

**From:** Brian Tracey <Brian\_Tracey@genpower.net>  
**To:** Peter Courtney <Peter.Courtney@dnr.state.ga.us>  
**CC:** "tyneshia.tate@dnr.state.ga.us" <tyneshia.tate@dnr.state.ga.us>  
**Date:** 6/11/2010 5:43 PM  
**Subject:** RE: Yellow Pine Energy Company, SIP Application 19518, AIRS:06100001 - air dispersion modeling information  
**Attachments:** 100611 YPE\_PSD\_Response\_to\_EPD\_Comments.pdf

Pete:

Please find our responses to your information requests in the attached letter report. A copy of the Supporting Data CD for the additional dispersion modeling conducted by Yellow Pine's consultant has been sent out today to your attention. I will also have a paper copy of the letter report sent to your attention via US Mail on Monday.

Please call with questions or additional issues you may have regarding any of this information.

Regards,

Brian

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June 10, 2010

Mr. Brian Tracey  
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**Subject: Response to EPD Comments  
Revised Air Dispersion Modeling Analysis  
PSD Permit Application  
Yellow Pine Energy, LLC  
Clay County, GA**

Dear Mr. Tracey:

As requested by Yellow Pine Energy Company, LLC (YPE), CH2M HILL recently reviewed Georgia Department of Natural Resources, Environmental Protection Division (GA EPD) comments regarding the additional dispersion modeling analyses to assess potential ambient air quality impacts attributable to proposed engineering design modifications provided by YPE.

This report details the changes that were made to the modeling analysis in response to GA EPD comments to reflect the proposed design modifications, as well as a summary of the modeling analysis and the associated results. The comments from GA EPD and CH2M HILL's responses are provided below:

May 26, 2010

**GA EPD Comment No. 1** - Did the updated dispersion modeling analysis use the CFB Boiler NOx emission rate provided by GenPower or was a factor of 0.75 applied to the rate before entry into the model.

**Response to GAEPD Comment No. 1:** The modeling analysis described in the letter report dated April 12, 2010 accounted for 100% of the NOx emissions of 0.07 lb/MMBtu as provided by GenPower for the Circulating Fluidized Bed (CFB) boiler. NOx emissions rates from the CFB

boiler and Auxiliary boiler were revised and modeled at a 75% factor to account for the Ambient Ratio Method in response to GA EPD comment and to be consistent with the original permit modeling analysis.

June 01, 2010

**GA EPD Comment No. 1** - The CO, NO<sub>x</sub>, and SO<sub>2</sub> models only show main boiler downwash inputs for 3 of 36 10-degree sectors. The utility that produces such inputs was re-run by EPD to show at least 6 10-degree sectors of downwash for the main boiler. The PM models show some 14 10-degree sectors are affected by downwash of the main boiler. Since I'm only discussing the main boiler which is present in each pollutant model, I would think there should be some consistency in the number of downwash sectors for all the models.

**Response to GAEPD Comment No. 1:** CH2M HILL reviewed the downwash inputs for the model and revised the inputs for consistency between the CO, NO<sub>x</sub> and SO<sub>2</sub> model run and the PM-10 model runs. The revised inputs also reflect the changes made to the site layout inputs in response to GA EPD Comment No. 3, as described below.

**GA EPD Comment No. 2** - I have located in pencil on the attached site source plot the only building I find represented in any model. It seems to me that the building is distant from the main boiler stack, or that another building which houses the main boiler should be closer to the main boiler stack. It is possible, without seeing a detailed site plan at a legible scale, that there may be other structures which could cause downwash effects and should be represented in the models. It is not uncommon for both the main boiler and the auxiliary boiler to be housed in separate (sizeable) structures. Other structures may be proposed for the site, such as baghouses, cooling towers, fugitive source-supporting towers, silos, etc. A portion of the site plan with a useable scale should be provided that clearly shows the locations and heights of any other structures which could influence the air quality impacts by creating downwash effects.

**Response to GAEPD Comment No. 2:**

The revised dispersion modeling analysis also accounted for the following changes to the CFB Boiler stack location, boiler structure location, and site layout changes:

- Revised boiler stack location and an increase in stack base elevation of approximately 28 feet to 198 feet above mean sea level.
- Revised CFB boiler structure location to a position adjacent to the boiler stack location and consistent with the boiler structure layout. For the purpose of this modeling analysis, the Auxiliary boiler was assumed to be adjacent to the CFB boiler structure and therefore no downwash effects would be created by an Auxiliary boiler structure.
- Revised site layout, as provided by YPE. The attached Figure 1 illustrates the layout of the facility emission sources for truck delivery operations as inputs to the dispersion model. The attached Figure 2 illustrates structures that were added to the revised modeling analysis in response to GA EPD comments. This includes the addition of the following structures: cooling tower, fly ash silo, sand silo, lime silo, boiler structure, water treatment building, administrative building, warehouse/maintenance building, conveyor transfer towers for T6 and T7, fuel processing building, and the truck receiving building.

The dispersion modeling analysis was based on the same meteorological data and terrain data that was used in the original modeling analysis as described in the PSD Permit Application Report prepared for the project. The most recent version of the AERMOD model was used in the analysis described herein (Version 09292).

The revised modeling analysis was performed for one scenario, namely all delivery of wood to the site by truck. Based on the results of the modeling analysis for the delivery of wood, the PM-10 modeling results from delivery of wood from 100% barge operations was assumed to be similar to the model results provided in the letter report dated April 12, 2010.

#### Summary of Modeling Results

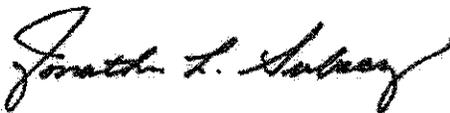
The results of the modeling analysis of the revised facility emissions of PM-10, NO<sub>x</sub>, SO<sub>2</sub>, and CO are summarized in the attached Table 7-1a [Revised 6-10-2010] for truck delivery operations. These results were compared to the original modeling results as provided in Table 7-1 of the PSD Permit Application Report. A copy of the original table is also attached.

As illustrated in the revised versions of Table 7-1a, the maximum predicted concentrations attributable to the Facility's proposed emissions of PM-10, NO<sub>x</sub>, SO<sub>2</sub> and CO are in all cases below the applicable significant impact levels for all averaging periods, regardless of the method of wood delivery to the site. The maximum predicted off-site concentrations for SO<sub>2</sub>, PM-10, and NO<sub>x</sub> were in some cases slightly higher than the original modeling results; however, the predicted concentrations are still below the significant impact levels for all averaging periods.

To summarize, the modeling analysis indicates that the proposed facility design changes will not result in a significant increase in ambient air quality impacts at any location for any pollutant. Therefore, no further modeling is recommended at this time.

Sincerely,

CH2M HILL



Jonathan L. Subacz  
Project Engineer



Ronald Vaughn, P.E.  
Project Engineer

#### Attachments:

Table 1

Table 7-1a (Revised 6-10-10)

Table 7-1

Figure 1

Figure 2

# Tables

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**Table 1**  
**Summary of Point Emission Sources**  
**Yellow Pine Energy**  
**Clay County, Georgia**

Parameter Scenario	Emission Source									
	CFB Boiler 100% Biomass	Aux Boiler	FPB1 Baghouse <sup>1</sup>	FPB2 Baghouse	Fuel Metering Birt Baghouse	Fly Ash Silo Baghouse	Sand Silo Baghouse	Lime Silo Baghouse		
Load	100	100								
Net Unit Output	MW	102								
Heat Input	MMBtu/hr	1,450								
Fuel		Biomass								
Heat content of Fuel	Btu/gal	No. 2 Oil								
Sulfur content of Fuel	wt. %	0.05								
Stack Temperature	deg F	338	70	70	70	70	70	70		
Stack Height	ft	210	24	24	186	186	186	186		
Stack Diameter	ft	14	2.0	0.7	0.7	0.7	0.7	0.7		
Exit Velocity	ft/sec	55	39.2	28.7	28.7	28.7	28.7	28.7		
UTM Easting		2,024,897								
UTM Northing		553,763								
Nox	lb/MMBtu	0.07								
CO	lb/MMBtu	102	3.50	0	0	0	0	0		
VOC	lb/MMBtu	0.149	0.036							
PM-10	lb/MMBtu	216	0.90	0	0	0	0	0		
SO2	lb/MMBtu	0.02	0.0024							
	lb/hr	29	0.060	0	0	0	0	0		
	lb/hr	0.018	0.017							
	lb/MMBtu	26	0.43	0.0049	0.0049	4.54E-07	7.69E-08	9.84E-08		
	lb/hr	0.014	0.051	0	0	0	0	0		
	lb/hr	20	1.28	0	0	0	0	0		

**Summary of Fugitive Emission Sources**

Emission Unit	ID	PM lb/hr	PM-10 lb/hr
Truck Unloading Station	TUS	0.071	0.033
Conveyor Transfer Tower 6	T6	0.071	0.033
Conveyor Transfer Tower 7	T7	0.071	0.033
Active Storage Pile 4	ASP4	0.089	0.041
Reserve Storage Pile	RSP	0.089	0.041
Fly Ash Loading - Truck	TRUCK	0.00	4.54E-07
Paved Road #1	PR1	1.596	0.306
Paved Road #2	PR2	0.018	0.001
Paved Road #3	PR3	0.010	0.002
Paved Road #4	PR4	0.192	0.052

**Notes:**  
 1) FPB1 only operates during barge operations.

**Summary of Fugitive Emission Sources from Barge Operations**

Emission Unit	ID	PM-10 lb/hr
Conveyor Transfer Tower 1	T1	0.033
Conveyor Transfer Tower 2	T2	0.033
Active Storage Pile 3	ASP3	0.041

Table 7-1a [Revised 6-10-2010]  
 Maximum Predicted Offsite Concentrations and Radii of Significant Impact at 100% Load (100% Biomass, 100% Truck Delivery)  
 Yellow Pine Energy  
 Clay County, Georgia

Pollutant	Averaging Period	Significant Impact Level (ug/m <sup>3</sup> )	Maximum Predicted Offsite Concentration (ug/m <sup>3</sup> )					Maximum Radius of Significant Impact (km)
			1989	1990	1991	1992	1993	
PM <sub>10</sub>	Annual	1	0.84 Location (686896.7, 3488620) ROI = 0 km	0.87 Location (686896.7, 3488620) ROI = 0 km	0.82 Location (686896.7, 3488620) ROI = 0 km	0.87 Location (686896.7, 3488620) ROI = 0 km	0.83 Location (686896.7, 3488620) ROI = 0 km	0
		5	4.60 Location (686895.4, 3488430) ROI = 0 km	4.47 Location (686403.1, 3488340) ROI = 0 km	4.37 Location (686530.3, 3488360) ROI = 0 km	3.59 Location (686896.9, 3488395) ROI = 0 km	4.42 Location (686466.7, 3488350) ROI = 0 km	0
NO <sub>x</sub>	Annual	1	0.60 Location (686090.6, 3488470) ROI = 0 km	0.57 Location (686090.6, 3488470) ROI = 0 km	0.59 Location (686099.7, 3488490) ROI = 0 km	0.63 Location (686090.6, 3488470) ROI = 0 km	0.61 Location (686090.6, 3488470) ROI = 0 km	0
		5	2.15 Location (686232.7, 3488335) ROI = 0 km	2.11 Location (686100, 3488400) ROI = 0 km	2.04 Location (686232.7, 3488335) ROI = 0 km	2.10 Location (686099.7, 3488490) ROI = 0 km	2.02 Location (686400, 3488400) ROI = 0 km	0
SO <sub>2</sub>	Annual	1	0.281 Location (686090.6, 3488470) ROI = 0 km	0.261 Location (686099.7, 3488490) ROI = 0 km	0.277 Location (686099.7, 3488490) ROI = 0 km	0.295 Location (686090.6, 3488470) ROI = 0 km	0.287 Location (686099.7, 3488490) ROI = 0 km	0
		25	6.51 Location (686210.4, 3488390) ROI = 0 km	5.74 Location (686210.4, 3488390) ROI = 0 km	6.55 Location (686255.3, 3488040) ROI = 0 km	6.72 Location (686232.7, 3488335) ROI = 0 km	5.77 Location (686210.4, 3488390) ROI = 0 km	0
CO	1-hour	2000	29.33 Location (686500, 3489100) ROI = 0 km	29.67 Location (685768.1, 3489032) ROI = 0 km	30.61 Location (685768.1, 3489032) ROI = 0 km	28.45 Location (686500, 3489100) ROI = 0 km	29.73 Location (685922, 3489156) ROI = 0 km	0
		500	15.17 Location (686400, 3489200) ROI = 0 km	15.20 Location (686706.5, 3489040) ROI = 0 km	15.73 Location (686700, 3489400) ROI = 0 km	14.79 Location (686800, 3488900) ROI = 0 km	17.88 Location (687000, 3488200) ROI = 0 km	0

Notes:  
 Location = (UTM Coordinates)  
 Bold indicates maximum value

**Table 7-1**  
**Maximum Predicted Offsite Concentrations and Radii of Significant Impact at 100% Load (85% Biomass and 16% Coal Firing, by Heat Input)**  
**Yellow Pine Energy**  
**Clay County, Georgia**

Pollutant	Averaging Period	Significant Impact Level (ug/m <sup>3</sup> )	Maximum Predicted Offsite Concentration (ug/m <sup>3</sup> )					Maximum Radius of Significant Impact (km)
			1989	1990	1991	1992	1993	
PM <sub>10</sub>	Annual	1	0.50	0.58	0.61	0.58	0.55	0
			Location (685714, 3488710)	Location (685714, 3488710)	Location (685714, 3488710)	Location (685714, 3488710)	Location (685714, 3488710)	
PM <sub>10</sub>	24-hour	5	3.84	3.93	3.08	3.07	3.07	0
			Location (685714, 3488710)	Location (685714, 3488710)	Location (685714, 3488710)	Location (685714, 3488710)	Location (685714, 3488710)	
NO <sub>x</sub>	Annual	1	0.60	0.61	0.63	0.60	0.61	0
			Location (686773, 3488985)	Location (685600, 3488500)	Location (685600, 3488500)	Location (686806, 3488778)	Location (686806, 3488778)	
SO <sub>2</sub>	Annual	1	1.18	1.24	1.27	1.12	1.15	1.2
			Location (686800, 3489100)	Location (685600, 3488600)	Location (685500, 3488500)	Location (686900, 3488900)	Location (686900, 3488900)	
SO <sub>2</sub>	24-hour	5	10.6	11.9	12.2	11.1	14.1	3.0
			Location (686600, 3489400)	Location (686400, 3489500)	Location (686300, 3489600)	Location (686900, 3488900)	Location (686400, 3488700)	
CO	1-hour	2000	54.2	51.9	54.1	51.8	51.3	1.1
			Location (686400, 3489200)	Location (687000, 3488500)	Location (686400, 3488200)	Location (686900, 3488900)	Location (686400, 3489500)	
CO	8-hour	500	30.0	30.2	32.3	28.7	29.1	0
			Location (686605, 3488778)	Location (686600, 3489100)	Location (686800, 3489600)	Location (686000, 3488500)	Location (686400, 3488700)	

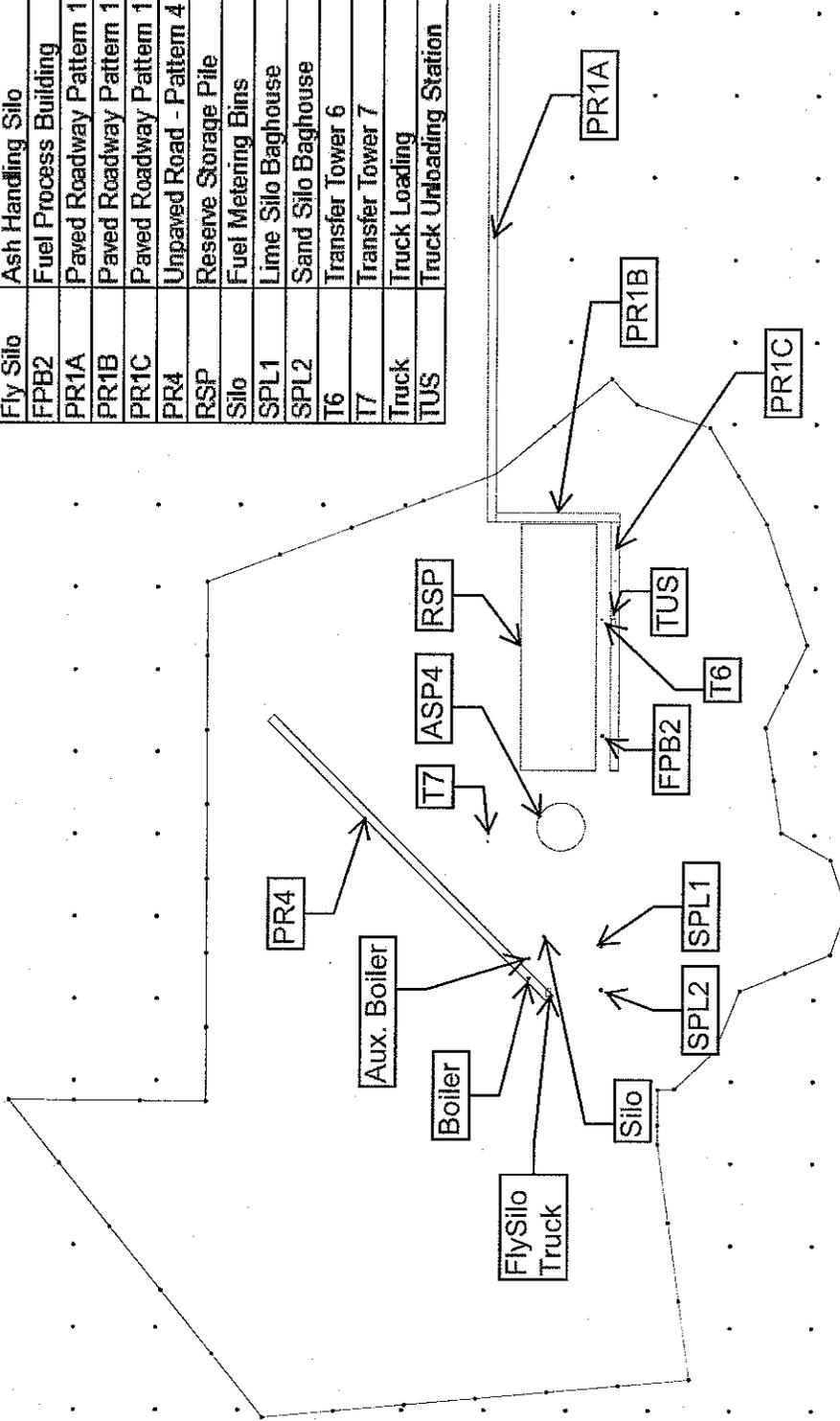
**Notes:**  
 Location = (UTM Coordinates)  
 Bold indicates maximum value  
 A refined grid was used to determine the ROI for the 24-hr averaging period

# Figures

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Yellow Pine Energy  
 Clay County, Georgia  
 Revised: 06/10/2010

ASP4	Active Storage Pile
Aux. Boiler	Auxiliary Boiler
Boiler	Boiler
Fly Silo	Ash Handling Silo
FPB2	Fuel Process Building
PR1A	Paved Roadway Pattern 1
PR1B	Paved Roadway Pattern 1
PR1C	Paved Roadway Pattern 1
PR4	Unpaved Road - Pattern 4
RSP	Reserve Storage Pile
Silo	Fuel Metering Bins
SPL1	Lime Silo Baghouse
SPL2	Sand Silo Baghouse
T6	Transfer Tower 6
T7	Transfer Tower 7
Truck	Truck Loading
TUS	Truck Unloading Station



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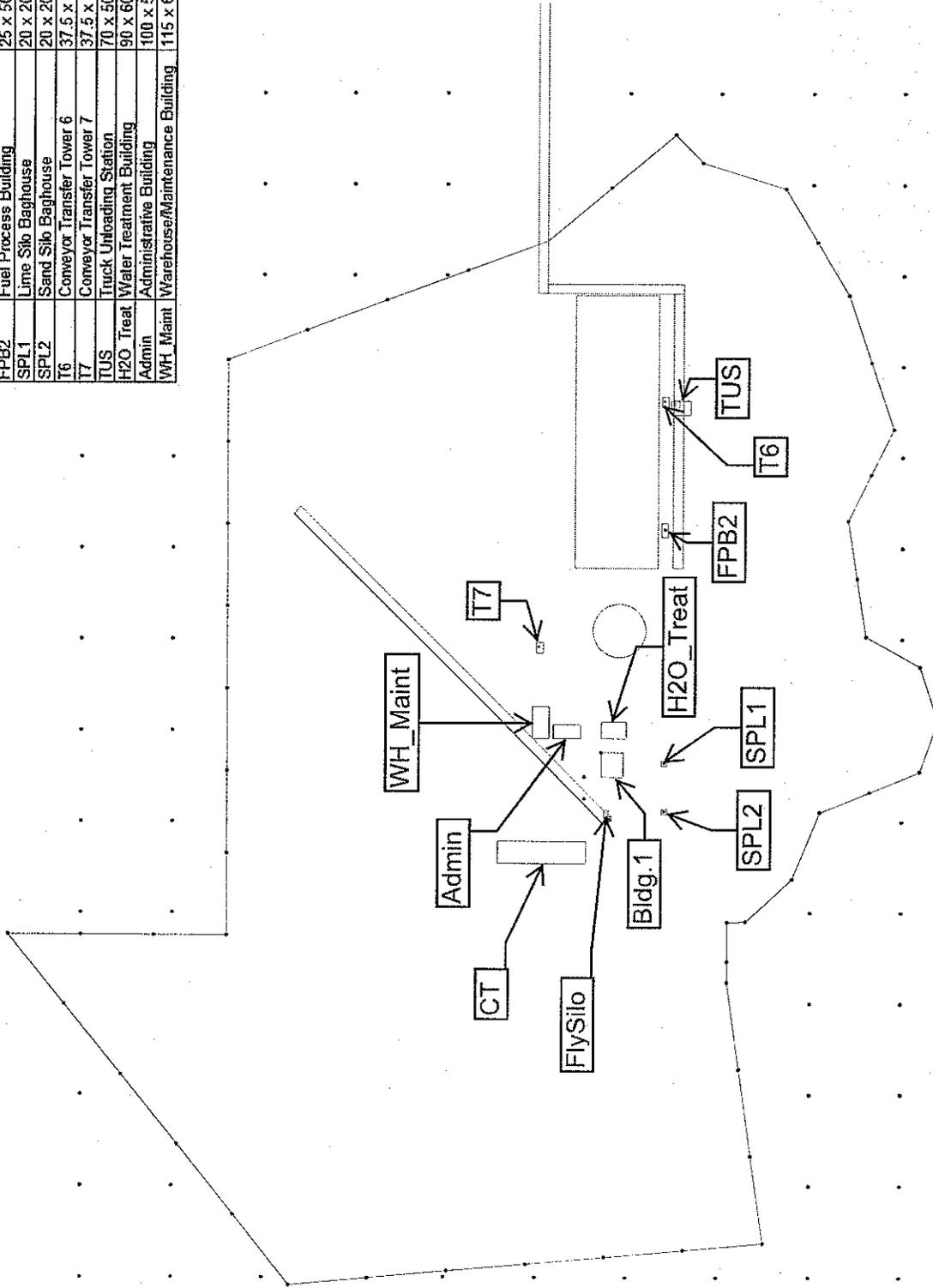
Title One

Scale: 1" = 209.6 Meters

Figure 1.  
 Site Layout and Source Inputs

Yellow Pine Energy  
 Clay County, Georgia  
 Revised: 06/10/2010

ID	Building Name	Building Dimensions L x W x H in Feet (ft.)
Bldg. 1	Boiler Structure	88 x 79 x 170
CT	Cooling Tower	320 x 80 x 42
Fly Silo	Fly Ash Handling Silo Baghouse	20 x 20 x 80
FPB2	Fuel Process Building	25 x 50 x 60
SPL1	Lime Silo Baghouse	20 x 20 x 60
SPL2	Sand Silo Baghouse	20 x 20 x 110
T6	Conveyor Transfer Tower 6	37.5 x 25 x 50
T7	Conveyor Transfer Tower 7	37.5 x 25 x 50
TUS	Truck Unloading Station	70 x 50 x 34
H2O_Treat	Water Treatment Building	90 x 60 x 18
Admin	Administrative Building	100 x 50 x 14
WH_Maint	Warehouse/Maintenance Building	115 x 60 x 16



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Scale: 1" = 169.3 Meters

Figure 2.  
 Site Layout and Building Inputs