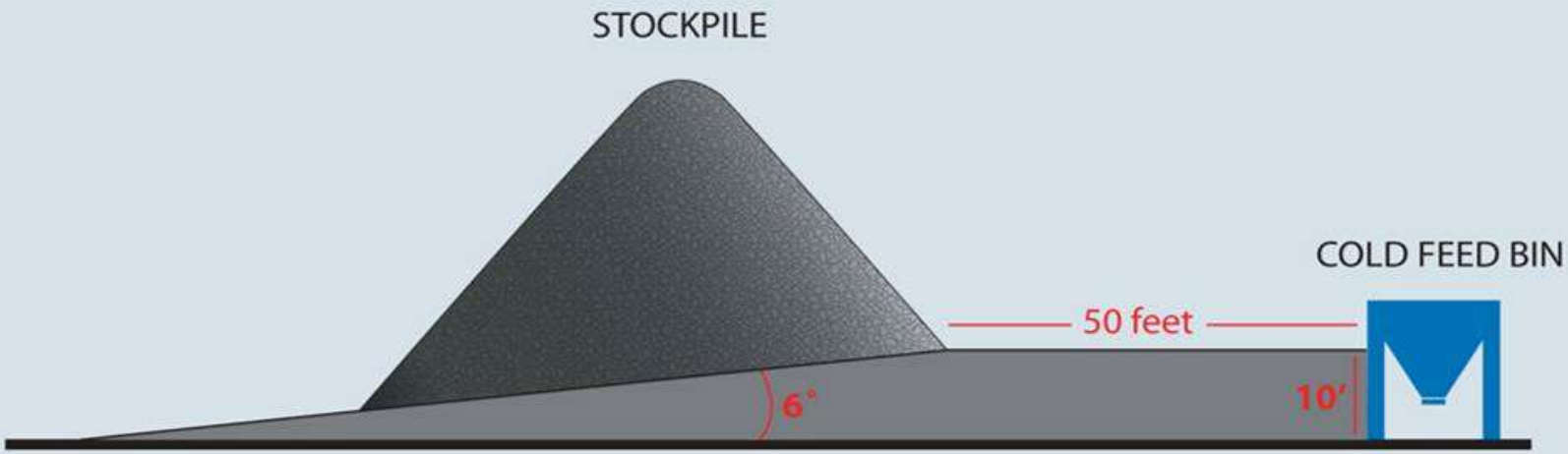
CORRECT



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With just 1% reduction in moisture

- Cost of Paving – 60,000 ft.^{2}, 6" thick = $36.00 / ton

  2,000 tons x $36.00 = $72,000.00

- Based – 200,000 tons / year; $2.40 /ton fuel cost

  10% Fuel Savings = $ 0.24 /ton

  200,000 tons x $0.24 / ton= $48,000.00 per year

- ROI ≅ 18 months

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DRUM DIAMETER	PROCESS GASES THRU DRUM	Percent of Moisture Removed and Gallons of Fuel per Ton										TOTAL EXHAUST THRU SYSTEM
		3% / 1.43	4% / 1.63	5% / 1.84	6% / 2.05	7% / 2.26	8% / 2.48	9% / 2.71	10% / 2.94	11% / 3.17	12% / 3.41	
6'	27,315	262	219	188	164	145	130	117	107	97	90	30,487
7'	40,911	392	328	281	245	217	194	175	159	146	134	45,869
8'	54,751	525	439	376	328	291	260	235	213	195	180	60,700
9'	68,286	655	548	469	409	362	324	292	266	244	224	76,219
1									319	292	268	91,737

Increase in production of 86 TPH

- Process Temperatures: 240F Stack, 300F Mix, 5% AC
- Drum Process Ocygen = 9% (well-tuned burner)

Fuel: No. 2 Diesel with LHV of 132300 Btu/gal

Actual tonnage rates may be limited by mixing capacity, actual fuel heating values and/or maximum burner output.

Production rates of Counter Flow Drum Mixers (Imbedded Burner) including liquid asphalt

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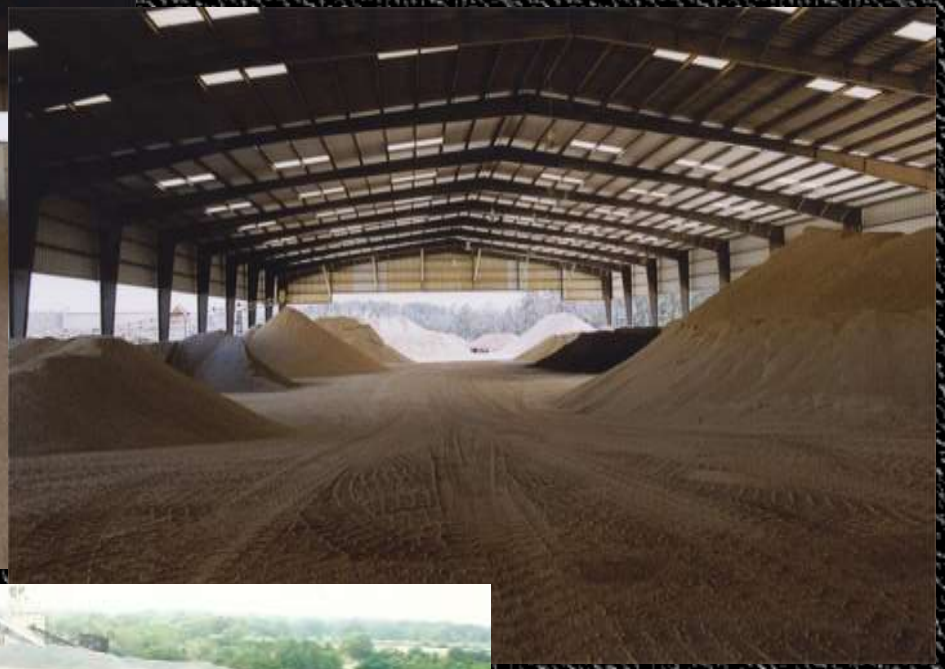

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Which one of these things is not like the others?

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Reduce Shell Loss with Insulation

- The NAPA IS-52 report states that insulating the dryer shell can save 10%
- Most new dryers now come insulated
- $480,000 x 5% = **$24,000**
- Talk to after market suppliers

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Reduce Exit Gas Temperature

- A 40˚F reduction in exit gas can save 4%
- Replace worn flights
- Check the temperature across the back
- Don't go too low… Minimum of 240˚F

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USING WELL DESIGNED FLIGHTS AND KEEPING THEM IN GOOD CONDITION CAN SAVE A LOT OF MONEY.

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BURNED PAINT ON ONE SIDE OF BREECHING INDICATES EXTREME HEAT LOSS.

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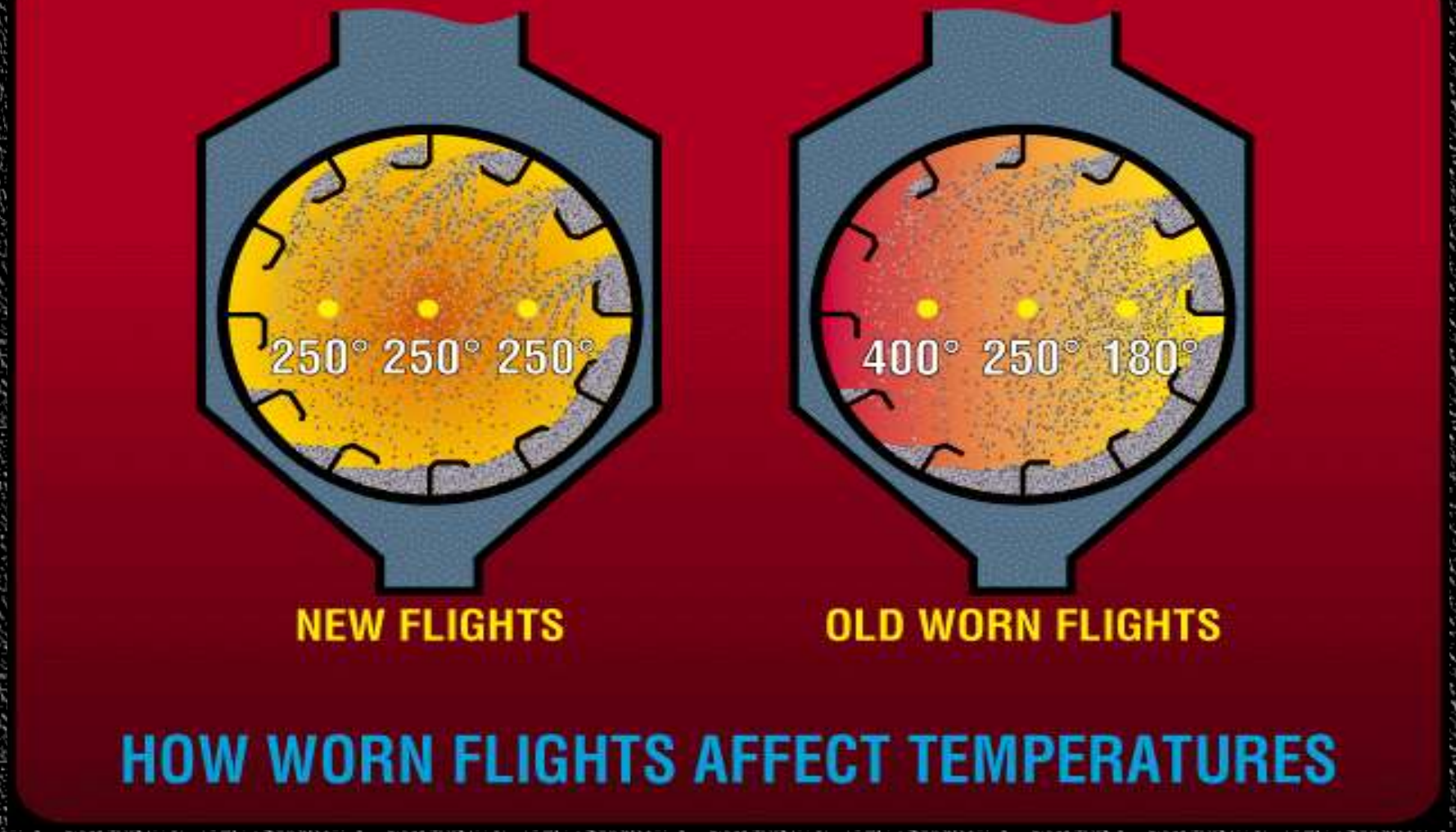

TEMPERATURES ACROSS THE INTAKE BREECHING SHOULD BE CONSTANT.

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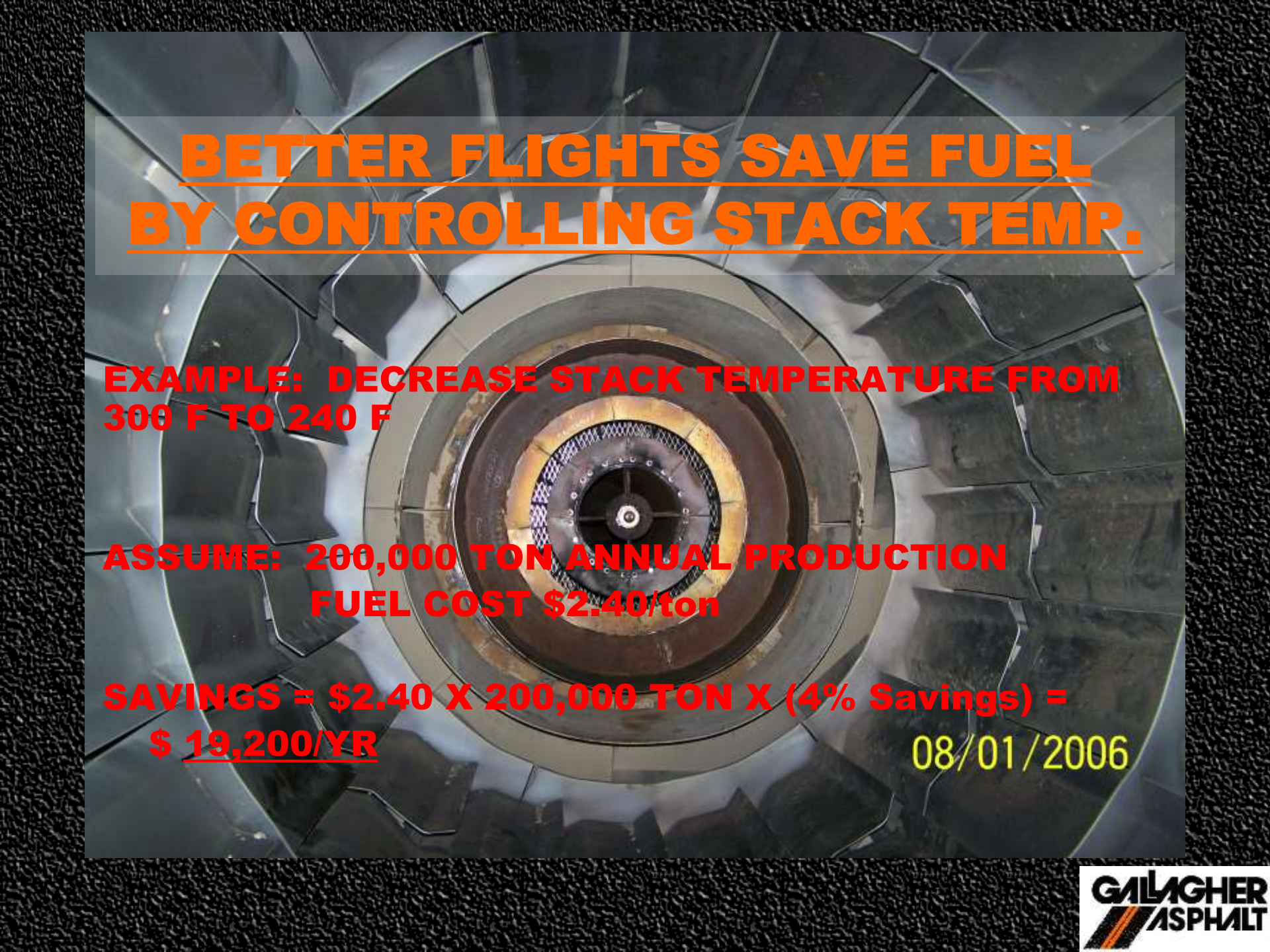

BETTER FLIGHTS SAVE FUEL BY CONTROLLING STACK TEMP.

EXAMPLE: DECREASE STACK TEMPERATURE FROM 300 F TO 240 F

ASSUME: 200,000 TON ANNUAL PRODUCTION
FUEL COST $2.40/ton

SAVINGS = $2.40 X 200,000 TON X (4% Savings) =
$ 19,200/YR

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OVER HEATED MIX WASTES FUEL, REDUCES CAPACITY, AND INCREASES EMISSIONS.

- 2-3% savings for every 10˚F final mix temperature

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COMBINED FUEL SAVED DUE TO STACK TEMPERATURE AND MIX TEMPERATURE REDUCTIONS.

STACK TEMP. REDUCTION	$19,200
MIX TEMPERATURE REDUCTION	$12,000
TOTAL FUEL SAVINGS	**$31,200**

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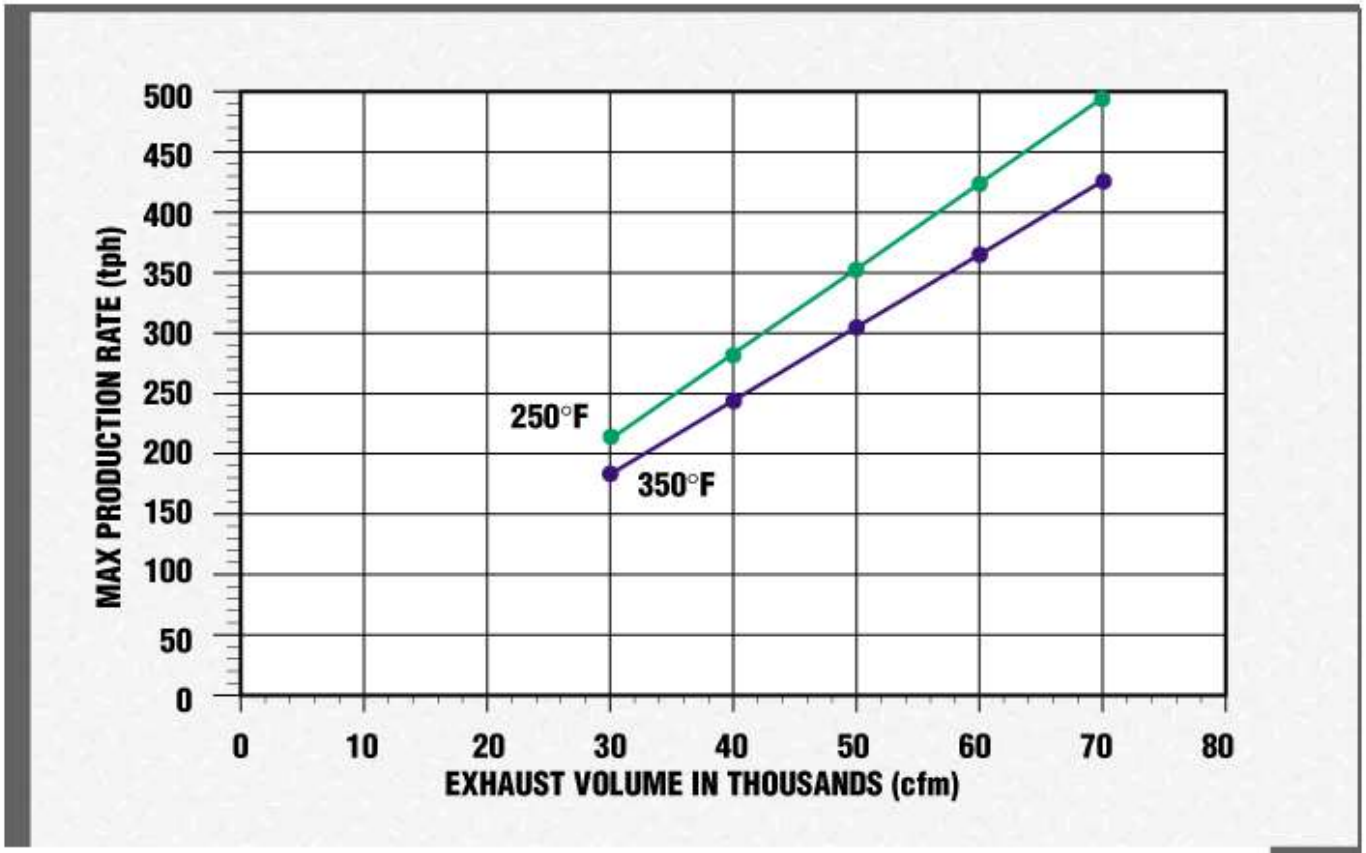
LOWERING STACK TEMPERATURE INCREASES EFFECTIVE CAPACITY TOO.



EFFECT OF EXHAUST TEMPERATURE ON PRODUCTION

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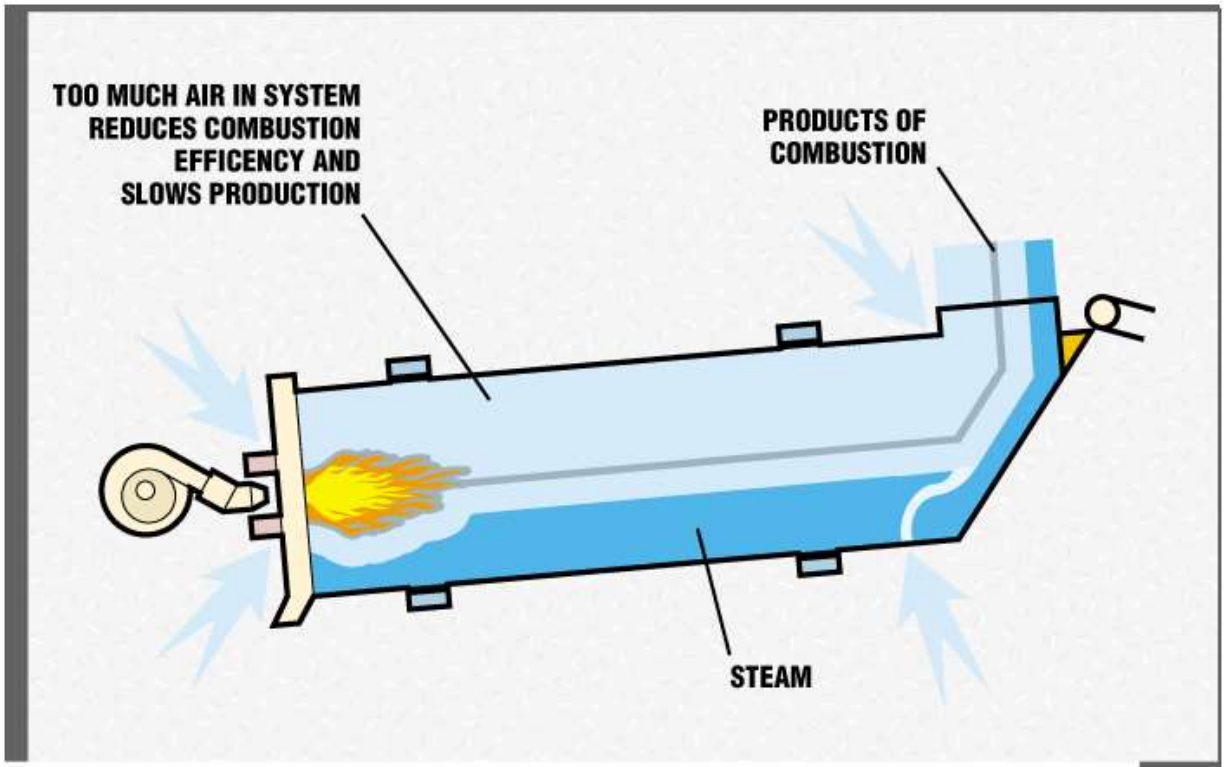
REDUCING EXCESS AND LEAKAGE AIR SAVES FUEL AND INCREASES EFFECTIVE CAPACITY.



DRYER WITH LEAKAGE AIR

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SOURCES OF UNNEEDED AIR

- »BURNER EXCESS AIR
- »DRUM SEALS
- »FLOPGATES (100 TPH)
- »UNSEALED DUCT JOINTS
- »LOOSE DOORS
- »MISSING GASKETS
- »AIRLOCKS

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EXHAUST FAN

- VFD
- Dual vs. Single motor
- Dampers functional & controlled
- Impeller clean and balanced
- Backward Incline Fan
- Power Monitoring

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Using Alternate Fuels

- Natural Gas
- Propane

} Clean and easy to burn

- No. 2 diesel Fuel
- No. 5 oil

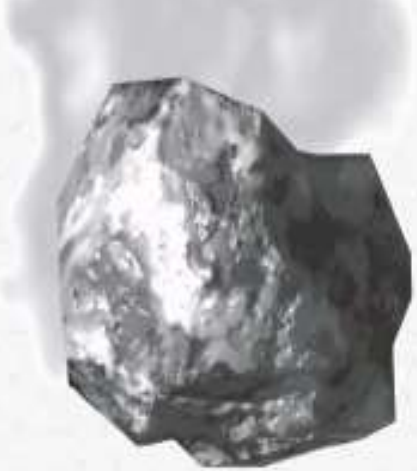
} Maybe cheaper with some challenges

- Reclaimed oil or Re-fined oil (RFO) } Less then No.2
- Coal } Very cheap..takes work/equipment - emissions

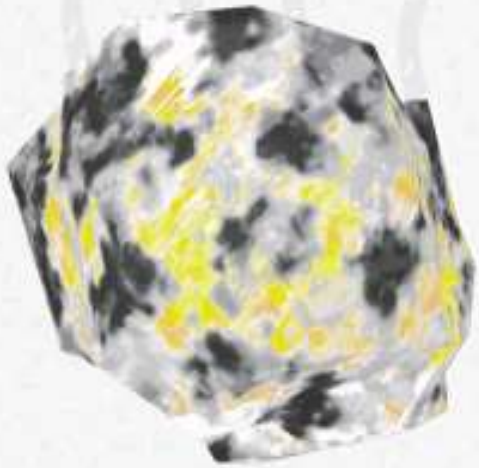
Which one is best?

Photo by Tim Murphy

It's all about the BTU's



MOISTURE REMOVAL



HEATING AGGREGATE

The Drying Process

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Equivalent Energy Costs

Equivalent Energy Costs

Type of Energy	Heating Value (Net or LHV)		Billing Units	Cost Comparisons Based On Heating Values																
NO. 2 FUEL OIL	Btu/gal	132,000	Per Gallon	$0.80	$0.90	$1.00	$1.10	$1.20	$1.30	$1.40	$1.50	$1.60	$1.70	$1.80	$1.90	$2.00	$2.10	$2.20	$2.30	$2.40	$2.50
NO. 5 FUEL OIL	Btu/gal	143,250	Per Gallon	$0.87	$0.98	$1.09	$1.19	$1.30	$1.41	$1.52	$1.63	$1.74	$1.84	$1.95	$2.06	$2.17	$2.28	$2.39	$2.50	$2.60	$2.71
PROPANE (LPG)	Btu/gal	84,345	Per Gallon	$0.51	$0.58	$0.64	$0.70	$0.77	$0.83	$0.89	$0.96	$1.02	$1.09	$1.15	$1.21	$1.28	$1.34	$1.41	$1.47	$1.53	$1.60
NATURAL GAS	Btu/CCF (see note*)	90,500	Per CCF	$0.55	$0.62	$0.69	$0.75	$0.82	$0.89	$0.96	$1.03	$1.10	$1.17	$1.23	$1.30	$1.37	$1.44	$1.51	$1.58	$1.65	$1.71
	Btu/Therm	100,000	Per Therm	$0.61	$0.68	$0.76	$0.83	$0.91	$0.98	$1.06	$1.14	$1.21	$1.29	$1.36	$1.44	$1.52	$1.59	$1.67	$1.74	$1.82	$1.89
ELECTRICITY	Btu/Kwh	3,413	Per Kwh	$0.02	$0.02	$0.03	$0.03	$0.03	$0.03	$0.04	$0.04	$0.04	$0.04	$0.05	$0.05	$0.05	$0.05	$0.06	$0.06	$0.06	$0.06
COAL	Btu/pound	12,000	Per Ton	$145	$164	$182	$200	$218	$236	$255	$273	$291	$309	$327	$345	$364	$382	$400	$418	$436	$455

Each column of cost comparisons relates the costs of various types of energy to each other based on heating values.

For example, the cost of No. 2 fuel oil at $1.00 per gallon is equivalent to a cost of $1.09 for No. 5 fuel oil for the same Btu. Thus, if No. 2 fuel oil is $1.00 per gallon it doesn't pay to choose No. 5 fuel oil unless it is less than $1.09.

Likewise, it wouldn't pay to use electricity unless it is less than $0.03 per Kwh when No. 2 fuel oil is $1.00 per gallon.

The actual heating values of various fuels vary somewhat from one region to another. However, the values used here are for fuels commonly used in the U.S.

CCF stands for 100 cubic feet. The net heating value of one cubic foot of natural gas is 905 Btu. *However, natural gas is normally billed at its gross heating value, which is approximately 1,000 Btu per cubic foot.

Suppliers may show prices for natural gas as $ per MMBtu (dollars per million Btu). If so, divide the price by 10 to obtain the price Per Therm.

You can down load this from Astec

ON THE BASIS OF HEAT PROVIDED PER DOLLAR, THESE ARE ALL EQUAL VALUES:

1. WASTE OIL AT $1.00/GAL * } Higher BTU
2. NO. 2 OIL AT $0.98/GAL }
3. NATURAL GAS AT $0.74/THERM

*** WASTE OIL CONTAINING 5% WATER.**

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RECYCLED OIL:

IS GENERALLY
LESS EXPENSIVE THAN NO. 2 OIL
BUT IS BECOMING INCREASINGLY SCARCE
WHILE QUALITY STEADILY DIMINISHES.

MAKE SURE YOU CONSIDER THE
HIDDEN COSTS.

EXPEND THE EXTRA EFFORT TO
DO IT RIGHT.

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SUBTRACT THE WATER

5% WATER IN THE FUEL AMOUNTS TO A DECREASE IN HEATING VALUE OF ABOUT ABOUT 7,500 BTU PER GALLON.

FUEL OIL HHV	142,000 BTU/GAL
WATER LOSS	7,500 BTU/GAL
USABLE HEAT	134,500 BTU/GAL

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KEYS TO BURNING RECYCLED OIL

- KEEP OIL CLEAN COMING IN
- KEEP BURNER CLEAN AND IN GOOD CONDITION
- VISCOSITY
  - 80 SSU or less
    - Must be preheated for good atomization.
    - Preheating is easier if oil is “pushed” through the preheater.
    - Vaporizing in the nozzle is minimized by using an air atomized nozzle.
- OIL PROPERTIES
  - Make sure the oil is free of destructive contaminants.

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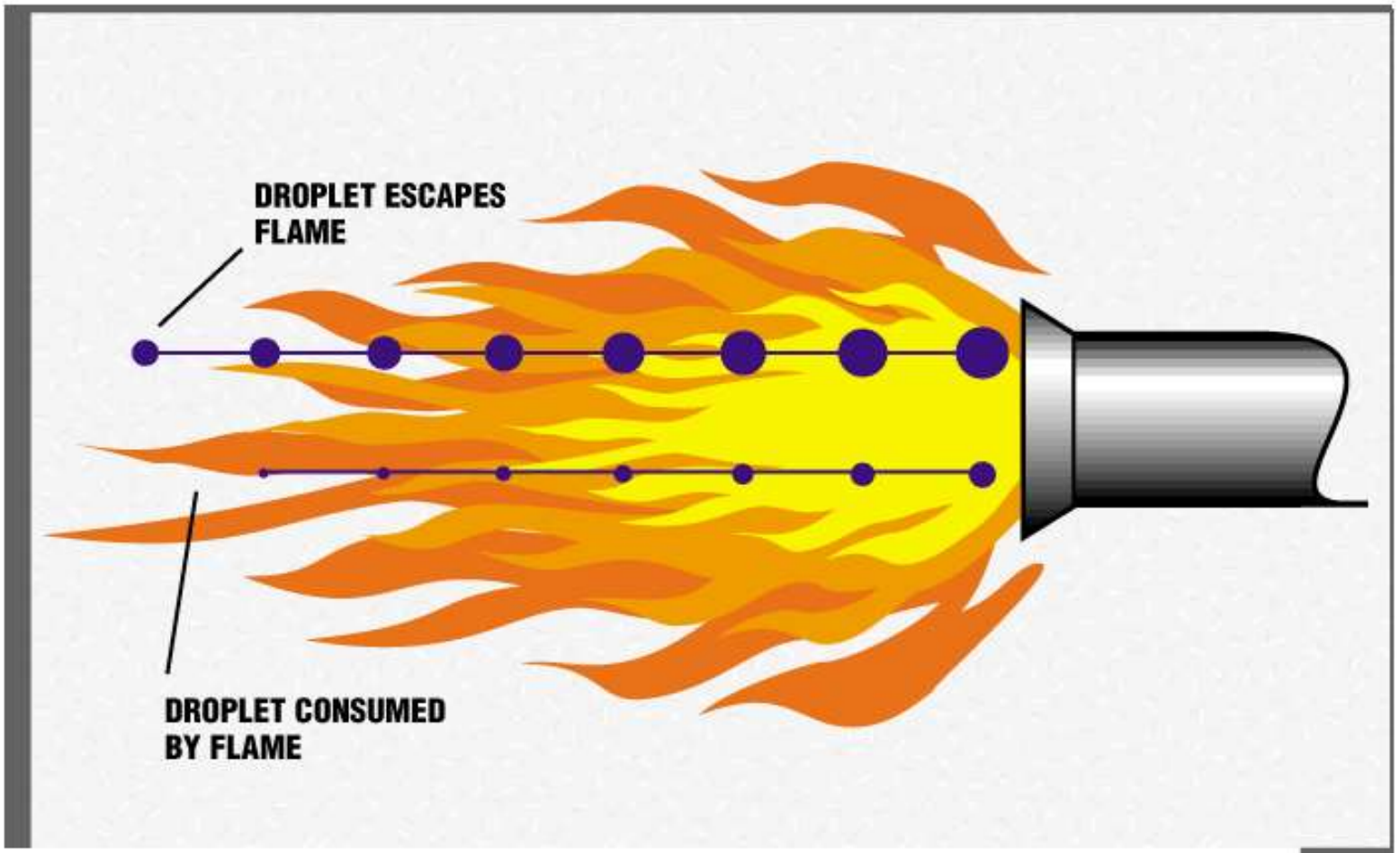

OVERSIZE DROPLETS ESCAPE FLAME

ATOMIZATION IS CRITICAL

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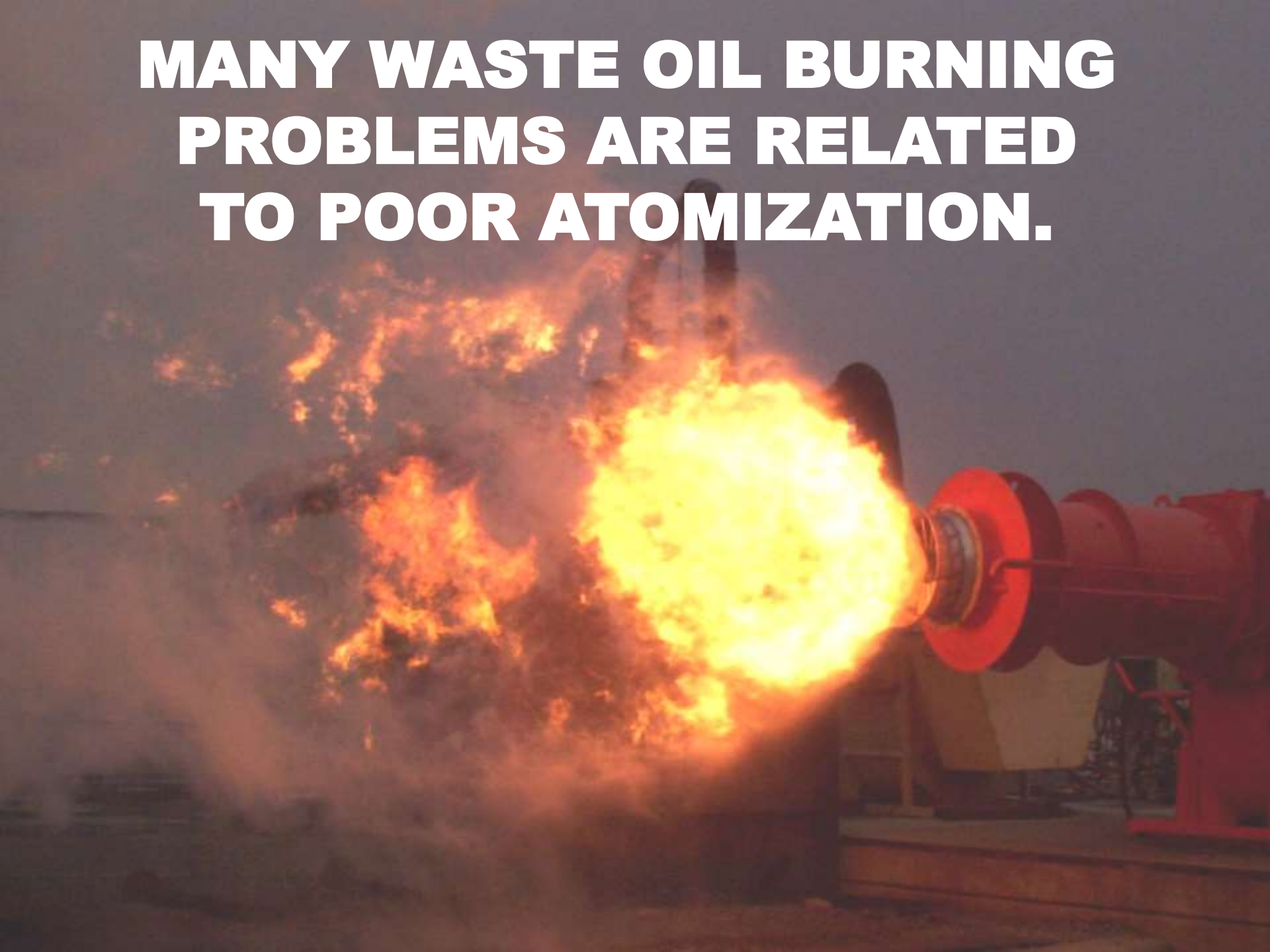
MANY WASTE OIL BURNING
PROBLEMS ARE RELATED
TO POOR ATOMIZATION.

IMPROPERLY ATOMIZED OIL CAN FOUL THE WHOLE BURNERFRONT.

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LARGE OIL DROPLETS WILL BE BLOWN INTO THE VEIL BEFORE THEY CAN BURN COMPLETELY.


POOR ATOMIZATION
CAN LEAD TO A
DISASTER.
DANGER

POOR ATOMIZATION DESTROYS COMBUSTION ZONE FLIGHTS.

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PROPERLY ATOMIZED FUEL HELPS PRODUCE A FLAME THAT IS SHORT AND SMALL IN DIAMETER LIKE THIS.

VISCOSITY *AT THE BURNER* IS WHAT MATTERS.

- CONTROL VISCOSITY, NOT OIL TEMPERATURE.
- AVOID LONG UNINSULATED FUEL LINES.
- KEEP FUEL HOSES UP OFF OF THE GROUND AND OUT OF THE MUD.
- RECIRCULATE BEFORE LIGHTING.
- HEAT IN-LINE (OK TO HEAT TANK TOO BUT NOT INSTEAD OF IN-LINE.)

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RECYCLED OIL CANNOT BE BURNED

EFFECTIVELY WITHOUT PROPER PREHEATING.

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THIS WASTE OIL SYSTEM WORKS WELL EVEN WITH LONG PIPING RUNS BECAUSE THE PIPING IS WELL INSULATED.

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WORN ATOMIZERS WASTE FUEL AND MONEY.

USE SOCK FILTER AT UNLOADING POINT.

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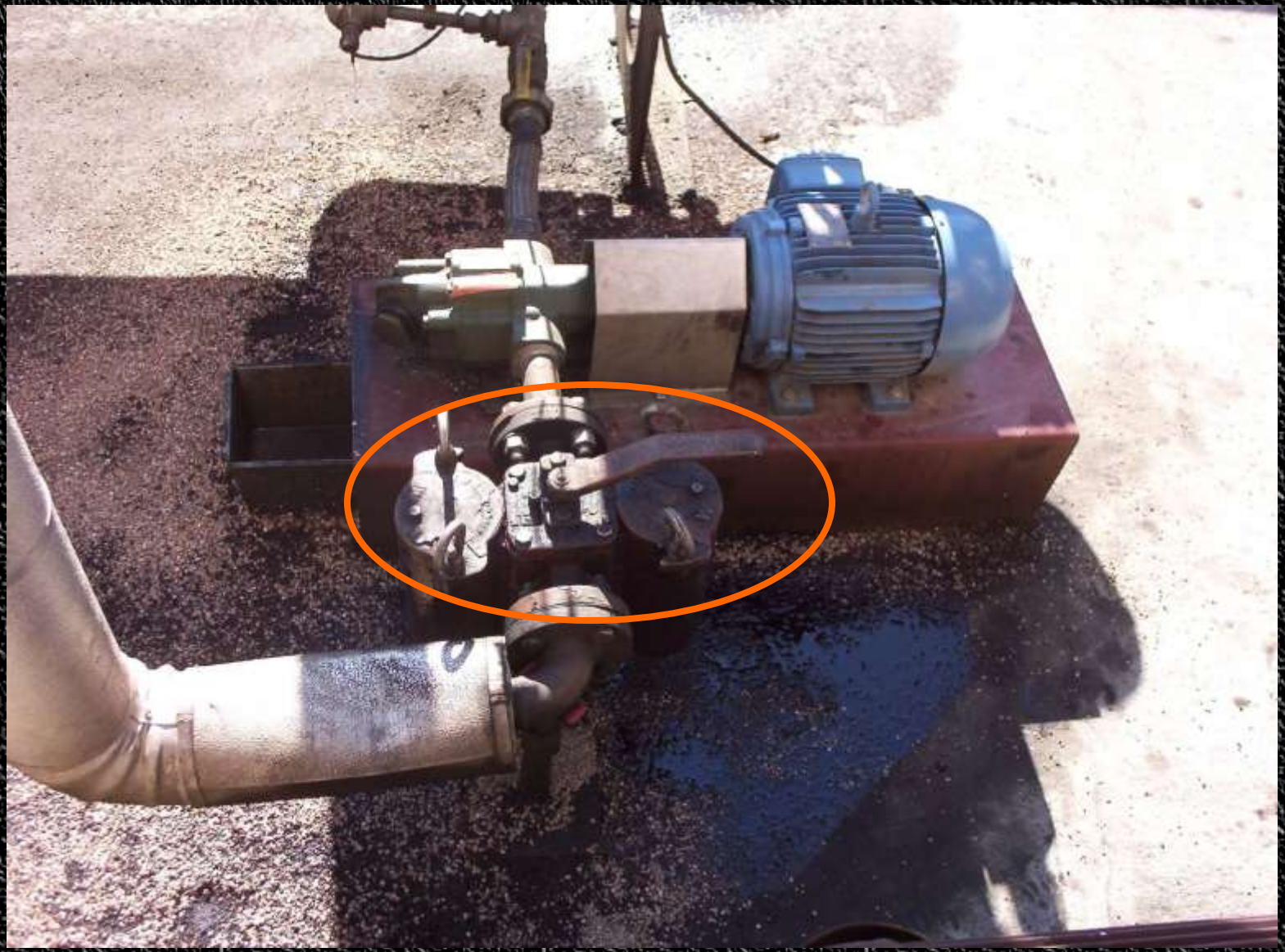

DUPLEX SCREENS JUST BEFORE PUMP

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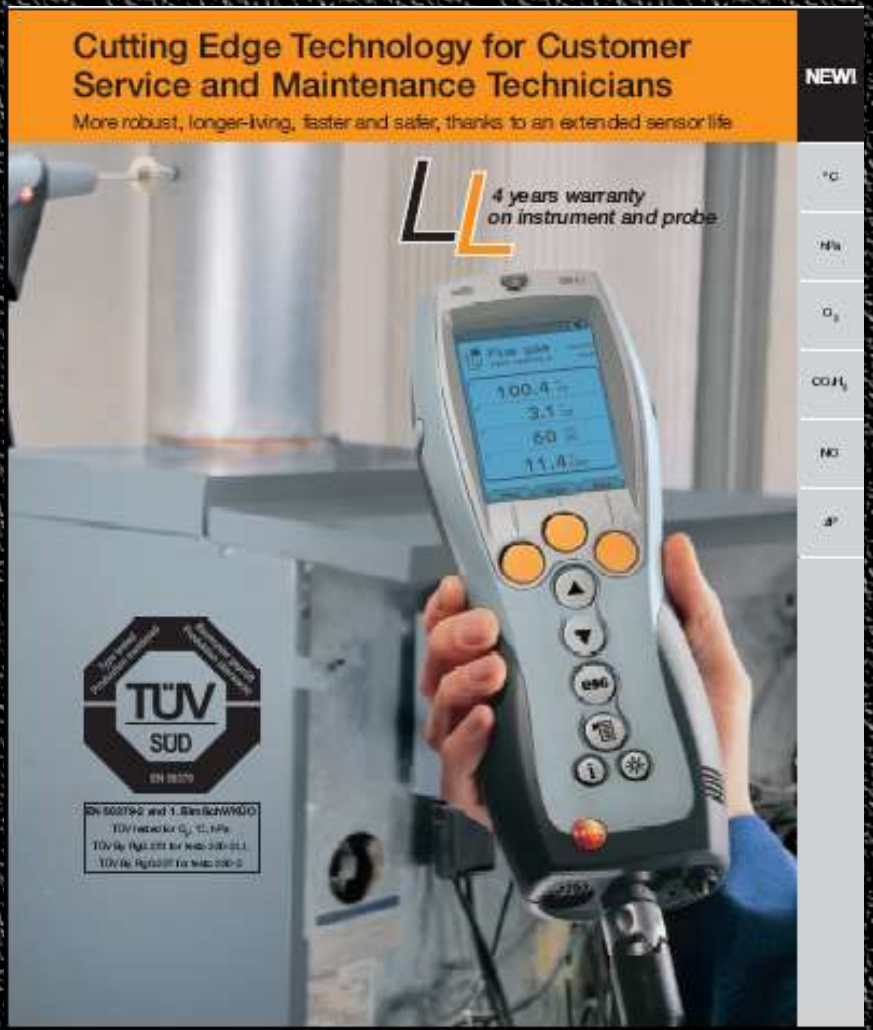
KEEP BURNER AIR AND
OIL PASSAGES CLEAN.

KEEP EXCESS AIR LOW. CHECK EXHAUST GASES WITH AN ANALYZER.



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NORMAL RECYCLED
OIL APPEARANCE


SEPARATED WASTE
OIL COMPONENT
MAKING ASH

BEWARE OF CORROSIVE CONTAMINANTS

THIS DAMAGE WAS CAUSED BY SULFURIC ACID RESIDUAL FROM A WASTE OIL TREATMENT PROCESS.

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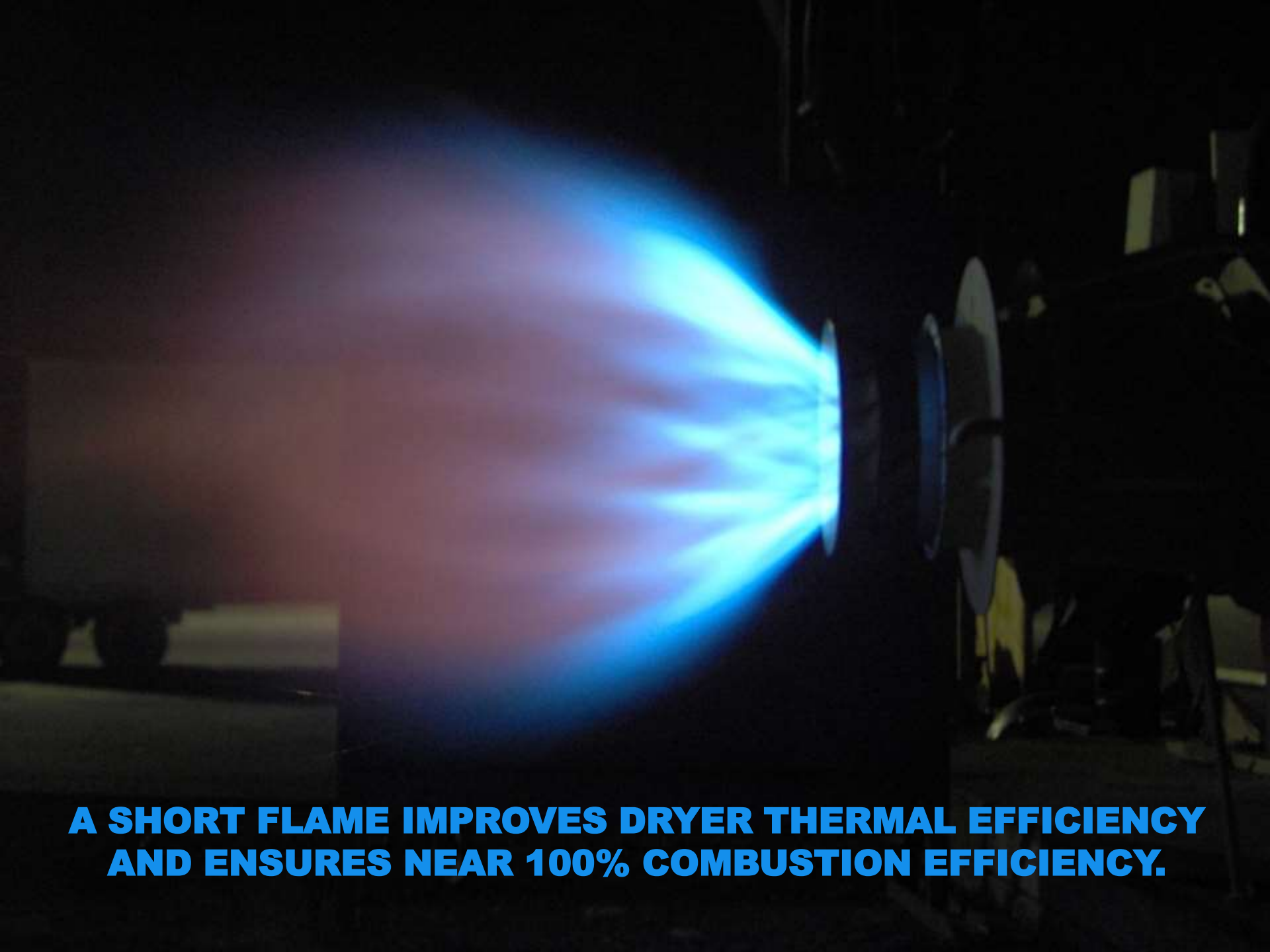
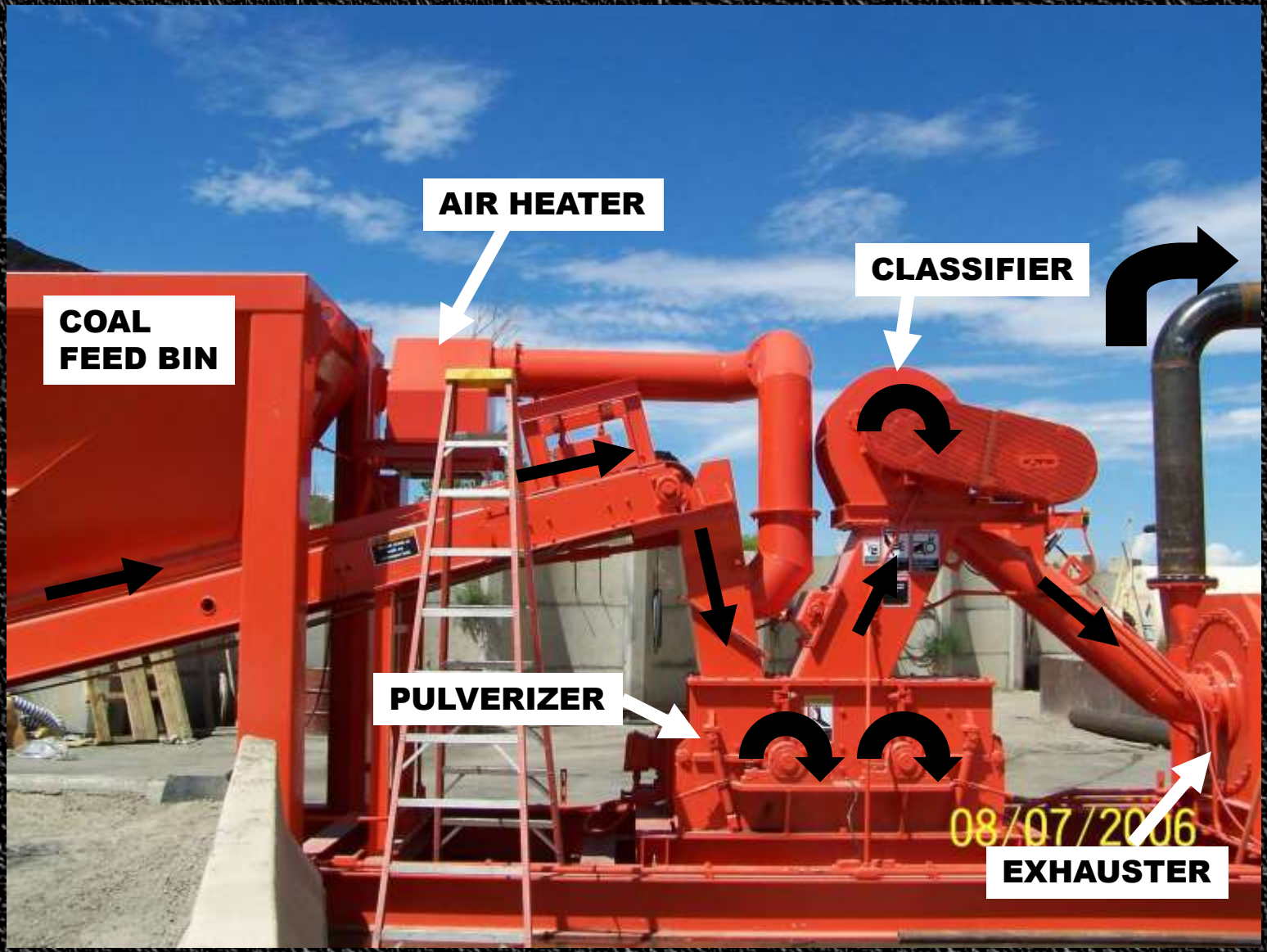

A SHORT FLAME IMPROVES DRYER THERMAL EFFICIENCY
AND ENSURES NEAR 100% COMBUSTION EFFICIENCY.



COAL PREPARATION SYSTEM

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ELEMENTS OF AN ENERGY SAVING STRATEGY FOR HMA PLANT DRYING OPERATIONS:

- FUEL CHOICE
- BURNER PERFORMANCE
- FLIGHTING SYSTEM PERFORMANCE
- MIX TEMPERATURE
- AIR IN THE SYSTEM
- HEAT LOSS

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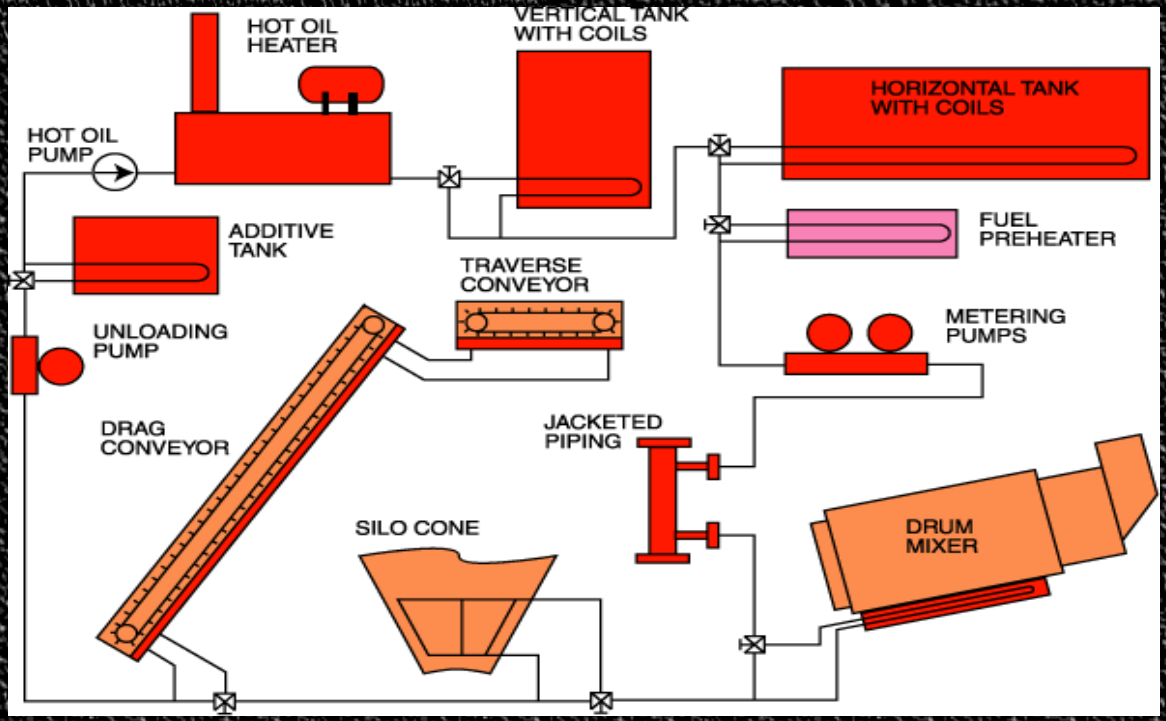
Efficient Asphalt Storage and Heating



Typical Heating And Storage For A Large HMA Plant

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Efficient Asphalt Storage

Vertical & Horizontal Storage Tanks

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Vertical Tank Advantages

Secondary Containment

Small Footprint

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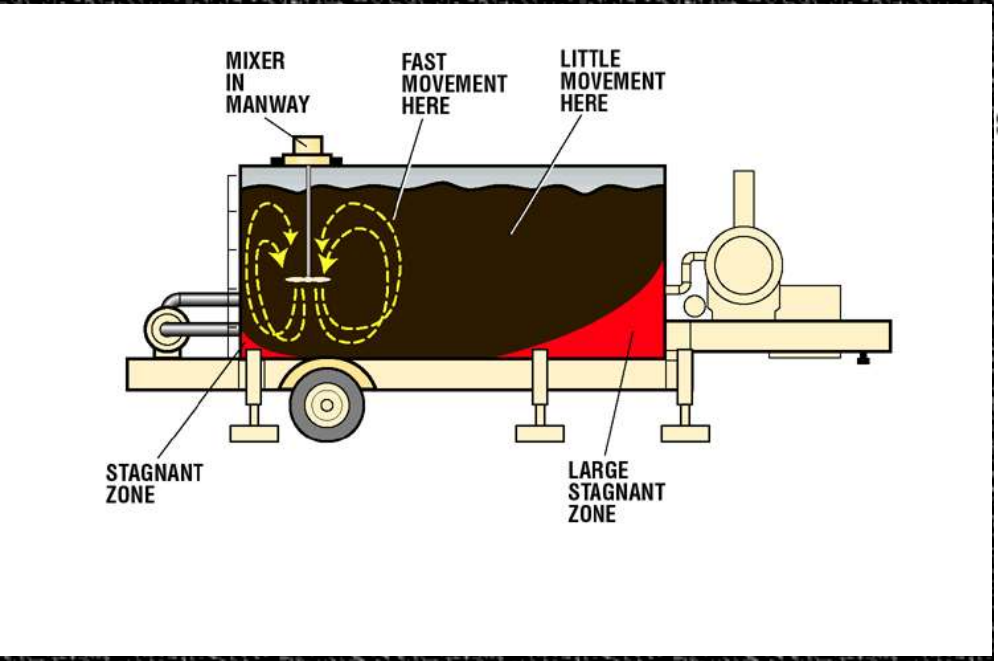
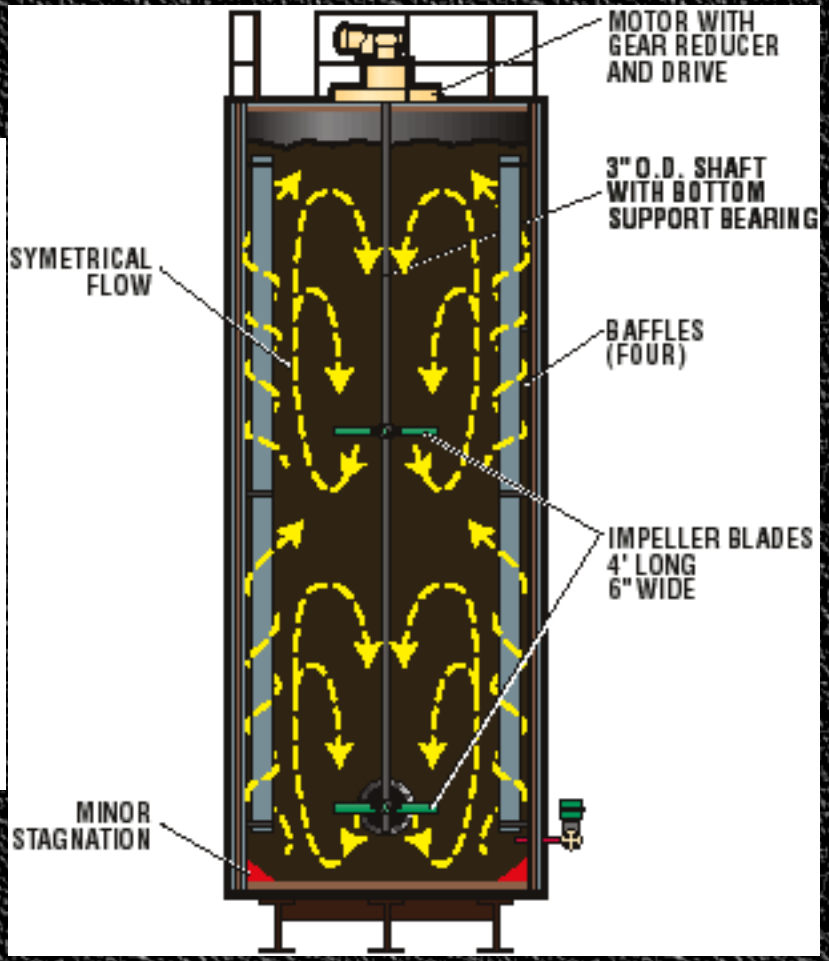
Vertical Tank Advantages





Excellent Mixing In Vertical Tanks

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Vertical Tank Advantages

- Accurate Level Measurement
- Reduced Oxidation

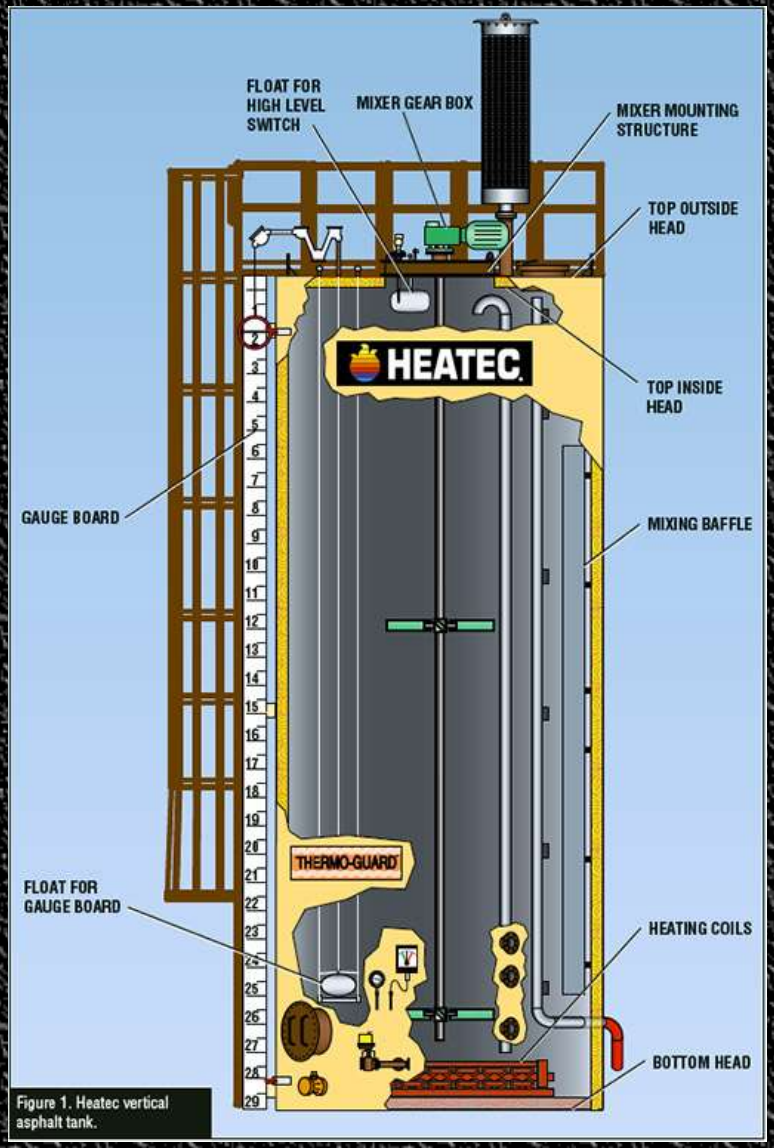

Figure 1. Heatec vertical asphalt tank.

Conserving Energy

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Capacity (Gallons)	Btu Per Hour		
	Horizontal Tank No Insulation	Horizontal Tank 3-inch Insulation*	Horizontal Tank 6-inch Insulation*
10,000	633,850	21,217	11,760
15,000	791,621	26,179	14,347
20,000	1,006,753	33,117	18,118
25,000	1,221,886	40,054	21,889
30,000	1,437,018	46,992	25,660
35,000	1,562,050	50,933	27,755
40,000	1,786,536	58,411	31,813

* Btu values are for new Heatec tanks and do not include heat for valves or connections. Old tanks may require double the heat or more. Asphalt temperature = 300 degrees F.

Asphalt Tanks — Maintaining Temperature

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Conserving Energy

30,000 Gallon Tank

46,992BTU/hr – 25,660 BTU/hr = 21,332 BTU/hr saved

21,332 BTU/hr divided by .85 heater efficiency = 25,096 BTU/hr

25,096 BTU/hr divided by 132,000 BTU/gal = 0.19 gal/hr

0.19 gal/hr x 24 hrs/day x 260 days x$2.00/gal = $2,371/year

6” vs 3” Insulation Savings

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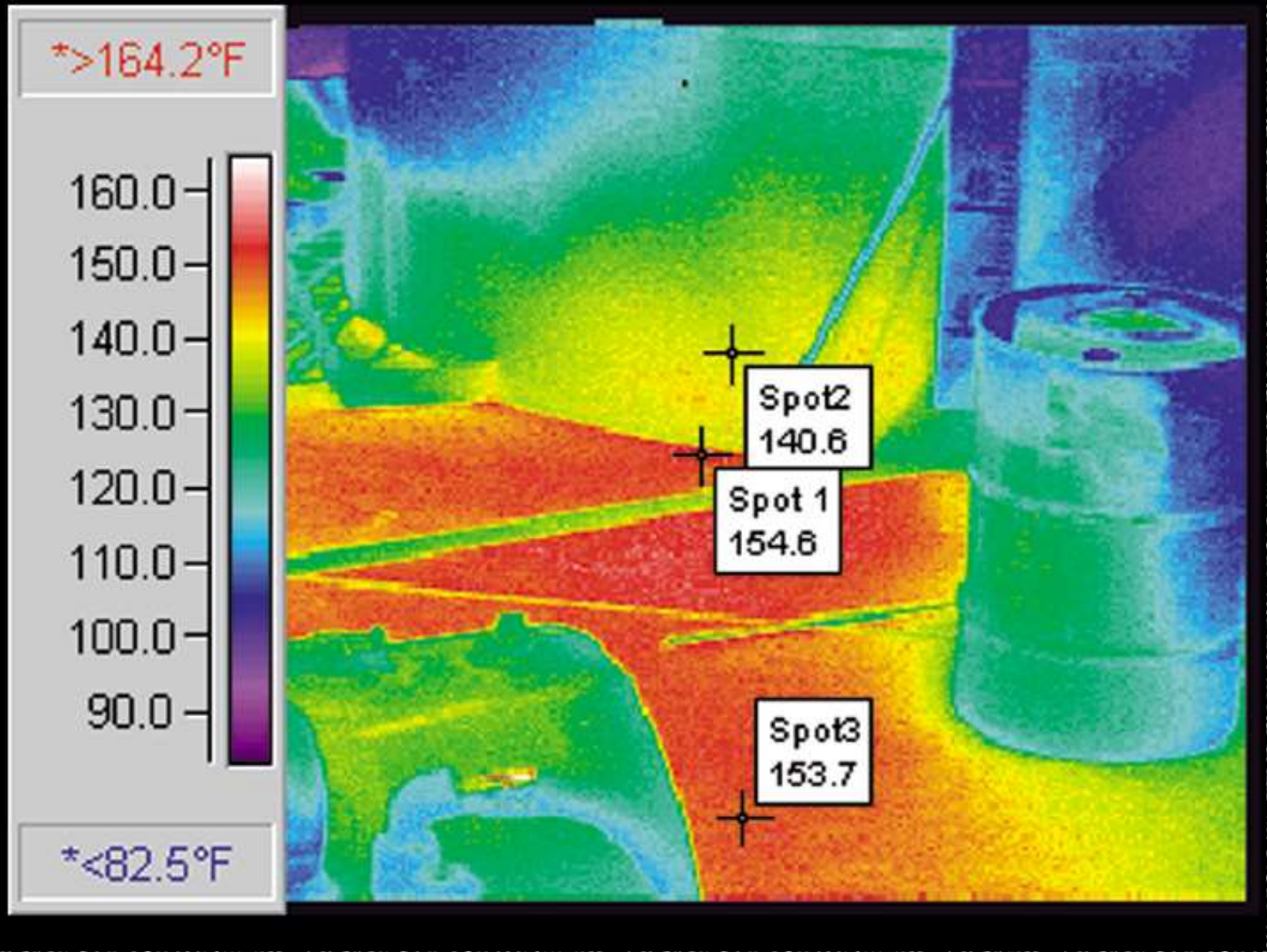
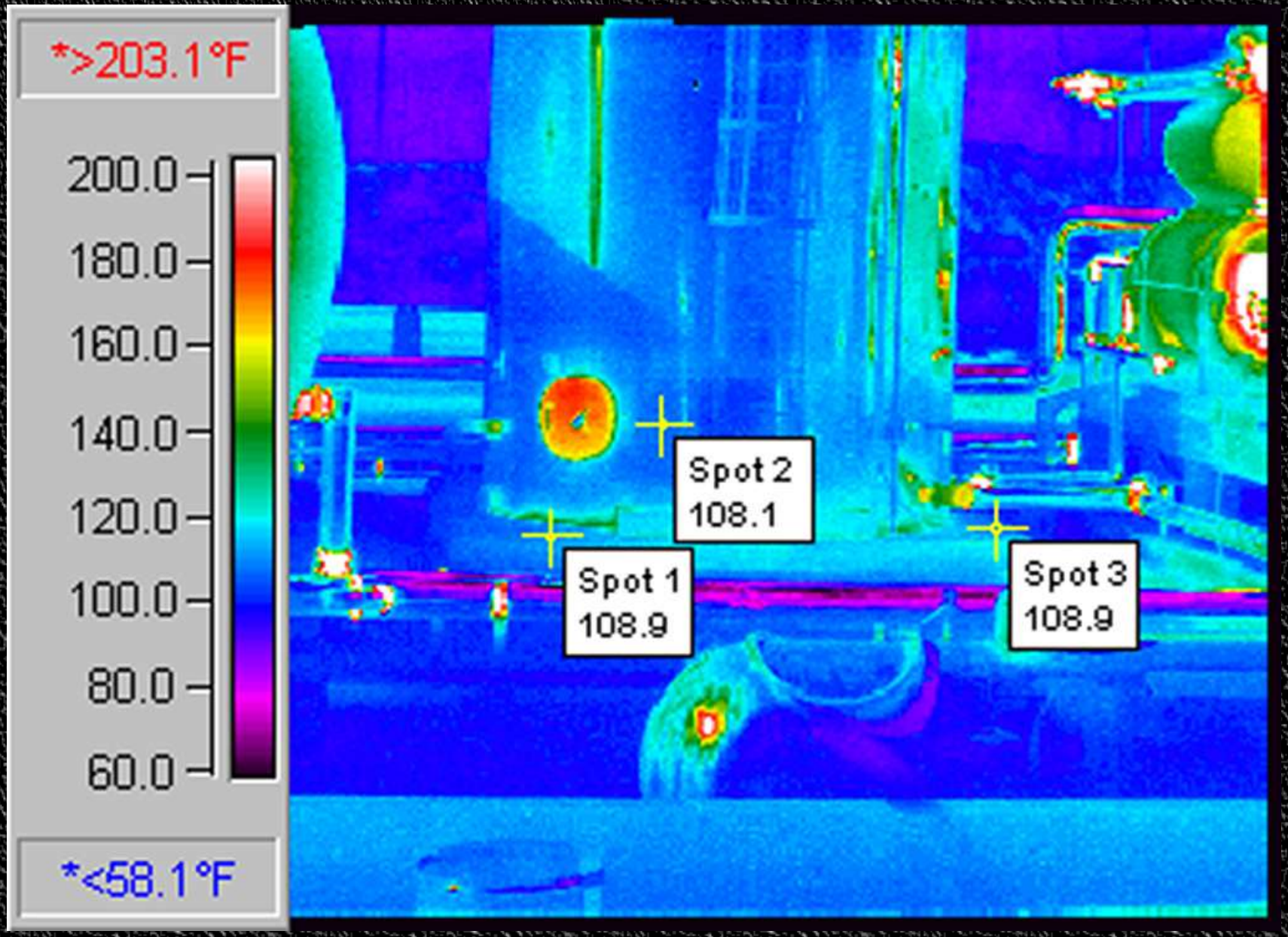


Infrared Photo Of A Poorly-Insulated Tank

GALLAGHER ASPHALT



Infrared Photo Of Insulated Tank

GALLAGHER ASPHALT

Conserving Energy

Insulated Piping

GALLAGHER ASPHALT

Conserving Energy

Softpack Insulation

GALLAGHER ASPHALT

Heater Efficiency

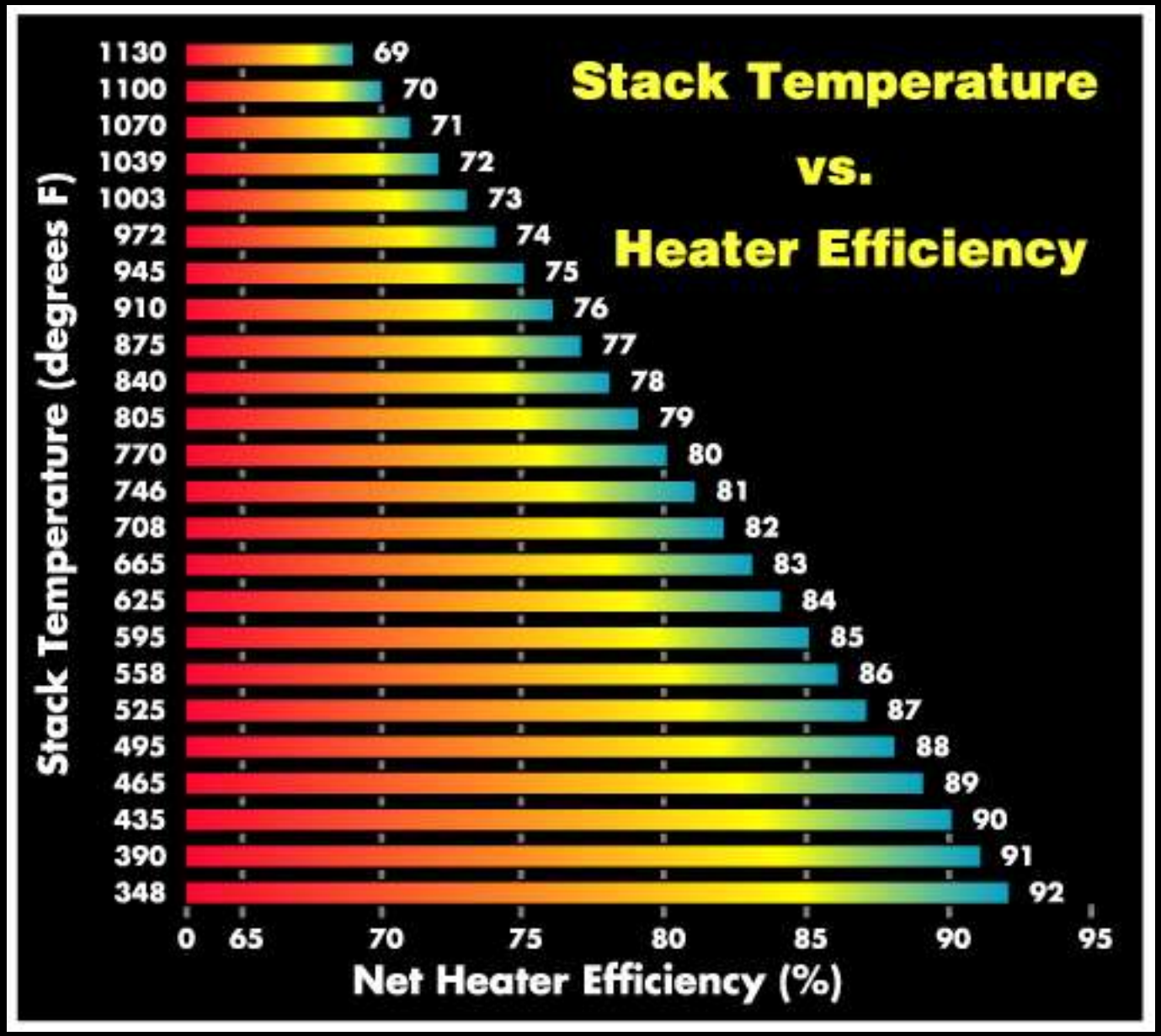
Heatec Helical Oil Heater

GALLAGHER ASPHALT

HEATER EFFICIENCY	COST PER HOUR
50 PERCENT	1,000,000 Btu per hour / 132,000 Btu per gallon X 1 / 0.50 X $ 2.00 = $ 30.30
60 PERCENT	1,000,000 Btu per hour / 132,000 Btu per gallon X 1 / 0.60 X $ 2.00 = $ 25.25
70 PERCENT	1,000,000 Btu per hour / 132,000 Btu per gallon X 1 / 0.70 X $ 2.00 = $ 21.65
80 PERCENT	1,000,000 Btu per hour / 132,000 Btu per gallon X 1 / 0.80 X $ 2.00 = $ 18.94
85 PERCENT	1,000,000 Btu per hour / 132,000 Btu per gallon X 1 / 0.85 X $ 2.00 = $ 17.83

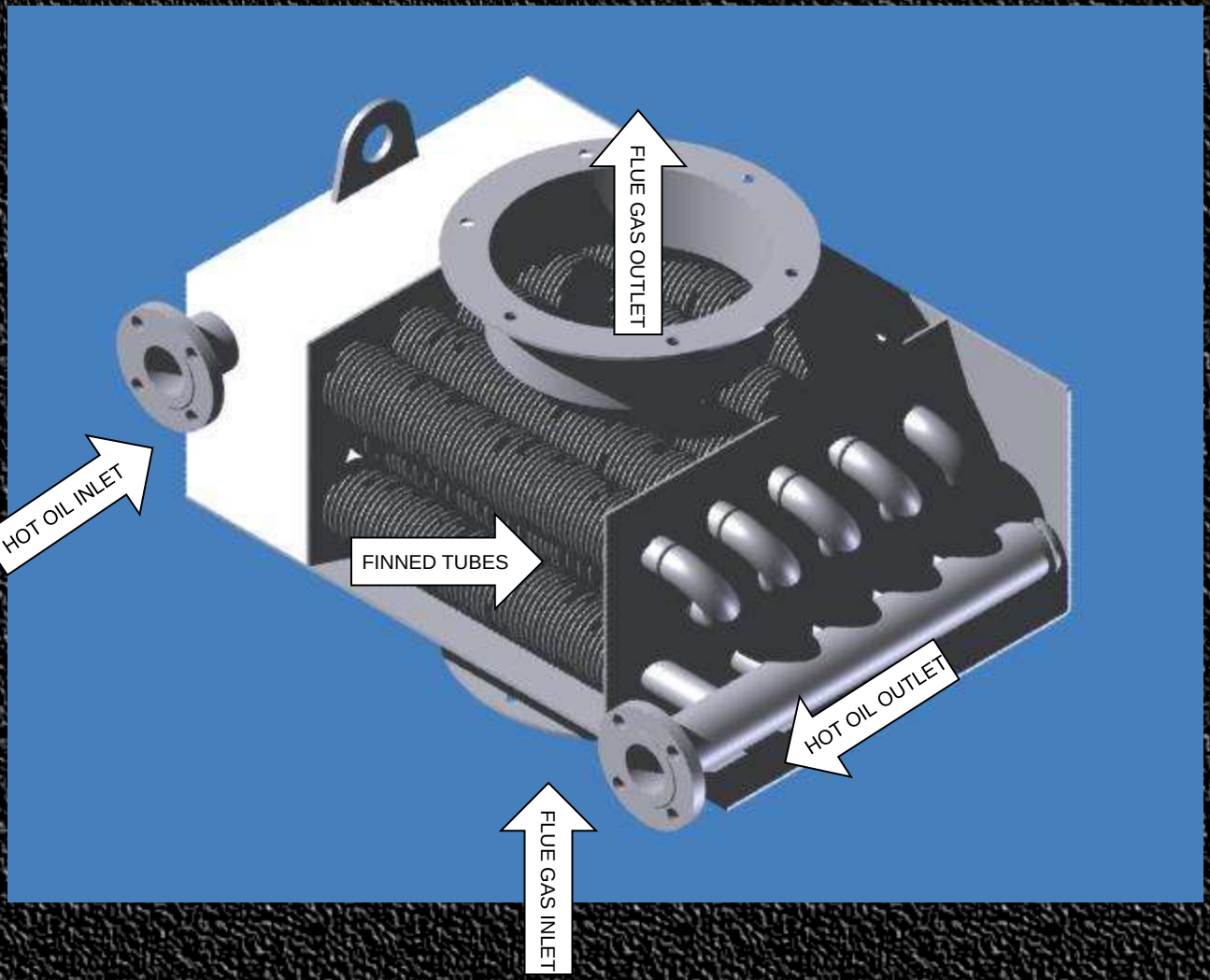
Heating load = 1,000.000 Btu per hour. No. 2 fuel oil LHV (low heating value) = 132,000 Btu per gallon.
No. 2 fuel oil cost = **$2.00** per gallon.

Calculating Heater Fuel Costs Per Hour



Stack Temperature Vs. Heater Efficiency

Heater Efficiency



Stack Economizer

GALLAGHER ASPHALT

Heater Efficiency

Stack Economizer

LAGHER ASPHALT

Economizer Test Data

Case Study:

- Heater Size – HCS 175
- Fuel - Diesel
- Exhaust Gas Inlet Temp. = 541 F
- Exhaust Gas Outlet Temp. = 395.9 F
- Thermal Oil Inlet Temp. = 279.9 F
- Thermal Oil Outlet Temp. = 281.9 F
- Efficiency Increase – 5%

GALLAGHER ASPHALT

Heater Efficiency

Stack Temperature Vs. Heater Efficiency

- Change Heat Transfer Oils
- Sample the Heat Transfer Oils
- Filter Heat Transfer Oils
- Burner Tune-Ups—Immediate Savings!!
- Eliminate Leaks –Oil is costly!!

Heater Maintenance

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Conserving Energy

- Invested App. $12,000.00 in Stack Economizer, Burner Tune-Up, Pipe Insulation and Installation
- Fuel Usage Dropped From 6 GPH to 3.7 GPH Saving $4.60/hr
- Will Result In Yearly Savings of App. ***$40,000.00 or $0.27/ton***

Case Study

GALLAGHER ASPHALT

Telephone Dialers

- Alerts plant personnel before tanks cool down
- Eliminates expensive down time before Monday morning backups
- If it works one time will pay for itself

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Calibration Tanks

- Fast and trouble free meter calibration
- No tracking down distributor and driver
- Safety
- Accuracy

Automated Valves

- Automated Valves Are Air Operated
- Allows Control House Operation
- Visual Indicators Easy To Notice
- With The More Tanks /PG Grades Becomes More Practical

GALLAGHER ASPHALT

GALLAGHER ASPHALT

Reducing Trucking Costs

GALLAGHER ASPHALT

JANUARY/FEBRUARY 2006

HMAT

Hot Mix Asphalt Technology

VOLUME 11, NUMBER 1

PUBLISHED BY THE NATIONAL ASPHALT PAVEMENT ASSOCIATION

MANAGING TRUCKS for an Efficient Asphalt Paving Operation

HMAT – Trucking Articles

- Balancing Production Rates in Hot Mix Operations
- Dump Truck Diligence: Keeping your Work Zone and Workers Safe
- Truck Management is Crucial to a Successful Paving Operation

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Asphalt Production Cost Categories

- Material – 60 % of Cost
- Plant Production – 11 % of Cost
- Trucking – 15% of Cost ↑
- Lay Down – 14 % of Cost

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Factors that Increase Trucking Costs

- Higher Fuel cost & Fuel Tax
- Higher Equipment cost
- Higher License fees
- Higher Insurance cost
- Regulations limiting Driver hours
- Higher Labor cost
- Less Skilled Drivers
- Congestion
- Delays in Trucking Cycle

GALLAGHER ASPHALT

Factors that Increase Trucking Costs

- **Higher Fuel cost & Fuel Tax**
- **Higher Equipment cost**
- **Higher License fees**
- **Higher Insurance cost**
- **Regulations limiting Driver hours**
- **Higher Labor cost**
- **Lower Quality Drivers**
- **Congestion**
- **Delays in Trucking Cycle**

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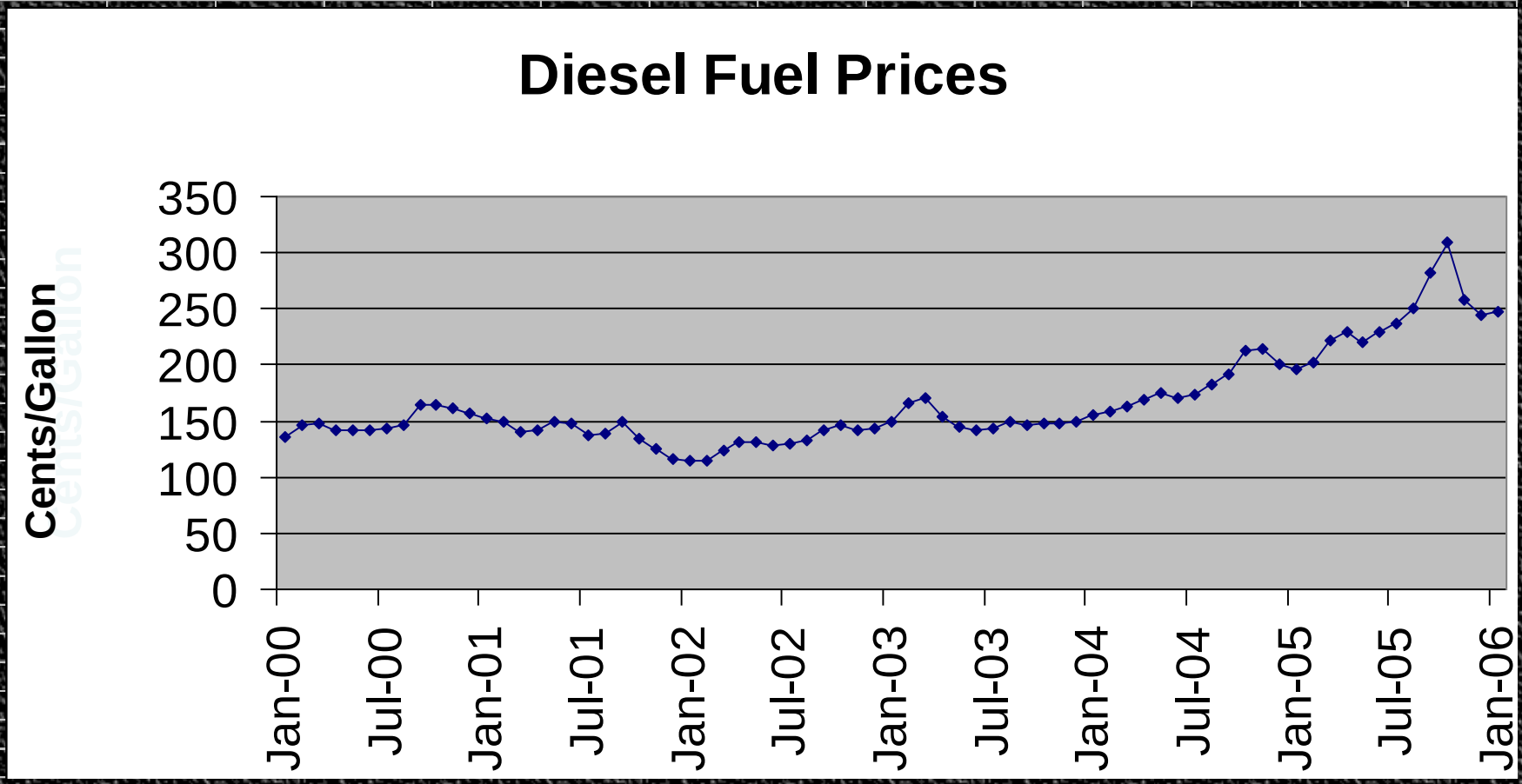
Rising Cost Of Fuel



Rising Cost Of Fuel

US 48 State Average Retail Price Per Gallon

January 2004 $ 1.55

January 2006 $ 2.46

59% Increase

- Control Excess Engine Idling
- Maintain Truck Engine Performance
- Insure Tire Pressure Levels - Lower Rolling Resistance
- Shorten Haul Cycles – Minimize Stop & Go's
- Find Most Economical Haul Route in relation to Grade

GALLAGHER ASPHALT

Factors that Increase Trucking Costs

- Higher Fuel cost & Fuel Tax
- **Higher Equipment cost**
- Higher License fees
- Higher Insurance cost
- Regulations limiting Driver hours
- Higher Labor cost,
- Less Skilled Drivers
- Congestion
- Delays in Trucking Cycle

GALLAGHER ASPHALT

OEM Truck Price Increases

2002 – 2006 U.S. Truck Manufacturers by Model Year

Paccar Corp. (Kenworth-Peterbilt)	19%
Volvo – Mack	17%
Freightliner	21%

GALLAGHER ASPHALT

Factors that Increase Trucking Costs

- Higher Fuel cost & Fuel Tax
- Higher Equipment cost
- Higher License fees
- Higher Insurance cost
- Regulations limiting Driver hours
- **Higher Labor cost,**
- **Less Skilled Drivers**
- **Congestion**
- **Delays in Trucking Cycle**

GALLAGHER ASPHALT

- **Production: 240 tons per hour = 2,400 tons per day**
- **20 Tons per Truck**
- **Truck Cost: $85 per hour = $1.42 per minute**

• Delay at Plant	15 Min.
• Loading Time	5 Min.
• Ticket, Tarp, Sampling	5 Min.
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• Dump	3 Min.
• Return to Plant	20 Min.
Total Cycle Time	85 Min.

Cost Cycle	$120.70
Cost / Ton	$ 6.04
Trucks Required	17

GALLAGHER ASPHALT

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• Return to Plant	20 Min.
Total Cycle Time	85 Min.

Delay Time can be Improved To as Little 2 minutes

Cost Cycle	$120.70
Cost / Ton	$ 6.04
Trucks Required	17

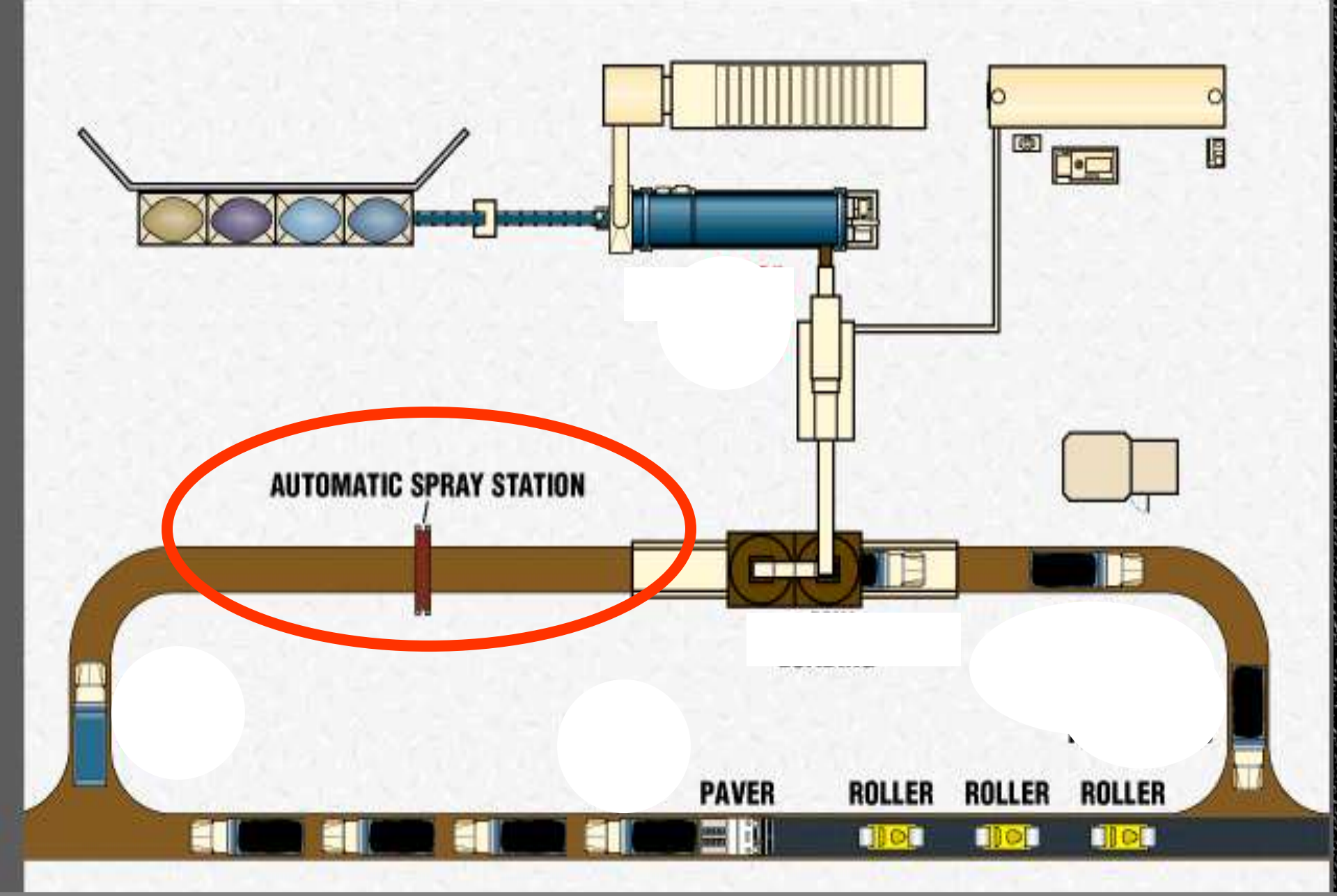
GALLAGHER ASPHALT

Delays at Plant

- **Automatic spray system**

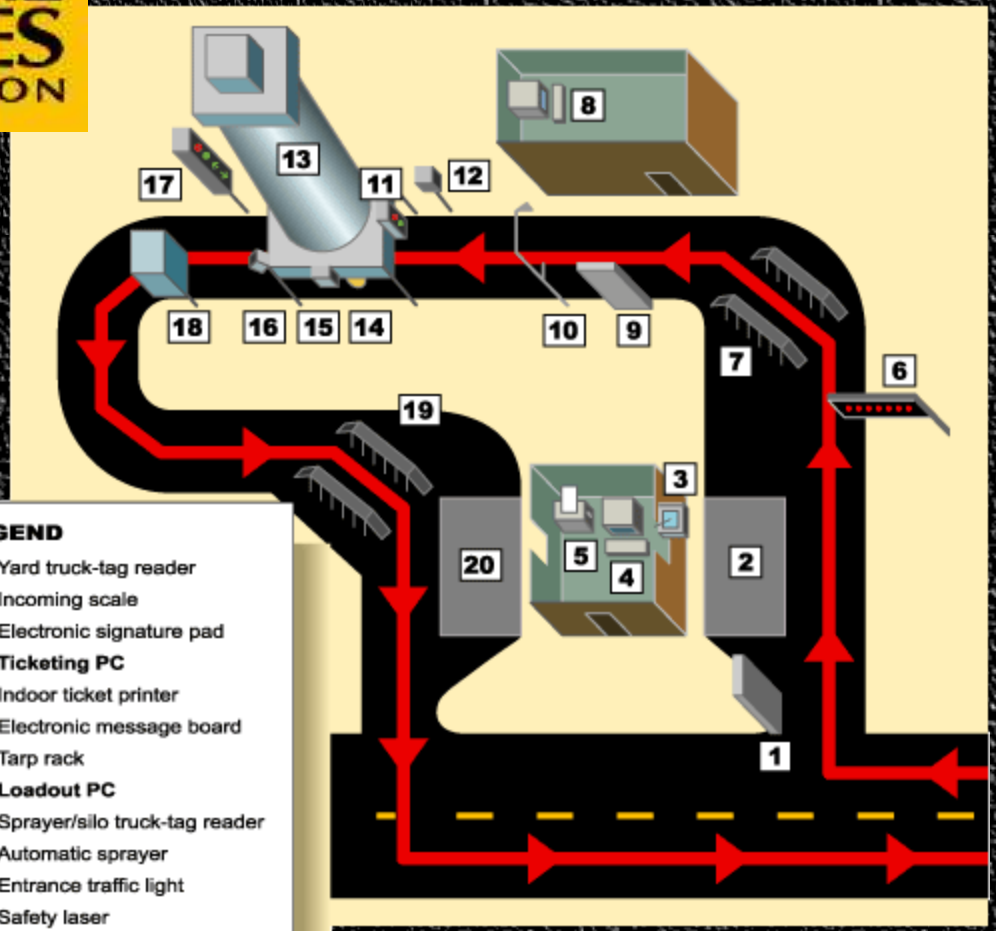
GALLAGHER ASPHALT

Release Agent Application System



Locate Spray System in line with Plant

DIGITAL FORCES CORPORATION



LEGEND

1. Yard truck-tag reader
2. Incoming scale
3. Electronic signature pad
4. **Ticketing PC**
5. Indoor ticket printer
6. Electronic message board
7. Tarp rack
8. **Loadout PC**
9. Sprayer/silo truck-tag reader
10. Automatic sprayer
11. Entrance traffic light
12. Safety laser
13. Silo
14. Silo selected light
15. Speaker
16. Video camera
17. Exit traffic light
18. Outdoor ticket printer
19. Tarp rack
20. Exit scale

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Delays at Plant

- Automatic spray system
- Bed liners

GALLAGHER ASPHALT

QuickSilver
THE RIGHT BRAND

QuickSilver outlasts aluminum — and steel in many cases. QuickSilver is a specially formulated UHMW to achieve a super slick, tough surface. It handles hot asphalt up to 350°F. Its impact strength has been tested to -100°F without cracking or breaking.

GALLAGHER ASPHALT

Delays at Plant

- Automatic spray system
- Bed liners
- Stagger truck start time

GALLAGHER ASPHALT

Left Unmanaged ;
Trucks Start the Day in a Group and Stay in a Group

- **Production: 240 tons per hour = 2,400 tons per day**
- **20 Tons per Truck**
- **Truck Cost: $85 per hour = $1.42 per minute**

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• Return to Plant	20 Min.
Total Cycle Time	85 Min.

Loading Time can be Improved To as Little 2 minutes

Cost Cycle	$120.7
Cost / Ton	$ 6.04
Trucks Required	17

GALLAGHER ASPHALT

- Poor Loading Time Is Directly related to how well Silos are managed

End The Day With Silos Full

- Less labor cost through out day
- Time to do maintenance on the plant in the afternoon
- 95% of all plant breakdowns occur at start-up in the morning

GALLAGHER ASPHALT

- Well managed Silos eliminate long truck loading times through out the day

- **Production: 240 tons per hour = 2,400 tons per day**
- **20 Tons per Truck**
- **Truck Cost: $85 per hour = $1.42 per minute**

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• Loading Time	5 Min.
• Ticket, Tarp, Sampling	5 Min.
• Haul to Lay Down	20 Min.
• Delay at Job	15 Min.
• Truck Exchange	2 Min.
• Dump	3 Min.
• Return to Plant	20 Min.
Total Cycle Time	85 Min.

Ticket, Tarp, & Sampling Time can be Improved To as Little 2 minutes

Cost Cycle	$120.70
Cost / Ton	$ 6.04
Trucks Required	17

GALLAGHER ASPHALT

Improving Ticket, Tarp, & Sampling

- **Remote Ticket Printing System**

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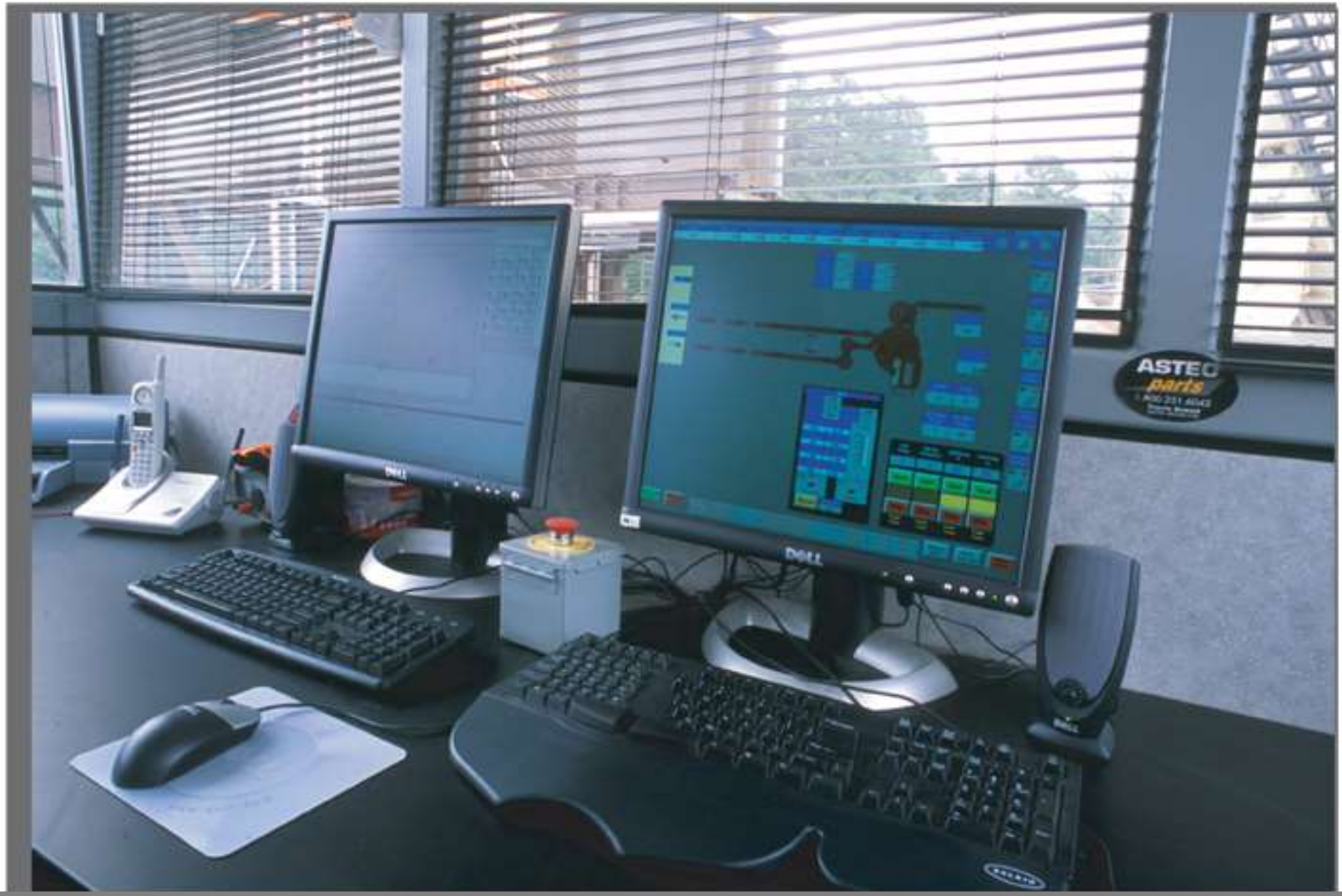

Remote Printing is Faster than
Conventional Vacuum Ticket Tube Delivery System

GALLAGHER MATERIALS
Thornton 706-877-7169
Joliet 815-740-2903
www.GallagherAsphalt.com

Ticket 382973

5:57 A 10/01/01 6:29 A

Crew: RED. Foreman: CM. CCode: 43000

SOLD **GALLAGHER ASPHALT** 30780
18100 S.INDIANA AVE

THORNTON, IL 60476-

JOB **THE MEADOWS OF PEOTONE** **GE01333**
4TH ADDITION
NORTH OF WILL./PEOTONE RD

LOC MEADOWS OF PEOTONE

TRUCK: SHEPLEY 51094 TRP N/A
MATERIAL: REGULAR BINDER
THORNTON. Printer C
TARE: 29860 LBS
GROSS: **71180 LBS**
NET: 41320 LBS TAXABLE
20.66 Tons

LOAD NO. 2
ACCUM TOTAL: 42.11 Tons

DIRECTIONS 30 TO GOVERNORS HWY, SOUTH TO WILL./PEOTONE RD. (SOUTH OF TOWN AT STOP SIGN) WEST TO RATHJE RD., NORTH TO THE MEADOWS

Received by _____

Late payments subject to 1% monthly interest. Buyer shall also pay all attorney and collection expenses.

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Improving Ticket, Tarp, & Sampling

- Remote Ticket Printing System
- **Automatic Tarping**

GALLAGHER ASPHALT



Help increase productivity because you can tarp and un-tarp while on the move

Driver operates from the cab. No climbing or dangling off the truck. No out-of-control flying cranks to break hands or arms. No chain guard to block rear vision

Just turn a switch mounted inside the cab. Includes circuit breaker and indicator light

Neilly

GALLAGHER CANVAS GOODS COMPANY

Improving Ticket, Tarp, & Sampling

- Remote Ticket Printing System
- Automatic Tarping
- Automatic Sampling

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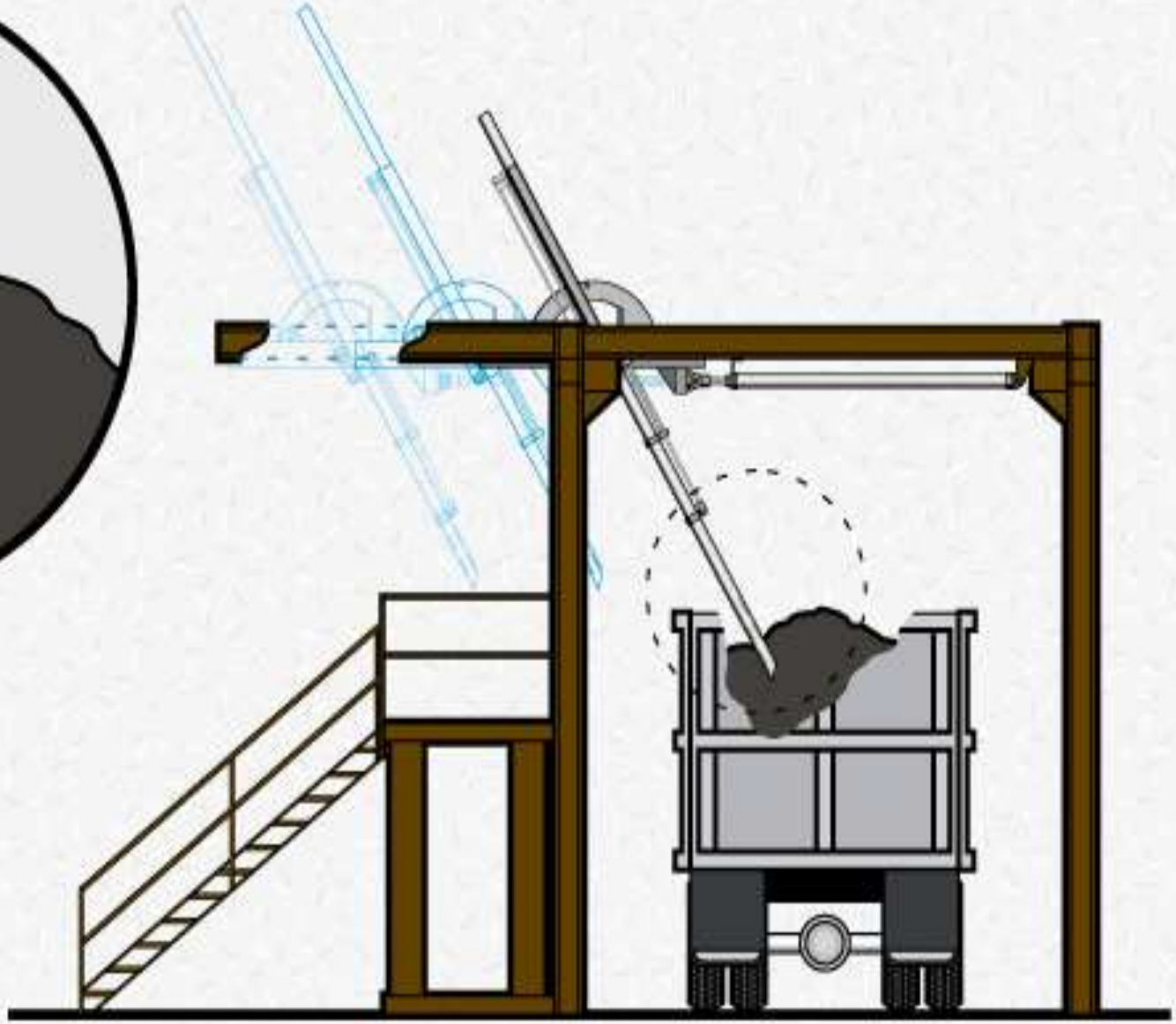

Automatic Truck Sampling System

- **Production: 240 tons per hour = 2,400 tons per day**
- **20 Tons per Truck**
- **Truck Cost: $85 per hour = $1.42 per minute**

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• Ticket, Tarp, Sampling	5 Min.
• Haul to Lay Down	20 Min.
• Delay at Job	15 Min.
• Truck Exchange	2 Min.
• Dump	3 Min.
• Return to Plant	20 Min.
Total Cycle Time	85 Min.

Haul to Lay Down & Return to Plant Time can be Improved 20%

Cost Cycle	$120.7
Cost / Ton	$ 6.04
Trucks Required	17

GALLAGHER ASPHALT

Better Management of Trucking

Make a Interested person Truck Foreman to Identify Opportunities

- Best Truck Driver
- Young Engineer

Supervisors Responsibilities

- **Monitor & Improve Driver Skills**
- **Ride Frequently with Drivers**
- **Define Route for Drivers before shift starts**
- **Teach Technique on Paving Trucking**
- **Lowering the Amount of Over Trucking**

GALLAGHER ASPHALT

- **Production: 240 tons per hour = 2,400 tons per day**
- **20 Tons per Truck**
- **Truck Cost: $85 per hour = $1.42 per minute**

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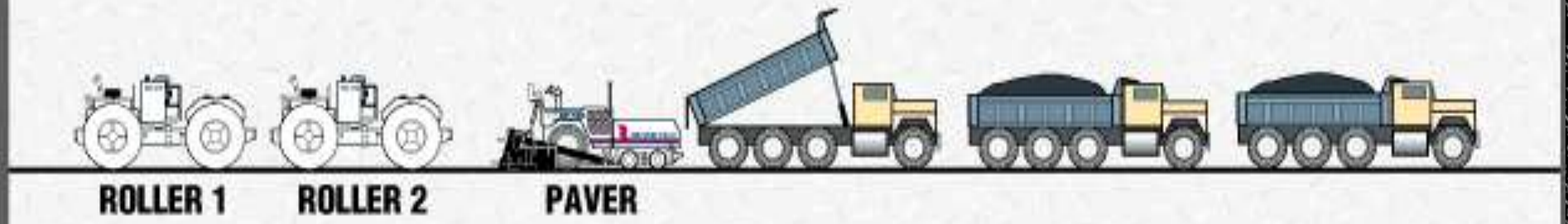
• Ticket, Tarp, Sampling	5 Min.
• Haul to Lay Down	20 Min.
• Delay at Job	15 Min.
• Truck Exchange	2 Min.
• Dump	3 Min.
• Return to Plant	20 Min.
Total Cycle Time	85 Min.

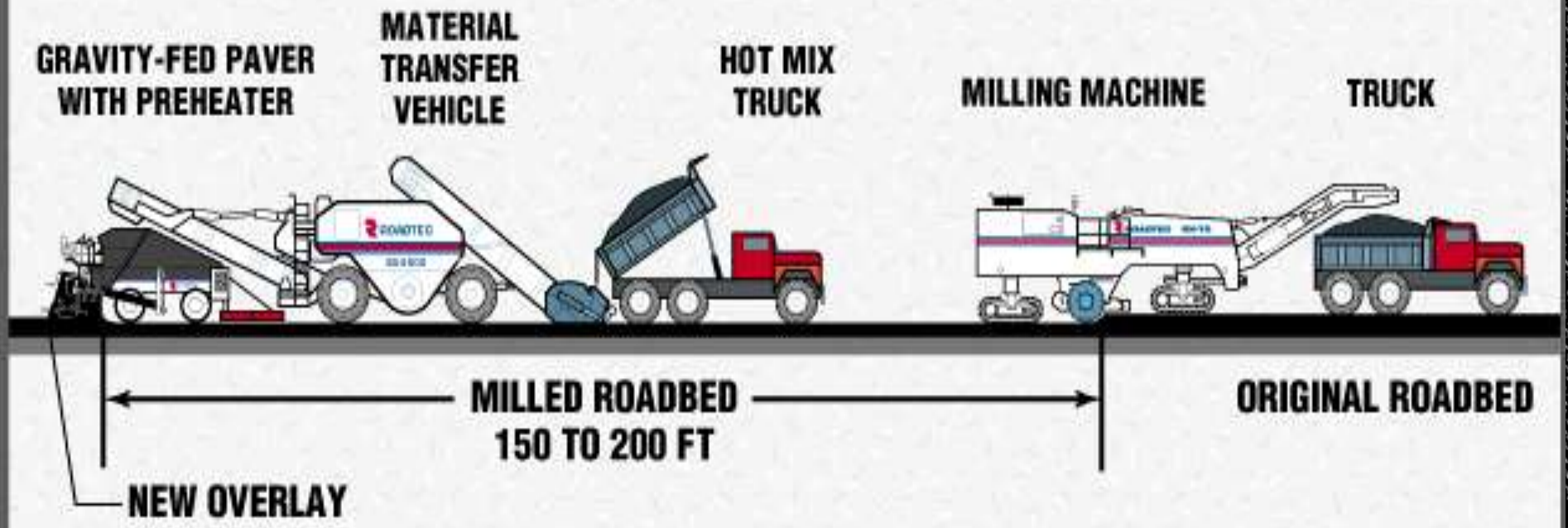
Delay At Job Time can be Improved To as Little 4 minutes

Cost Cycle	$120.70
Cost / Ton	$ 6.04
Trucks Required	17

GALLAGHER ASPHALT



- Space Trucks to correlate with Coverage
- Do not Over Truck



Find ways to increase Double Hauling

- **Production: 240 tons per hour = 2,400 tons per day**
- **20 Tons per Truck**
- **Truck Cost: $85 per hour = $1.42 per minute**

• Delay at Plant	15 Min.
• Loading Time	5 Min.
• Ticket, Tarp, Sampling	5 Min.
• Haul to Lay Down	20 Min.
• Delay at Job	15 Min.
• Truck Exchange	2 Min.
• Dump	3 Min.
• Return to Plant	20 Min.
Total Cycle Time	85 Min.

• Delay at Plant	2 Min.
• Loading Time	2 Min.
• Ticket, Tarp, Sampling	2 Min.
• Haul to Lay Down	16 Min.
• Delay at Job	4 Min.
• Truck Exchange	2 Min.
• Dump	3 Min.
• Return to Plant	16 Min.
Total Cycle Time	47 Min.

Cost Cycle	$120.7	Cost Cycle	$66.74
Cost / Ton	$ 6.04	Cost / Ton	$ 3.34 ($2.70
Trucks Required	17	Trucks Required	10

2400 tons X ($6.04-$3.34) = $6,480

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Gross Loading

- Find methods to increase the load on each and every Truck

- Use truck scales to maximize the GVW of each Truck

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- **Production: 240 tons per hour = 2,400 tons per day**
- **20 Tons per Truck**
- **Truck Cost: $85 per hour = $1.42 per minute**

Increase Truck Load
To 21.5 Tons Per Truck

• Delay at Plant	15 Min.
• Loading Time	5 Min.
• Ticket, Tarp, Sampling	5 Min.
• Haul to Lay Down	20 Min.
• Delay at Job	15 Min.
• Truck Exchange	2 Min.
• Dump	3 Min.
• Return to Plant	20 Min.
Total Cycle Time	85 Min.

• Delay at Plant	2 Min.
• Loading Time	2 Min.
• Ticket, Tarp, Sampling	2 Min.
• Haul to Lay Down	16 Min.
• Delay at Job	4 Min.
• Truck Exchange	2 Min.
• Dump	3 Min.
• Return to Plant	16 Min.
Total Cycle Time	47 Min.

Cost Cycle	$120.70	Cost Cycle	$66.74
Cost / Ton	$ 6.04	Cost / Ton	$ 3.10
Trucks Required	17	Trucks Required	10

Additional $60,000 a year savings at 250,000 tons

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Review Truck Specs

- Trucks are typically overspec'd for use
- Consider using lighter trucks for increased hauling weight
- Most often trucks have higher HP than required, structural components made of steel instead of lighter alloys
- Trade trucks more often to get increased hauling loads to offset costs

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Conclusion

- Do not Over-Truck
- Have an alternate use for the trucks, during slow times of day
- Double-haul when possible
- Eliminate all delay…keep the trucks moving
- Keep the Drivers in the Trucks

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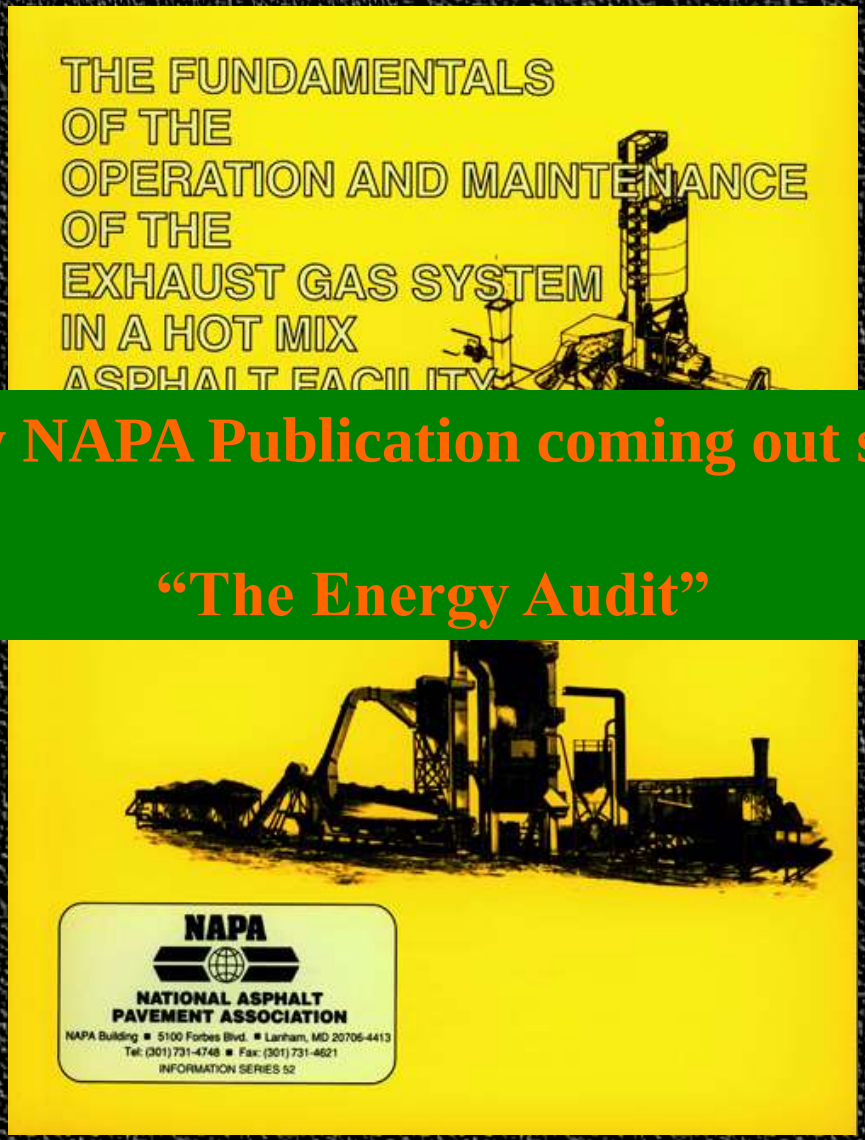
NAPA

National Asphalt Pavement Association



New NAPA Publication coming out soon

"The Energy Audit"

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Technical Papers

ASTEC INDUSTRIES, INC.

Updated! **T-127**
Milling and Recycling

1.9 mb

T-117
Segregation: Causes and Cures

2.4 mb

Flow Chart 5.5 mb

T-119
Dryer Drum Mixer

465k

T-125
Evolution of Thermal Remediation

221k

T-129
Stockpiles

676k

T-138
Hot Mix Glossary

Defines about 400 special terms frequently used by people in the hot mix asphalt industry. Most are not defined in standard dictionaries. 68 pages.

355k

T-139
Baghouse Applications

3.3 mb

T-143
Hot Mix Blue Smoke Emissions

2.1 mb

http://www.astecinc.com/literature/default.htm

GALLAGHER ASPHALT

NAPA
NATIONAL ASPHALT PAVEMENT ASSOCIATION

JOIN NAPA

Plus next tons over 5,000,000	@ 0.55¢ per ton ($.0055)
Plus next tons between 1,000,000 AND 5,000,000	@ 0.60¢ per ton ($.0060)
Plus next tons between 500,000 AND 1,000,000	@ 1.35¢ per ton ($.0135)
Plus next tons between 100,000 AND 500,000	@ 1.85¢ per ton ($.0185)
For first tons up to 100,000	@ 3.25¢ per ton ($.0325)

MINIMUM DUES OF $1,000 PER YEAR

NAPA plays a vital role in keeping the HMA industry vibrant and profitable. Supporting NAPA is one way that companies can make sure that the industry will stay healthy tomorrow.

NAPA is an investment that pays dividends for its members today and in the future.

GALLAGHER ASPHALT

NAPA's Diamond Achievement Commendation

- Appearance
- Operations
- Environmental
- Safety
- Regulatory Compliance
- Community Relations

NAPA
NATIONAL ASPHALT PAVEMENT ASSOCIATION

GALLAGHER ASPHALT

Earn Your Diamond Today

Illinois Diamond Winners

Arrow Road Construction
- Plant #1 Mt. Prospect
- Plant #3 Carpentersville

Central Blacktop Co., Inc.
- Quarry Materials – Hodgkins Plant

Gallagher Asphalt Corporation
- Joliet Plant
- Thornton Plant

Geneva Construction Co.
- North Aurora

K-Five Construction
- Chicago Plant
- Dupage Materials
- Lemont Facility
- Markham Facility
- Naperville Facility

Payne & Dolan, Inc.
- Fox Lake Asphalt Plant

Plote Construction, Inc.
- Allied Asphalt at Franklin Park
- Allied Asphalt at Huntley
- Allied Asphalt at West Chicago

Rockford Blacktop Construction
- Nimtz Plant

E.T. Simonds Construction
- Anna Plant
- Campbell Hill Plant
- Shetlerville Plant

Southern Illinois Materials Co., Inc.
- Asphalt Plant #1 Buncombe
- Asphalt Plant #2 Mt. Vernon

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NEXT WEEK

World of Asphalt 2007
SHOW & CONFERENCE

SHOW
MARCH 20-22, 2007
CONFERENCE
MARCH 19-22, 2007
ATLANTA, GEORGIA USA

National Center for Asphalt Technology
NCAT
AUBURN UNIVERSITY

NAPA
NATIONAL ASPHALT PAVEMENT ASSOCIATION

GALLAGHER ASPHALT