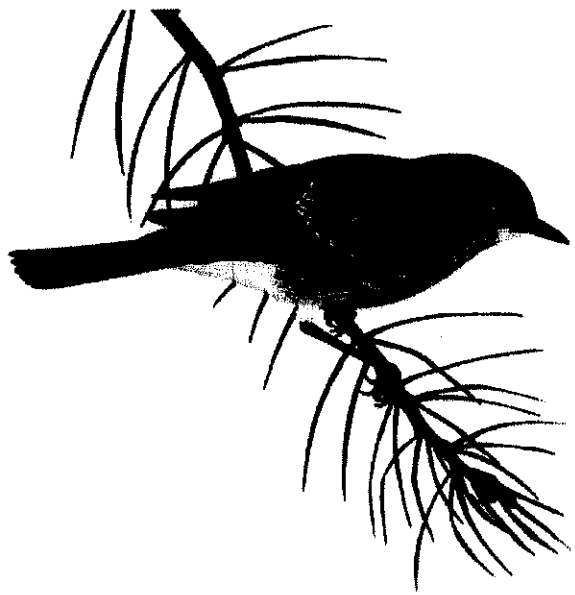
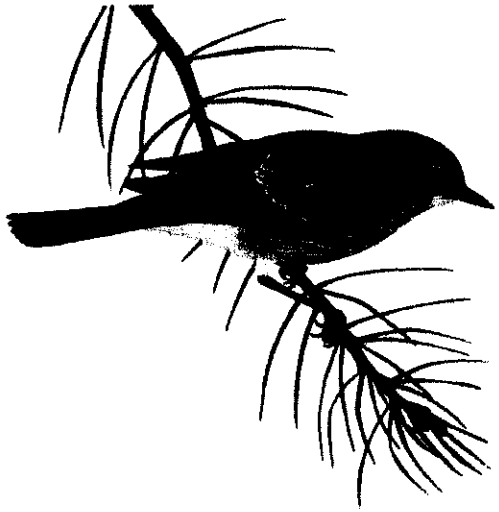
Kirtland Products, LLC

1 Altair Drive, Boyne City, MI 49712 (231) 582-4470

Proposal for



Kirtland Wood Pellet Manufacturing



Kirtland Products, LLC

Kirtland Wood Pellet Manufacturing

Introduction

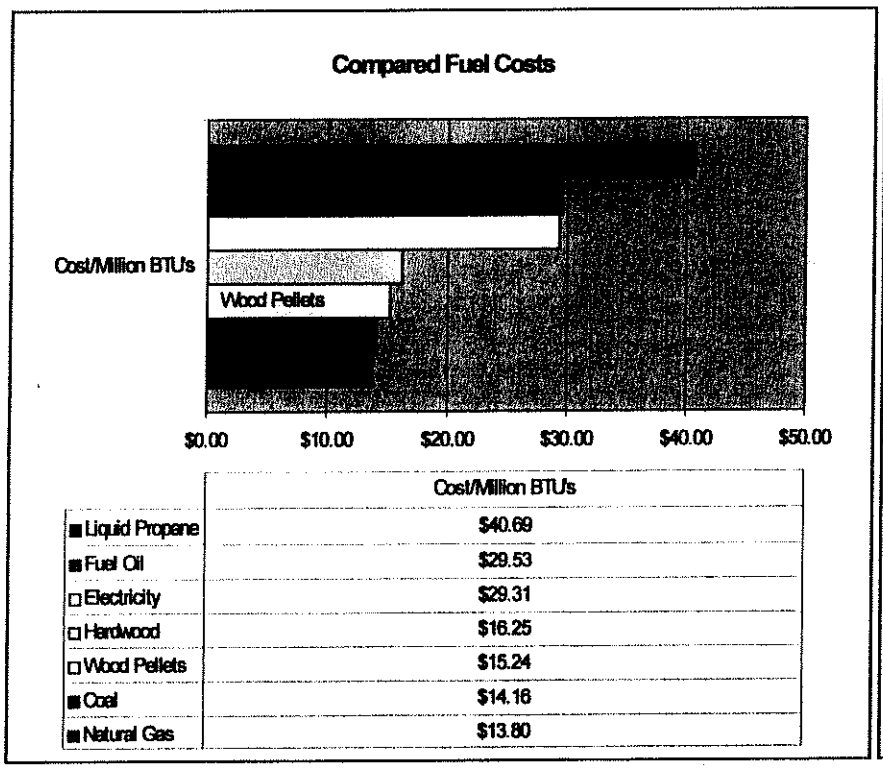
One doesn't have to look far to find someone who is struggling to make ends meet in today's economy. Perhaps gazing into the mirror is far enough. Our community has recently lost over 100 jobs. The state of Michigan is seeing economic conditions that are reminiscent of our grandparents' time. Our nation is at war. We have realized that our dependency on foreign oil has created a financial burden for Americans across the country.

It is difficult to identify products and businesses that are not affected by the significant increases in oil prices. Many products we buy are made of plastic, packaged in plastic containers, and delivered in trucks burning diesel fuel. The food we eat is harvested with tractors burning fuel. Many of our homes are heated with propane, fuel oil, natural gas, or electricity (which may have been produced by burning coal or natural gas). Painting an ugly picture is not difficult.

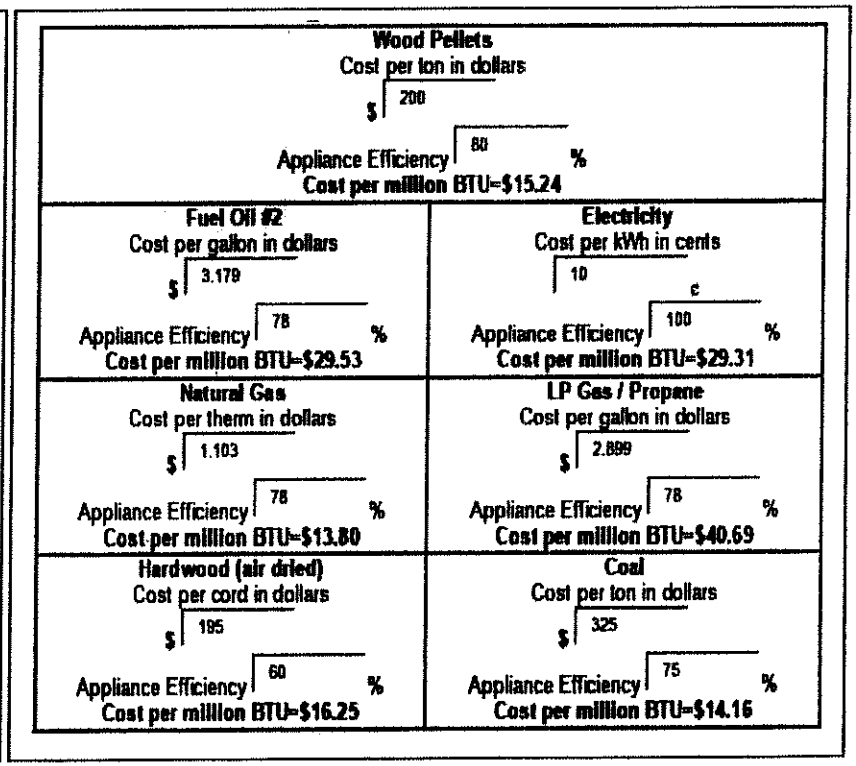
What can we do? We can sit back and wait to see what happens next. Or we can take action and do something about it. At Kirtland Products, LLC, we feel the latter is the most appropriate course of action. Say hello to Kirtland Wood Pellets.

Home Heating

As Americans, we have many options for heating our homes. Some of the more popular options are; liquid propane, fuel oil, natural gas, hardwood, coal, and wood pellets. Some of us have a great number of options. Others are limited by the resources in our area. The choice we make may have a significant impact on our pocket books. Below is a snapshot of home heating costs based on Fall 2008 Northern Michigan prices:



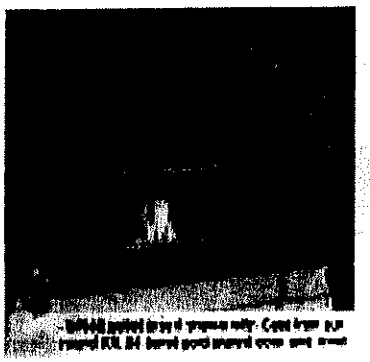
	Cost/Million BTUs
Liquid Propane	$40.69
Fuel Oil	$29.53
Electricity	$29.31
Hardwood	$16.25
Wood Pellets	$15.24
Coal	$14.16
Natural Gas	$13.80



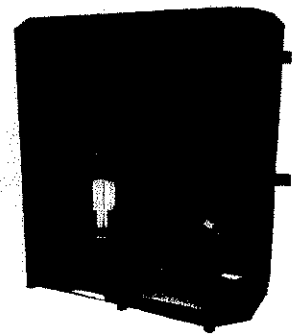
Appliance Efficiency Source: Pellet Fuels Institute, Wood Pellet Cost Source: Matelski Lumber, Fuel Oil Cost Source: Derrer Oil, Electricity Cost Source: Great Lakes Energy, Natural Gas Cost Source: DTE, LP Gas Cost Source: Petoskey Propane, Hardwood Cost Source: Local Producers, Coal Cost Source: KW Feeds, Farwell

Wood Pellet Heat

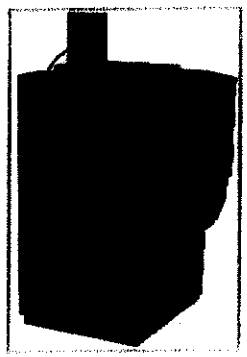
Wood pellet fuel provides clean, inexpensive, efficient heat for many homes across the country. There are a variety of stove styles including fireplace inserts, outside pellet burning boilers, pellet fuel furnaces, and free standing pellet stoves:



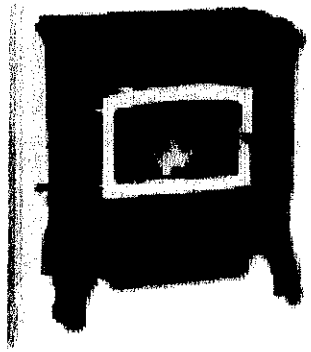
Pellet Fireplace Insert



Pellet Fuel Boiler



Pellet Fuel Furnace



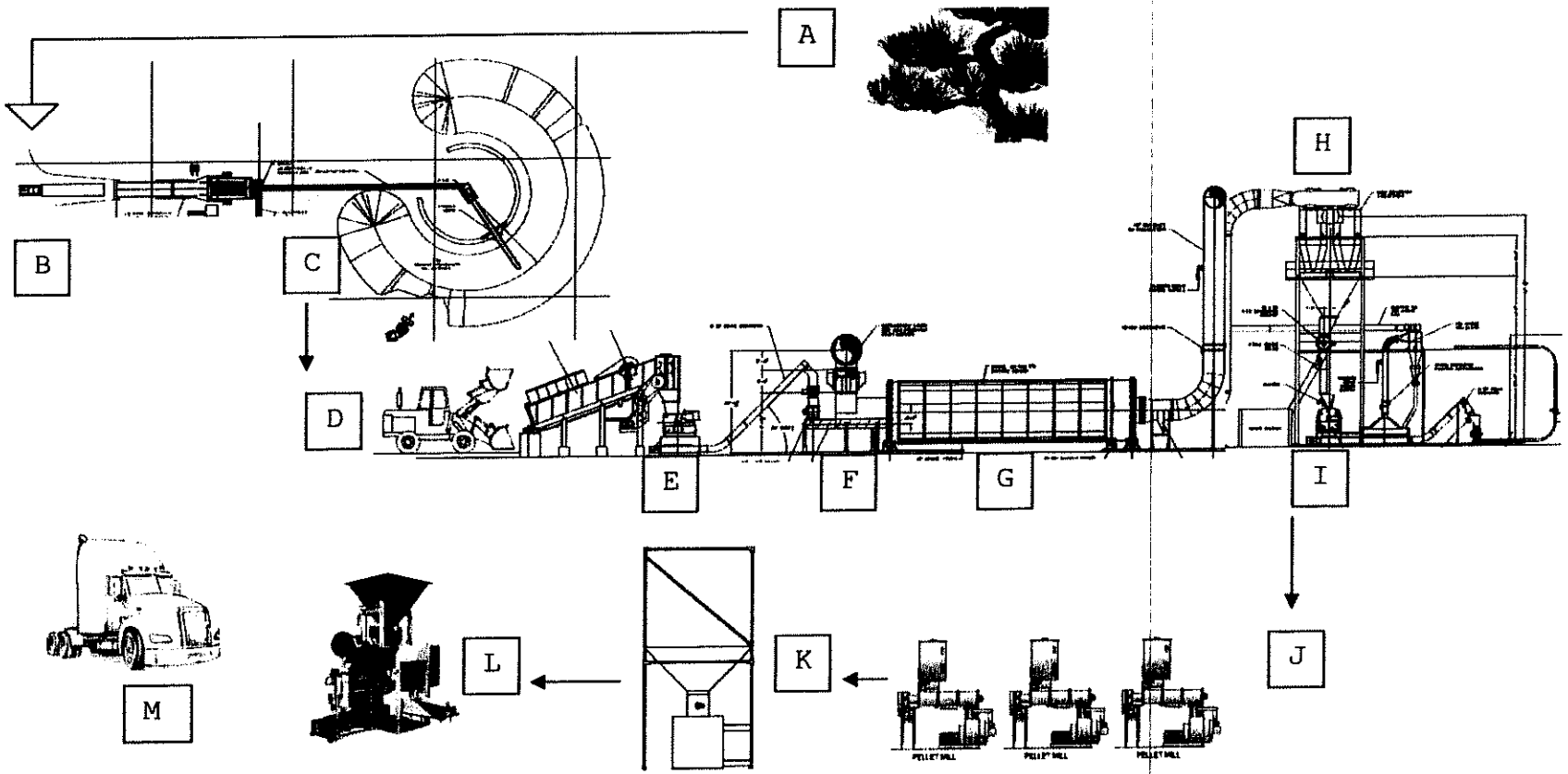
Free Standing Pellet Stove

Natural Resources

Following recommendations from the Michigan Department of Natural Resources, we intend to primarily use Jack Pine as the feedstock for the Kirtland Wood Pellets. Northern Michigan is home to very mature stands of Jack Pine. Jack Pine only grows in Canada and the Northern Great Lakes region. Because of the low density of Jack Pine, it is a poor choice for conventional wood stoves. After it is compressed into wood pellets, Jack Pine actually produces more BTU's per pound than hardwood. Jack Pine is not a straight growing tree. It is also cursed with having low tensile and compressive strength, making it a bad choice for lumber. To put it simply, there is a very limited market for Jack Pine. This creates a problem for the DNR.

Kirtland's Warbler

Kirtland's Warblers are found only in ten counties on Michigan's northern Lower Peninsula and four counties in the Upper Peninsula. Kirtland's Warblers nest only on the ground near the lower branches of large stands of young jack pines that are five to 20 feet tall and six to 22 years old. The tree's age is crucial. The birds need low branches near the ground to help conceal their nests. Before the trees are six years old, the lower branches are not large enough to hide the nest. After 15 years, these lower branches begin to die. Kirtland's warblers will not nest without young jack pines, and the Warbler's population dwindled dramatically before scientists realized that forest fires were actually good for Kirtland's Warblers. In the absence of forest fires, the Jack Pine forests have become mature, thus dwindling the habitat of the Kirtland's Warbler. Kirtland Wood Pellets will be made from mature Jack Pine. The harvest of mature Jack Pine will allow the young growth to flourish, thus providing a larger habitat for the Kirtland's Warbler.



Wood Pellet Manufacturing

A. Timber producers harvest the tree by selecting only mature Jack Pine. The tree is then delimbed, debarked and chipped in the woods. The limbs, bark and needles are collected from the woods and sold to local energy companies as biomass fuel. The clean chips will be trucked into Boyne City in covered box trailers (20 trucks/day).

B. The chips will be unloaded outside of the manufacturing facility by use of a hydraulic truck dump.

C. The chips will then be conveyed into a radial stacker. The purpose of the radial stacker is to distribute the various densities of wood chips and saw dust, creating a consistent dispersion of product into the pelleting operation.

D. The chips are loaded with a front end loader into a conveyor which distributes the chips for grinding.

E. The chips are then conveyed into a hammer mill for course grinding.

F. Biomass fuel is used in the burner for drying.

G. The ground wood chips are passed through the dryer three times before exiting.

H. Once dried, these chips are sent through a cyclone to separate the wood from the air. A small percentage of the chips are fed back to the biomass burner.

I. The chips are sent through another mill for fine grinding. At this point the wood is in a state called wood meal.

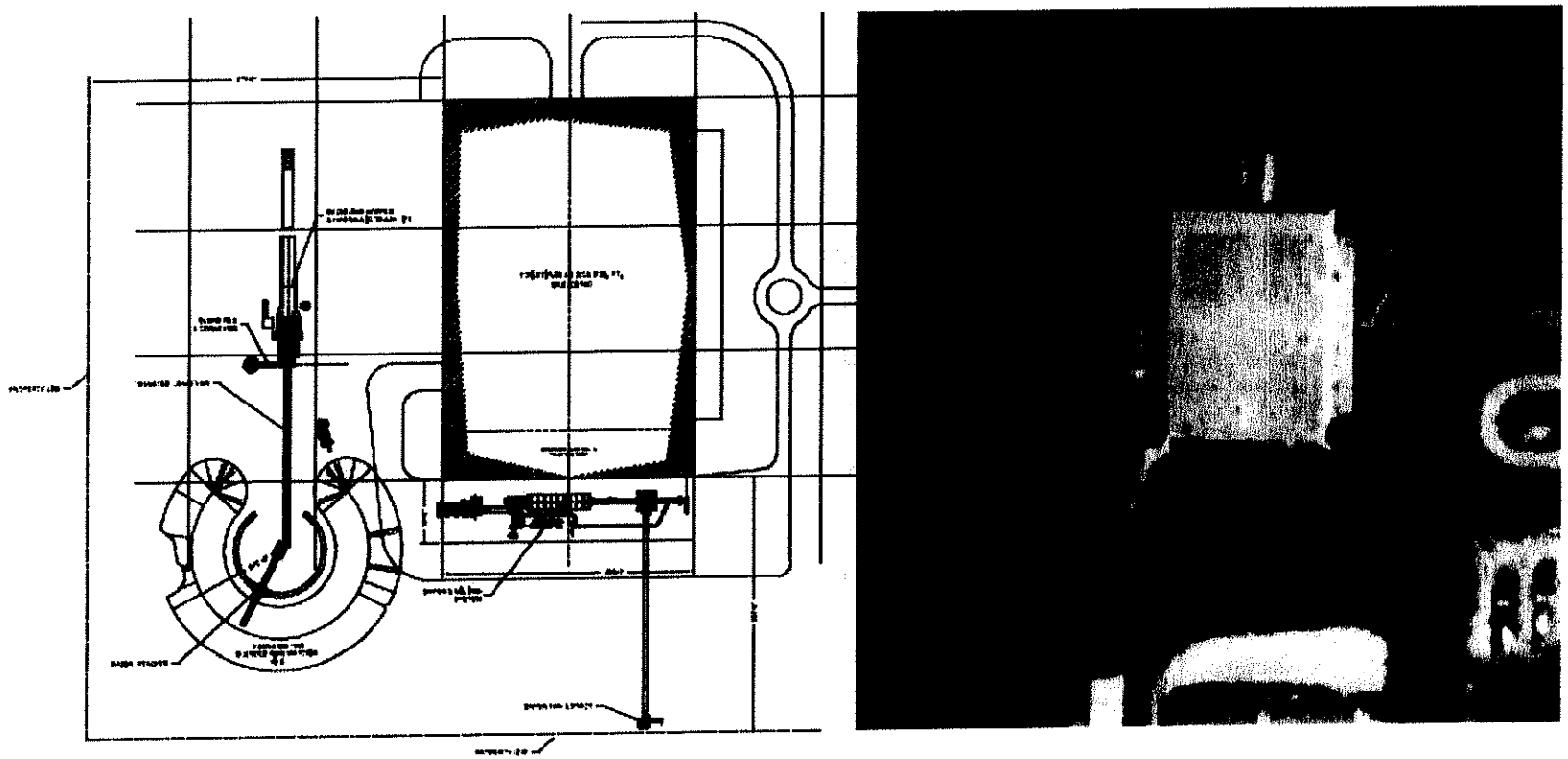
J. The heated wood meal is transferred into the pellet mills where pellets are formed by pressing the wood meal through ¼" dies, similar to the way a grist mill presses wheat into flour. But, instead of grinding grain into flour, a pellet mill presses wood through hundreds of small holes (dies).

K. The hot pellets, held together by the wood's own lignin, are screened to remove fines. Then, the wood chips are transferred to a cooling hopper.

L. The cooled pellets are then placed into 40 pound bags. These bags are sealed and palletized, 50 bags to the pallet; or 2000 pounds to the pallet.

M. Pallets are trucked to retail stores for market distribution (14 trucks/day).

Site Plan



→ Inbound trucks will enter from the East via Altair Drive. The trucks will drive around the North side of the building, to the West side. Trucks are unloaded using a hydraulic truck dumper (20 trucks/day). Empty trailers exit via Altair Drive.

← Outbound trucks will be loaded at the North dock. These trucks will enter and exit using Altair Drive (14 trucks/day).

CO2 Emissions

How many lbs. of carbon emissions can be saved by burning one ton of wood pellets

- if you heat with electricity you will save 3323 lbs.
- if you heat with oil you will save 943 lbs.
- if you heat with lpg you will save 709 lbs.
- if you heat with natural gas you will save 549 lbs.

The average household would use 2.67 tons of pellets, saving 8872 lbs. of carbon emissions if you heat with electricity, 2518 lbs. if you heat with oil, 1893 lbs. if you heat with LPG, and 1466 lbs. if you heat with natural gas.

If every household converted to wood pellet (or equivalent renewable source) for heating, the total carbon emissions of the United States would drop by more than 8%.

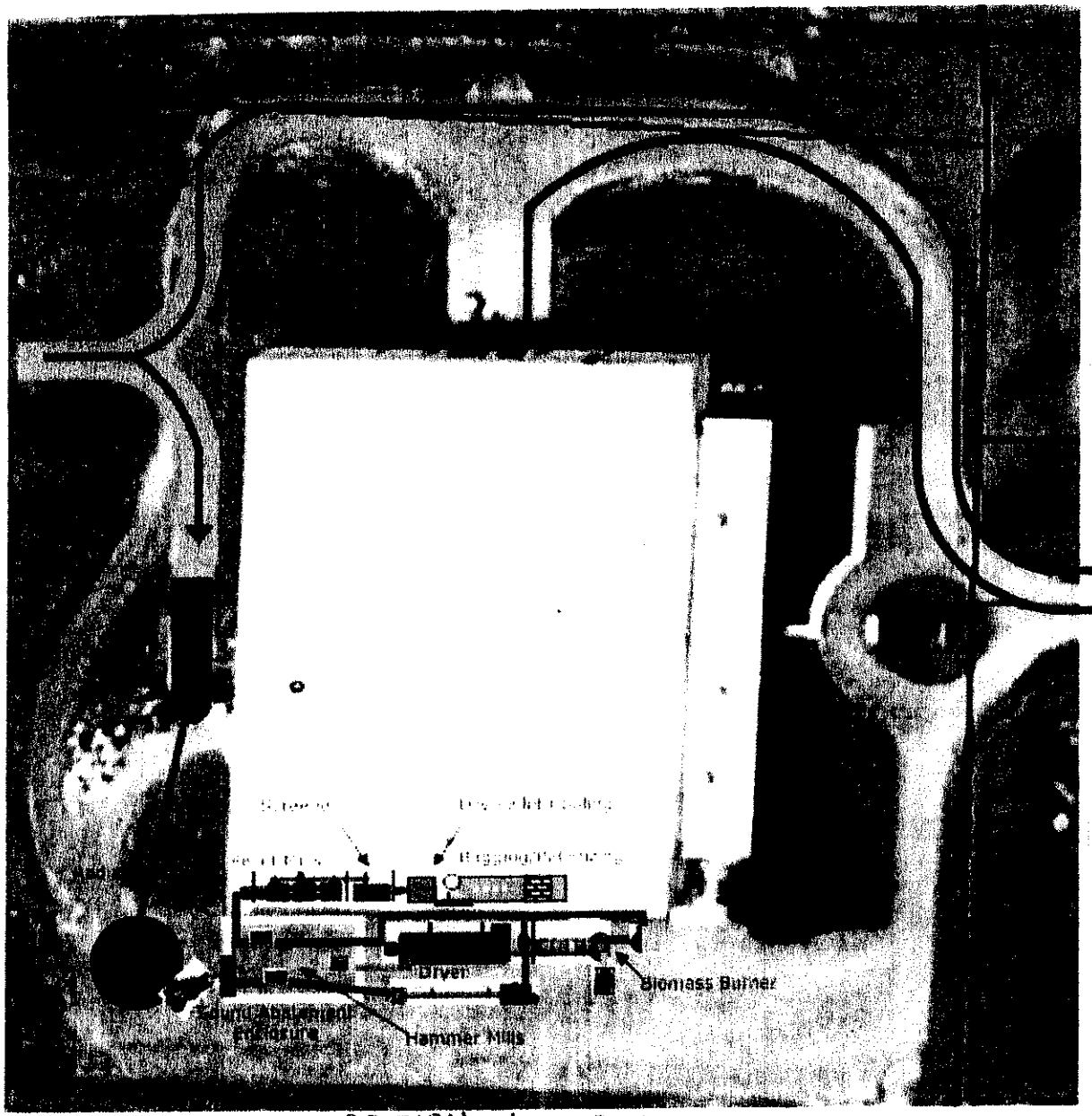
GLOBAL WARMING? You "can" do your part.

Data taken from Dr. Jerry Whitfield's talk "Reduction in Greenhouse Gases Using Biomass Pellets for Residential Space Heating", 6/3/98

Healthy Vibrant Diverse Manufacturing Community

It is our vision to help Boyne regain its standing as a healthy, vibrant, diverse, manufacturing community.

Thank you!



OPTION 1 P.1-1

Kirtland Wood Pellets

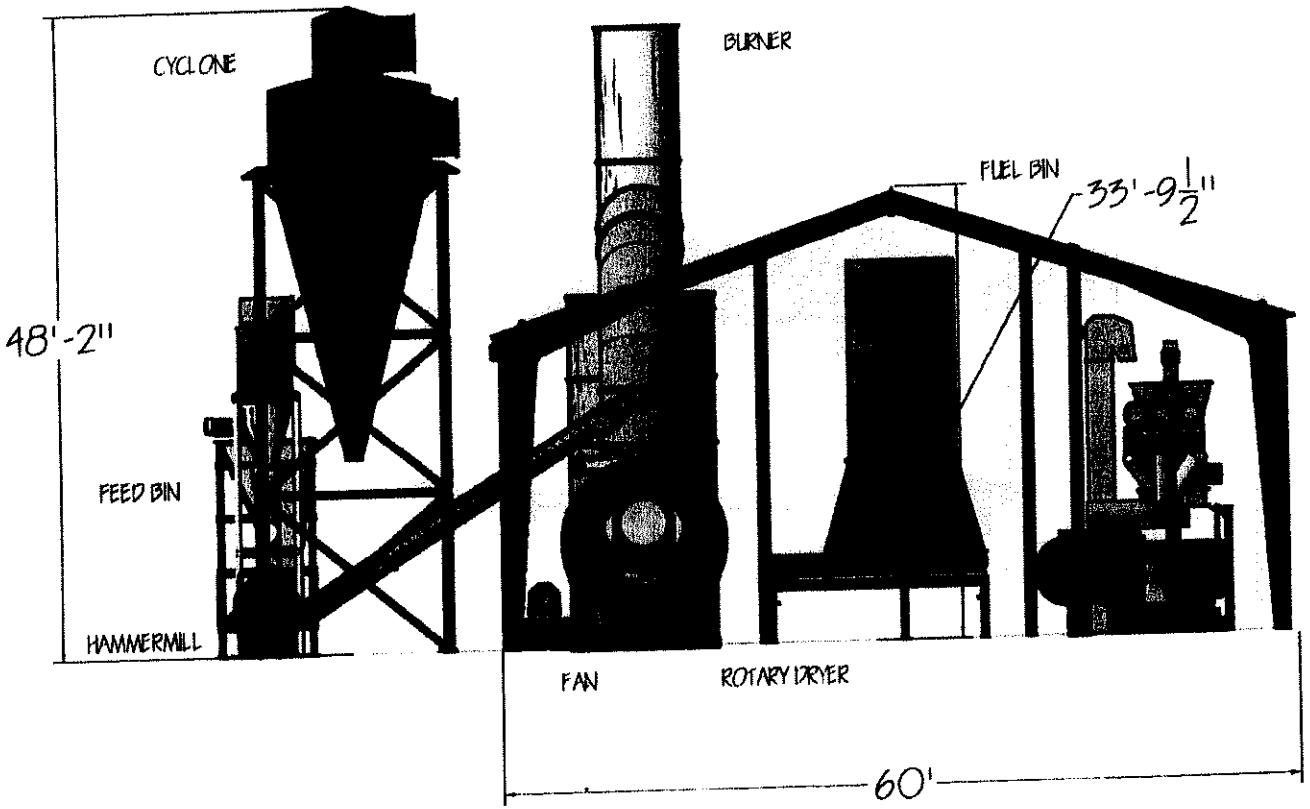
Incoming 20 Trucks/Day

Outgoing 14 Trucks/Day

Wood Pellet Manufacturing Site Plan

Hours of Operation

7:00AM Monday thru 7:00AM Saturday



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S.S.D. WESTERN L.L.C.

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CONSTRUCTION MANAGEMENT
FEASIBILITY STUDIES
TECHNOLOGY SELECTION
PROCESS DESIGN
EQUIPMENT SPECIFICATIONS
TECHNICAL ASSISTANCE
PELLETIZING CONSULTANTS

ISSUE	DATE
1	03-08

ARIZONA DRAWING

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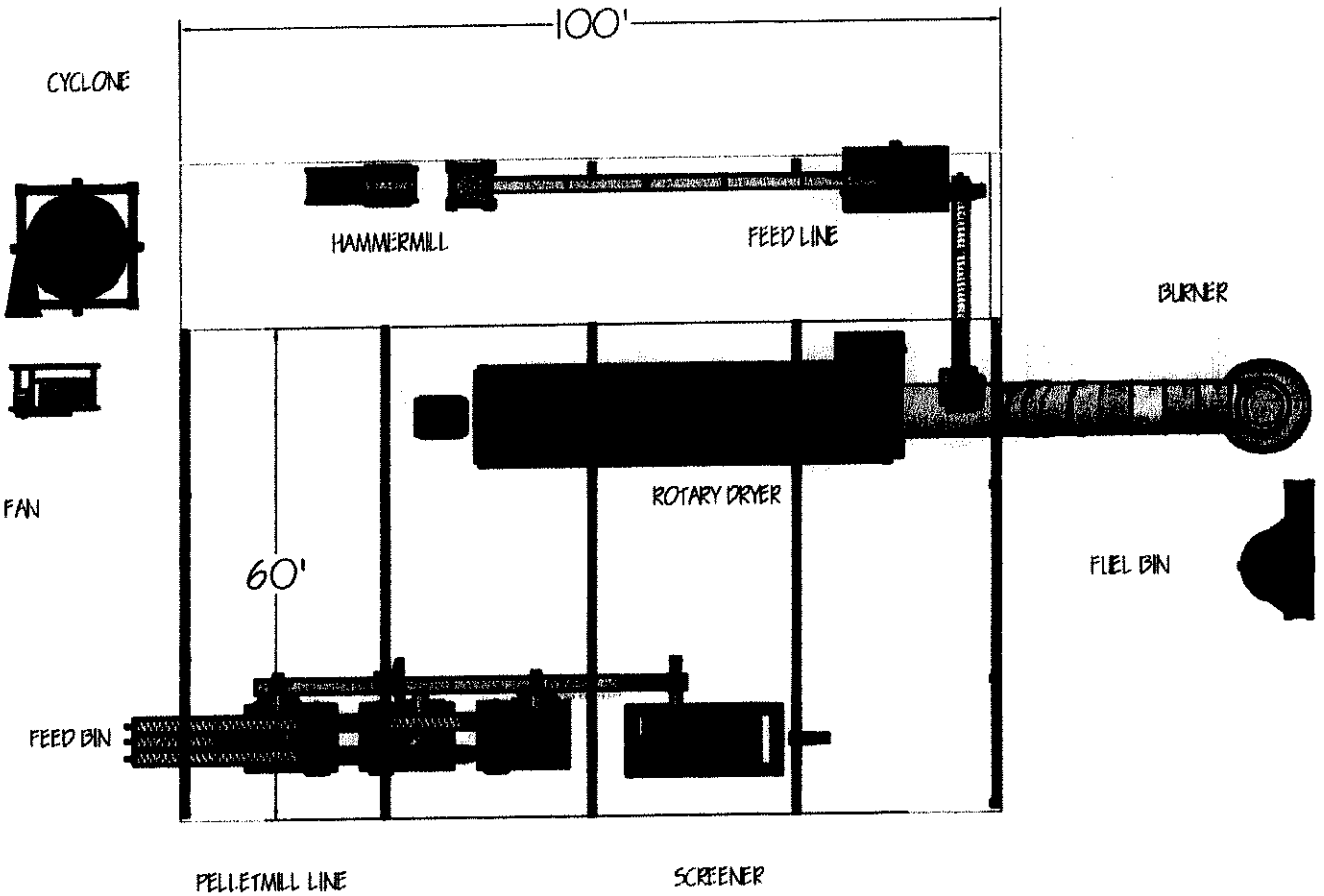
HAMMERMILL DESIGN

EAST

CA-4



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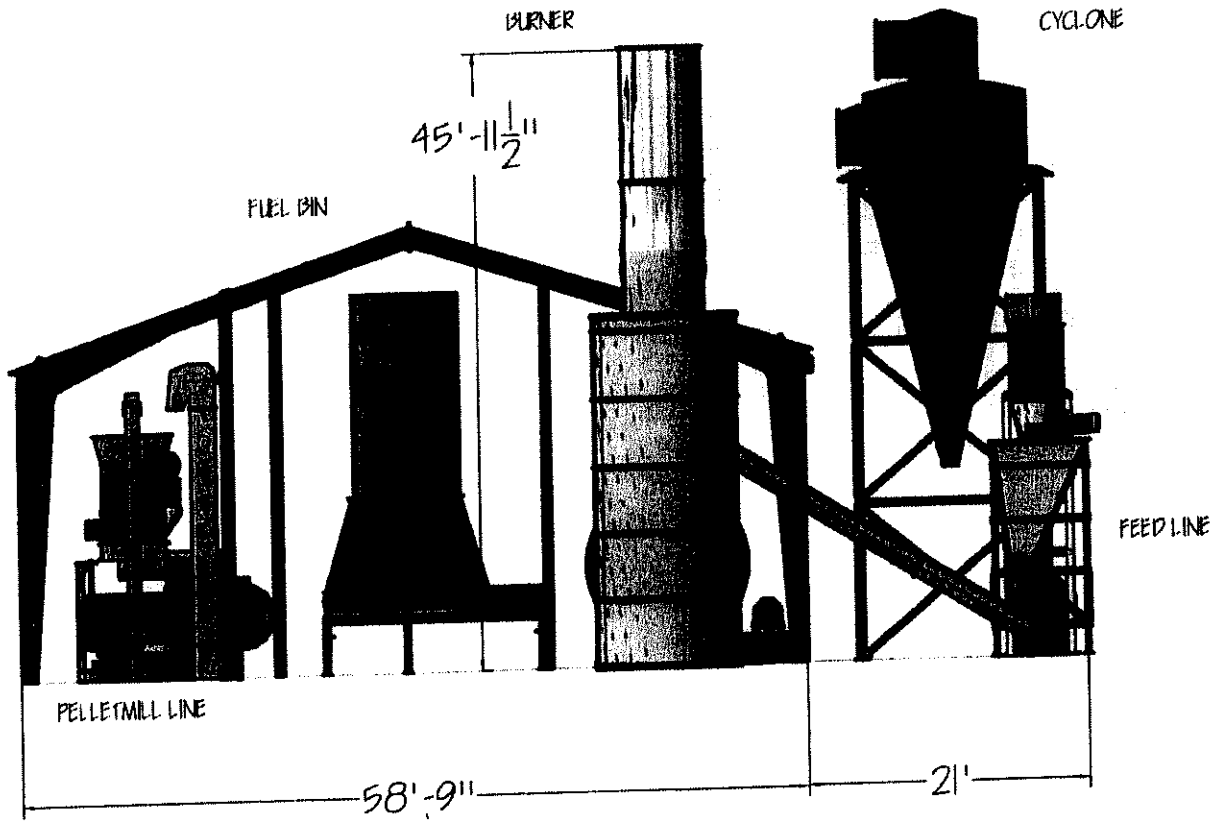
PLAN VIEW

GA-1



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HOWARD HARPER ROAD
SILOAM SPRINGS, AR 72761
479-228-0555
479-228-0560 FAX
ROTARY DRYER & PELLETIZING CONSULTANTS

REVISIONS		
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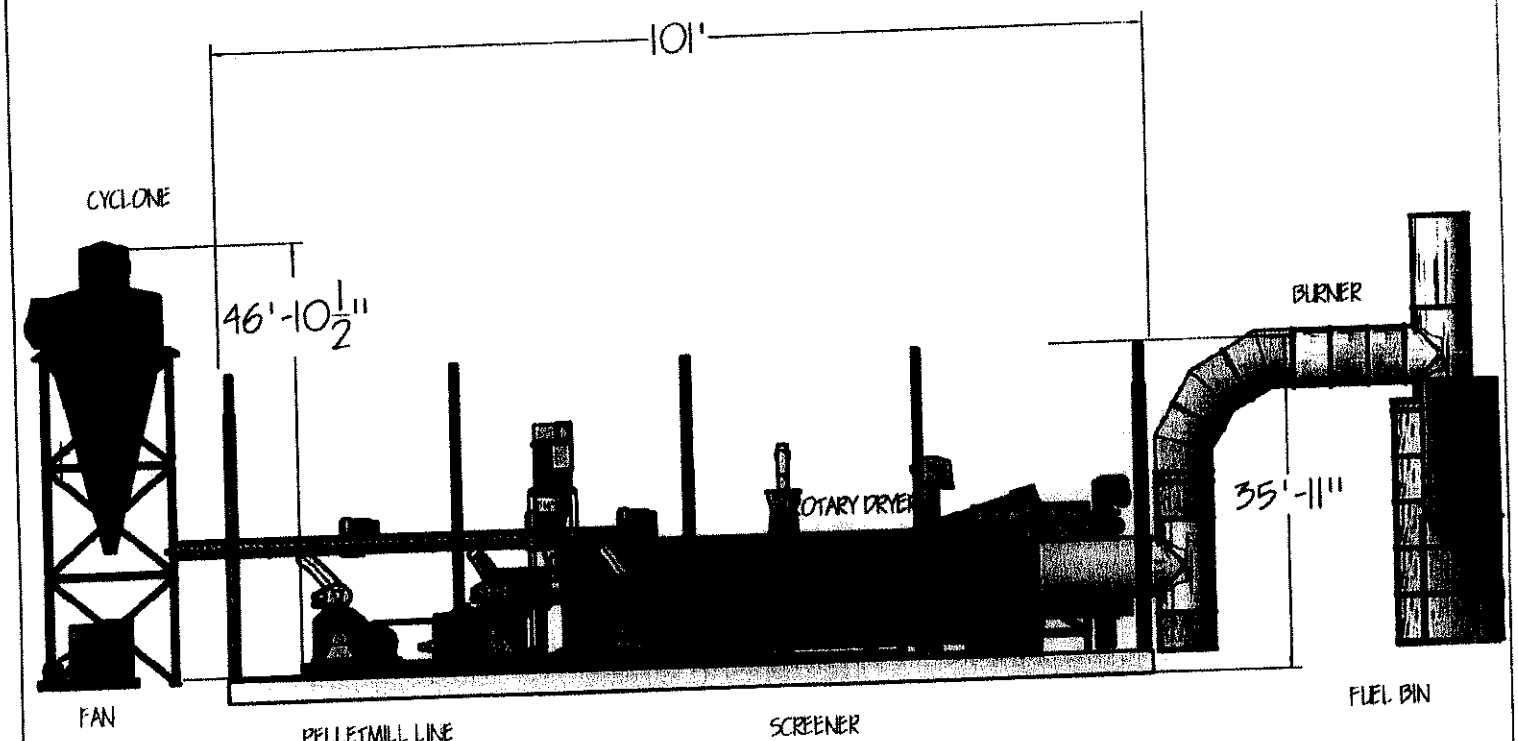
CHK'D BY:	V
COMMENCED:	5-31-05

INCOMPLETE LAYOUT
UNENGINEERED DESIGN

WEST

DWG GA-5



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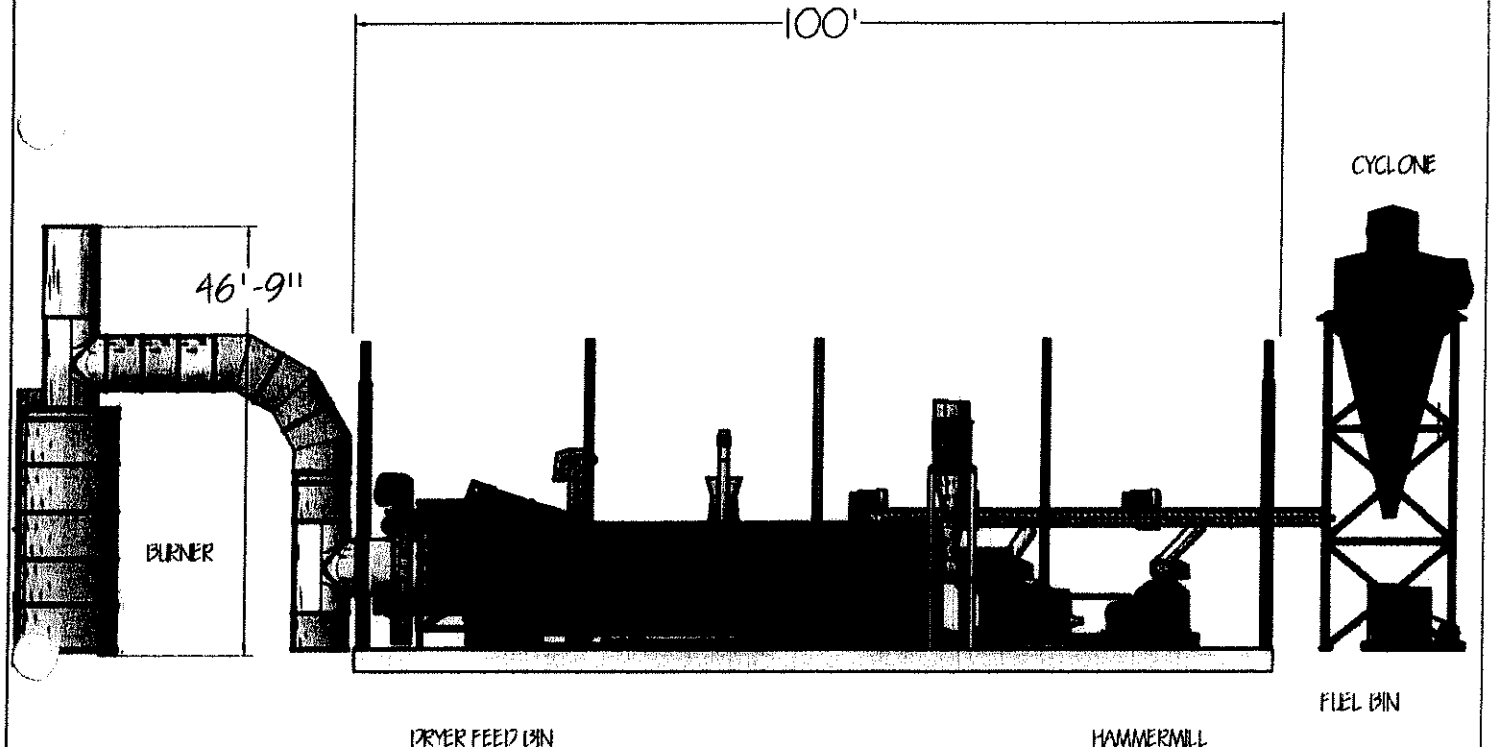
NORTH ELEVATION

GA-2



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15340 ARTOR ROAD
SLOAN SPRINGS, AR 72761
479-238-0135
479-238-0146 FAX

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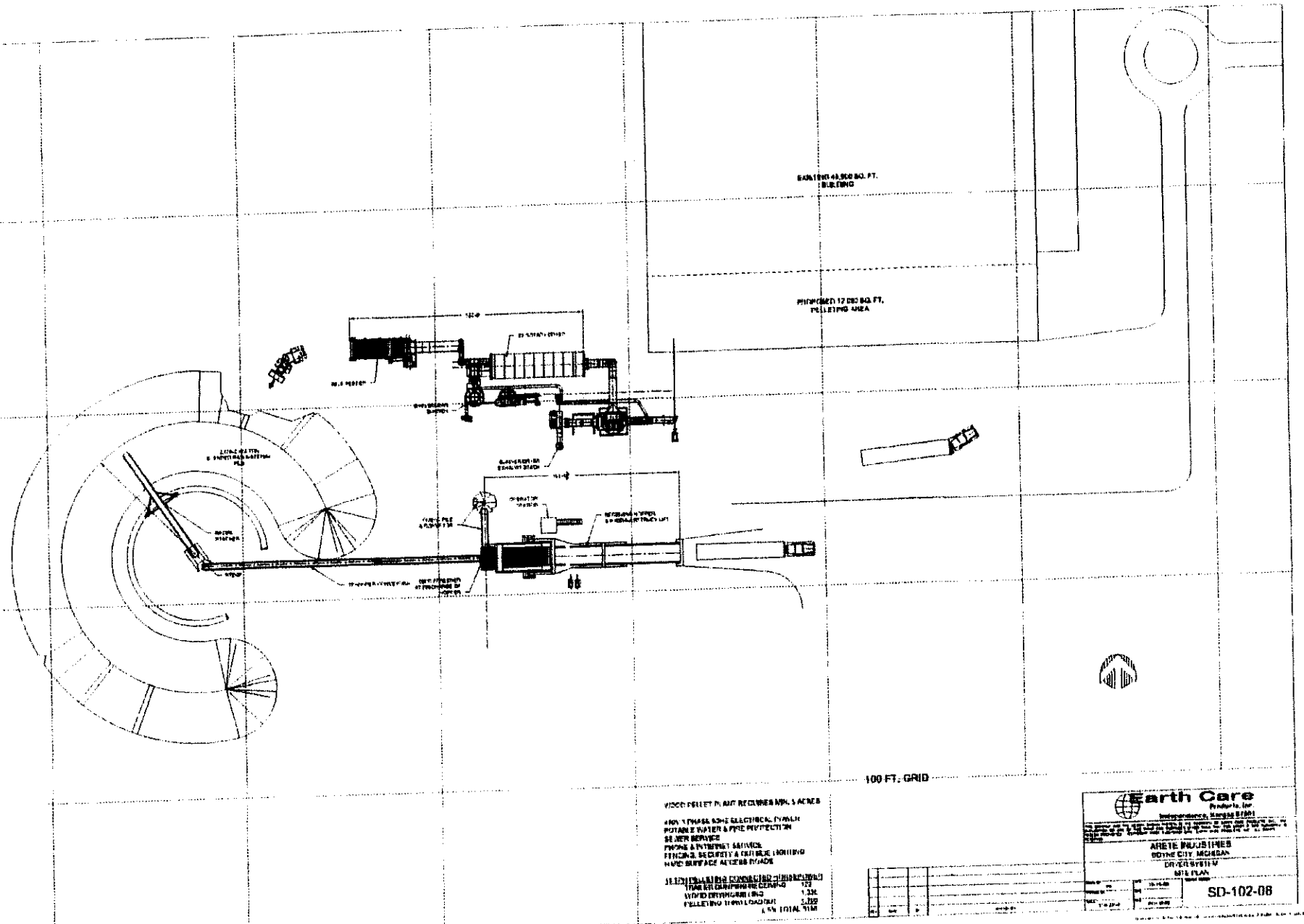
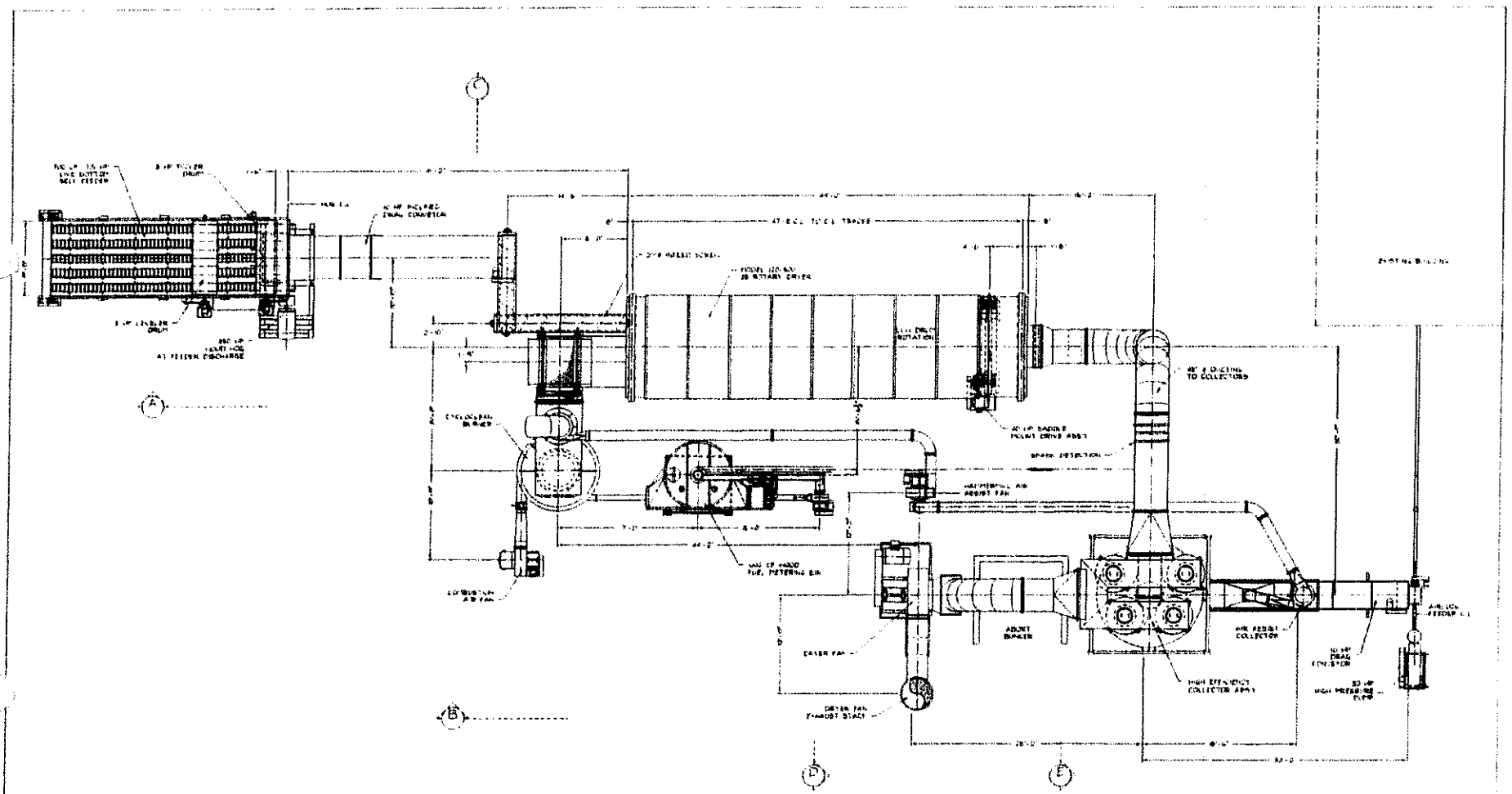
GA-3



OPTION 2 - P.2-1

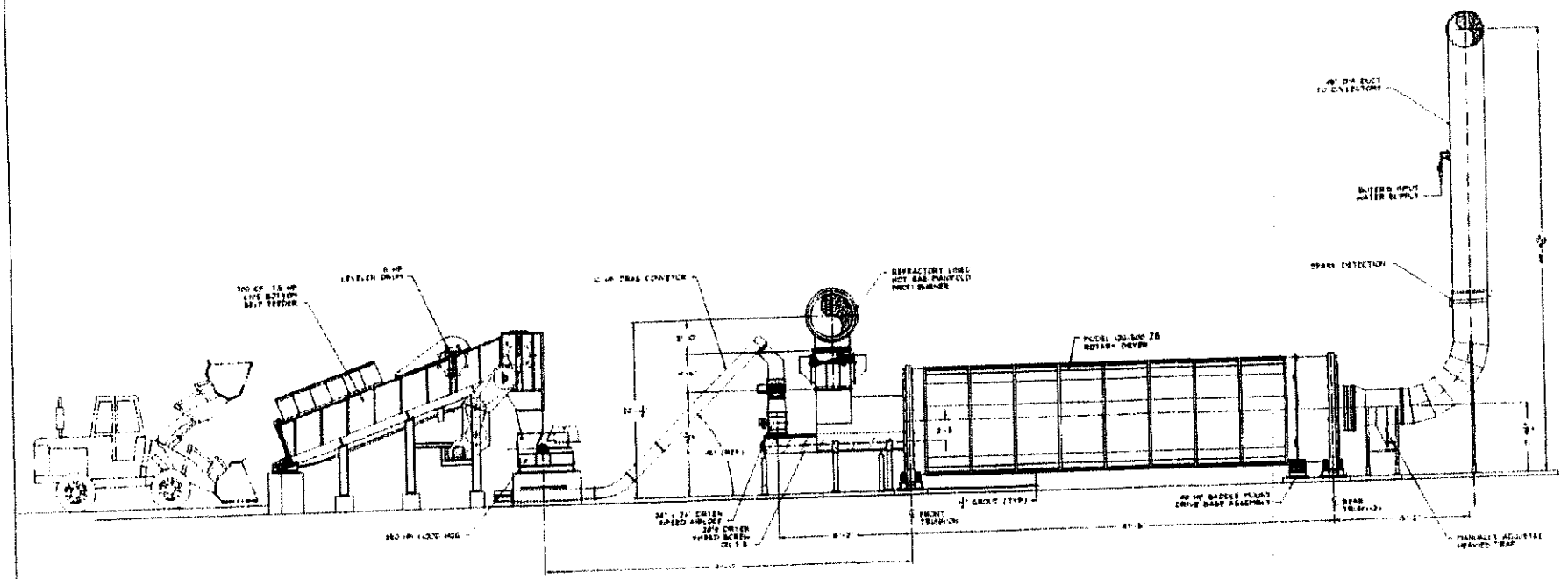


Earth Care
Products, Inc.

ARETE INDUSTRIES
BOYNE CITY, MICHIGAN
WOOD DRYER SYSTEM
PLAN

SD-103-08

P.2-2

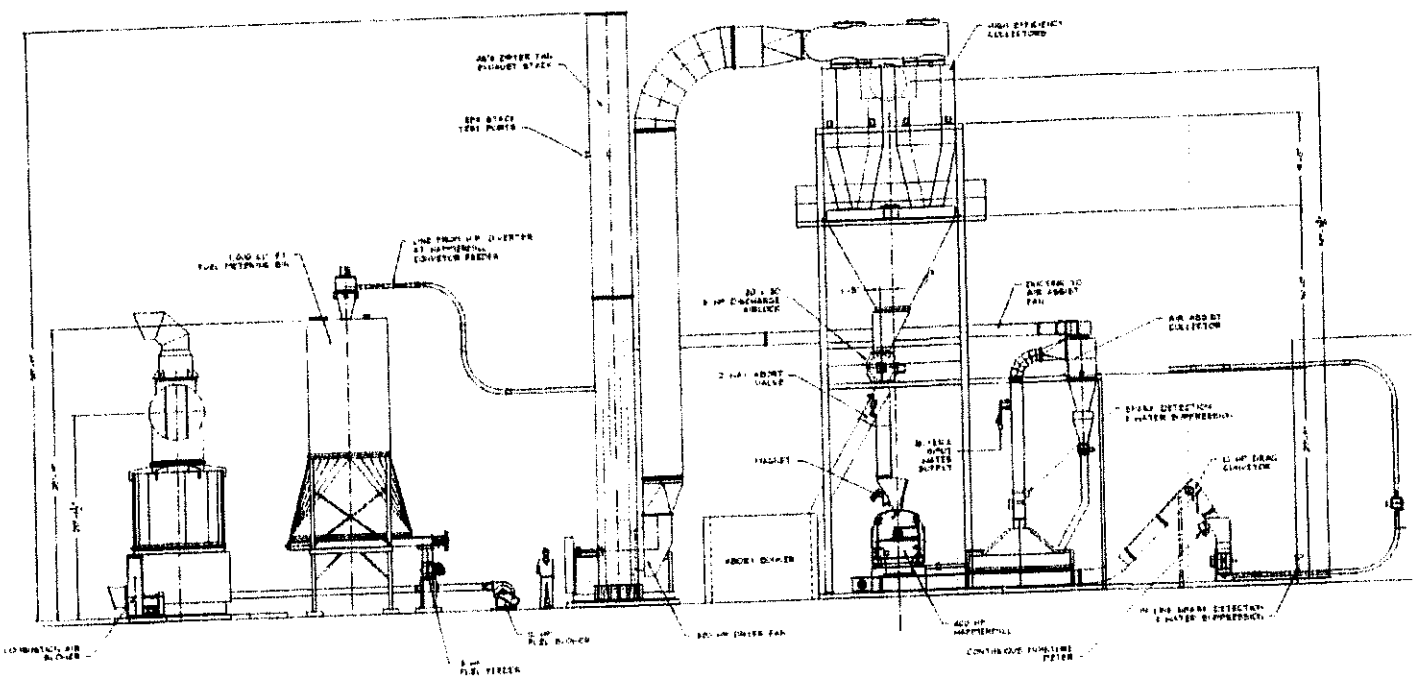


ELEVATION (A)

Earth Care
Products Inc.
Independence, Kansas 67301

ARETE INDUSTRIES
BOYNE CITY, MICHIGAN
WOOD DRYER SYSTEM
ELEVATIONS

SD-104-08



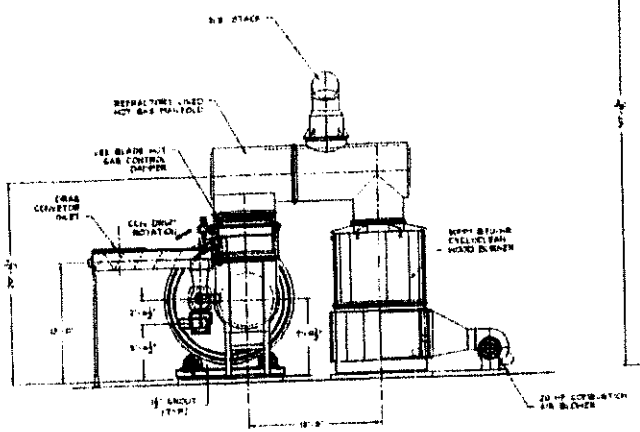
ELEVATION (B)

Earth Care
Products, Inc.
Independence, Kansas 67301

ARIETE INDUSTRIES
ROYAL CITY, MICHIGAN
WOOD DRYER SYSTEM
ELEVATIONS

SD-105-08

P 2 4



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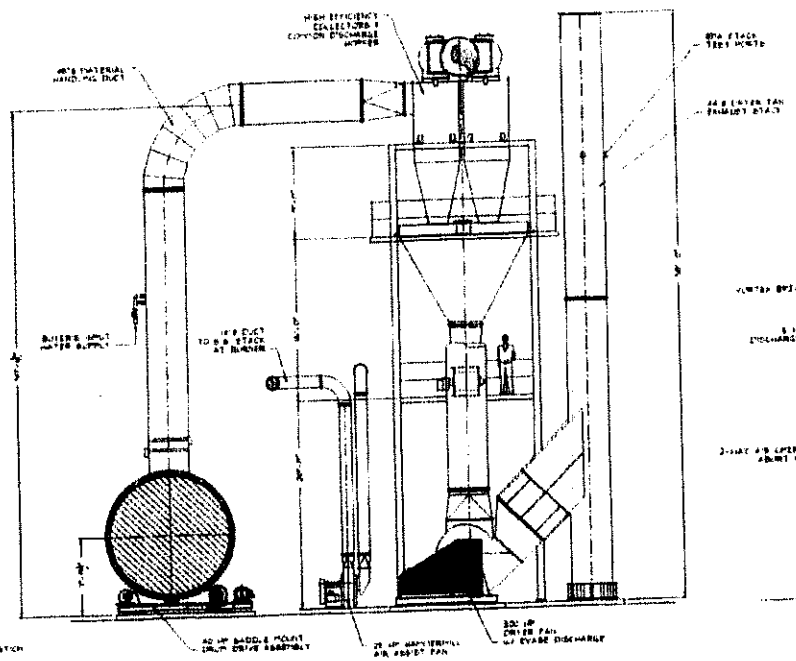

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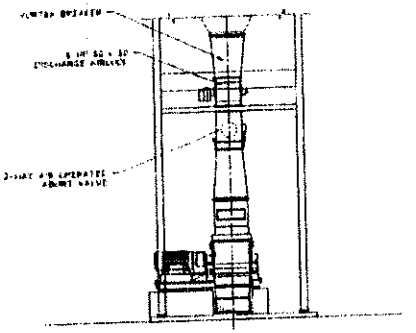


ELEVATION (E)

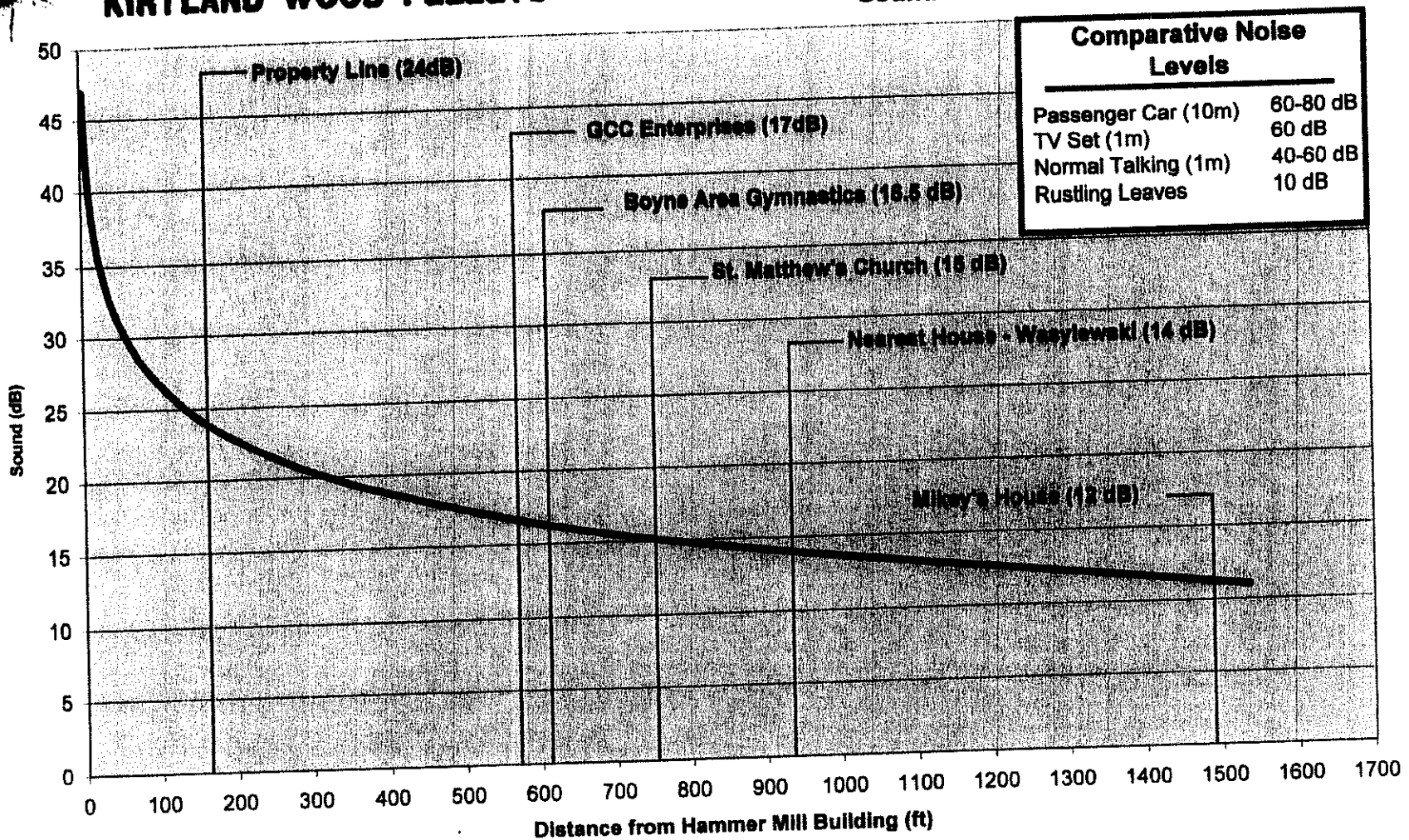
Earth Care
Products, Inc.
Independence, Kansas 67301

ARETE INDUSTRIES
BOYNE CITY, MICHIGAN
WOOD DRYER SYSTEM
ELEVATIONS

SD-106-08

KIRTLAND WOOD PELLETS

Sound Travel from Hammer Mill Building

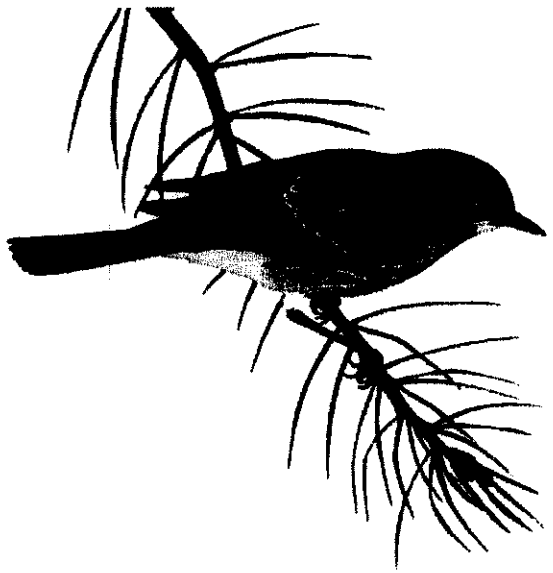


Comparative Noise Levels	
Passenger Car (10m)	60-80 dB
TV Set (1m)	60 dB
Normal Talking (1m)	40-60 dB
Rustling Leaves	10 dB

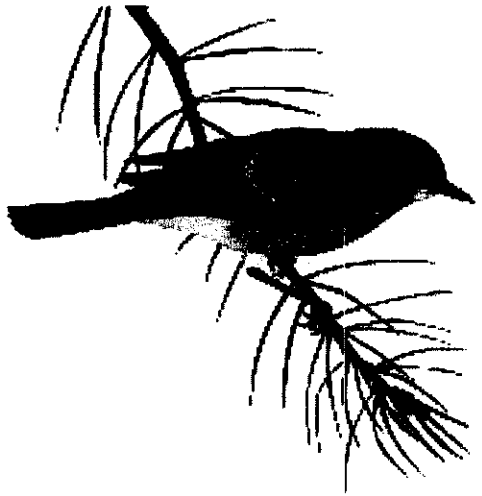
KIRTLAND PRODUCTS, LLC

DIVISION OF LMT ENTERPRISES, LLC

1 Altair Drive, Boyne City, MI 49712 (231) 582-4470



KIRTLAND WOOD PELLET MANUFACTURING



KIRTLAND PRODUCTS, LLC

KIRTLAND WOOD PELLET MANUFACTURING

Introduction

One year ago, the members of Kirtland Products, LLC; Leon Tupper, Tom Monley, and Mike Lange; introduced the Boyne City Planning and Zoning Commission to the Kirtland Wood Pellet Manufacturing Project. In the project proposal, Kirtland addressed its plans to build a wood pellet manufacturing facility in the Boyne City Industrial Park, at 1 Altair Drive, Boyne City, MI 49712.

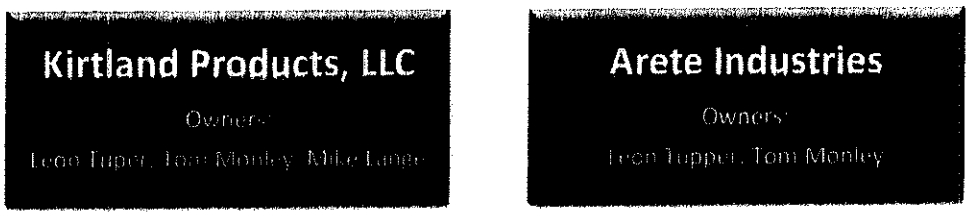
As a result of this meeting, the Board unanimously approved Kirtland Products' Conditional Use application. The board also granted conditional Site Plan approval based on the drawings presented in November 2008. The follow-up items resulting from this meeting were landscaping, sound abatement, grading and storm water management, exterior lighting and traffic flow.

Since November 2008, Kirtland Products' plan to manufacture wood fuel pellets is still strong. The mechanisms by which this will be accomplished have changed. The following information will detail the changes and address the open questions.

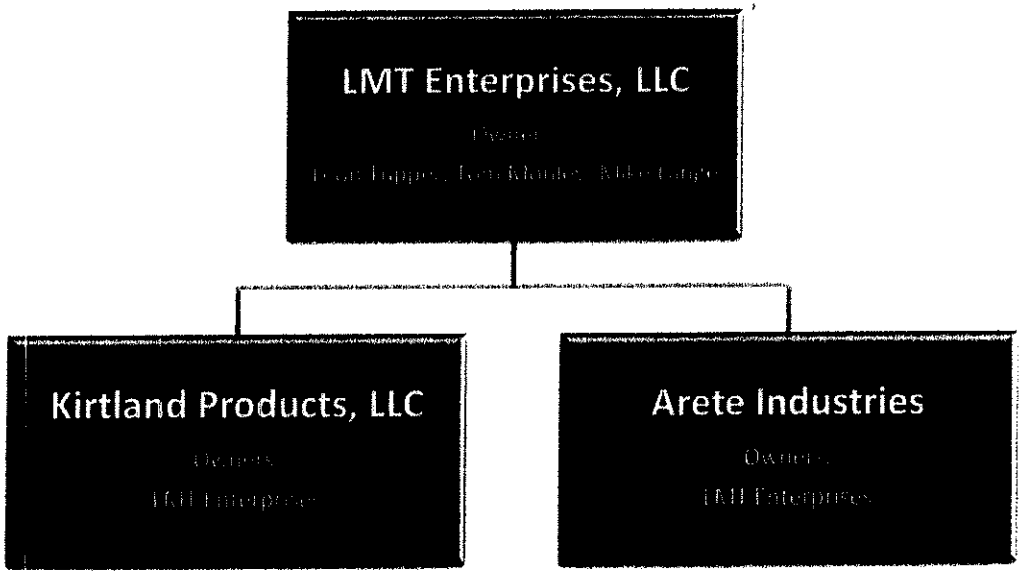
Company Structure

Kirtland Products, LLC was developed to design and build a wood pellet facility in Northern Michigan. This operation will operate at 1 Altair Drive in Boyne City's industrial park. This facility is also the home of Areté Industries. The members of Kirtland Products have made the decision to incorporate these two companies under one holding company, LMT Enterprises, LLC. The illustrations below show the old and new structure:

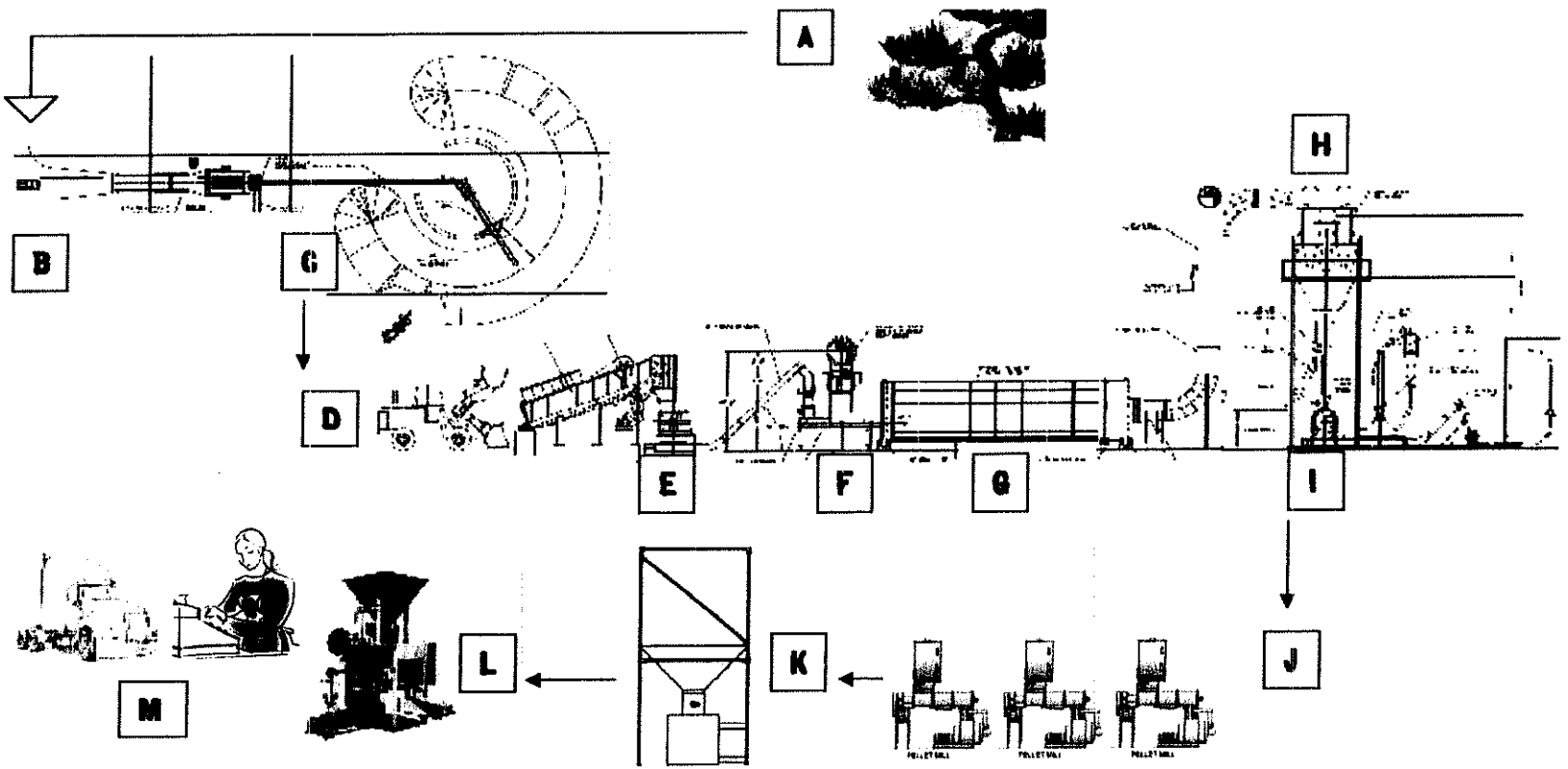
Old Structure



New Structure



Pellet Manufacturing Process



Pellet Manufacturing Process

A. Timber producers harvest the tree by selecting only mature Jack Pine. The tree is then delimbed, debarked and chipped in the woods. The limbs, bark and needles are collected from the woods and sold to local energy companies as biomass fuel. The clean chips will be trucked into Boyne City in covered box trailers; 232 tons/day max. (10 trucks/day).

B. The chips will be unloaded outside of the manufacturing facility by use of a hydraulic truck dump.

C. The chips will then be conveyed into a stacker.

D. The chips are loaded with a front end loader into a two conveyors separated by species type. These conveyors are proportional loaders designed to meter the wood species according to the process recipe.

E. The chips are then conveyed into a hammer mill for course grinding.

F. Biomass fuel is used in the burner for drying.

G. The ground wood chips are passed through the rotary drum dryer.

H. Once dried, these chips are sent through a cyclone to separate the wood from the air. A small percentage of the chips are fed back to the biomass burner.

I. The chips are sent through another mill for fine grinding. At this point the wood is in a state called wood meal.

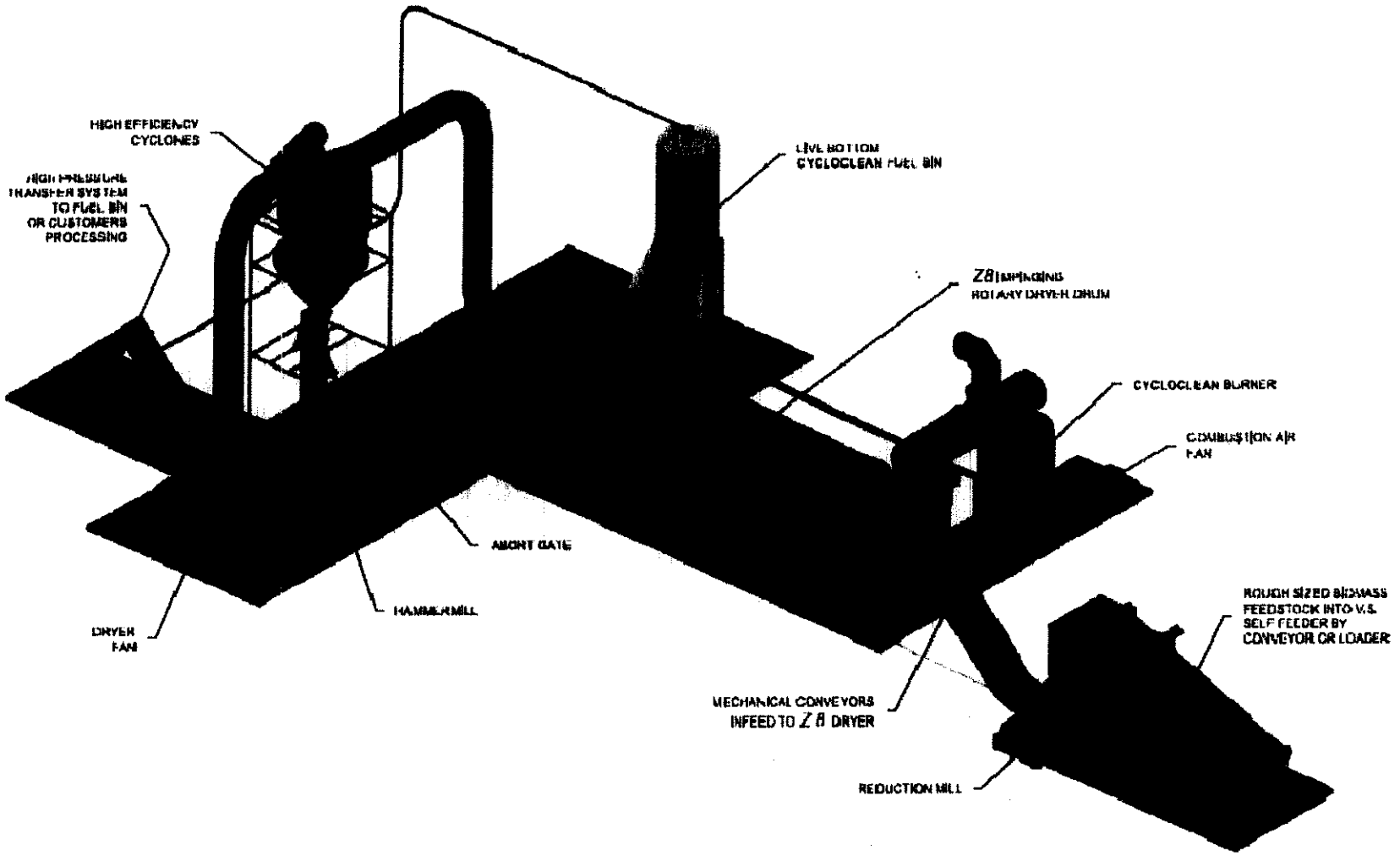
J. The heated wood meal is transferred into the pellet mills where pellets are formed by pressing the wood meal through ¼" dies.

K. The hot pellets, held together by the wood's own lignin, are screened to remove fines. Then, the wood chips are transferred to a cooling hopper.

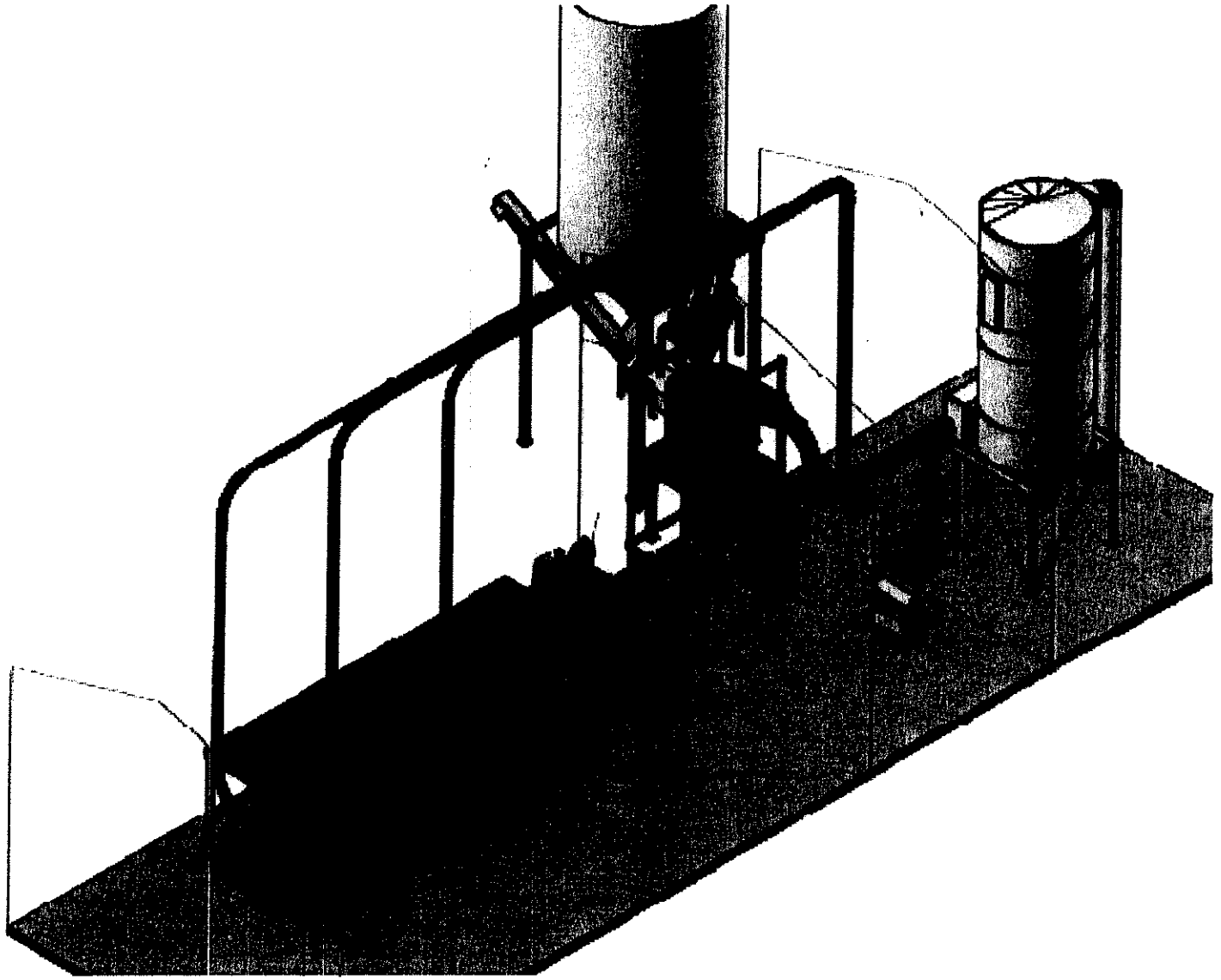
L. The cooled pellets are then placed into 40 pound bags. These bags are sealed and palletized, 50 bags to the pallet; or 2000 pounds to the pallet.

M. Pallets are trucked to retail stores for market distribution (up to 6 trucks/day). Pellets will also be available for retail sale at the plant.

Pellet Manufacturing Process



Pellet Manufacturing Process



Site Plan – as presented in November 2008

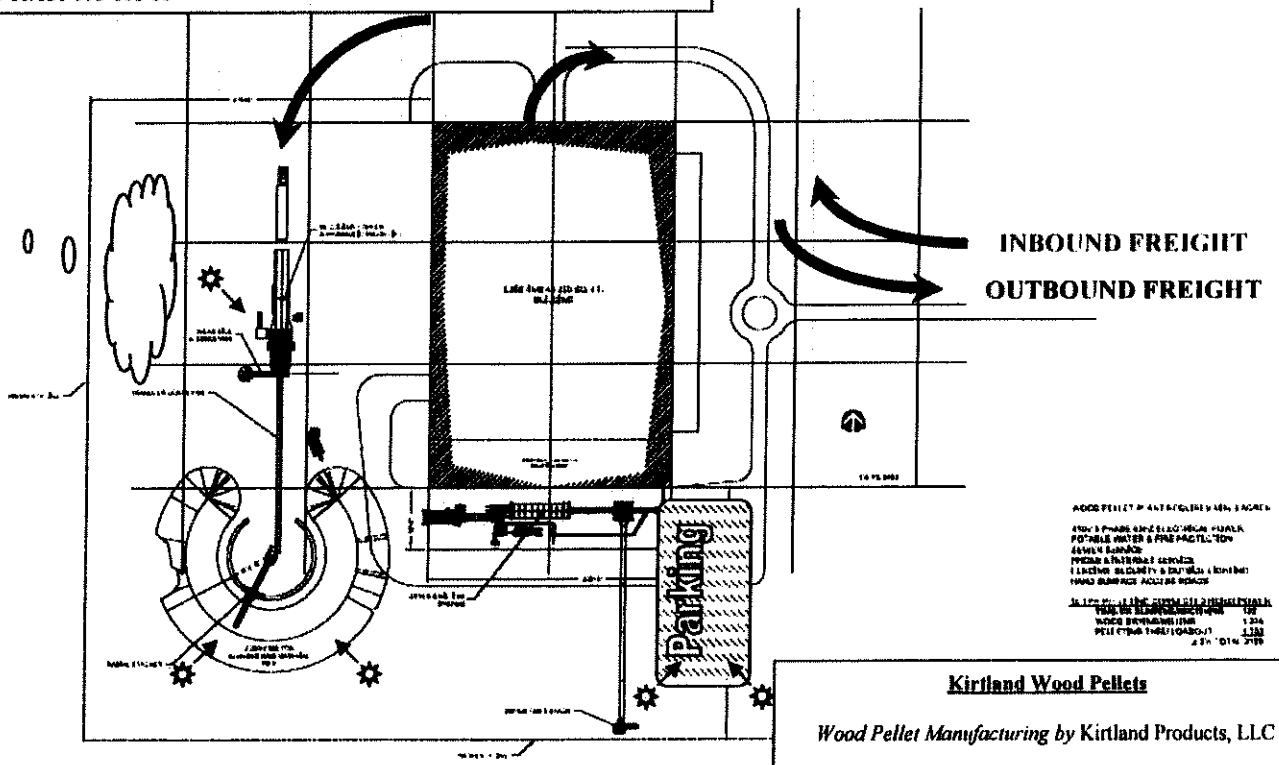
The owners of Kirtland Products, LLC are Leon Tupper, Tom Monley, and Mike Lange. The below described property is owned by Tupper Enterprises, LLC; which is solely owned by Leon Tupper:

Tax ID: 015-336-165-15; Legal Description: LDFA PA 281 OF 1986 89SP1188 FROM 336-165-00 & 336-166-00 COM AT S 1/4 COR SEC 36 T33N R6W TH N89 DEG36'51"W AL S LI SEC 36, 335.78FT TH N1DEG19'49"E 621.00FT TO POB TH N89DEG 36'43"W 618.49FT TH N1DEG09'08"E 727.15 FT TO C/L OF EARTH BERM TH S87DEG39'56"EAL SD C/L 620.75FT TH S1DEG19'49"W 706.10FT TO POB PART OF SE 1/4 OF SW 1/4SEC 36 T33N R6W REF: IFT 051-990-008-00/051-995-008-00

AERIAL VIEW OF PROPOSED SITE

Storm drainage and retention ponds will be located on the premises based on engineering analysis of site requirements.

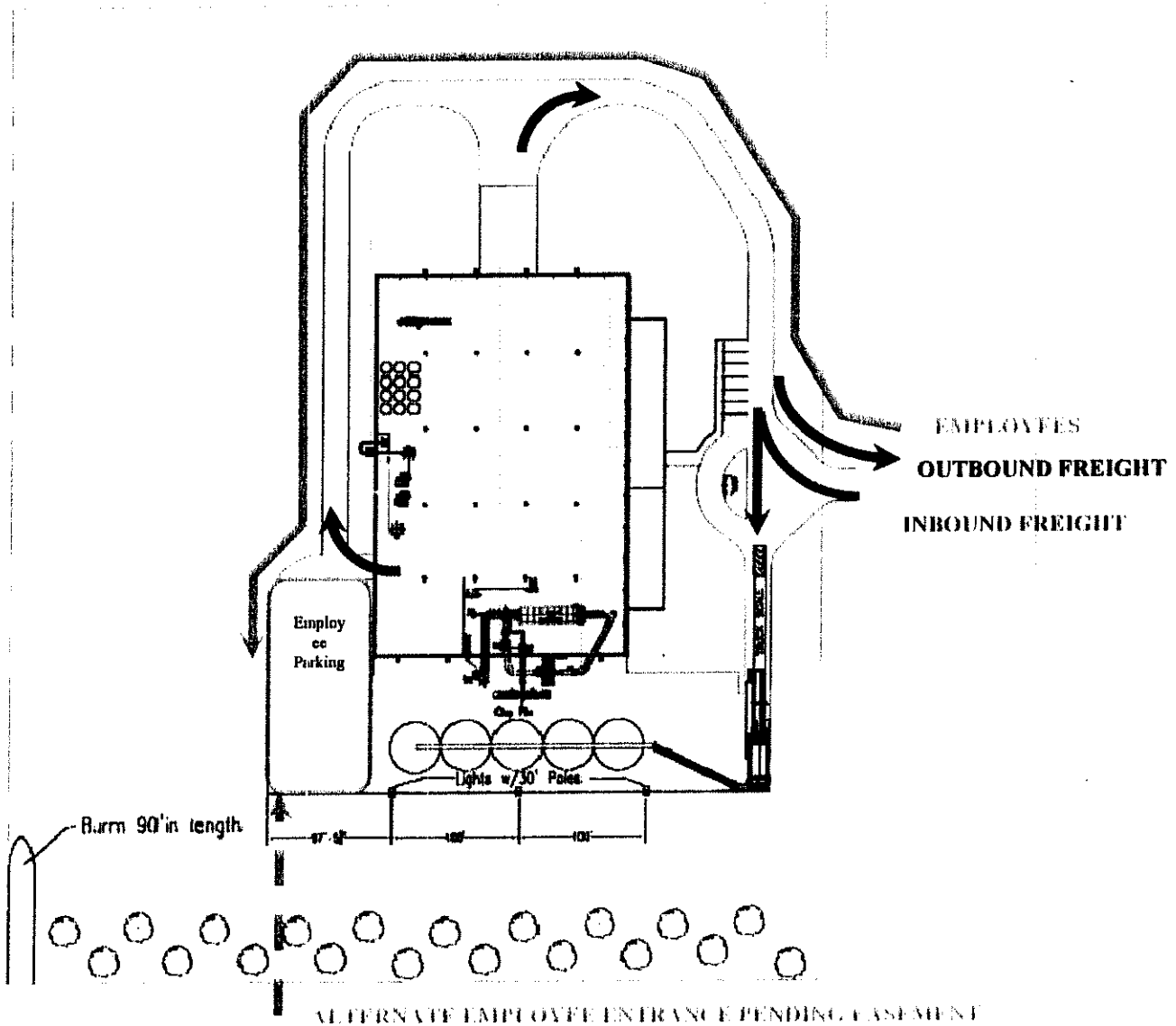
Inbound and outbound trucks will enter and exit the facility via Altair Drive. No access point changes will be required.



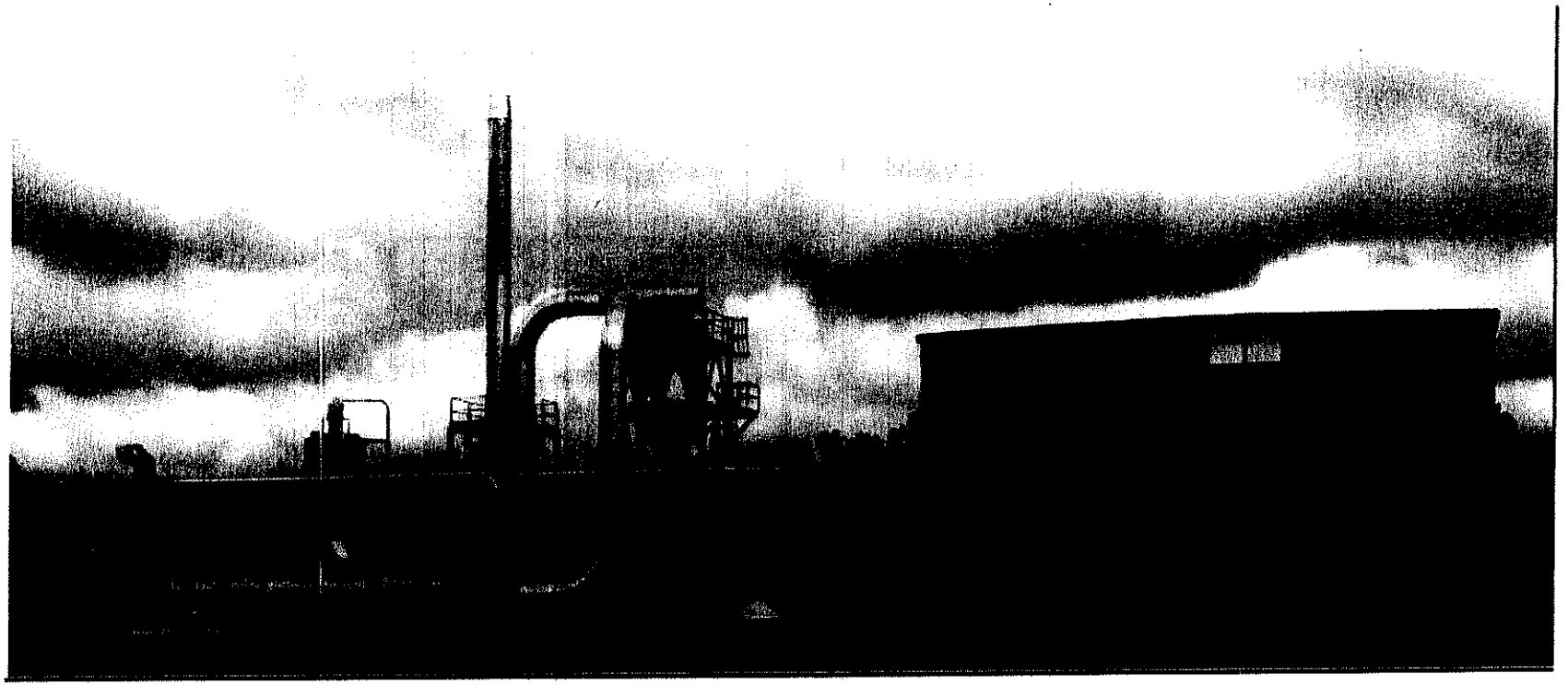
Kirtland Wood Pellets

Wood Pellet Manufacturing by Kirtland Products, LLC

Site Plan – Current Plan



Pelleting Plant



Grading and Storm Water

In an attempt to understand the requirements for changes in the storm water management at our site, Kirtland enlisted the assistance of Marc Seelye, Charlevoix County Drain Commissioner.

On Mr. Seelye's recommendation, we measured the total area that we intend to convert to impervious surface. The total change in imprevious surface is 4531 ft^2.

We invited Mr. Seelye to review the site. Upon completion of his review, he forwarded his recommendation that no changes in the storm water facilities were required.

CHARLEVOIX COUNTY
Drain Commissioner
Marc Seelye

301 State Street
Charlevoix, Michigan 49720
(231) 547 7236
Fax (231) 547-7250
seelyem@charlevoixgovt.com
website: www.charlevoixcounty.org

September 3, 2009

Michael Lange
Vice President
Kirtland Products, LLC
1 Altair Drive
Boyne City, MI 49712

Dear Mr. Lange:

I received the information on your proposed project concerning the increase in impervious surface and how it will affect storm water runoff. If the former Charlevoix County Storm Water Ordinance was still being enforced, it would allow an increase of a tenth of an acre of impervious surface before any changes to the storm water control facilities would be required. You have submitted that there would be an increase of 4531 square feet of impervious surface that just exceeds the tenth of an acre exemption. A review of your site showed that there is no apparent existing problems with storm water runoff.

Considering the existing conditions and the small increase in impervious surface, I feel comfortable that there would not be any problems with storm water runoff if this project is completed and no improvements were made to the existing storm water facilities.

If there is anything else that I can do to help in this matter, please contact me at 231-547-7236 or 231-675-2845.

Sincerely,
Marc Seelye
Marc Seelye
Charlevoix County Drain Commissioner, CDA

Lighting

Four Metal Halide lamps will be added to the South line of the existing South parking lot, on three poles, in box style fixtures; directed down and toward the center of the lot / chip pile.

Landscaping / Sound Abatement

In our last proposal, the plan was to have most of the operating equipment outside, with just pelleting and packaging equipment inside. To address noise, we planned to construct decoupled wall buildings around all equipment exceeding 40 dB noise level. In the new plant design, we have placed all loud (over 40 dB) equipment inside the building.

The landscaping will address noise abatement through a berm on the South and West property lines. Since the existing contour of the ground provides an existing berm on most of these lines, an additional berm will be added on the SW corner (West Line) to bridge the gap. Trees will also be planted along the South property line to provide a more natural view from M-75. Though a mix of species is planned, White Pine will be the predominant species due to its rapid growth.

Construction

Construction is expected to begin in December 2009, and conclude in June 2010.

Contact Us:

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Mike Lange
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Lange & Associates
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Fax: (231) 582-4472

Kirtland Products, LLC

1 Altair Drive, Boyne City, MI 49712 (231) 582-4470

Site Plan Revision

Introduction

One year ago, the members of Kirtland Products, LLC; Leon Tupper, Tom Monley, and Mike Lange; reviewed revisions to the proposed wood pellet manufacturing facility. The proposed changes were approved. Since November 2009, Kirtland Products has purchased equipment and has made traffic flow improvements which resulted in process layout / equipment location changes.

Site Plan – As Presented on November 16, 2009

The previously proposed site plan removed most of the circle drive in front of the building. Incoming trucks would turn North at the front of the building. Then, they would back over the scale and onto the truck tipper in a Southward direction. This process had trucks backing up in front of retail parking spaces. In addition, the truck tipper purchased is much larger than the originally designed equipment.

The previous design also had the pellet storage inside the building in twelve, nine foot diameter storage bins along the West wall of the plant. This design not only utilized valuable interior manufacturing space, but it also did not afford Kirtland enough storage space to package on demand.

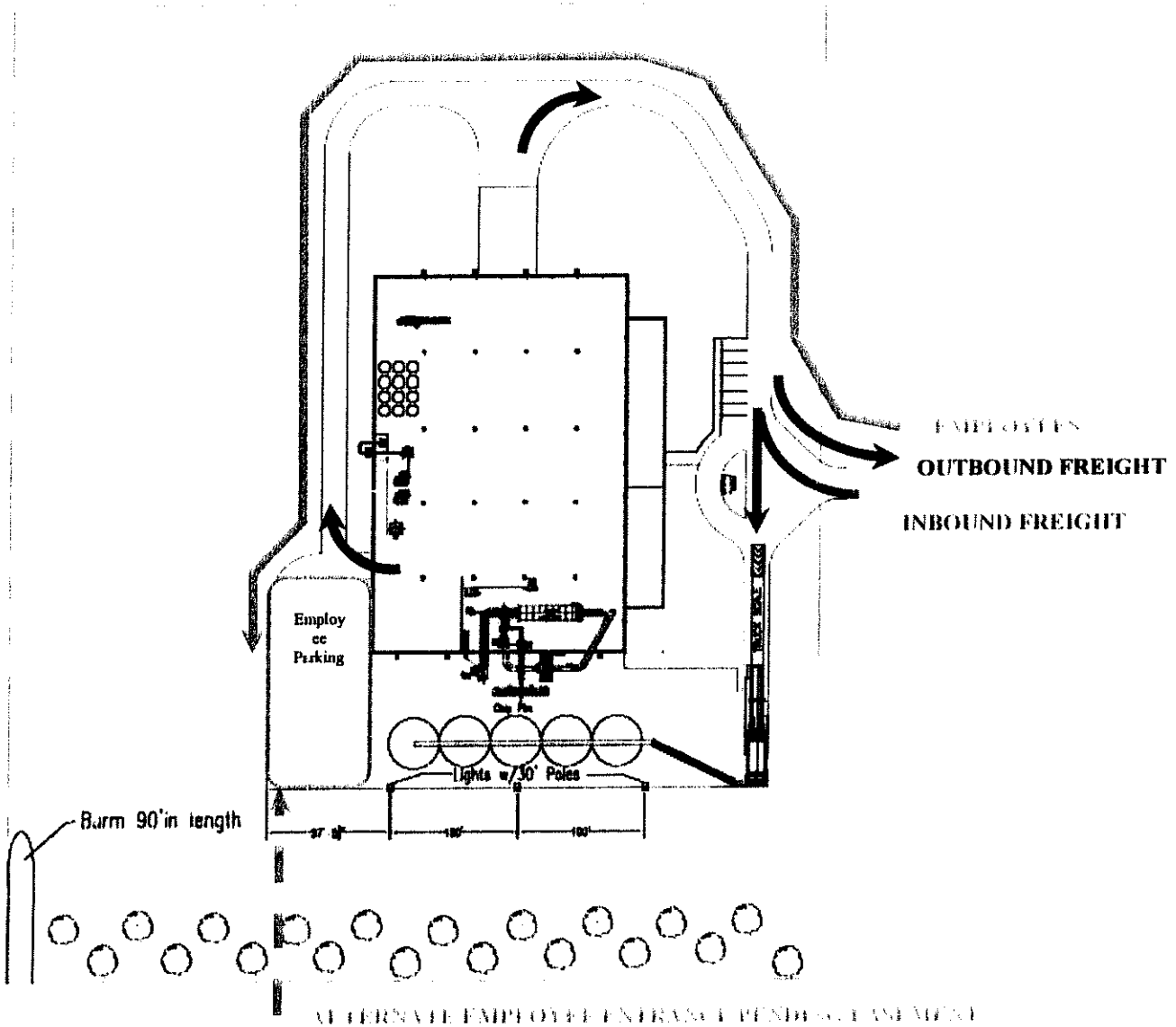
The November 2009 plan also required employees to enter from the East side of the building, drive around the North end, circling the building to the Southwest corner for parking. Also, because the truck tipper and scales were located over the existing Southeast drive, fire/rescue vehicles would also have to take the Northward trip around the plant.

Proposed Site Plan

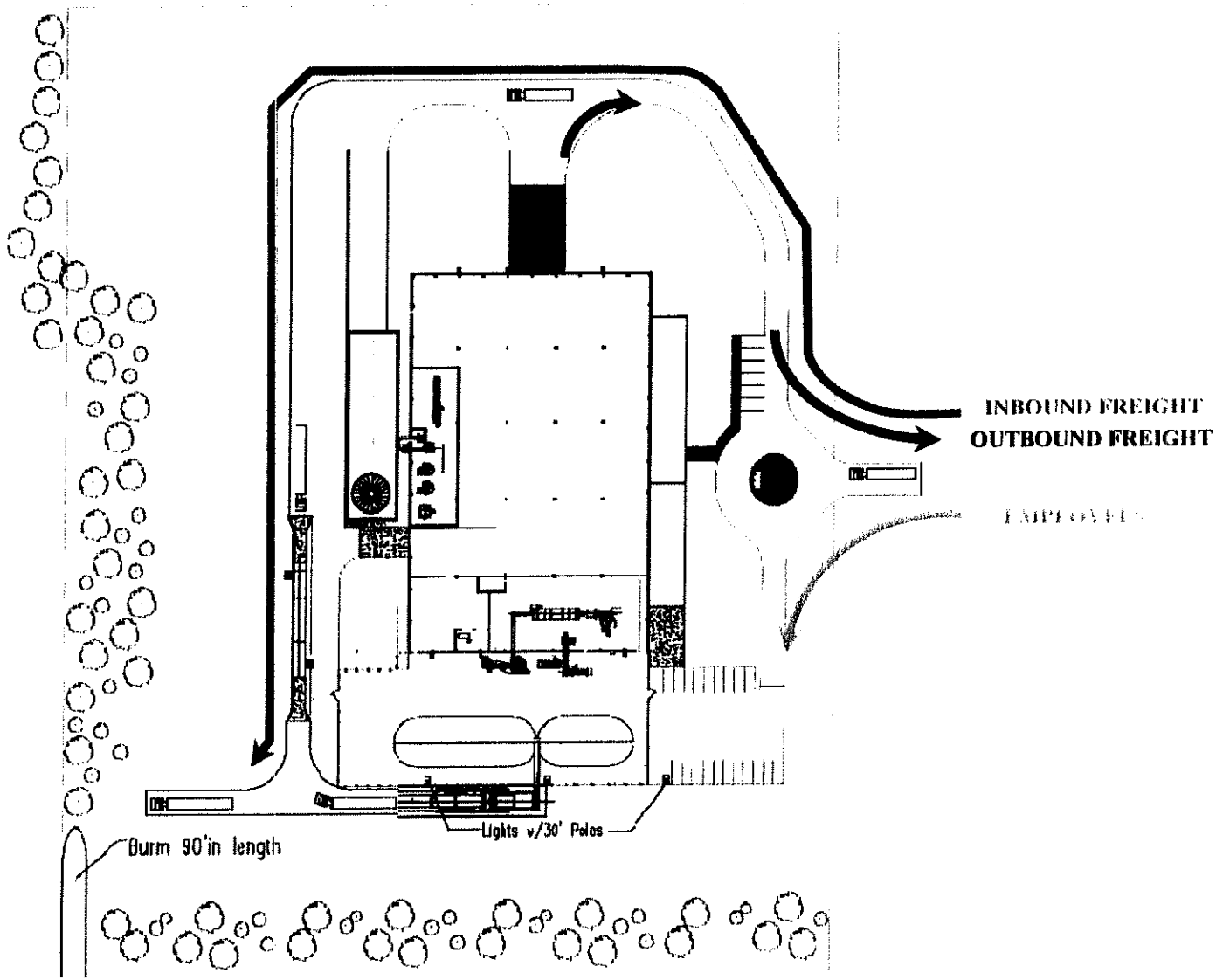
The proposed site plan moves the truck tipper and receiving hopper to the Southwest corner of the building. No equipment will be located on the East side (front) of the building. Employees will enter from the East (Altair Drive), then park in the existing lot at the Southeast corner of the building. All truck traffic will move around the North end of the building, as it does now. This alleviates truck congestion in the front of the building.

Pellet storage is being moved to larger silo storage outside, along the West wall of the building. FAA Aeronautical Study Number 2010-6467-OE, has been assigned to this proposal. Should a favorable finding not be received, the silos will be set onto a subsurface foundation to accommodate the FAA's recommendations. A chain link fence will be added around the chip yard to protect citizens from entering the chip handling area. This fence will have gates to permit entry of emergency vehicles.

Site Plan – As Presented on November 16, 2009



Proposed Site Plan



Construction

Construction is expected to begin in late November, or early December 2010, and conclude in May 2011.

Contact Us:

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