Norlite Corporation

Norlite

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October 27, 1995

William J. Clarke
Regional Permit Administrator
Region 4
New York State Department
of Environmental Conservation
1150 North Westcott Road
Schnectady, New York 12306-2014

Subject: Fugitive Dust Plan Addendum

References:
1. DEC letter, Clarke to Ziegler, dated October 26, 1995 with attachments. (373 HW/APC Permit - Fugitive Dust Plan)
2. DEC memo, Warland to Clarke, dated October 25, 1995 (Revised Approval of Norlite Fugitive Dust Plan)

Dear Mr Clarke:

Norlite Corporation has reviewed the Department's comments (refs. 1 and 2) on the Norlite Fugitive Dust Plan Addendum submitted on October 20, 1995. Norlite's responses have been incorporated into the Fugitive Dust Plan Addendum and is hereby resubmitted, in its entirety, for your review and approval. This document contains the dust control strategy and schedule for implementation which has been mutually agreed upon by Norlite and the Department in accordance with the above referenced documents.

Norlite has also revised two pages of the approved Best Management Practices Plan (BMPP) in accordance with Condition Number 5 in the October 25 NYS DEC memo (attachment to reference 1). The revised BMPP pages, nos. 66 and 67, are included with this letter. Please remove and discard pages 66 and 67 from the Department copies of the BMPP and replace them with the included pages.

Finally, Norlite will increase the amount of the dust control escrow account by $365,000 to bring the total amount of funds to $565,000. Norlite will provide the Department evidence of the added funds on or before November 22, 1995.

Since the enclosed Fugitive Dust Plan Addendum supersedes all FDP documents submitted to the Department between February 1995 and October 20, 1995 please discard the previous FDP documents.

We trust that the enclosed documents adequately address the conditions imposed by the Department in your October 26 letter and that Norlite will receive formal approval of the Fugitive Dust Plan Addendum on or before November 1, 1995.

Norlite greatly appreciates the Department's cooperation during this transition period. If you have any questions, please contact Chuck Vannoy or myself.

Sincerely,
Norlite Corporation

Edward C Burgher

Edward C Burgher
Director of Compliance

Enclosures

SCI-TECH, INC.

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ADDENDUM
FUGITIVE DUST CONTROL PLAN
NORLITE CORPORATION
COHOES, NEW YORK

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No. 58387

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SCI-TECH Project No. 95003

October 1995

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1.0 INTRODUCTION

The Norlite facility in Cohoes, New York, produces expanded shale aggregate in two dry process rotary kilns. Raw materials are quarried on-site and are transported to the kilns via a crushing, screening, and conveyor system. The final product is also crushed, screened, and conveyed to various storage piles depending on material size. The product is then transferred to railcars or trucks for transportation to markets.

The storage and handling of the raw materials and product as well as vehicular traffic throughout the site result in the emission of fugitive dust. Under certain meteorological conditions, the dust, if not controlled, has the potential to cross the property line of the facility, particularly at the eastern boundary. Although the dust contains no hazardous constituents which are of regulatory concern (it is essentially finely divided construction material), it does present a potential nuisance to residents at the eastern boundary.

In 1990, the New York State Department of Environmental Conservation (NYSDEC) requested Norlite to submit a plan for a comprehensive fugitive dust emission control program. To prepare the plan, Norlite retained the services of SCI-TECH, INC., an environmental consulting firm with expertise in the fugitive dust control area. SCI-TECH reviewed the material handling and storage operations and the existing control methodologies, determined the sources of fugitive dust and their relative source strengths, and provided recommendations for the reduction of the dust emissions. The final report, entitled "Fugitive Dust Control Plan - Norlite Corporation - Cohoes, New York", was submitted to Norlite in August 1990. The report was subsequently submitted to NYSDEC as the Fugitive Dust Plan (FDP). NYSDEC approved the FDP in November 1990.

Norlite began implementing many of the dust control measures recommended by the study. However, at the time of a management change in early 1992 (Norlite was acquired by American NuKEM), several recommendations had yet to be implemented. The new management reviewed the existing FDP and prepared a Best Management Practices (BMP) plan, dated April 30, 1992, which was incorporated by reference as Special Condition 10 in the facility's Part 373 permit.

Although Norlite implemented the controls outlined in the BMP, there are still areas where dust can be reduced or mitigated. Notwithstanding the implementation of the prior dust control measures, Norlite, on occasion, still receives complaints from adjacent property owners on the eastern boundary. To improve this situation, the Order on Consent issued to Norlite in December 1994 requires Norlite to update its Fugitive Dust Plan. The Order requests Norlite to provide an addendum to the 1990 FDP that addresses the fugitive dust areas of concern. This report was prepared and submitted to comply with the Schedule of Compliance, paragraph 6 of the Order on Consent R4-1734-94-08 issued by NYSDEC on December 28, 1994.

In order to prepare the FDP addendum, Norlite again retained the services of SCI-TECH to reanalyze the dust sources and provide new or modified recommendations for the reduction of the dust emissions. This report describes this analysis and presents the results in the following manner. Section 2.0 discusses the dust controls implementation history since 1990. Included in Section 3.0 are process flow diagrams and a tabular compilation that depict the current layout of facility operations, dust sources, and controls. This section also presents a quantitative estimate of the current emission rates. Section 4.0 provides a critique of the current control methodologies and presents a listing of the sources and areas that would benefit from new or modified control systems. Recommendations for primary and secondary control methodologies are provided in Section 5.0 along with discussions on feasibility and cost-effectiveness, where applicable. Also included in this section is a quantitative estimate of the overall reduction in emission rates that would result from implementation of the primary control strategies. Section 6.0 discusses the proposed mechanism for public reporting. The operational procedure for the watering of plant roadways is provided in Section 7.0. Section 8.0 presents the control methodology implementation schedule. The revised pages of the BMP plan are given in Appendix A. Supporting information, such as vendor literature, is provided in Appendix B. Appendix C contains the emission calculation methodology and supporting information used with the 1990 FDP.

2.0 CONTROL METHODOLOGY IMPLEMENTATION HISTORY

The 1990 FDP included recommendations for both primary and secondary control strategies for all of the dust sources of concern at the facility at that time. The control methodologies that were subsequently instituted at the facility were based, in part, on these recommendations as well as on the conditions that existed at the time of the change in management and the resulting alterations to some facility operations. The controls implemented from 1990 to the present consisted of the following:

- Ceased use of coal as fuel and removed over 1,450 tons of coal as well as the processing equipment which was a significant source of dust.
- Transferred all previously stored settling pond sludge and baghouse dust piles (previously stored near the north portion of the site) into an on-site solid waste landfill which was subsequently capped and seeded.
- Installed numerous water sprays on product and raw material piles.
    - Sprinkler installations met SCI-TECH report recommendations.
    - Automatic timing devices with manual override controls.
- Increased frequency for wetting plant roadways.
    - Watered every 2 hours during dry conditions using 3,000 gallons of water over 2 miles of road.
    - Purchased a second watering truck.
- Closed the entrance at Saratoga Street to heavy vehicles and defined dedicated roads for large equipment travel. Moved all LGF and aggregate truck entrances to Gate 1 on the south-western portion of the facility. These actions moved all heavy traffic away from the residences on the eastern border of the facility.
- Purchased and applied over 900 tons of railroad ballast to the entrance and plant roads [Note: The gravel has subsequently been buried beneath shale and clay due to weathering and vehicular activity].
- Repaired leakage points in storage silos and installed more efficient Aeropulse silo bin vents.
- Repaired enclosures around conveyor transfer points, and installed dust covers for all operational conveyor belts.
- Installed pneumatic conveying system for transporting baghouse dust from both kilns directly to the product finishing area.

- Aerodynamically shaped long-term storage piles when inventory was present [Note: This practice has been discontinued due, in part, to current storage requirements].
- Completed hard piping and winterization of water spray lines in some areas.
- Installed improved kiln seals to Kilns 1 and 2 and improved instrumentation to better control draft through the kilns, thus effecting better dust control.
- Hydroseeded overburden five acre area on western boundary of quarry.

3.0 CURRENT OPERATIONS, DUST SOURCES, AND CONTROLS

The current operations at the Norlite facility are summarized in a series of flowcharts, presented herein as Figures 3-1 through 3-7. These flowcharts also show the locations at which fugitive dust is generated, the product throughput, and the associated controls, if any. Table 3-1 is a compilation of all the dust generating sources along with details of the control methodologies being used. The table also includes estimates of the effectiveness of the controls and the "weighted" emission rates. Note that the "Source ID" given in the table refers back to the flowcharts.

The weighted emission rates were determined in a manner analogous to that used in the 1990 FDP study. A discussion of the weighting factor concept and a complete description of the methodology used to calculate emissions from each source were presented in that document and are repeated herein as Appendix C. Please note that the source ID numbers, calculations, methodology, and data presented in Appendix C are those that were originally used for the 1990 study and are included herein strictly for reference. For this current study, similar calculations were performed taking into account changes in throughput, traffic patterns, etc., as appropriate. However, it must be emphasized that these calculations were performed solely for comparison purposes. It was not the intent of this study to develop a detailed emission inventory of the fugitive dust sources at the facility. Similarly, the effectiveness assigned to each control methodology reflects "best engineering judgement" in some cases, and is thus somewhat subjective. Note also that the source ID numbers have been changed for this study.

The elimination of several dust generating activities along with the implementation of the control methodologies described in Section 2.0 have significantly reduced the overall plant fugitive dust emission rates. The extent of this reduction can be approximated by comparing the present total weighted emission rate given in Table 3-1 (45 tpy) with the total weighted emission rate for 1990 (98 tpy). Table 3-2 presents the sources, controls, and weighted emission rates for the situation that existed in 1990. These data were based on the information presented in Appendix C to this report, with some adjustments and modifications as necessary to allow for better comparison to present conditions. It can be seen from these data that the overall emission level has been reduced approximately 54 percent, due to the implementation of additional/modified controls since 1990.

FIGURE 3-1

QUARRY OPERATIONS

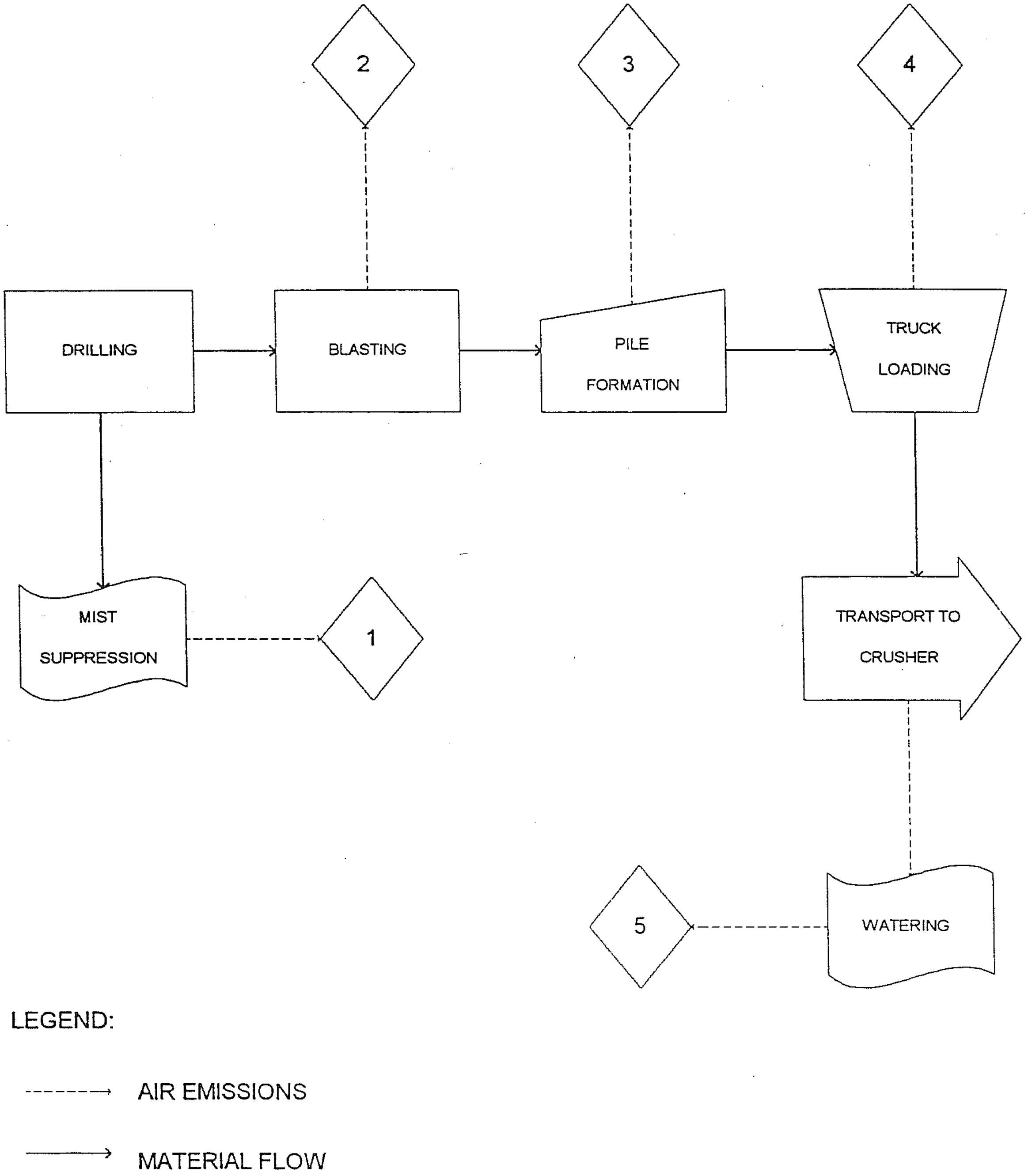


FIGURE 3-2
PRIMARY CRUSHING OPERATIONS

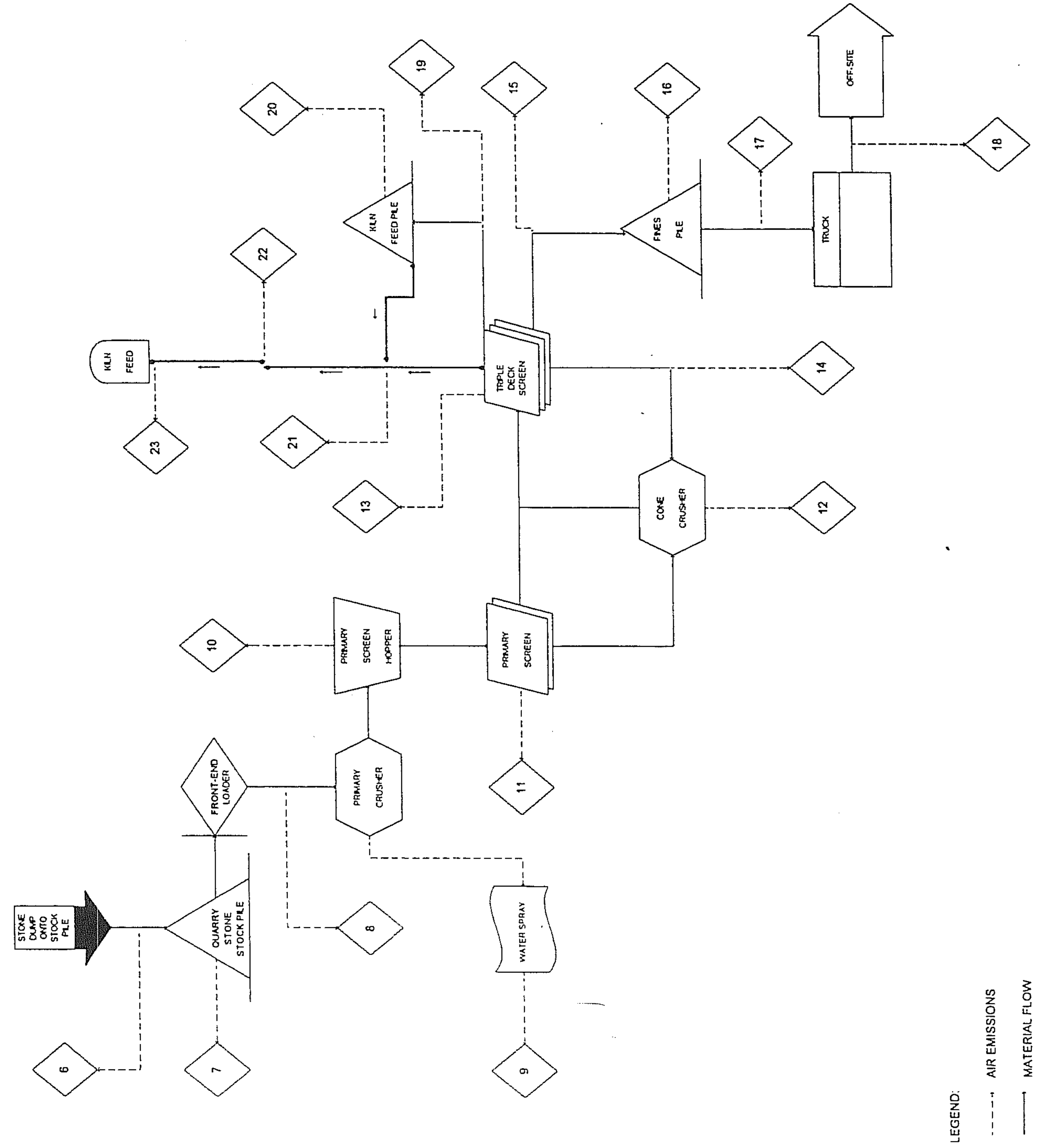
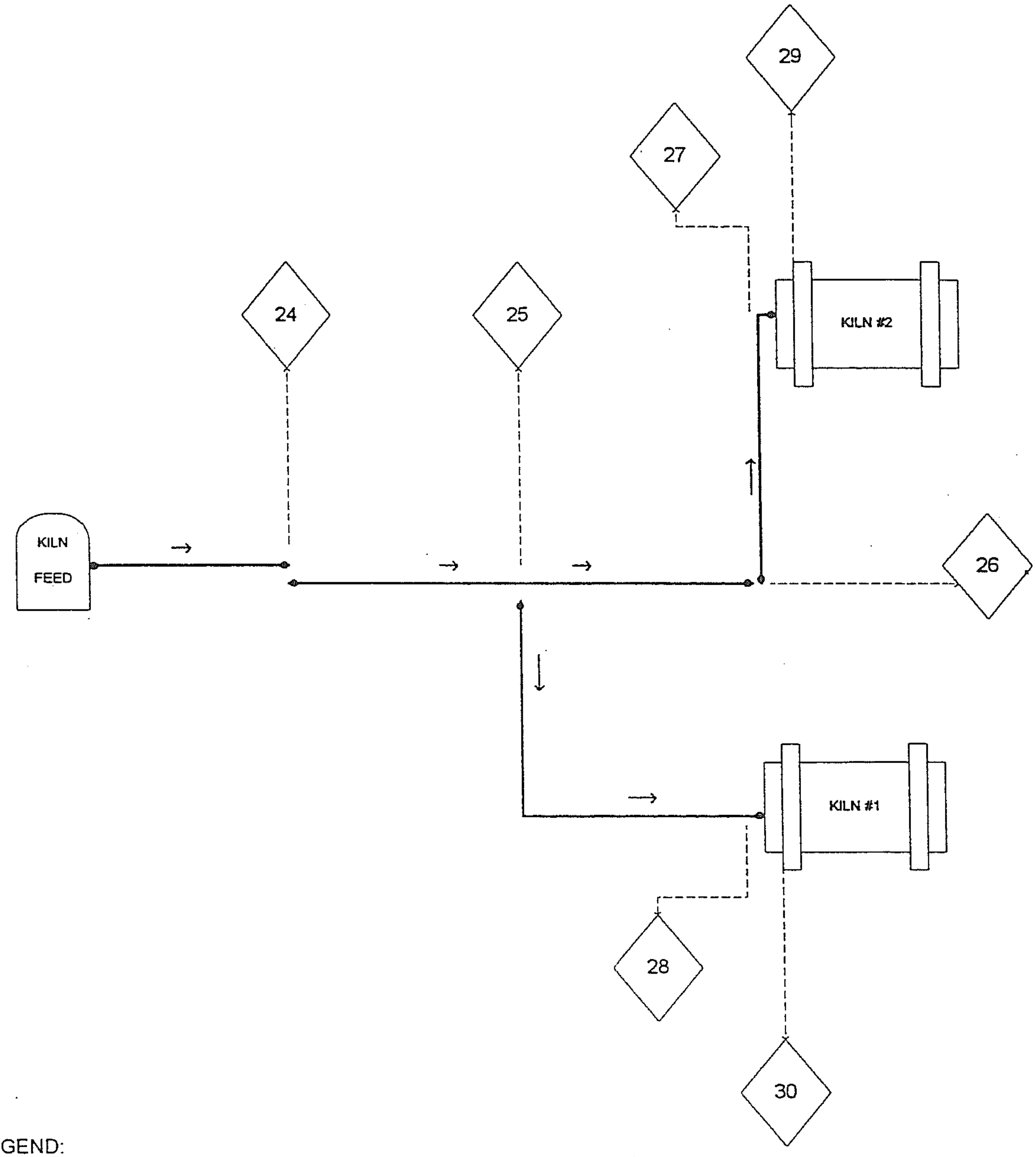


FIGURE 3-3

KILN FEED OPERATIONS



LEGEND:

- - - - - -→ AIR EMISSIONS

——————→ MATERIAL FLOW

FIGURE 3-4

CLINKER MANUFACTURING OPERATIONS

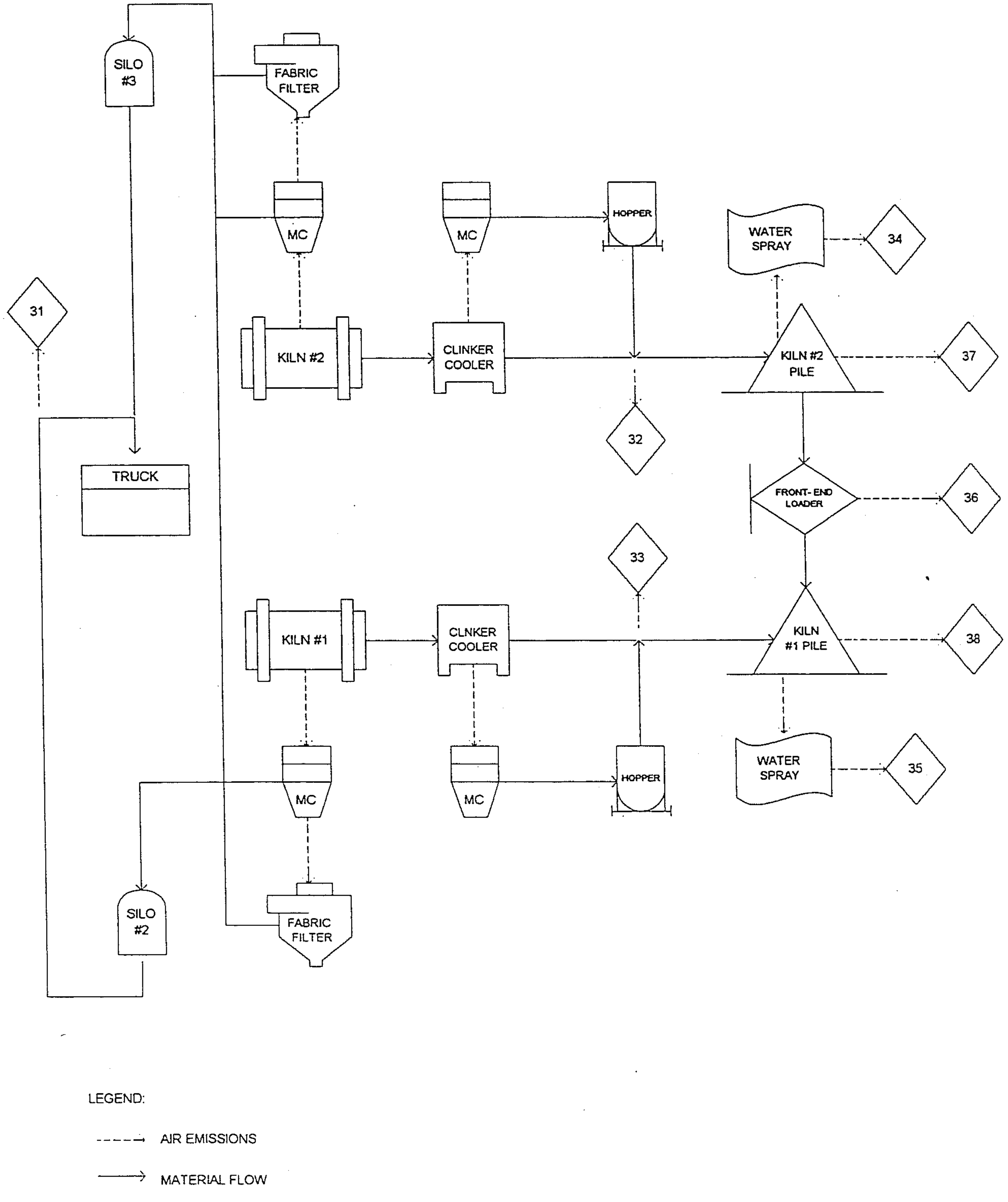
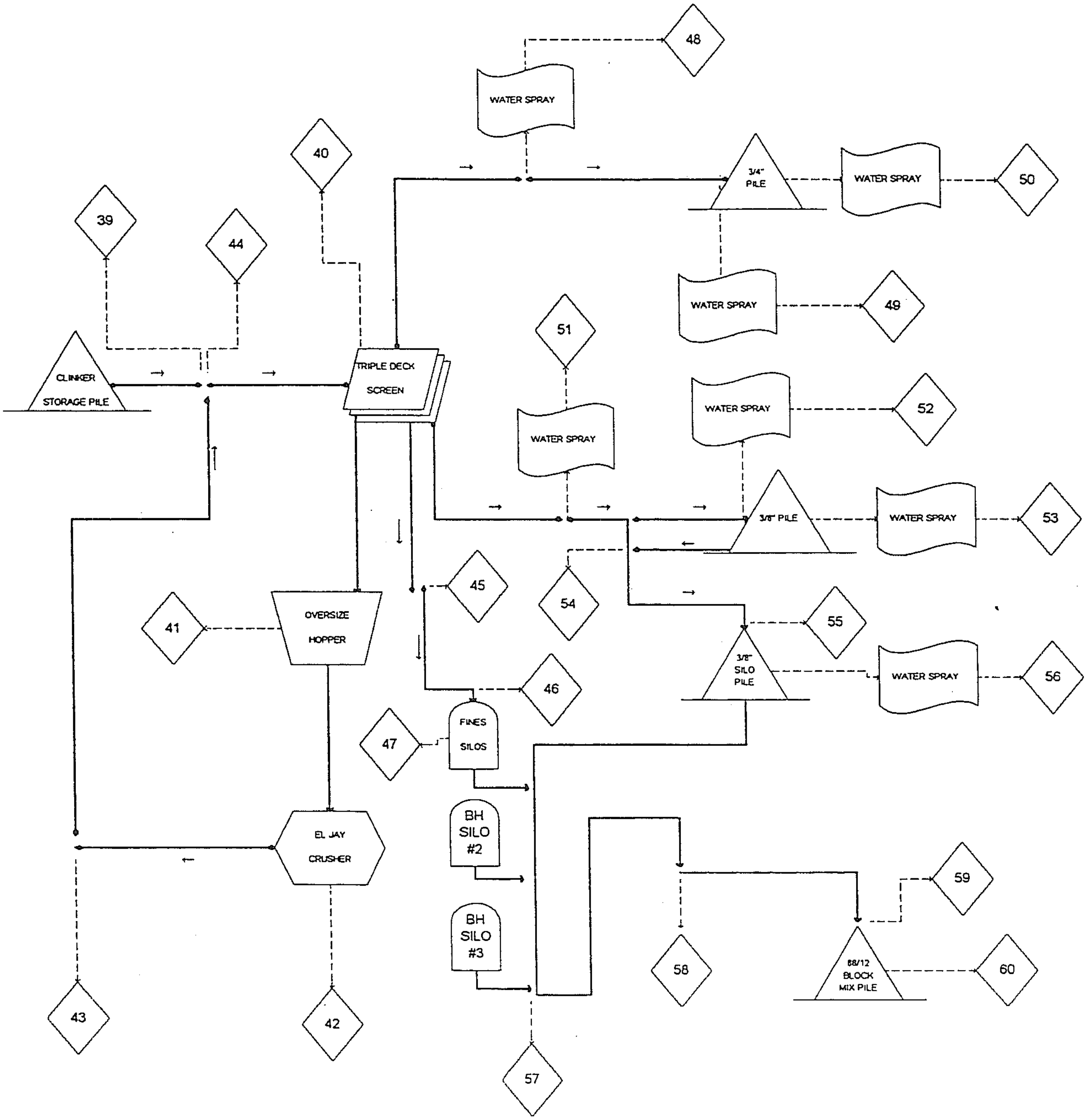


FIGURE 3-5

FINISH MILL OPERATIONS



LEGEND:

- - - - → AIR EMISSIONS

———→ MATERIAL FLOW

FIGURE 3-6
PRODUCT SHIPPING

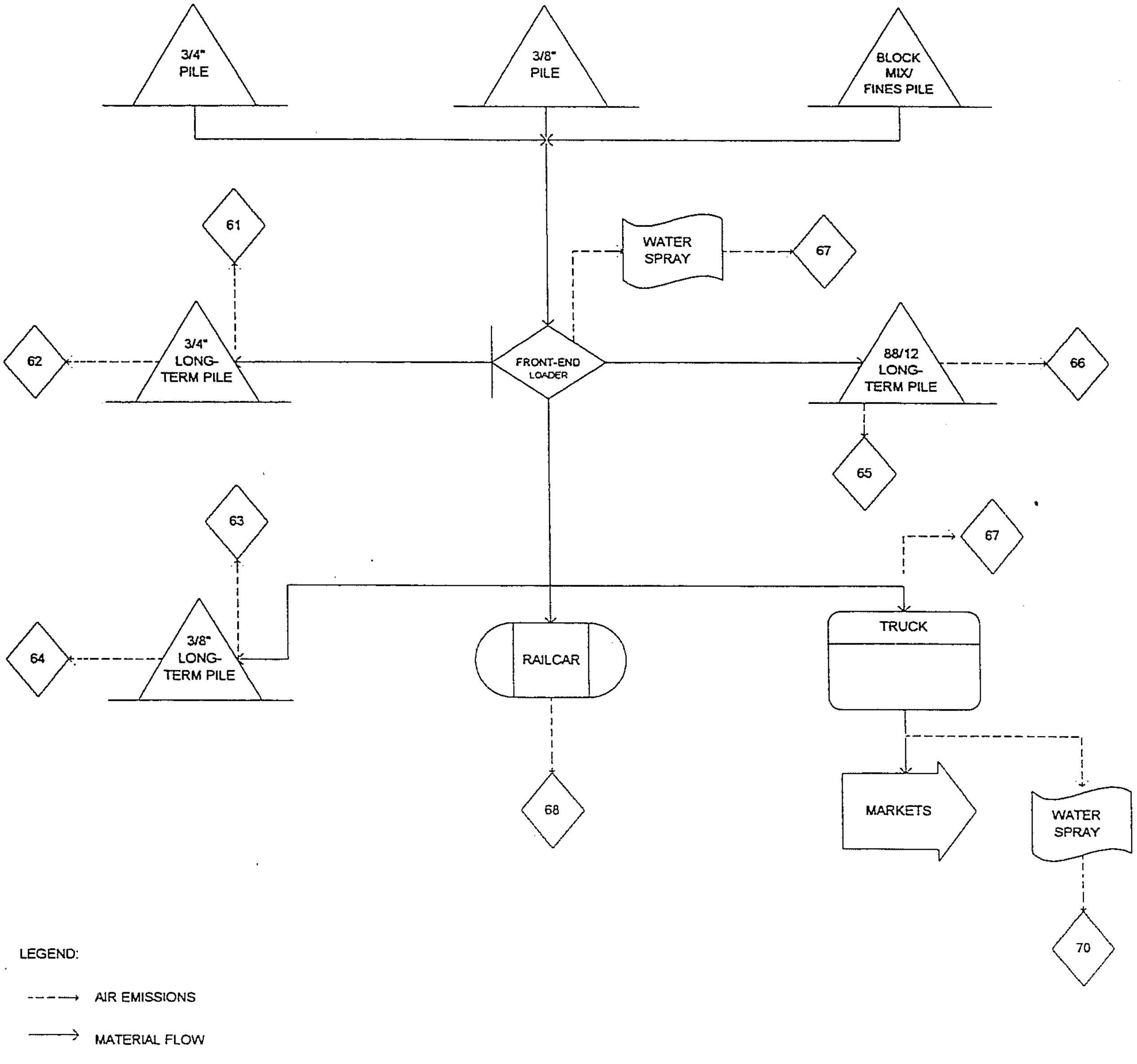


FIGURE 3-7

MISCELLANEOUS TRAFFIC

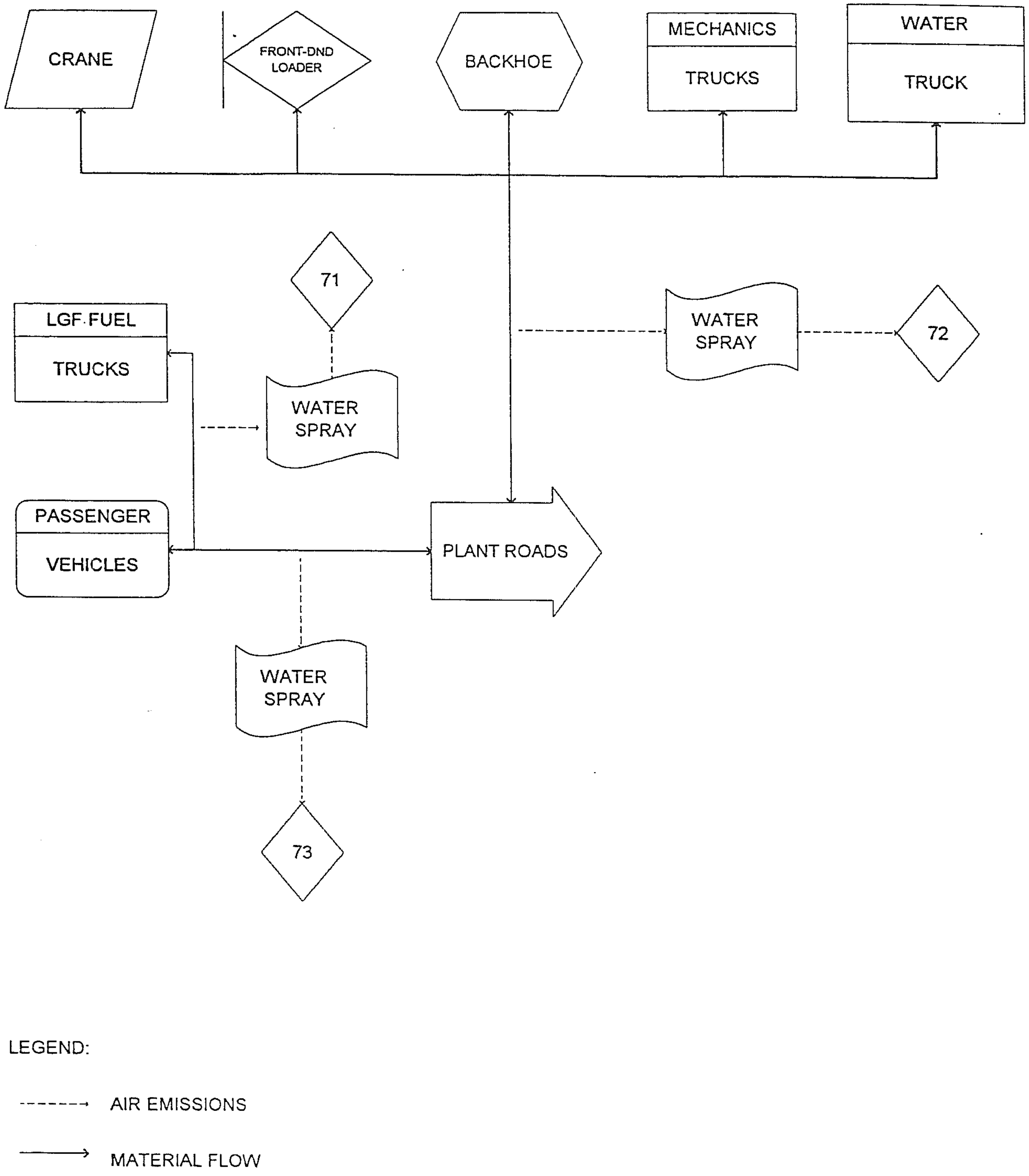


TABLE 3-1

CURRENT EMISSIONS OF FUGITIVE DUST SOURCES

Source ID	Change Code	Source Name	Current Production	Units	Current Emission Rate Potential (tpy)	Impact Potential Adjustment Factor (0 -> 1)	Weighted Emission Rate Potential (tpy)	Current Control Method	Current Control Efficiency (%)	Current Emission Rate (tpy)
1	R	Drilling at quarry	350,000	tpy	1.40E-01	0.05	7.00E-03	Mist suppression	50	3.5E-03
2	R	Blasting at quarry	350,000	tpy	1.40E+01	0.05	7.00E-01	None	0	7.0E-01
3	R	Formation of quarried stone pile	350,000	tpy	1.26E+00	0.05	6.31E-02	None	0	6.3E-02
4	R	Loading of stone into haul truck	350,000	tpy	1.91E-01	0.05	9.56E-03	None	0	9.6E-03
5	R	Quarry stone transport to crusher	8,400	vmt	5.62E+01	0.05	2.81E+00	Road watering	90	2.8E-01
6	R*	Stone dump onto stock pile	350,000	tpy	1.91E-01	0.2	3.83E-02	None	0	3.8E-02
7	R*	Quarry stone stock pile	350,000	tpy	1.41E-02	0.2	2.81E-03	None	0	2.8E-03
8	R	Stone transfer into primary crusher	350,000	tpy	1.91E-01	0.2	3.83E-02	Water hose	50	1.9E-02
9	R	Primary crusher	350,000	tpy	2.61E+01	0.2	5.22E+00	H2O carry-through	70	1.6E+00
10	R	Transfer to primary screen hopper	350,000	tpy	1.91E-01	0.2	3.83E-02	H2O carry-through	70	1.1E-02
11	R	Primary screen	350,000	tpy	2.80E+01	0.2	5.60E+00	H2O carry-through	70	1.7E+00
12	R	Secondary crusher	140,000	tpy	2.94E+01	0.2	5.88E+00	H2O carry-through	40	3.5E+00
13	R	Triple deck screen for crushing	350,000	tpy	2.80E+01	0.2	5.60E+00	H2O carry-through	30	3.9E+00
14	R	Discharge onto cone crusher belt	70,000	tpy	3.64E-01	0.2	7.28E-02	H2O carry-through	30	5.1E-02
15	R	Loading onto crushing operations fines pile	112,500	tpy	1.30E+00	0.2	2.60E-01	H2O carry-through	25	1.9E-01
16	R	Crushing operations fines pile	112,500	tpy	2.57E+00	0.2	5.15E-01	None	0	5.1E-01
	E	Transfer of fines to kiln feed pile	0	tpy	0.00E+00	0.2	0.00E+00	Eliminated	0	0.0E+00
17	R	Loading of fines into trucks	112,500	tpy	5.85E-01	0.2	1.17E-01	None	0	1.2E-01
18	R	Transport of fines off-site	5,625	vmt	2.60E+01	0.2	5.19E+00	Road watering	90	5.2E-01
19	R	Loading of kiln feed onto stock pile	205,000	tpy	7.39E-01	0.2	1.48E-01	H2O carry-through	25	1.1E-01
20	R	Kiln feed stock pile	205,000	tpy	4.02E-01	0.2	8.04E-02	None	0	8.0E-02
21	R	Kiln feed to screen discharge belt	205,000	tpy	2.29E-01	0.2	4.58E-02	None	0	4.6E-02
22	R	Kiln feed transfer to silo conveyer	205,000	tpy	2.29E-01	0.2	4.58E-02	None	0	4.6E-02
23	R*	Silo conveyor to kiln feed silo	205,000	tpy	2.29E-01	0.2	4.58E-02	Enclosure	90	4.6E-03
24	R	Kiln feed transfer to #2 kiln belt	205,000	tpy	2.29E-01	0.2	4.58E-02	None	0	4.6E-02

TABLE 3-1 (CONT.)

CURRENT EMISSIONS OF FUGITIVE DUST SOURCES

Source ID	Change Code	Source Name	Current Production	Units	Current Emission Rate Potential (tpy)	Impact Potential Adjustment Factor (0 ->1)	Weighted Emission Rate Potential (tpy)	Current Control Method	Current Control Efficiency (%)	Current Emission Rate (tpy)
25	R	Kiln feed transfer to #1 kiln belt	102,500	tpy	1.15E-01	0.2	2.29E-02	None	0	2.3E-02
26	R	#2 kiln feed transfer to loading belt	102,500	tpy	1.15E-01	0.2	2.29E-02	None	0	2.3E-02
27	R	Loading of #2 kiln	102,500	tpy	1.60E-01	0.2	3.20E-02	Collection hood	95	1.6E-03
28	R	Loading of #1 kiln	102,500	tpy	1.60E-01	0.2	3.20E-02	Collection hood	95	1.6E-03
29	R	#2 kiln rim seal	102,500	tpy	1.48E+01	0.5	7.39E+00	Improved seals	90	7.4E-01
30	R	#1 kiln rim seal	102,500	tpy	1.48E+01	0.5	7.39E+00	Improved seals	90	7.4E-01
31	R*	Removal of baghouse plug	500	tpy	3.60E-01	0.5	1.80E-01	Enclosure + slurry	90	1.8E-02
32	M	Kiln + clinker dust transfer onto #2 belt	400	tpy	2.88E-01	1	2.88E-01	Clinker dust only	0	2.9E-01
33	M	Kiln + clinker dust transfer onto #1 belt	400	tpy	2.88E-01	1	2.88E-01	Clinker dust only	0	2.9E-01
34	R	Discharge of #2 clinker onto pile	89,500	tpy	3.81E-01	1	3.81E-01	Water hose	25	2.9E-01
35	R	Discharge of #1 clinker onto pile	89,500	tpy	3.81E-01	1	3.81E-01	Water hose	25	2.9E-01
36	R	#2 kiln clinker pile transfer to #1 pile	89,500	tpy	1.00E-01	1	1.00E-01	H2O carry-through	25	7.5E-02
37	R	#2 kiln clinker pile	89,500	tpy	2.13E-01	1	2.13E-01	H2O carry-through	25	1.6E-01
38	R	#1 kiln clinker pile	89,500	tpy	2.13E-01	1	2.13E-01	H2O carry-through	25	1.6E-01
39	R	Clinker transfer to screen feed belt	180,000	tpy	2.01E-01	1	2.01E-01	None	0	2.0E-01
40	R	Triple deck finish mill screen	440,000	tpy	3.52E+01	1	3.52E+01	Partial enclosure	70	1.1E+01
41	R	Discharge into oversize hopper	180,000	tpy	2.01E-01	1	2.01E-01	Partial enclosure	70	6.0E-02
42	R	El Jay crusher	180,000	tpy	1.62E+00	1	1.62E+00	None	0	1.6E+00
43	R	Transfer to El Jay loadout belt	180,000	tpy	1.62E+00	1	1.62E+00	None	0	1.6E+00
44	R	El Jay belt transfer to screen belt	180,000	tpy	2.01E-01	1	2.01E-01	None	0	2.0E-01
45	R*	Transfer from fines belt to fines silo belt	85,000	tpy	9.50E-02	1	9.50E-02	None	0	9.5E-02
46	R*	Discharge from fines silo belt to fines silo	85,000	tpy	4.90E+00	1	4.90E+00	Partial enclosure	50	2.5E+00
47	R	Fines silos screens	85,000	tpy	6.80E+00	0.5	3.40E+00	Partial enclosure	70	1.0E+00
48	R	Transfer from screen belt to 3/4" belt	105,000	tpy	1.17E-01	1	1.17E-01	Water hose	50	5.9E-02
49	R	Discharge onto short-term 3/4" pile	105,000	tpy	3.78E-01	1	3.78E-01	Chute + water	90	3.8E-02

TABLE 3-1 (CONT.)

CURRENT EMISSIONS OF FUGITIVE DUST SOURCES

Source ID	Change Code	Source Name	Current Production	Units	Current Emission Rate Potential (tpy)	Impact Potential Adjustment Factor (0 ->1)	Weighted Emission Rate Potential (tpy)	Current Control Method	Current Control Efficiency (%)	Current Emission Rate (tpy)
50	R	3/4" short-term storage pile	105,000	tpy	1.00E-02	1	1.00E-02	Watering	50	5.0E-03
51	R	Transfer from screen belt to 3/8" belt	70,000	tpy	7.82E-02	1	7.82E-02	Water hose	50	3.9E-02
52	R	Discharge onto short-term 3/8" pile	70,000	tpy	2.52E-01	1	2.52E-01	Chute + water	90	2.5E-02
53	R	3/8" short-term storage pile	70,000	tpy	8.04E-03	1	8.04E-03	Watering	50	4.0E-03
54	R*	Transfer from 3/8" pile belt to 3/8" silo belt	18,500	tpy	2.07E-02	1	2.07E-02	H2O carry-through	25	1.6E-02
55	R*	Discharge from 3/8" silo belt to 3/8" silo pile	18,500	tpy	6.67E-02	1	6.67E-02	H2O carry-through	25	5.0E-02
56	R*	3/8" silo pile	18,500	tpy	4.02E-04	1	4.02E-04	None	0	4.0E-04
57	R*	Silo loading onto shipping belt	88,875	tpy	4.62E-01	1	4.62E-01	Partial enclosure	70	1.4E-01
58	R*	Shipping belt transfer to stock belt	88,875	tpy	4.62E-01	1	4.62E-01	Partial enclosure	70	1.4E-01
	R	Stock belt discharge onto 75/25 pile	0	tpy	0.00E+00	1	0.00E+00	Eliminated	0	0.0E+00
	R	75/25 block mix short-term pile	0	tpy	0.00E+00	1	0.00E+00	Eliminated	0	0.0E+00
59	R	Stock belt discharge onto 88/12 pile	88,000	tpy	4.50E+00	1	4.50E+00	None	0	4.5E+00
60	R	88/12 block mix short-term pile	88,000	tpy	1.71E-01	1	1.71E-01	None	0	1.7E-01
59	R	Stock pile belt discharge onto fines pile	875	tpy	5.05E-02	1	5.05E-02	None	0	5.0E-02
60	R	Finish mill straight fines pile	875	tpy	1.54E-03	1	1.54E-03	None	0	1.5E-03
61	R	Loading onto 3/4" long-term pile	52,500	tpy	1.27E-03	0.5	6.33E-04	None	0	6.3E-04
62	R	Long-term 3/4" storage pile	52,500	tpy	6.43E-01	0.5	3.22E-01	None	0	3.2E-01
63	R	Loading onto 3/8" long-term pile	25,750	tpy	1.53E-03	0.5	7.64E-04	None	0	7.6E-04
64	R	Long-term 3/8" storage pile	25,750	tpy	4.02E-01	0.5	2.01E-01	None	0	2.0E-01
65	N	Loading onto 88/12 long-term pile	88,000	tpy	1.64E-01	0.2	3.29E-02	None	0	3.3E-02
66	N	Long-term 88/12 storage pile	88,000	tpy	3.42E+00	0.2	6.85E-01	None	0	6.8E-01
67	R	Finish mill front-end loader travel	3,782	vmt	8.53E+00	1	8.53E+00	Road watering	90	8.5E-01
68	R	Loading of product into railcars	44,278	tpy	8.73E-02	1	8.73E-02	None	0	8.7E-02
69	R	Loading of product into trucks	119,716	tpy	2.36E-01	1	2.36E-01	None	0	2.4E-01
70	M	Transport of product off-site by truck	2,982	vmt	1.67E+01	1	1.67E+01	Road watering	90	1.7E+00

TABLE 3-1 (CONT.)

CURRENT EMISSIONS OF FUGITIVE DUST SOURCES

Source ID	Change Code	Source Name	Current Production	Units	Current Emission Rate Potential (tpy)	Impact Potential Adjustment Factor (0 ->1)	Weighted Emission Rate Potential (tpy)	Current Control Method	Current Control Efficiency (%)	Current Emission Rate (tpy)
	E	Travel of coal delivery trucks	0	vmt	0.00E+00	1	0.00E+00	Eliminated	0	0.0E+00
	E	Unloading of coal onto pile	0	tpy	0.00E+00	0.5	0.00E+00	Eliminated	0	0.0E+00
	E	Coal pile	0	tpy	0.00E+00	0.5	0.00E+00	Eliminated	0	0.0E+00
	E	Dump into coal mill hopper	0	tpy	0.00E+00	0.5	0.00E+00	Eliminated	0	0.0E+00
71	R	Travel of LGF delivery trucks	728	vmt	1.01E+01	0.5	5.06E+00	Road watering	90	5.1E-01
	E	Baghouse dust discharge from silo	0	tpy	0.00E+00	0.5	0.00E+00	Eliminated	0	0.0E+00
	E	Loading of baghouse dust onto pile	0	tpy	0.00E+00	0.5	0.00E+00	Eliminated	0	0.0E+00
	E	Baghouse dust pile	0	tpy	0.00E+00	0.5	0.00E+00	Eliminated	0	0.0E+00
	E	Loading of baghouse dust into trucks	0	tpy	0.00E+00	0.5	0.00E+00	Eliminated	0	0.0E+00
	E	Transport of baghouse dust off-site	0	vmt	0.00E+00	1	0.00E+00	Eliminated	0	0.0E+00
72	R	Maintenance traffic	1,664	vmt	4.05E+00	0.5	2.02E+00	Road watering	90	2.0E-01
73	R	Passenger vehicle traffic	5,040	vmt	7.49E+00	1	7.49E+00	Road watering	90	7.5E-01
		TOTAL			358	0.40	145		69	45

NOTES:

R	remaining source
R*	remaining source not addressed by 1990 FDP
E	source eliminated
M	modified source
N	new source

TABLE 3-2

1990 EMISSIONS OF FUGITIVE DUST SOURCES

Source ID	Change Code	Source Name	1990 Production	Units	1990 Emission Rate Potential (tpy)	Impact Potential Adjustment Factor (0 ->1)	Weighted Emission Rate Potential (tpy)	1990 Control Method	1990 Control Efficiency (%)	1990 Emission Rate (tpy)
1	R	Drilling at quarry	350,000	tpy	1.40E-01	0.05	7.00E-03	Mist suppression	50	3.5E-03
2	R	Blasting at quarry	350,000	tpy	1.40E+01	0.05	7.00E-01	None	0	7.0E-01
3	R	Formation of quarried stone pile	350,000	tpy	1.26E+00	0.05	6.31E-02	None	0	6.3E-02
4	R	Loading of stone into haul truck	350,000	tpy	1.91E-01	0.05	9.56E-03	None	0	9.6E-03
5	R	Quarry stone transport to crusher	8,400	vmt	5.62E+01	0.05	2.81E+00	Road watering	70	8.4E-01
6	R*	Stone dump onto stock pile	350,000	tpy	1.91E-01	0.2	3.83E-02	None	0	3.8E-02
7	R*	Quarry stone stock pile	350,000	tpy	1.41E-02	0.2	2.81E-03	None	0	2.8E-03
8	R	Stone transfer into primary crusher	350,000	tpy	1.91E-01	0.2	3.83E-02	Water hose	50	1.9E-02
9	R	Primary crusher	350,000	tpy	2.61E+01	0.2	5.22E+00	H2O carry-through	70	1.6E+00
10	R	Transfer to primary screen hopper	350,000	tpy	1.91E-01	0.2	3.83E-02	H2O carry-through	70	1.1E-02
11	R	Primary screen	350,000	tpy	2.80E+01	0.2	5.60E+00	H2O carry-through	70	1.7E+00
12	R	Secondary crusher	140,000	tpy	2.94E+01	0.2	5.88E+00	H2O carry-through	40	3.5E+00
13	R	Triple deck screen for crushing	350,000	tpy	2.80E+01	0.2	5.60E+00	H2O carry-through	30	3.9E+00
14	R	Discharge onto cone crusher belt	70,000	tpy	3.64E-01	0.2	7.28E-02	H2O carry-through	30	5.1E-02
15	R	Loading onto crushing operations fines pile	70,000	tpy	8.07E-01	0.2	1.61E-01	H2O carry-through	25	1.2E-01
16	R	Crushing operations fines pile	70,000	tpy	4.50E+00	0.2	9.00E-01	None	0	9.0E-01
	E	Transfer of fines to kiln feed pile	7,000	tpy	3.64E-02	0.2	7.28E-03	None	0	7.3E-03
17	R	Loading of fines into trucks	25,000	tpy	1.30E-01	0.2	2.60E-02	None	0	2.6E-02
18	R	Transport of fines off-site	1,250	vmt	4.52E+00	0.2	9.04E-01	Road watering	70	2.7E-01
19	R	Loading of kiln feed onto stock pile	280,000	tpy	1.01E+00	0.2	2.02E-01	H2O carry-through	25	1.5E-01
20	R	Kiln feed stock pile	280,000	tpy	8.02E-02	0.2	1.60E-02	None	0	1.6E-02
21	R	Kiln feed to screen discharge belt	280,000	tpy	3.13E-01	0.2	6.26E-02	None	0	6.3E-02
22	R	Kiln feed transfer to silo conveyer	280,000	tpy	3.13E-01	0.2	6.26E-02	None	0	6.3E-02
23	R*	Silo conveyor to kiln feed silo	280,000	tpy	3.13E-01	0.2	6.26E-02	Enclosure	90	6.3E-03
24	R	Kiln feed transfer to #2 kiln belt	280,000	tpy	3.13E-01	0.2	6.26E-02	None	0	6.3E-02

TABLE 3-2 (CONT.)
1990 EMISSIONS OF FUGITIVE DUST SOURCES

Source ID	Change Code	Source Name	1990 Production	Units	1990 Emission Rate Potential (tpy)	Impact Potential Adjustment Factor (0 ->1)	Weighted Emission Rate Potential (tpy)	1990 Control Method	1990 Control Efficiency (%)	1990 Emission Rate (tpy)
25	R	Kiln feed transfer to #1 kiln belt	140,000	tpy	1.56E-01	0.2	3.13E-02	None	0	3.1E-02
26	R	#2 kiln feed transfer to loading belt	140,000	tpy	1.56E-01	0.2	3.13E-02	None	0	3.1E-02
27	R	Loading of #2 kiln	140,000	tpy	1.60E-01	0.2	3.20E-02	Collection hood	95	1.6E-03
28	R	Loading of #1 kiln	140,000	tpy	1.60E-01	0.2	3.20E-02	Collection hood	95	1.6E-03
29	R	#2 kiln rim seal	140,000	tpy	1.48E+01	0.5	7.39E+00	None	0	7.4E+00
30	R	#1 kiln rim seal	140,000	tpy	1.48E+01	0.5	7.39E+00	None	0	7.4E+00
31	R*	Removal of baghouse plug	500	tpy	3.60E-01	0.5	1.80E-01	Enclosure + slurry	90	1.8E-02
32	M	Kiln + clinker dust transfer onto #2 belt	10,400	tpy	7.50E+00	1	7.50E+00	None	0	7.5E+00
33	M	Kiln + clinker dust transfer onto #1 belt	10,400	tpy	7.50E+00	1	7.50E+00	None	0	7.5E+00
34	R	Discharge of #2 clinker onto pile	129,600	tpy	5.51E-01	1	5.51E-01	Water hose	25	4.1E-01
35	R	Discharge of #1 clinker onto pile	129,600	tpy	5.51E-01	1	5.51E-01	Water hose	25	4.1E-01
36	R	#2 kiln clinker pile transfer to #1 pile	129,600	tpy	1.45E-01	1	1.45E-01	H2O carry-through	25	1.1E-01
37	R	#2 kiln clinker pile	129,600	tpy	1.42E+00	1	1.42E+00	H2O carry-through	25	1.1E+00
38	R	#1 kiln clinker pile	129,600	tpy	1.42E+00	1	1.42E+00	H2O carry-through	25	1.1E+00
39	R	Clinker transfer to screen feed belt	180,000	tpy	2.01E-01	1	2.01E-01	None	0	2.0E-01
40	R	Triple deck finish mill screen	440,000	tpy	3.52E+01	1	3.52E+01	Partial enclosure	70	1.1E+01
41	R	Discharge into oversize hopper	180,000	tpy	2.01E-01	1	2.01E-01	Partial enclosure	70	6.0E-02
42	R	El Jay crusher	180,000	tpy	1.62E+00	1	1.62E+00	None	0	1.6E+00
43	R	Transfer to El Jay loadout belt	180,000	tpy	1.62E+00	1	1.62E+00	None	0	1.6E+00
44	R	El Jay belt transfer to screen belt	180,000	tpy	2.01E-01	1	2.01E-01	None	0	2.0E-01
45	R*	Transfer from fines belt to fines silo belt	85,000	tpy	9.50E-02	1	9.50E-02	None	0	9.5E-02
46	R*	Discharge from fines silo belt to fines silo	85,000	tpy	4.90E+00	1	4.90E+00	Partial enclosure	50	2.5E+00
47	R	Fines silos screens	85,000	tpy	6.80E+00	0.5	3.40E+00	Partial enclosure	70	1.0E+00
48	R	Transfer from screen belt to 3/4" belt	105,000	tpy	1.17E-01	1	1.17E-01	None	0	1.2E-01
49	R	Discharge onto short-term 3/4" pile	105,000	tpy	3.78E-01	1	3.78E-01	Chute + water	90	3.8E-02

TABLE 3-2 (CONT.)

1990 EMISSIONS OF FUGITIVE DUST SOURCES

Source ID	Change Code	Source Name	1990 Production	Units	1990 Emission Rate Potential (tpy)	Impact Potential Adjustment Factor (0 ->1)	Weighted Emission Rate Potential (tpy)	1990 Control Method	1990 Control Efficiency (%)	1990 Emission Rate (tpy)
50	R	3/4" short-term storage pile	105,000	tpy	3.01E-01	1	3.01E-01	None	0	3.0E-01
51	R	Transfer from screen belt to 3/8" belt	70,000	tpy	7.82E-02	1	7.82E-02	None	0	7.8E-02
52	R	Discharge onto short-term 3/8" pile	70,000	tpy	2.52E-01	1	2.52E-01	Chute + water	90	2.5E-02
53	R	3/8" short-term storage pile	70,000	tpy	4.37E-01	1	4.37E-01	None	0	4.4E-01
54	R*	Transfer from 3/8" pile belt to 3/8" silo belt	18,500	tpy	2.07E-02	1	2.07E-02	None	0	2.1E-02
55	R*	Discharge from 3/8" silo belt to 3/8" silo pile	18,500	tpy	6.67E-02	1	6.67E-02	None	0	6.7E-02
56	R*	3/8" silo pile	18,500	tpy	4.02E-04	1	4.02E-04	None	0	4.0E-04
57	R*	Silo loading onto shipping belt	103,500	tpy	4.97E+00	1	4.97E+00	Partial enclosure	70	1.5E+00
58	R*	Shipping belt transfer to stock belt	103,500	tpy	1.16E-01	1	1.16E-01	None	0	1.2E-01
	R	Stock belt discharge onto 75/25 pile	50,000	tpy	2.21E+00	1	2.21E+00	None	0	2.2E+00
	R	75/25 block mix short-term pile	50,000	tpy	4.92E+00	1	4.92E+00	None	0	4.9E+00
59	R	Stock belt discharge onto 88/12 pile	50,000	tpy	2.56E+00	1	2.56E+00	None	0	2.6E+00
60	R	88/12 block mix short-term pile	50,000	tpy	5.71E+00	1	5.71E+00	None	0	5.7E+00
59	R	Stock pile belt discharge onto fines pile	3,500	tpy	2.02E-01	1	2.02E-01	None	0	2.0E-01
60	R	Finish mill straight fines pile	3,500	tpy	3.21E-01	1	3.21E-01	None	0	3.2E-01
61	R	Loading onto 3/4" long-term pile	52,500	tpy	1.27E-03	0.5	6.33E-04	None	0	6.3E-04
62	R	Long-term 3/4" storage pile	52,500	tpy	4.02E-01	0.5	2.01E-01	Watering	50	1.0E-01
63	R	Loading onto 3/8" long-term pile	25,750	tpy	1.53E-03	0.5	7.64E-04	None	0	7.6E-04
64	R	Long-term 3/8" storage pile	25,750	tpy	8.04E-01	0.5	4.02E-01	Watering	50	2.0E-01
65	N	Loading onto 88/12 long-term pile	0	tpy	0.00E+00	0.2	0.00E+00	None	0	0.0E+00
66	N	Long-term 88/12 storage pile	0	tpy	0.00E+00	0.2	0.00E+00	None	0	0.0E+00
67	R	Finish mill front-end loader travel	3,782	vmt	8.53E+00	1	8.53E+00	Road watering	70	2.6E+00
68	R	Loading of product into railcars	60,000	tpy	1.18E-01	1	1.18E-01	None	0	1.2E-01
69	R	Loading of product into trucks	200,000	tpy	3.94E-01	1	3.94E-01	None	0	3.9E-01
70	M	Transport of product off-site by truck	3,637	vmt	1.53E+01	1	1.53E+01	Road watering	70	4.6E+00

TABLE 3-2 (CONT.)

1990 EMISSIONS OF FUGITIVE DUST SOURCES

Source ID	Change Code	Source Name	1990 Production	Units	1990 Emission Rate Potential (tpy)	Impact Potential Adjustment Factor (0 -> 1)	Weighted Emission Rate Potential (tpy)	1990 Control Method	1990 Control Efficiency (%)	1990 Emission Rate (tpy)
	E	Travel of coal delivery trucks	102	vmt	3.30E-01	1	3.30E-01	Road watering	70	9.9E-02
	E	Unloading of coal onto pile	7,000	tpy	4.43E-03	0.5	2.22E-03	None	0	2.2E-03
	E	Coal pile	7,000	tpy	8.85E-02	0.5	4.43E-02	None	0	4.4E-02
	E	Dump into coal mill hopper	7,000	tpy	4.43E-03	0.5	2.22E-03	None	0	2.2E-03
71	R	Travel of LGF delivery trucks	500	vmt	6.94E+00	0.5	3.47E+00	Road watering	70	1.0E+00
	E	Baghouse dust discharge from silo	6,000	tpy	3.12E-02	0.5	1.56E-02	Watering	90	1.6E-03
	E	Loading of baghouse dust onto pile	6,000	tpy	4.33E+00	0.5	2.16E+00	Watering	90	2.2E-01
	E	Baghouse dust pile	6,000	tpy	4.02E+00	0.5	2.01E+00	None	0	2.0E+00
	E	Loading of baghouse dust into trucks	6,000	tpy	1.77E-02	0.5	8.85E-03	None	0	8.8E-03
	E	Transport of baghouse dust off-site	144	vmt	1.03E+00	1	1.03E+00	Road watering	70	3.1E-01
72	R	Maintenance traffic	1,664	vmt	4.05E+00	0.5	2.02E+00	Road watering	70	6.1E-01
73	R	Passenger vehicle traffic	5,040	vmt	7.49E+00	1	7.49E+00	Road watering	70	2.2E+00
		TOTAL			374	0.47	176		44	98

NOTES:

- R remaining source
- R* remaining source not addressed by 1990 FDP
- E source eliminated
- M modified source
- N new source

4.0 CRITIQUE OF CONTROL METHODOLOGIES

In general, the controls instituted by Norlite to reduce fugitive dust emissions appear to be relatively effective in most areas. As noted in Section 3.0, the controls have reduced the overall quantity of dust emitted as compared to the situation that existed at the facility in 1990. However, some of the controls require modification to improve their effectiveness and reliability, and some sources that are currently uncontrolled require the institution of a control methodology.

Table 4-1 presents a summary of each of the fugitive dust sources or source categories, the current control methodology, and a qualitative assessment of the effectiveness of the controls. Note that some sources are classified as not needing controls. In these cases, the sources are either far removed from the neighboring community, emit very little dust, or do not lend themselves to cost-effective control systems.

TABLE 4-1

QUALITATIVE ASSESSMENT OF CURRENT DUST CONTROLS

DUST SOURCE	CURRENT CONTROLS	CONTROL STATUS				
		NOT WARRANTED	EFFECTIVE AS IS	FINE-TUNING SUGGESTED	MODIFICATIONS NEEDED	CONTROLS NEEDED
Drilling at quarry	Mist suppression		X			
Blasting at quarry	None	X				
Formation of quarried stone pile	None	X				
Loading of stone into haul truck	None	X				
Quarry stone transport to crusher	Road watering		X			
Stone dump onto stock pile	None	X				
Stone transfer into primary crusher	None	X				
Primary crusher	Water hose				X	
Transfer to primary screen hopper	H_2O carry-through		X			
Primary screen	H_2O carry-through		X			
Secondary crusher	H_2O carry-through				X	
Triple deck screen for crushing	H_2O carry-through		X			
Discharge onto cone crusher belt	H_2O carry-through		X			
Loading onto crushing operations fines pile	H_2O carry-through		X			
Crushing operations fines pile	H_2O carry-through		X			
Transfer of fines to kiln feed pile	Eliminated		X			
Loading of fines into trucks	None	X				

TABLE 4-1 (CONT.)

QUALITATIVE ASSESSMENT OF CURRENT DUST CONTROLS

DUST SOURCE	CURRENT CONTROLS	CONTROL STATUS				
		NOT WARRANTED	EFFECTIVE AS IS	FINE-TUNING SUGGESTED	MODIFICATIONS NEEDED	CONTROLS NEEDED
Transport of fines off-site	Road watering			X		
Loading of kiln feed onto stock pile	H_2O carry-through		X			
Kiln feed stock pile	None	X				
Kiln feed to screen discharge belt	None	X				
Kiln feed transfer to silo conveyer	None	X				
Silo conveyor to kiln feed silo	Enclosure	X				
Kiln feed transfer to #2 Kiln Belt	None	X				
Kiln feed transfer to #1 kiln belt	None	X				
#2 kiln feed transfer to loading belt	None	X				
Loading of #2 kiln	Collection hood		X			
Loading of #1 kiln	Collection hood		X			
#2 kiln rim seal	Improved seals			X		
#1 kiln rim seal	Improved seals			X		
Kiln + clinker dust transfer onto #2 belt	None					X
Kiln + clinker dust transfer onto #1 belt	None					X
Discharge of #2 clinker onto pile	Water hose				X	

TABLE 4-1 (CONT.)

QUALITATIVE ASSESSMENT OF CURRENT DUST CONTROLS

DUST SOURCE	CURRENT CONTROLS	CONTROL STATUS				
		NOT WARRANTED	EFFECTIVE AS IS	FINE-TUNING SUGGESTED	MODIFICATIONS NEEDED	CONTROLS NEEDED
Discharge of #1 clinker onto pile	Water hose				X	
#2 kiln clinker pile	H_2O carry-through		X			
#2 kiln clinker pile transfer to #1 pile	H_2O carry-through		X			
#1 kiln clinker pile	H_2O carry-through		X			
Clinker transfer to screen feed belt	None		X			
Triple deck finish mill screen	Partial enclosure				X	
Discharge into oversize hopper	Partial enclosure			X		
El Jay crusher	None				X	
Transfer to El Jay loadout belt	None					X
El Jay belt transfer to screen belt	None			X		
Fines silos screens	Partial enclosure			X		
Transfer from screen belt to 3/4" belt	Water hose				X	
Discharge onto short-term 3/4" pile	Chute + water			X		
3/4" short-term storage pile	Watering			X		
Transfer from screen belt to 3/8" belt	Water hose				X	
Discharge onto short-term 3/8" pile	Chute + water			X		

TABLE 4-1 (CONT.)

QUALITATIVE ASSESSMENT OF CURRENT DUST CONTROLS

DUST SOURCE	CURRENT CONTROLS	CONTROL STATUS				
		NOT WARRANTED	EFFECTIVE AS IS	FINE-TUNING SUGGESTED	MODIFICATIONS NEEDED	CONTROLS NEEDED
3/8" short-term storage pile	Watering			X		
Transfer from 3/8" pile belt to 3/8" silo belt	None	X				
Discharge from 3/8" silo belt to 3/8" silo pile	None	X				
3/8" silo pile	None	X				
Transfer from fines belt to fines silo belt	None	X				
Discharge from fines silo belt to fines silo	Partial enclosure				X	
Silo loading onto shipping belt	Partial enclosure			X		
Shipping belt transfer to stock belt	Partial enclosure			X		
Stock belt discharge onto 75/25 pile	Eliminated	X				
75/25 block mix short-term pile	Eliminated	X				
Stock belt discharge onto 88/12 pile	None					X
88/12 block mix short-term pile	None					X
Stock pile belt discharge onto fines pile	None	X				
Finish mill straight fines pile	None	X				
Finish mill front-end loader travel	Road watering		X			
Loading onto 3/4" long-term pile	None	X				

TABLE 4-1 (CONT.)

QUALITATIVE ASSESSMENT OF CURRENT DUST CONTROLS

DUST SOURCE	CURRENT CONTROLS	CONTROL STATUS				
		NOT WARRANTED	EFFECTIVE AS IS	FINE-TUNING SUGGESTED	MODIFICATIONS NEEDED	CONTROLS NEEDED
Long-term 3/4" storage pile	None				X	
Loading onto 3/8" long-term pile	None	X				
Long-term 3/8" storage pile	None				X	
Loading onto 88/12 long-term pile	None	X				
Long-term 88/12 storage pile	None				X	
Loading of product into railcars	None					X
Loading of product into trucks	None	X				
Transport of product off-site by truck	Road watering		X			
Travel of coal delivery trucks	Eliminated	X				
Unloading of coal onto pile	Eliminated	X				
Coal pile	Eliminated	X				
Dump into coal mill hopper	Eliminated	X				
Travel of LGF delivery trucks	Road watering		X			
Baghouse dust discharge from silo	Eliminated	X				
Loading of baghouse dust onto pile	Eliminated	X				
Baghouse dust pile	Eliminated	X				

TABLE 4-1 (CONT.)

QUALITATIVE ASSESSMENT OF CURRENT DUST CONTROLS

DUST SOURCE	CURRENT CONTROLS	CONTROL STATUS				
		NOT WARRANTED	EFFECTIVE AS IS	FINE-TUNING SUGGESTED	MODIFICATIONS NEEDED	CONTROLS NEEDED
Loading of baghouse dust into trucks	Eliminated	X				
Transport of baghouse dust off-site	Eliminated	X				
Maintenance traffic	Road watering		X			
Passenger vehicle traffic	Road watering		X			
Unloading of baghouse plug in truck	Water to make slurry			X		

5.0 RECOMMENDATIONS AND DISCUSSION

The intent of this section is to provide recommendations for cost-effective control methodologies for all fugitive dust sources identified in Section 4.0 as requiring new or modified control systems. The recommendations are based on source strength, proximity to plant boundaries, ease of implementation, cost of implementation, and overall effectiveness of the control methodology. The fugitive dust control methodologies presented are designated as being either primary or secondary. Primary control methodologies are proven, cost-effective techniques. Secondary control methodologies are less proven and/or more costly to implement. The feasibility and need for these additional measures is contingent upon the success of the primary control strategies.

Table 5-1 presents a summary of the control methodologies recommended for the fugitive dust sources at Norlite. Details of each of the sources and recommended controls are provided in the subsections that follow. Vendor information that may be relevant to the understanding of some of the recommended controls is provided in Appendix B to this report. Table 5-2 provides a quantitative assessment of the weighted emission rates that may be achieved through the implementation of all of the primary control strategies recommended in Table 5-1. The emission estimates listed here are developed for comparison purposes. It is not the intent of this study to develop detailed emissions estimates for purposes of facility permitting. The data in Table 3-1 show that the current control efficiency is 69 percent. By implementing the primary control strategies listed in Table 5-1, the control efficiency will increase to 91 percent, as shown in Table 5-2. The improvements in dust suppression are shown graphically in Figure 5-1.

5.1 Railcar/Truck Loading

The loading of railcars and trucks with product is a sporadic activity. For example, current requirements only necessitate the loading of product into railcars once or twice per week, five cars at a time. Dust is produced by this activity as a result of boil-up during loading. The worst case is when block mix is loaded, with lesser amounts of dust produced when 3/8 inch and 3/4 inch aggregate are loaded due to the coarseness of these materials. Note that only 25 percent of all railcar shipments are for block mix with the remainder being structural material.

TABLE 5-1
PROPOSED CONTROL METHODOLOGIES

FUGITIVE DUST SOURCE/CATEGORY	PRIMARY CONTROL METHODOLOGIES	SECONDARY CONTROL METHODOLOGIES
Railcar/truck loading	Operational guidelines based on wind speed, direction Water spray from watering truck	Restrict location Water sprays Wind screen
Roadways	Water every 2 hours on dry days Procedure for having a truck available at all times	Stabilize roads in select areas with roller compacted concrete Optimize water truck nozzles
Block mix storage by Gate 1	Pile shaping	Berm (shale pile) along western boundary Portable wind screens
Transfer points/crushers/screens	Hard pipe Relocate nozzles to more optimum positions Add more nozzles for larger sources Replace existing "garden hose" nozzles Winterize where possible	Partial enclosures
Stacking tubes	Rubber flaps over openings	
Drop chute to fines silo	Repair hole(s) in chute Change chute mouth geometry	
Tunnel mouth	Rubber curtains	
Kiln seals	Operation and maintenance program	
Finish mill storage piles	Optimize and maintain current spray system	
Baghouse dust unloading via vacuum truck	Follow current unloading procedure	
Finish mill (general)	Install radial stacker to eliminate several dust sources	
Clinker cooler dust to clinker belt	Convey to hopper with bin vent	Investigate alternative handling, conveying systems
Housekeeping/general	Replace missing conveyor covers Replace missing enclosure panels Clean up/spray spillage from conveyors/transfer points Employee/operator training Replace soda ash silo bin vent	
Windblown dust migrating across eastern boundary	Wind screen on top of berm along eastern boundary Modify pile shapes/locations	Vegetation/trees along fenceline

Table 5-2

Anticipated Emissions of Fugitve Dust Sources

Source ID	Plant Locatioin	Source Name	Anticipated Production	Units	Anticipated Emission Rate Potential (tpy)	Impact Potential Adjustment Factor (0 ->1)	Weighted Emission Rate Potential (tpy)	Anticipated Control Method	Anticipated Control Efficiency (%)	Anticipated Emission Rate (tpy)
1	Quarry	Drilling at quarry	350,000	tpy	1.40E-01	0.05	7.00E-03	Mist suppression	50	3.5E-03
2	Quarry	Blasting at quarry	350,000	tpy	1.40E+01	0.05	7.00E-01	None	0	7.0E-01
3	Quarry	Formation of quarried stone pile	350,000	tpy	1.26E+00	0.05	6.31E-02	None	0	6.3E-02
4	Quarry	Loading of stone into haul truck	350,000	tpy	1.91E-01	0.05	9.56E-03	None	0	9.6E-03
5	Road	Quarry stone transport to crusher	8,400	vmt	5.62E+01	0.05	2.81E+00	Road watering	90	2.8E-01
6	Quarry	Stone dump onto stock pile	350,000	tpy	1.91E-01	0.2	3.83E-02	None	0	3.8E-02
7	Quarry	Quarry stone stock pile	350,000	tpy	1.41E-02	0.2	2.81E-03	None	0	2.8E-03
8	Road	Stone transfer into primary crusher	350,000	tpy	1.91E-01	0.2	3.83E-02	Water spray	90	3.8E-03
9	Primary	Primary Jaw crusher	350,000	tpy	2.61E+01	0.2	5.22E+00	Spray and partial encl	97	1.6E-01
10	Primary	Transfer to primary screen hopper (Surge Bin)	350,000	tpy	1.91E-01	0.2	3.83E-02	Spray and partial encl	97	1.1E-03
11	Primary	Primary screen	350,000	tpy	2.80E+01	0.2	5.60E+00	Spray and partial encl	97	1.7E-01
12	Primary	Secondary crusher	140,000	tpy	2.94E+01	0.2	5.88E+00	Spray and partial encl	97	1.8E-01
13	Primary	Triple deck screen for crushing	350,000	tpy	2.80E+01	0.2	5.60E+00	Spray and partial encl	97	1.7E-01
14	Primary	Discharge onto cone crusher belt (Drop from Traylor Crusher)	70,000	tpy	3.64E-01	0.2	7.28E-02	H2O carry-through	90	7.3E-03
15	Primary	Loading onto crushing operations fines pile	112,500	tpy	1.30E+00	0.2	2.60E-01	H2O carry-through	90	2.6E-02
16	Primary	Crushing operations fines pile	112,500	tpy	2.57E+00	0.2	5.15E-01	None	0	5.1E-01
17	Primary	Loading of fines into trucks	112,500	tpy	5.85E-01	0.2	1.17E-01	None	0	1.2E-01
18	Road	Transport of fines off-site	5,625	vmt	2.60E+01	0.2	5.19E+00	Road watering	90	5.2E-01
19	Primary	Loading of kiln feed onto stock pile	205,000	tpy	7.39E-01	0.2	1.48E-01	H2O carry-through	90	1.5E-02
20	Primary	Kiln feed stock pile	205,000	tpy	4.02E-01	0.2	8.04E-02	None	0	8.0E-02
21	Primary	Kiln feed to screen discharge belt	205,000	tpy	2.29E-01	0.2	4.58E-02	None	0	4.6E-02
22	Primary	Kiln feed transfer to silo conveyer	205,000	tpy	2.29E-01	0.2	4.58E-02	None	0	4.6E-02
23	Primary	Silo conveyor to kiln feed silo	205,000	tpy	2.29E-01	0.2	4.58E-02	Enclosure	90	4.6E-03
24	Kiln	Kiln feed transfer to #2 kiln belt	205,000	tpy	2.29E-01	0.2	4.58E-02	None	0	4.6E-02
25	Kiln	Kiln feed transfer to #1 kiln belt	102,500	tpy	1.15E-01	0.2	2.29E-02	None	0	2.3E-02
26	Kiln	#2 kiln feed transfer to loading belt	102,500	tpy	1.15E-01	0.2	2.29E-02	None	0	2.3E-02
27	Kiln	Loading of #2 kiln	102,500	tpy	1.60E-01	0.2	3.20E-02	Collection hood	95	1.6E-03
28	Kiln	Loading of #1 kiln	102,500	tpy	1.60E-01	0.2	3.20E-02	Collection hood	95	1.6E-03
29	Kiln	#2 kiln rim seal	102,500	tpy	1.48E+01	0.5	7.39E+00	Improved seals	95	3.7E-01
30	Kiln	#1 kiln rim seal	102,500	tpy	1.48E+01	0.5	7.39E+00	Improved seals	95	3.7E-01
31	Kiln	Removal of baghouse plug Vacuum Truck Unloading	500	tpy	3.60E-01	0.5	1.80E-01	Enclosure + slurry	99	1.8E-03
32	Eliminiated	Kiln + clinker dust transfer onto #2 belt	0	tpy	0.00E+00	1	0.00E+00	Eliminated	0	0.0E+00
33	Eliminiated	Kiln + clinker dust transfer onto #1 belt	0	tpy	0.00E+00	1	0.00E+00	Eliminated	0	0.0E+00
34	Kiln	Discharge of #2 clinker onto pile	89,100	tpy	3.79E-01	1	3.79E-01	Water spray	90	3.8E-02
35	Kiln	Discharge of #1 clinker onto pile	89,100	tpy	3.79E-01	1	3.79E-01	Water spray	90	3.8E-02
36	Kiln	#2 kiln clinker pile transfer to #1 pile	89,100	tpy	9.96E-02	1	9.96E-02	H2O carry-through	90	1.0E-02
37	Kiln	#2 kiln clinker pile	89,100	tpy	2.13E-01	1	2.13E-01	H2O carry-through	90	2.1E-02
38	Kiln	#1 kiln clinker pile	89,100	tpy	2.13E-01	1	2.13E-01	H2O carry-through	90	2.1E-02
39	Finish	Clinker transfer to screen feed belt	180,000	tpy	2.01E-01	1	2.01E-01	Baghouse	99	2.0E-03
40	Finish	Triple deck finish mill screen	440,000	tpy	3.52E+01	1	3.52E+01	Baghouse	99	3.5E-01
41	Finish	Discharge into oversize hopper	180,000	tpy	2.01E-01	1	2.01E-01	Baghouse	99	2.0E-03

Source ID	Plant Location	Source Name	Anticipated Production	Units	Anticipated Emission Rate Potential (tpy)	Impact Potential Adjustment Factor (0 ->1)	Weighted Emission Rate Potential (tpy)	Anticipated Control Method	Anticipated Control Efficiency (%)	Anticipated Emission Rate (tpy)
42	Finish	El Jay crusher	180,000	tpy	1.62E+00	1	1.62E+00	Baghouse	99	1.6E-02
43	Finish	Transfer to El Jay loadout belt	180,000	tpy	1.62E+00	1	1.62E+00	Baghouse	99	1.6E-02
44	Finish	El Jay belt transfer to screen belt	180,000	tpy	2.01E-01	1	2.01E-01	Baghouse	99	2.0E-03
45	Finish	Transfer from fines belt to fines silo belt	85,000	tpy	9.50E-02	1	9.50E-02	Baghouse	99	9.5E-04
46	Finish	Discharge from fines silo belt to fines silo	85,000	tpy	4.90E+00	1	4.90E+00	Enclosure	90	4.9E-01
47	Eliminated	Fines silos screens	0	tpy	0.00E+00	0	3.40E+00	Eliminated	100	0.0E+00
48	Finish	Transfer from screen belt to 3/4" belt	105,000	tpy	1.17E-01	1	1.17E-01	Baghouse	99	1.2E-03
49	Finish	Discharge onto short-term 3/4" pile	105,000	tpy	3.78E-01	1	3.78E-01	Chute + water	90	3.8E-02
50	Finish	3/4" short-term storage pile	105,000	tpy	1.00E-02	1	1.00E-02	Watering	50	5.0E-03
51	Finish	Transfer from screen belt to 3/8" belt	70,000	tpy	7.82E-02	1	7.82E-02	Baghouse	99	7.8E-04
52	Finish	Discharge onto short-term 3/8" pile	70,000	tpy	2.52E-01	1	2.52E-01	Chute + water	90	2.5E-02
53	Finish	3/8" short-term storage pile	70,000	tpy	8.04E-03	1	8.04E-03	Watering	50	4.0E-03
54	Finish	Transfer from 3/8" pile belt to 3/8" silo belt	18,500	tpy	2.07E-02	1	2.07E-02	H2O carry-through	50	1.0E-02
55	Finish	Discharge from 3/8" silo belt to 3/8" silo pile	18,500	tpy	6.67E-02	1	6.67E-02	H2O carry-through	50	3.3E-02
56	Finish	3/8" silo pile	18,500	tpy	4.02E-04	1	4.02E-04	None	0	4.0E-04
57	Finish	Silo loading onto shipping belt	88,875	tpy	4.62E-01	1	4.62E-01	Enclosure	90	4.6E-02
58	Finish	Shipping belt transfer to stock belt	88,875	tpy	4.62E-01	1	4.62E-01	Partial Enclosure	70	1.4E-01
59	Finish	Stock belt discharge onto 88/12 pile	88,000	tpy	4.50E+00	0.5	2.25E+00	Radial stacker	90	2.3E-01
59	Finish	Stock pile belt discharge onto fines pile	875	tpy	5.05E-02	0.2	5.05E-02	Eliminated	100	0.0E+00
60	Finish	88/12 block mix short-term pile	88,000	tpy	1.71E-01	0.5	8.56E-02	None	0	8.6E-02
60	Finish	Finish mill straight fines pile	875	tpy	1.54E-03	1	1.54E-03	None	0	1.5E-03
61	Finish	Loading onto 3/4" long-term pile	52,500	tpy	1.27E-03	0.5	6.33E-04	None	0	6.3E-04
62	LT Pile	Long-term 3/4" storage pile	52,500	tpy	6.43E-01	0.5	3.22E-01	Watering	50	1.6E-01
63	Finish	Loading onto 3/8" long-term pile	25,750	tpy	1.53E-03	0.5	7.64E-04	None	0	7.6E-04
64	LT Pile	Long-term 3/8" storage pile	25,750	tpy	4.02E-01	0.5	2.01E-01	Watering	50	1.0E-01
65	LT Pile	Loading onto 88/12 long-term pile	88,000	tpy	1.64E-01	0.2	3.29E-02	None	0	3.3E-02
66	LT Pile	Long-term 88/12 storage pile	88,000	tpy	3.42E+00	0.2	6.85E-01	Pile shaping	25	5.1E-01
67	Road	Finish mill front-end loader travel	3,782	vmt	8.53E+00	1	8.53E+00	Road watering	90	8.5E-01
68	Finish	Loading of product into railcars	44,278	tpy	8.73E-02	0.5	4.36E-02	Water spray [1]	50	2.2E-02
69	Finish	Loading of product into trucks	119,716	tpy	2.36E-01	0.5	1.18E-01	Water spray [1]	50	5.9E-02
70	Road	Transport of product off-site by truck	2,982	vmt	1.67E+01	1	1.67E+01	Road watering	90	1.7E+00
71	Road	Travel of LGF delivery trucks	728	vmt	1.01E+01	0.5	5.06E+00	Road watering	90	5.1E-01
72	Road	Maintenance traffic	1,664	vmt	4.05E+00	0.5	2.02E+00	Road watering	90	2.0E-01
73	Road	Passenger vehicle traffic	5,040	vmt	7.49E+00	1	7.49E+00	Road watering	90	7.5E-01
	Eliminated	Baghouse dust pile	0	tpy	0.00E+00	0.5	0.00E+00	Eliminated	0	0.0E+00
	Eliminated	Loading of baghouse dust onto pile	0	tpy	0.00E+00	0.5	0.00E+00	Eliminated	0	0.0E+00
	Eliminated	Baghouse dust discharge from silo	0	tpy	0.00E+00	0.5	0.00E+00	Eliminated	0	0.0E+00
	Eliminated	Transfer of fines to kiln feed pile	0	tpy	0.00E+00	0.2	0.00E+00	Eliminated	0	0.0E+00
	Eliminated	Transport of baghouse dust off-site	0	vmt	0.00E+00	1	0.00E+00	Eliminated	0	0.0E+00
	Eliminated	Loading of baghouse dust into trucks	0	tpy	0.00E+00	0.5	0.00E+00	Eliminated	0	0.0E+00
	Eliminated	Stock belt discharge onto 75/25 pile	0	tpy	0.00E+00	1	0.00E+00	Eliminated	0	0.0E+00
	Eliminated	75/25 block mix short-term pile	0	tpy	0.00E+00	1	0.00E+00	Eliminated	0	0.0E+00
	Eliminated	Travel of coal delivery trucks	0	vmt	0.00E+00	1	0.00E+00	Eliminated	0	0.0E+00
	Eliminated	Dump into coal mill hopper	0	tpy	0.00E+00	0.5	0.00E+00	Eliminated	0	0.0E+00
	Eliminated	Coal pile	0	tpy	0.00E+00	0.5	0.00E+00	Eliminated	0	0.0E+00

Source ID	Plant Locatioin	Source Name	Anticipated Production	Units	Anticipated Emission Rate Potential (tpy)	Impact Potential Adjustment Factor (0 ->1)	Weighted Emission Rate Potential (tpy)	Anticipated Control Method	Anticipated Control Efficiency (%)	Anticipated Emission Rate (tpy)
	Eliminiated	Unloading of coal onto pile	0	tpy	0.00E+00	0.5	0.00E+00	Eliminated	0	0.0E+00
		TOTAL			279	0.50	138		93	9.42

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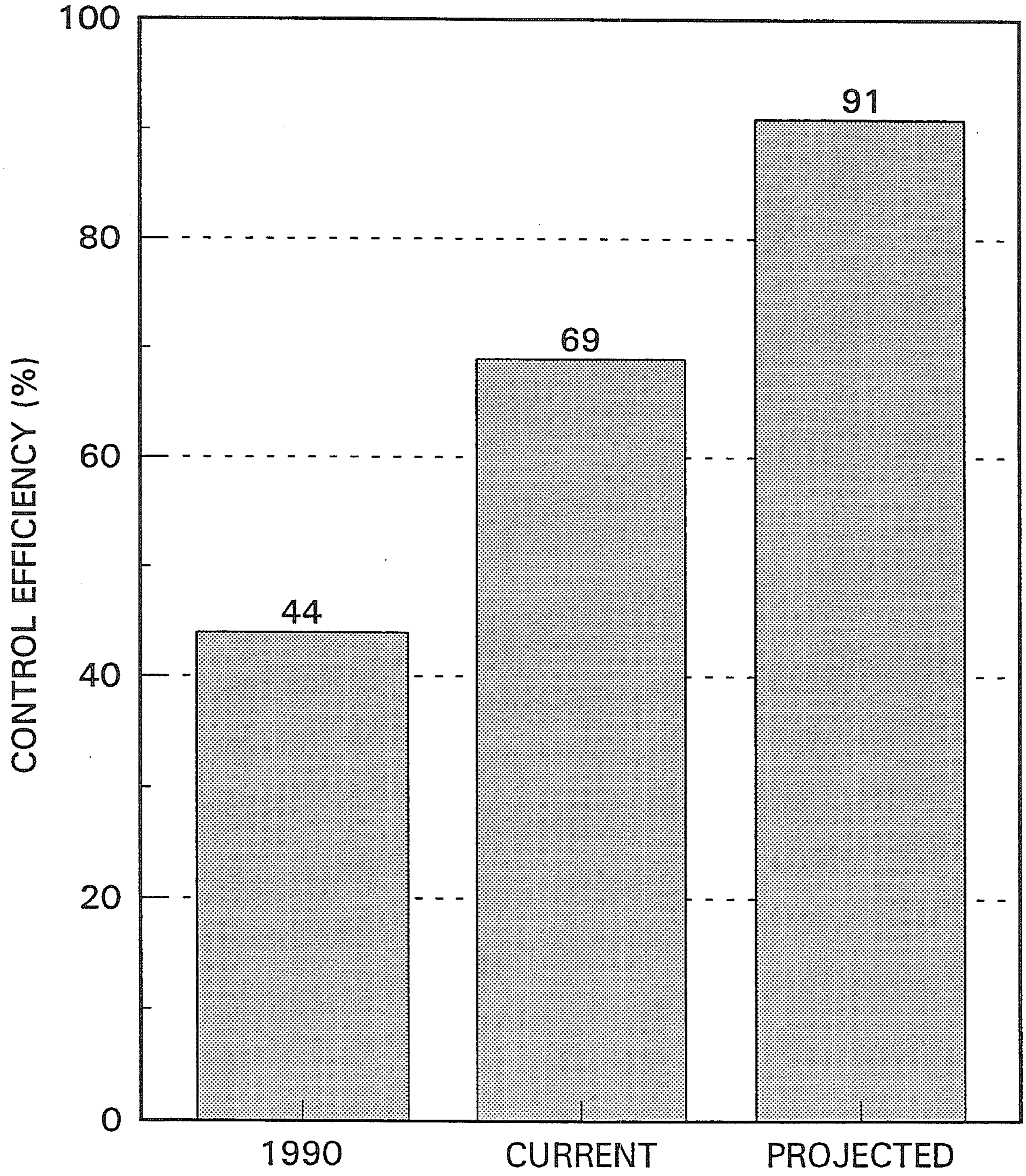
FIGURE 5-1
EMISSION CONTROL EFFICIENCY COMPARISON



The primary recommendation for control of the emissions that are generated during loading is restricting the loading to times when meteorological conditions are favorable. If operational requirements preclude such restrictions, then the water spray from the water truck should be used to wet the material prior to and/or during loading operations. However, it should be noted that adding too much water to the block mix product will degrade the quality and thereby make it unsuitable for sale.

An integral part of the primary recommendations is the installation near the Finish Mill of a meteorological system, consisting of a directional vane and an anemometer with remote digital display of wind speed and wind direction. The vane and anemometer should be installed in an unobstructed area at a height above ground roughly equivalent to the height of a railroad car or truck (i.e., approximately 15 feet). The digital readout should be located in the garage. A guideline should be established and posted whereby, whenever possible, based on product shipping requirements, loading is not conducted if the wind is towards the nearby property, i.e., in an easterly direction, and wind speeds are above a specified threshold level. The threshold level should be determined by observing the operation during varying wind speeds and noting the correlating dust dispersion characteristics. Loading operations need not be restricted if the wind direction is towards any other ordinal compass point. It is further recommended that a backup meteorological system should be installed at the Elm Street entrance so that wind speed can still be monitored if the unit at the Finish Mill is inoperable.

For loading operations at the eastern portion of the property, the water spray improvements for the Finish Mill storage piles described in Section 5.9 and the wind screen described in Section 5.14 will provide additional dust mitigation for this activity.

5.2 <u>Roadways</u>

The current procedure of watering the plant roadways every two hours on dry days using 3,000 gallons of water is effective in maintaining road dust emissions at an acceptable level. In fact, it can be shown that this operational practice will result in a control effectiveness of approximately 90 percent (refer to the 1990 FDP for the calculation methodology). To ensure that this schedule can be maintained, it is recommended that a recently established procedure should be followed that allows for a watering truck to be available at all times. The procedure includes a maintenance program for the vehicle(s) owned by Norlite as well as a contingency plan for rental of another truck, if the need arises. This procedure is presented herein in Section 7.0.

Secondary control recommendations include stabilizing roads in select plant areas with roller compacted concrete and further restrictions on traffic patterns. Norlite has recently tried road stabilization in the vicinity of Gate 1 and found it to be effective in that area. It is not clear whether such stabilization would be effective in all areas due to the types of equipment utilizing various road segments. Norlite should also investigate relocating the heavy equipment overnight parking area to a more remote location on the plant property.

5.3 Block Mix Storage by Gate 1

As part of the control methodologies implemented by Norlite since 1990, the block mix storage piles were relocated from the vicinity of the Finish Mill to the area adjacent to Gate 1. This area is far removed from the eastern boundary of the plant, and there is extensive vegetation in the area, particularly between the pile storage area and residences along the western boundary of the plant. The vegetation provides a good buffer to any dust migration off-site and there have been no complaints from neighbors regarding dust in this area. However, as part of the overall FDP, the dust control guidelines described below should be instituted for this area.

The primary recommendation for this area is pile shaping and operational guidelines. The storage piles should be shaped after work has been finished in a particular area. All ridges and cornices should be smoothed, thereby eliminating rough leading or trailing edges which result in air turbulence and cause dust to be entrained.

A secondary recommendation for this area includes the use of portable wind screens near shaping or screening operations if such operations had to be performed during adverse meteorological conditions due to product shipping requirements. This recommendation is secondary due to the fact that it is more costly and, therefore, not currently warranted based on the fact that there have been few, if any, complaints regarding this area. Note that watering of the piles is not recommended for this area because too much water will degrade the quality of the block mix and thereby make it unsuitable for sale.

5.4 Transfer Points/Crushers/Screens

The water sprays that are currently in place at many of the transfer points, crushers, and screening operations are, as a rule, not optimally engineered to effectively control dust. Most of the locations consist of a rubber hose with a "garden hose" spray nozzle. The resulting spray patterns are very coarse and the nozzle positions are typically not optimized for knocking down the dust that is generated. To increase the effectiveness of this control methodology, it is recommended that the entire spray system be re-evaluated by a vendor with direct expertise with such systems. Specific items to address in such an evaluation would include nozzle location, number of nozzles at each position, and nozzle type. All screens, crushers, and transfer points to piles should have water sprays if water does not carry through to these points or if they are not already enclosed. Other transfer points should be evaluated on a case-by-case basis since water "carry through" will occur to some extent. The installations should be hard-piped by each source to fix locations and the system should be winterized, wherever possible, through the use of heat tracing, automatic drain valves, etc. The use of water sprays in the winter can be further optimized by establishing a procedure for use that ties into the ambient temperature, as indicated by thermometers installed near control rooms.

If the water system is properly engineered, then the dust emissions from these sources should be minimized. As a secondary recommendation, partial enclosures around the sources could be erected. This measure is not strongly recommended due to cost considerations, operational issues and limited degree of effectiveness. While the enclosures would help to restrict air crossflow, they could only be installed if they did not restrict operations or line of sight by operators.

5.5 Stacking Tubes

The product generated at the Finish Mill is loaded onto piles via stacking tubes. These tubes have regularly spaced openings through which the product flows to form the storage piles. Wind passing through these openings as well as boil-up within the tubes can result in dust emissions. Norlite has placed rubber flaps over some of these openings to minimize dust. It is recommended that all openings be covered with these flaps.

5.6 Drop Chute to Fines Silo

Fines from the Finish Mill are transferred to a silo via a conveyor and drop chute. Observations of the transfer activity noted that dust was being generated due to a hole in the chute and material overflow at the mouth of the chute. To address these problems, it is recommended that the hole be repaired and that the geometry of the chute mouth be altered to allow full acceptance of the transferred material.

5.7 Tunnel Mouth

Material from the silos and adjacent 3/8 inch aggregate storage pile is transferred to an underground conveyor. The conveyor then passes through the mouth of the underground tunnel on its way to the block mix hopper. Dust has been observed exiting from the mouth of this tunnel. Attempts to contain the dust using plastic sheeting have proven ineffective due to degradation of the plastic. To correct this problem, it is recommended to install rubber curtains at the mouth of the tunnel. The rubber can be obtained from old conveyor belts to minimize costs.

5.8 Kiln Seals

As part of the dust control methodologies instituted by Norlite since 1990, the seals for Kilns 1 and 2 were re-engineered and new seals installed, thereby significantly reducing the dust previously generated at this area. Even though the dust generated at this source is very coarse and, therefore, less likely to become entrained into the ambient air, the seals should still be properly inspected and maintained in order to preserve their integrity.

5.9 Finish Mill Storage Piles

The storage piles at the Finish Mill are currently being watered using Toro nozzles, as recommended by SCI-TECH as part of an engineering study. These nozzles appear to be doing an adequate job in minimizing emissions from the piles. However, it is recommended that these controls be examined as part of the overall spray system analysis (refer to Section 5.4) to optimize their effectiveness.

5.10 Baghouse Dust Unloading Via Vacuum Truck

Prior to maintaining the rotary valves which are attached to the baghouse bin bottoms, the bins must be emptied of baghouse dust. Norlite has developed a procedure which ensures that the bin emptying operation is conducted in a manner which both minimizes the potential to emit fugitive dusts and ensures that the emptied dusts are managed appropriately.

The bin emptying operation involves the use of a vacuum truck to withdraw all baghouse dust from the bin(s). Since unloading dry dusts from the vacuum truck has a high potential to create fugitive emissions, Norlite fills the truck one-third to one-half full of water prior to vacuuming so fine dusts are mixed with water to form a slurry. Off-loading the slurry is then a dust-free operation. To ensure that the emptied dusts are appropriately mixed in a block mix product, slurried dusts emptied from vacuum trucks are unloaded onto the clinker pile and processed into block mix through the finishing plant.

5.11 Finish Mill (General)

The handling of the block mix at the Finish Mill incorporates numerous transfers that are potential dust sources. The current procedure is to transfer the block mix from one conveyor to another conveyor belt by a 20 foot high chute. From there, the mix is further conveyed and transferred to storage piles. To eliminate one 20 foot drop height, a potential 50 foot drop height, and approximately 200 feet of conveyor, it is recommended that a new transfer conveyor and radial stacker be installed. This installation will significantly reduce the dust generated by these operations and also serve to relocate the transfer point between the two conveyor belts further from the eastern facility boundary. This will further alleviate the channelling problem in this area (see Section 5.14).

5.12 Clinker Cooler Dust to Clinker Belt

The loading of the clinker cooler dust from the clinker cooler to the clinker belts results in dust emissions. Norlite has tried to reduce the dust emissions through the use of water sprays and partial enclosures. These measures have not proven to be effective due to the plugging of the drop chutes whenever moisture is present and due to the engineering of the partial enclosure. To eliminate this dust source, it is recommended that the dust be directly conveyed to a hopper that is equipped with a bin vent. Water can then be mixed with the fines prior to their unloading from the hopper in a manner analogous to that occasionally used with the baghouse dust (refer to Section 5.10).

5.13 Housekeeping/General

There are several recommendations that are intended to address general issues. These recommendations are the following:

- Replace any missing conveyor covers
- Replace/repair any missing/damaged enclosure panels
- Clean up/spray spillage from underneath conveyors and transfer points
- Continue employee and operating training regarding dust emissions and use of controls
- Replace soda ash silo bin vent with a new bin vent that is similar in design to the bin vents on top of the lime silo and baghouse dust silos.

5.14 Windblown Dust at Eastern Boundary

Under certain meteorological conditions, dust that is generated from a variety of sources in the vicinity of the Finish Mill can be carried by the wind across the eastern boundary. Such windblown dust can cross the eastern boundary where residences are located and has led to complaints. While the implementation of the control methodologies recommended in this report will greatly reduce the quantity of dust generated in this area, there are several additional controls that could be applied to further alleviate the potential for off-site dust migration.

The primary control recommendations for this area include constructing a wind screen on top of the existing berm along the fenceline south of the fuel pumps, and modifying storage pile shapes and locations. The intent of these measures is to reduce the effect of wind channelling that occurs between the storage piles. The wind screen will effect dispersion of any concentrated dust air volumes and prevent direct deposition beyond the property line. Reducing pile heights in the area and spreading the piles further apart, where feasible, will also reduce the channelling effect. The wind screen height should be based upon discussions with a vendor. The extent of the screen along the treeline in this area is dependent on the trade-off between installing a low screen below the branches of the trees and the feasibility of planting more evergreens to "fill in the gaps".

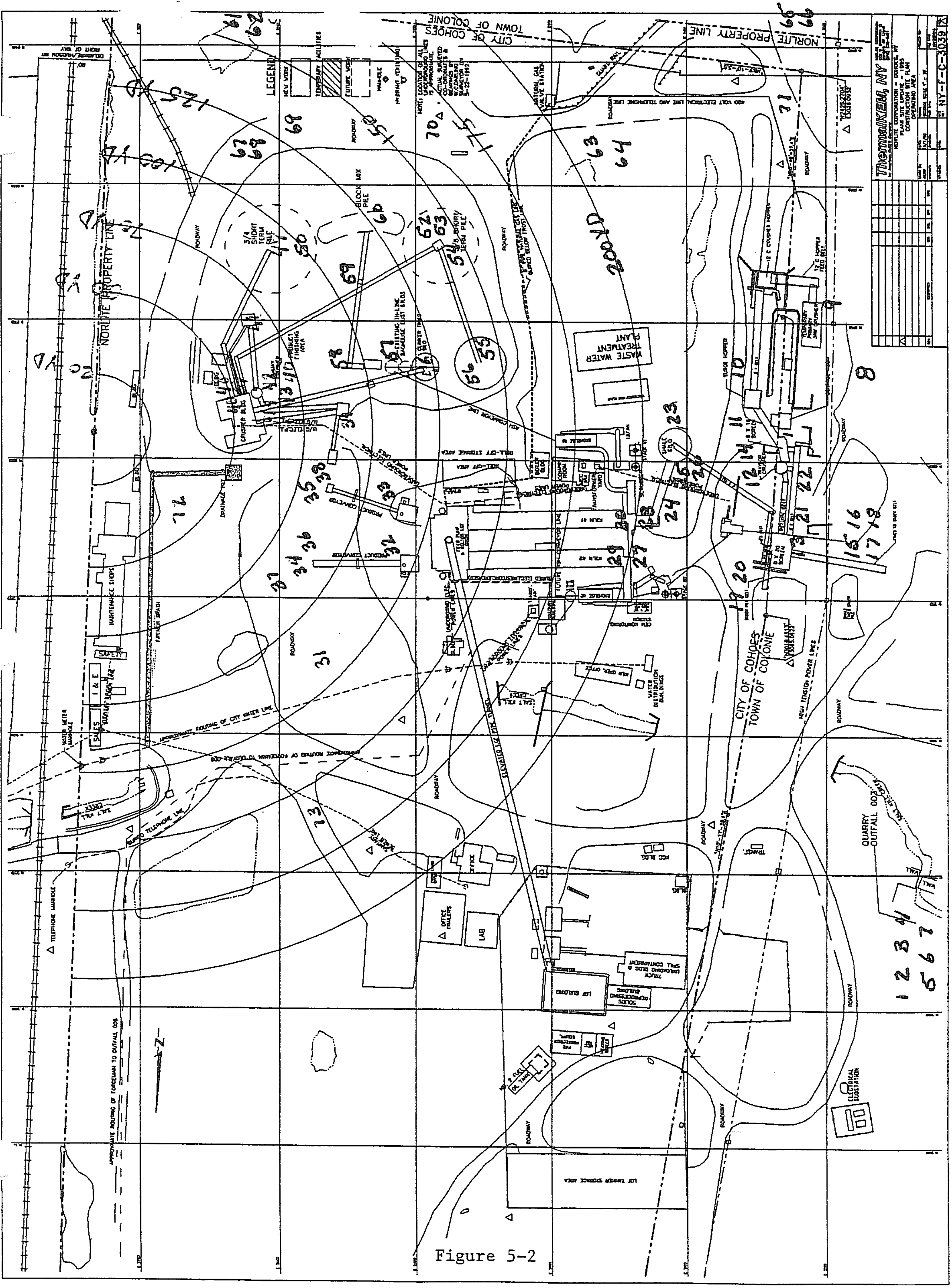
As a secondary control measure for this area, it is recommended that additional trees/vegetation be examined for the entire area. This control measure would supplement the wind screen.

Table 5-3

Emissions From Sources within 200 Yards of the Eastern Boundary

Source ID	Plant Locatioin	Source Name	Anticipated Production	Units	Anticipated Emission Rate Potential (tpy)	Impact Potential Adjustment Factor (0 ->1)	Weighted Emission Rate Potential (tpy)	Anticipated Control Method	Anticipated Control Efficiency (%)	Anticipated Emission Rate (tpy)
29	Kiln	#2 kiln rim seal	102,500	tpy	1.48E+01	0.5	7.39E+00	Improved seals	95	3.7E-01
30	Kiln	#1 kiln rim seal	102,500	tpy	1.48E+01	0.5	7.39E+00	Improved seals	95	3.7E-01
31	Kiln	Removal of baghouse plug Vacuum Truck Unloading	500	tpy	3.60E-01	0.5	1.80E-01	Enclosure + slurry	99	1.8E-03
32	Eliminated	Kiln + clinker dust transfer onto #2 belt	0	tpy	0.00E+00	1	0.00E+00	Eliminated	0	0.0E+00
33	Eliminated	Kiln + clinker dust transfer onto #1 belt	0	tpy	0.00E+00	1	0.00E+00	Eliminated	0	0.0E+00
34	Kiln	Discharge of #2 clinker onto pile	89,100	tpy	3.79E-01	1	3.79E-01	Water spray	90	3.8E-02
35	Kiln	Discharge of #1 clinker onto pile	89,100	tpy	3.79E-01	1	3.79E-01	Water spray	90	3.8E-02
36	Kiln	#2 kiln clinker pile transfer to #1 pile	89,100	tpy	9.96E-02	1	9.96E-02	H2O carry-through	90	1.0E-02
37	Kiln	#2 kiln clinker pile	89,100	tpy	2.13E-01	1	2.13E-01	H2O carry-through	90	2.1E-02
38	Kiln	#1 kiln clinker pile	89,100	tpy	2.13E-01	1	2.13E-01	H2O carry-through	90	2.1E-02
39	Finish	Clinker transfer to screen feed belt	180,000	tpy	2.01E-01	1	2.01E-01	Baghouse	99	2.0E-03
40	Finish	Triple deck finish mill screen	440,000	tpy	3.52E+01	1	3.52E+01	Baghouse	99	3.5E-01
41	Finish	Discharge into oversize hopper	180,000	tpy	2.01E-01	1	2.01E-01	Baghouse	99	2.0E-03
42	Finish	El Jay crusher	180,000	tpy	1.62E+00	1	1.62E+00	Baghouse	99	1.6E-02
43	Finish	Transfer to El Jay loadout belt	180,000	tpy	1.62E+00	1	1.62E+00	Baghouse	99	1.6E-02
44	Finish	El Jay belt transfer to screen belt	180,000	tpy	2.01E-01	1	2.01E-01	Baghouse	99	2.0E-03
45	Finish	Transfer from fines belt to fines silo belt	85,000	tpy	9.50E-02	1	9.50E-02	Baghouse	99	9.5E-04
46	Finish	Discharge from fines silo belt to fines silo	85,000	tpy	4.90E+00	1	4.90E+00	Enclosure	90	4.9E-01
47	Eliminated	Fines silos screens	0	tpy	0.00E+00	0	3.40E+00	Eliminated	100	0.0E+00
48	Finish	Transfer from screen belt to 3/4" belt	105,000	tpy	1.17E-01	1	1.17E-01	Baghouse	99	1.2E-03
49	Finish	Discharge onto short-term 3/4" pile	105,000	tpy	3.78E-01	1	3.78E-01	Chute + water	90	3.8E-02
50	Finish	3/4" short-term storage pile	105,000	tpy	1.00E-02	1	1.00E-02	Watering	50	5.0E-03
51	Finish	Transfer from screen belt to 3/8" belt	70,000	tpy	7.82E-02	1	7.82E-02	Baghouse	99	7.8E-04
52	Finish	Discharge onto short-term 3/8" pile	70,000	tpy	2.52E-01	1	2.52E-01	Chute + water	90	2.5E-02
53	Finish	3/8" short-term storage pile	70,000	tpy	8.04E-03	1	8.04E-03	Watering	50	4.0E-03
54	Finish	Transfer from 3/8" pile belt to 3/8" silo belt	18,500	tpy	2.07E-02	1	2.07E-02	H2O carry-through	50	1.0E-02
55	Finish	Discharge from 3/8" silo belt to 3/8" silo pile	18,500	tpy	6.67E-02	1	6.67E-02	H2O carry-through	50	3.3E-02
56	Finish	3/8" silo pile	18,500	tpy	4.02E-04	1	4.02E-04	None	0	4.0E-04
57	Finish	Silo loading onto shipping belt	88,875	tpy	4.62E-01	1	4.62E-01	Enclosure	90	4.6E-02
58	Finish	Shipping belt transfer to stock belt	88,875	tpy	4.62E-01	1	4.62E-01	Partial Enclosure	70	1.4E-01
59	Finish	Stock belt discharge onto 88/12 pile	88,000	tpy	4.50E+00	0.5	2.25E+00	Radial stacker	90	2.3E-01
59	Finish	Stock pile belt discharge onto fines pile	875	tpy	5.05E-02	0.2	5.05E-02	Eliminated	100	0.0E+00
60	Finish	88/12 block mix short-term pile	88,000	tpy	1.71E-01	0.5	8.56E-02	None	0	8.6E-02
60	Finish	Finish mill straight fines pile	375	tpy	1.54E-03	1	1.54E-03	None	0	1.5E-03
61	Finish	Loading onto 3/4" long-term pile	52,500	tpy	1.27E-03	0.5	6.33E-04	None	0	6.3E-04
62	LT Pile	Long-term 3/4" storage pile	52,500	tpy	6.43E-01	0.5	3.22E-01	Watering	50	1.6E-01
67	Road	Finish mill front-end loader travel	3,782	vmt	8.53E+00	1	8.53E+00	Road watering	90	8.5E-01
68	Finish	Loading of product into railcars	44,278	tpy	8.73E-02	0.5	4.36E-02	Water spray [1]	50	2.2E-02
69	Finish	Loading of product into trucks	119,716	tpy	2.36E-01	0.5	1.18E-01	Water spray [1]	50	5.9E-02
70	Road	Transport of product off-site by truck	2,982	vmt	1.67E+01	1	1.67E+01	Road watering	90	1.7E+00
72	Road	Maintenance traffic	1,664	vmt	4.05E+00	0.5	2.02E+00	Road watering	90	2.0E-01

Source ID	Plant Locatioin	Source Name	Anticipated Production	Units	Anticipated Emission Rate Potential (tpy)	Impact Potential Adjustment Factor (0 ->1)	Weighted Emission Rate Potential (tpy)	Anticipated Control Method	Anticipated Control Efficiency (%)	Anticipated Emission Rate (tpy)
73	Road	Passenger vehicle traffic	5,040	vmt	7.49E+00	1	7.49E+00	Road watering	90	7.5E-01
	Eliminiated	Baghouse dust pile	0	tpy	0.00E+00	0.5	0.00E+00	Eliminated	0	0.0E+00
	Eliminiated	Loading of baghouse dust onto pile	0	tpy	0.00E+00	0.5	0.00E+00	Eliminated	0	0.0E+00
	Eliminiated	Baghouse dust discharge from silo	0	tpy	0.00E+00	0.5	0.00E+00	Eliminated	0	0.0E+00
	Eliminiated	Transfer of fines to kiln feed pile	0	tpy	0.00E+00	0.2	0.00E+00	Eliminated	0	0.0E+00
	Eliminiated	Transport of baghouse dust off-site	0	vmt	0.00E+00	1	0.00E+00	Eliminated	0	0.0E+00
	Eliminiated	Loading of baghouse dust into trucks	0	tpy	0.00E+00	0.5	0.00E+00	Eliminated	0	0.0E+00
	Eliminiated	Stock belt discharge onto 75/25 pile	0	tpy	0.00E+00	1	0.00E+00	Eliminated	0	0.0E+00
	Eliminiated	75/25 block mix short-term pile	0	tpy	0.00E+00	1	0.00E+00	Eliminated	0	0.0E+00
	Eliminiated	Travel of coal delivery trucks	0	vmt	0.00E+00	1	0.00E+00	Eliminated	0	0.0E+00
	Eliminiated	Dump into coal mill hopper	0	tpy	0.00E+00	0.5	0.00E+00	Eliminated	0	0.0E+00
	Eliminiated	Coal pile	0	tpy	0.00E+00	0.5	0.00E+00	Eliminated	0	0.0E+00
	Eliminiated	Unloading of coal onto pile	0	tpy	0.00E+00	0.5	0.00E+00	Eliminated	0	0.0E+00
		TOTAL			120	0.86	103		94	6.08


ThermoKEM, NY
NORLITE CORPORATION - COHOES, NY
PLANT SITE UPDATE - 1993
CONSTRUCTION SITE PLAN
OPERATING AREA
NY-F-C-3039
NORLITE PROPERTY LINE
CITY OF COHOES
TOWN OF COLONIE
LEGEND
NEW WORK
TEMPORARY FACILITIES
FUTURE WORK
MANHOLE
HYDRANT
WASTE WATER TREATMENT PLANT
CRUSHER BLDG
PRODUCT FINISHING AREA
BLOCK MIX PILE
3/4 SHORT TERM PILE
5/8 SHORT TERM PILE
SHALE SILO
KILN #1
KILN #2
MAINTENANCE SHOPS
SAFETY
I & E
SALES
OFFICE
OFFICE TRAILERS
LAB
LGF BUILDING
TRUCK UNLOADING BLDG & SPILL CONTAINMENT
SOLIDS REPROCESSING BUILDING
LGF TANKER STORAGE AREA
ELECTRICAL SUBSTATION
QUARRY OUTFALL 002
DRAINAGE PIT
FRENCH DRAIN
ROADWAY
ELEVATED LGF PIPE TUNNEL
HIGH TENSION POWER LINES
APPROXIMATE ROUTING OF CITY WATER LINE
APPROXIMATE ROUTING OF FORCEMAIN TO OUTFALL 008
BURIED TELEPHONE LINE
TELEPHONE MANHOLE
WATER METER MANHOLE
SALT KILN CREEK
DELAWARE/HUDSON RR RIGHT OF WAY
NATURAL GAS VALVE STATION
WATER DISTRIBUTION BUILDINGS
ROLL-OFF STORAGE AREA
PRODUCT CONVEYOR
BAGHOUSE DUST SILOS
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200 VD

Figure 5-2

6.0 MECHANISM FOR PUBLIC REPORTING

Norlite will establish a Norlite Direct Line, a 24 hour telephone/pager system, to respond to neighbors' complaints and concerns about dust and other operational issues. The Direct Line will afford neighbors the opportunity to speak directly with a Norlite representative to register complaints, express concerns, or ask questions about Norlite's operations. The Direct Line will use a dedicated telephone line which, during normal business hours (8:00 AM to 5:00 PM, 5 days per week) will be directly answered by a Norlite representative. At all other times, a recording device will prompt the caller to leave a message which will include the caller's name and telephone number. A Norlite representative will promptly return the call, day or night. All calls/complaints will be logged on the form shown in Figure 6-1. Completed forms will be kept on file for review by NYSDEC.

Norlite's neighbors will be informed of this Direct Line service by letter. The letter will include a reminder which will be printed on magnetic stock so it can be affixed to a refrigerator or kept handy near a telephone. Neighbors who will receive the mailing will include the following:

1) Residents on the eastern perimeter of the plant, including residents and businesses on Saratoga Street (Route 32), including Saratoga Sites, from Bridge Street (in Cohoes) to the connector to Route 787 (in Maplewood);

2) Residents to the south of the facility, including residents and businesses on Elm Street from Saratoga Street to the Route 7 overpass (all in Maplewood).

FIGURE 6-1

NORLITE DIRECT LINE CONTACT REPORT

Contact Report Number__________

Date/Time Complaint Received

Norlite Direct Line Represenative

Name, Address and Phone Number of Calling Party

NATURE of CONTACT/COMPLAINT (be as specific as possible):

Date/Time of Incident (if known)

Specifics

Complaint Referred to:________________________________ Date/Time__________

Evaluation of Situation/Recommendations:________________________________

ACTION TAKEN :

By

Date

Action:________________________________

Caller Followup by:________________________________ Date/Time:__________

Discussion:________________________________

Final Signoff:

Director of Operations (date/time)________________________________

Director of Compliance (date/time)________________________________

7.0 Road Dust Suppression Plan

Vehicle traffic on unpaved roads is a significant source of fugitive dust emissions from Norlite's facility. In short, this Plan ensures that the hours of operation of the water truck at Norlite coincide with the hours of operation of heavy equipment. By defining the hours of opperation for the water truck, this Plan outlines a methodology which ensures that the facility's roads are reliably and consistently watered in dry conditions during normal operations. This Plan established requirements for all paved and unpaved roads at the plant. These roads are defined as (see map):

1. gate 1 entrance
2. quarry roads
3. west road bordering primary crusher plant
4. southern road bordering finished product storage piles
5. eastern road bordering finish plant and maintenance shop
6. northern road bordering front office and LGF tank farm (including office parking lot)

Normal operations are defined as passenger vehicle traffic during the Monday through Friday work week and traffic from one or more units of heavy equipment. Heavy equipment will include:

- Loaders (980C, 988B, 988F)
- Haul Trucks (Euclids, Autocars, dump trucks)
- LGF Fuel Trucks
- Aggregate Trucks
- Auxiliary Fuel Delivery Trucks

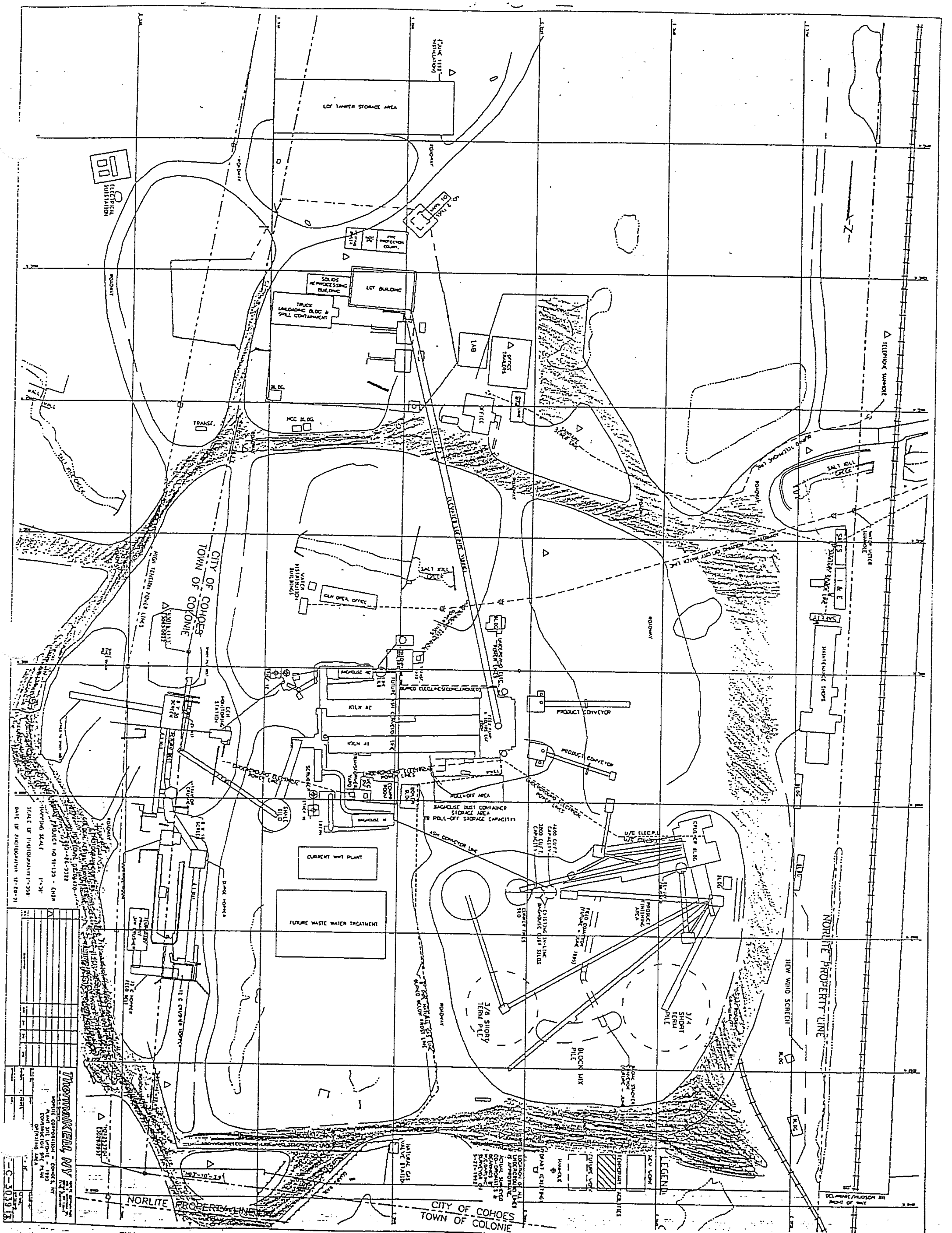
Dry conditions are defined as times when normally visible emissions can be observed by an individual when a unit of heavy equipment operating on a plant road passes by.

During normal operations in dry conditions would be expected between April 1 and November 15,Monday through Friday, from 6:00am to 6:00pm. During these times Norlite will maintain a full time operator whose primary responsibilities will be to water the roads every two hours during normal operations in dry conditions. The first application would begin at 6:30am and the last application would be at 4:30pm. If the primary crusher or quarry operations are scheduled for Saturday or Sunday then adequate manpower would be scheduled to water roads 2 and 3 every two hours.

Between November 16 and April 1 Norlite operators will be made available to water the roads if dry conditions exist and weather conditions are conducive to watering.

A typical application would be 3000 gallons of water every two hours over the 1.5 miles of roads in the plant. The application would require approximately 1.5 hours per trip and 0.5 hours to refill the truck. Specific roads requiring watering on weekends will receive an application of water in the amount necessary to eliminate normally visible emissions.

Norlite will maintain a primary and a secondary truck for road watering between April 1 and November 15. The secondary truck will be put into service in the event that maintenance must be performed on the primary unit when the roads require watering.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NORLITE CORPORATION - COHOES, NY
PLANT SITE UPDATE - 1993
CONSTRUCTION SITE PLAN
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LCF BUILDING
TRUCK UNLOADING BLDG & SPILL CONTAINMENT
LAB
OFFICE TRAILERS
OFFICE
MCC BLDG.
TRANSF.
SALT KILL CREEK
KILN OPER. OFFICE
KILN #2
KILN #1
BAGHOUSE
PRODUCT CONVEYOR
ROLL-OFF AREA
BAGHOUSE DUST CONTAINER STORAGE AREA
ASH CONVEYOR LINE
CURRENT WWT PLANT
FUTURE WASTE WATER TREATMENT
3/8 SHORT TERM PILE
3/4 SHORT TERM PILE
BLOCK MIX PILE
CRUSHER BLDG
PRODUCT FINISHING AREA
MAINTENANCE SHOPS
NEW WIND SCREEN
NORLITE PROPERTY LINE
CITY OF COHOES
TOWN OF COLONIE
HIGH TENSION POWER LINES
NATURAL GAS VALVE STATION
ROADWAY
LEGEND
NEW WORK
TEMPORARY FACILITIES
FUTURE WORK
TELEPHONE MANHOLE
DELAWARE/HUDSON RR RIGHT OF WAY
N

8.0 SCHEDULE FOR IMPLEMENTATION

Table 8-1 presents the emission sources, the control methodologies to be implemented, and the schedule for their completion. Descriptions of the sources and the controls to be implemented are included herein. Figure 8-1 is an overall site plan drawing. Enlarged sections of the primary crusher and finish plant areas can be found on Figure 8-2, which provides greater detail and identifies emission control points. Figures 8-4 through 8-29 are photographs and sketches of the systems which are identified on the site plan and are discussed in the narrative below.

- Finish Mill Block Mix Production: Currently, block mix, a combination of bag house dust, light weight aggregate fines, and 3/8 inch light weight aggregate, is produced using two long conveyor belts and two 40 to 50 feet high drop chutes. Norlite will install a field conveyor (Fig. 8-2, Item 1) and a raising and lowering radial stacking conveyor (Fig. 8-2, Item 2) to eliminate the two high drop points (Fig. 8-2, Items 3 and 4, Figs 8-3 through 8-5) and shorten the distance the block mix must travel on conveyor belts. The current block mix conveyor belt (Fig. 8-2, Item 6; Fig 8-5) will be removed after the new stacking conveyor system is installed. The stacking conveyor will have a discharge chute located at the head pulley. Brightly colored bars or pipes will be attached to the chute and extend 12 to 18 inches beyond the end of the chute. The operator will control the height of the conveyor so that the end of the chute will not be more than 18 inches above the top of the pile, i. e., the colored pipe will always be in or on the pile. The maximum height of the pile will be approximately 34 feet.

- Finish Plant Crusher, Screens and Transfer Points: Norlite will contract a vendor with expertise in dust collection to design a baghouse system to collect dust at critical points in the finish plant area. Negative pressure dust collection controls will be installed on the triple deck screen, the El-Jay crusher, the oversize hopper, the shipping tunnel enclosure, and on the two block mix conveyor transfer points. These point sources have been identified for control because of their potential to emit dust as calculated in Table 5-2. Norlite will continue to operate the Toro or Rainbird sprinkler systems (Fig. 8-2; Item 7, Figs. 8-6 and 8-7) in the finish plant area to suppress dust on and around the production piles during non-freezing conditions.

One 30,000 ACFM baghouse dust collection system will be installed to collect dust from the El-Jay Crusher, the 6x20 Triple Deck Screen, the Oversize Hopper, and 6 conveyor belt transfer points surrounding the 6x20 Screen and the El-Jay Crusher. Dust will be discharged from the baghouse via a chute to the Fines to Silo conveyor belt. This dust transfer point will be enclosed in a hood which is vented to the baghouse.

A second baghouse will be installed to vent the #1 Finish Plant Conveyor and the transfer points to the # 2 Finish Plant Conveyor and the Recrush Conveyor. These three points will be totally enclosed in hoods and vented to a 1,500 ACFM baghouse.

A 1,500 ACFM bin vent type unit will be installed on the discharge end of the Fines to Silo Conveyor. This baghouse will provide negative pressure dust collection for both the Fines Silo and the transfer point into the silo.

Two 1,500 ACFM induced-draft bin vent dust collectors will be installed at the transfer points of the new block mix conveyors.

- Outdoor Fines and Dust Storage: Norlite will only produce light weight aggregate fines as a stand-alone product, on special order. Currently, there are only two or three orders a year. Norlite will not store these materials outdoors. When an order is received, fines will be conveyed from the fines storage silo to an interim transfer pile, from which it will be loaded onto a truck on the same day. Following the installation of the stacking conveyor, trucks transporting lightweight aggregate fines will be loaded directly from the conveyor to eliminate intermediate transfer and handling.

Norlite does not and will not store bag house dust outdoors. Only blockmix, which contains baghouse dust, will be stored outside. Block mix is produced in the finish mill and is stored nearby in a short-term production pile. Norlites's long-term block mix inventory is stored in a more remote area of the plant which is far removed from Norlite's neighbors. Current practices to minimize dust formation include frequent watering of the short-term production pile by an automatic sprinkler. The working faces of the long-term block mix storage piles face leeward, i.e., towards the southeast. Therefore, loose material is shielded from the prevailing wind. Undisturbed faces of these piles form a crust which virtually eliminates dust pickup by the wind.

Storage pile contouring will be adopted as a future measure to control emission of fugitive dusts from the long-term block mix storage piles. Storage piles will be kept as low to the ground as possible and will be oriented to present minimum working surface area to the prevailing wind. Additionally, the leading edges of piles will be smoothed to minimize air turbulence and dust pick up by the wind.

- Clinker Dust to Clinker Belt: The dust collected in the Barron system (Fig. 8-8) that is currently transferred to the clinker pile via the clinker conveyor belt will transferred to an enclosed hopper. The dust will be wetted in the hopper and transferred to the clinker pile as a wet mixture.

- ✓ Windblown Dust Migrating Across Eastern Boundary: Two rows of Douglas Fir or Spruce trees will be planted along the eastern boundary of the plant in area shown in Figure 8-2 (Item 8). The trees will be placed far enough apart to allow for future growth and will be staggered to provide a continuous wind break along the boundary. When planted, the trees will be 10 to 12 feet in height with an approximate branch span 6 feet. The trees will be planted on a raised berm to increase their effective initial height.

Douglas Fir or Spruce trees were selected because of they grow well in a variety of soil conditions, they have very dense foliage and they maintain their density as they grow. The Douglas Fir and Spruce trees were two of the three types of evergreen trees recommended by the Albany County Cooperative Extension Horticulture Agent.

- ✓ Finish Mill Short Term Storage Piles: The short term storage piles at the finish mill (Fig. 8-2; Item 7) are currently wetted with Toro or Rainbird type sprinklers as shown in Figures 8-6 and 8-7. These sprinkler systems will continue to be used in all non-freezing weather conditions. The sprinkler on the block mix conveyor belt will be installed at the new radial stacking conveyor head pulley (Fig. 8-2, Item 2) to ensure that the block mix pile will continue to be sprayed with water.

- ✓ Roadways: The procedure detailed in Section 7.0 of this report was implemented on May 1, 1995. The purpose of this procedure is to make sure that the facility roadways are adequately watered to suppress dust. This procedure includes provisions to ensure that equipment and manpower are always available to water the roads when the temperature is above freezing and there is heavy vehicle traffic present in the plant. A site plan drawing, Figure 8-11 has been included to depict areas that the water truck will cover.

Other methods of wetting the roadways were examined, including the installation of a pipe and sprinkler system. These methods were determined to be more problematic and costly than the labor intensive water truck method.

- Primary Crusher Area: A wet dust suppression system will be installed for the primary crusher area by Norlite. This system will be designed to capture dust from the primary jaw crusher (Fig. 8-2, Item 15; Fig. 8-9), the 6x16 Screen, the Traylor Cone Crusher (Fig. 8-10), and the 8x20 Screen (Fig 8-10) using low volume, high pressure mist. The system will be completely heat traced and insulated to allow operation under all conditions. An automatic air purge will ensure that the water lines are cleared when the water is not being sprayed.

A partial enclosure or wind screen will be installed around the Jaw Crusher to contain dust emissions. A wet spray system will be installed to control dust while the loader is dumping shale into the crusher hopper. The use of electronic controls to activate and de-activate the spray headers will be investigated by Norlite. These additional controls will improve winter operations.

Covers will be installed over the Traylor Crusher, the 6x16 Screen, and the discharge points around the Traylor Crusher, and the partial enclosure around the 8x20 Screen building will be completed on all four sides to further contain dust.

Stone is transferred to the 12 C hopper (Fig. 8-2, Item 16; Fig 8-11) from the primary jaw crusher via a conveyor belt. Dust will be suppressed in the 12 C hopper with two spray bars. One spray bar will be centered over the top of the hopper with the spray directed downward. The second spray bar will have two nozzles. One nozzle will be directed at the stone being discharged from the conveyor belt, while the second will point up at a 30° angle towards the center of the hopper.

Spray bars with one nozzle each will be attached to the discharge end of the #1 Conveyor belt in the Surge Hopper (Fig. 8-2, Item 17) and to the discharge of the #2 Conveyor belt (Fig. 8-2, Item 18).

- Improved Baghouse on Soda Ash Silo: The original Soda Ash Silo baghouse (Fig. 8-2, Item 14) was removed and replaced with a modern pulse-jet bag house bin vent (Fig. 8-12) in June, 1995

- Railcar and Truck Loading: Norlite will prepare a standard operating procedure (SOP) to cover loading of trucks and railcars with block mix near the eastern plant boundary. Since the fundamental problem is the transport of wind borne dust across the eastern plant boundary, Norlite will install local wind monitoring stations near the loading areas. The SOP will be developed by observing and experimenting with loading operation over the course of a representative period. The goal will be to identify a set of acceptable practices and conditions, including wind speed and direction, during which block mix can be loaded without generating fugitive dusts which migrate across the eastern plant boundary.

Preliminary tests indicate that dust from block mix will not cross the site boundary unless operations are conducted with westerly winds in excess of 10 miles per hour. Restriction developed for this SOP will not apply to loading 3/4's or 3/8's lightweight aggregate since dust formation and migration from handling these materials is minimal.

- Kiln Clinker Conveyors: The wet dust suppression systems for the clinker belts have been designed by Norlite. These systems have been designed to spray water at a mass flow rate of 1.5% of the aggregate mass flow using a hollow cone spray nozzle similar to figure 8-25. Current literature shows that 0.5 to 1.5:100 (0.5% to 1.5%) water to product ratio by weight is sufficient to make the material wet and suppress dust. This is equivalent to about 1 gallon per ton of stone.

Each clinker belt (Fig. 8-2, Item 11) will have two spray systems. One system operates on a 5 minute intermittent cycle to suppress dust on the clinker pile. The second spray bar operates continuously to wet the clinker as it falls off of the head pulley. The pile spray system is detailed in figures 8-13 through 8-15. [The head pulley discharge spray bar has one nozzle and will be similar to figure 8-16.]

- Finished Product Storage Silo: The Finished Product Storage Silo is vented through a fabric filter (sock) which is provided to remove entrained dust from air which is displaced by product (aggregate fines) during silo filling operation. In reality, displacement air and entrained (fugitive) dust bypasses the vent and escapes the silo through the rooftop fill opening. To provide a more positive means of controlling this fugitive dust source, Norlite will install an induced draft bin vent system which will keep the silo under negative pressure during filling operaitons.

A second source of fugitive dust was a defective drop chute on top of the silo (Fig. 8-2, Item 10). The chute had several wear holes caused by abrasive scouring. During May, 1995, the chute was repaired by replacing eroded material with an abrasion resistant metal. The repaired areas were fabricated as bolted sections which can be readily replaced for easier maintenance (Fig. 8-17). Regular inspection will ensure that the chute is properly maintained.

- Shipping Tunnel Mouth: The mouth of the shipping tunnel under the dust and fines silos was covered with a curtain of conveyor belt strips (Fig. 8-18) to prevent dust from escaping the area shown as figure 8-2, Item 9. Under normal operations dust is not produced in this area. During block mix production the level in the bag house dust silos decreases. Some dust is produced when the silo reaches its near empty point. At this point the finish mill operator will stop block mix production or switch to the other dust silo.

Another potential source of dust from this area is from equipment wear. Worn vanes on the rotary airlock feeders can allow bypass air and dust to escape into the shipping tunnel. Norlite will include these rotary airlock feeders in its preventative maintenance program.

Norlite will also seal the joints and seams of the shipping tunnel entrance shelter and connect this area to the negative pressure baghouse filter system to collect dust in this area.

- Blockmix storage by Elm Street Entrance: The area north-west of the Elm Street entrance is being used for long term block mix storage. Norlite will prepare a SOP which will instruct the loader operators how to shape the storage piles and handle these materials in a manner which minimizes fugitive dust emissions from this source.

- Stacking Tubes: The stacking tubes for the block mix (Fig. 8-5) will be eliminated once the radial stacking conveyor has been installed. Outlets in the 3/4's stacking tube (Fig. 8-6) will be covered with rubber flaps to minimize dust emissions in this area.

- Kiln Seals: The seals at the rear of each kiln (Fig. 8-2, Item 13) will be maintained during planned kiln shutdowns as needed to prevent emissions from this area (Fig. 8-19).

- Baghouse Dust Unloading Via Vacuum Truck: The current procedure of slurrying dust within the vacuum truck and then off-loading a full truck will continue. All supervisors and potential vacuum truck vendors will be trained on this procedure.

- Housekeeping and General Items: Pre-shift inspection checklists will be revised to include looking for missing conveyor covers and screen enclosure panels. Missing covers/panels will be replaced prior to starting equipment.

- ✓ Norlite Direct Line: A mechanism to enable the public to report dust complaints, i.e., the Norlite Direct Line, was established on May 1, 1995 according to Section 6.0 of this report.

- ✓ Finishing Plant Operations: In the past Norlite operated the Finishing Plant during the night so maintenance could be performed during the daytime when a full maintenance crew was available. To ensure better control over Finishing Plant operations, Norlite voluntarily curtailed nighttime operations. Effective January 16, 1995, the Finishing Plant began operating on a 7:30 AM to 11:30 PM, Monday through Friday schedule. Norlite has agreed to make all reasonable efforts to abide by this routine schedule; however, Norlite reserves the right to extend operations beyond these hours, or to include weekends, on those infrequent occasions when it is faced with unusual demand, or when routine operations have been disturbed by weather conditions or maintenance.

- ✓ Winter Operations: The spraying systems that will be installed have been designed with low point drains and air purge capability. When the temperature drops below freezing, the water sprays will be turned off, drained and purged with air. When the temperature rises above freezing, the water spray systems will be turned on.

Natural crusts form on the storage piles in the winters with ice and snow. These crusts prevent dust from being picked up by wind. Norlite will minimize any disturbance of the crusts on the storage pile's western faces. Furthermore, Norlite will make efforts to ensure that there is only one active storage pile of each size of aggregate at any one time.

- Drilling Operations: Norlite is currently investigating the feasibility of adding a more effective dust removal/suppression system to the current drill rig. In the mean time, since the quarry is located at least 1/4 mile from the nearest neighbor, and drilling operations take place 100 - 300 feet below the top level of the quarry, any dust which is not captured by the existing wet suppression system has little chance of leaving the quarry.

- Blasting Operations: Norlite has reviewed the literature and discussed dust control measures applicable to blasting with its blasting contractor. There appears to be a paucity of information on the subject, since few insights into effective preventative measures could be found. Recent quarry blasts have produced very little dust. The location and depth of the quarry should be sufficient to prevent dust from leaving the site.

As an experiment, Norlite will attempt to wet the face and top surface of the blast area to contain or minimize dust. We do not believe this practice will be effective, since wetting will only affect the surface, and dust is created principally from the breaking an moving of the rock mass.

- Disciplinary System For Dust Issues: Norlite's union contract indirectly addresses fugitive dust control via a contract provision which empowers Norlite's management to "direct the work force" toward its goals. Since DEC has escalated the importance of controlling fugitive dusts, Norlite has responded by instituting studies (such as the FDP), modifying its equipment and practices, and educating its work force regarding the importance of dust control. Norlite will continue to train its managers, supervisors, and hourly employees regarding the importance of properly operating and maintaining dust control equipment and of diligently observing procedures to control fugitive dusts. Additionally, Norlite will establish a formal policy on dust control and will revise its disciplinary policy to address censure for violation of dust control policy.

Table 8-1 Schedule for Implementation

1995 - 96 Dust Control Plan		
Emission Source Area	Control Methodology	Completion Schedule Months from DEC Approval of FDP
✓ Vacuum Truck unloading	Follow current procedure, train new operators	12/1/95
Stacking tubes for 3/4's	Install and routinely maintain rubber flaps	3/1/96
✓ Block Mix Storage by Gate 1	Install MET Stations. Follow Procedure.	4/1/96
✓ Rail Car Loading	Install MET Stations. Follow Procedure.	4/1/96
Clinker Dust to Clinker Belt	Collect dust in vented bins. Unload as a slurry.	5/1/96
Kiln Clinker Conveyors	Optimize spraying systems.	5/1/96
Primary Crusher Area	Optimize spraying systems.	5/1/96
Primary Crusher Area	Partial enclosures on crusher and screens	7/1/96
✓ Finish Mill Block Mix Production	Install a transfer conveyor and stacking conveyor to control drop height of block mix.	11/1/96
✓ Block Mix Belt Transfer Points	Install bin vent dust collectors for each point	11/1/96
✓ Wind Blown Dust Across Eastern Boundary	Plant two staggered rows of evergreen trees	10/1/96
✓ Finish Plant Crushers and Screens	Install a baghouse dust collector	11/1/96
✓ Fines Silo	Install baghouse to vent silo and transfer point.	11/1/96
✓ Finish Plant Operation Schedule	Shift to day time operations	Complete Jan. 16, 1995
✓ Soda Ash Silo Vent	Install new bin vent dust collector	Completed June, 1995
✓ Drop Chute to Fines Silo	Install wear resistant metal plates on chute	Completed June, 1995
Norlite Direct Line	Method of public reporting	Completed May 1, 1995
✓ Kiln Seals	Continue Maintenance	On-going maintenance
Roadways	Follow procedure outlined in FDP Section 7.0	Started May 1, 1995

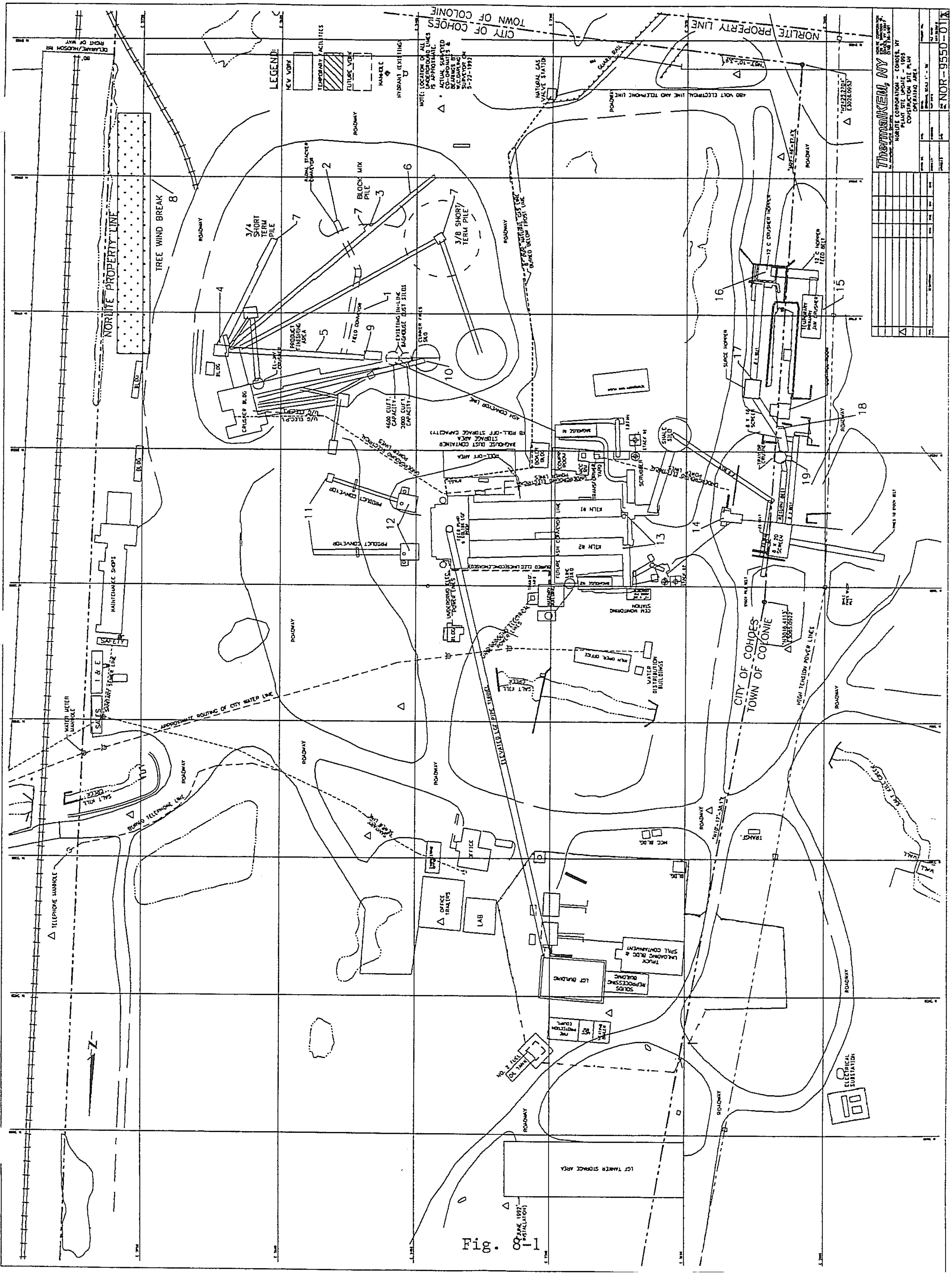
ThermalKEM, NY
NORLITE CORPORATION - COHOES, NY
PLANT SITE UPDATE - 1993
CONSTRUCTION SITE PLAN
OPERATING AREA
NOR-9550-01
LEGEND:
NEW WORK
TEMPORARY FACILITIES
FUTURE WORK
MANHOLE
HYDRANT (EXISTING)
NORLITE PROPERTY LINE
TREE WIND BREAK
CITY OF COHOES
TOWN OF COLONIE
DELAWARE/HUDSON RR RIGHT OF WAY
3/4 SHORT TERM PILE
3/8 SHORT TERM PILE
BLOCK MIX PILE
CRUSHER BLDG
PRODUCT FINISHING AREA
EXISTING IN-LINE BAGHOUSE DUST SILOS
CLINKER FINES SILO
ASH CONVEYOR LINE
ROLL-OFF AREA
PRODUCT CONVEYOR
KILN #1
KILN #2
SCRUBBER
SHALE SILO
SURGE HOPPER
12 C CRUSHER HOPPER
ELEVATED LCF PIPE TRESTLE
MAINTENANCE SHOPS
SAFETY
SALES
I & E
SALT KILL
ROADWAY
OFFICE
OFFICE TRAILERS
LAB
MCC BLDG.
TRUCK UNLOADING BLDG & SPILL CONTAINMENT
LCF BUILDING
SOLIDS REPROCESSING BUILDING
FIRE PROTECTION
NO. 2 FUEL OIL TANK
ELECTRICAL SUBSTATION
LCF TANKER STORAGE AREA
HIGH TENSION POWER LINES
WATER DISTRIBUTION BUILDINGS
APPROXIMATE ROUTING OF CITY WATER LINE
BURIED TELEPHONE LINE
TELEPHONE MANHOLE
WATER METER MANHOLE
NATURAL GAS VALVE STATION
CEM MONITORING STATION
1
2
3
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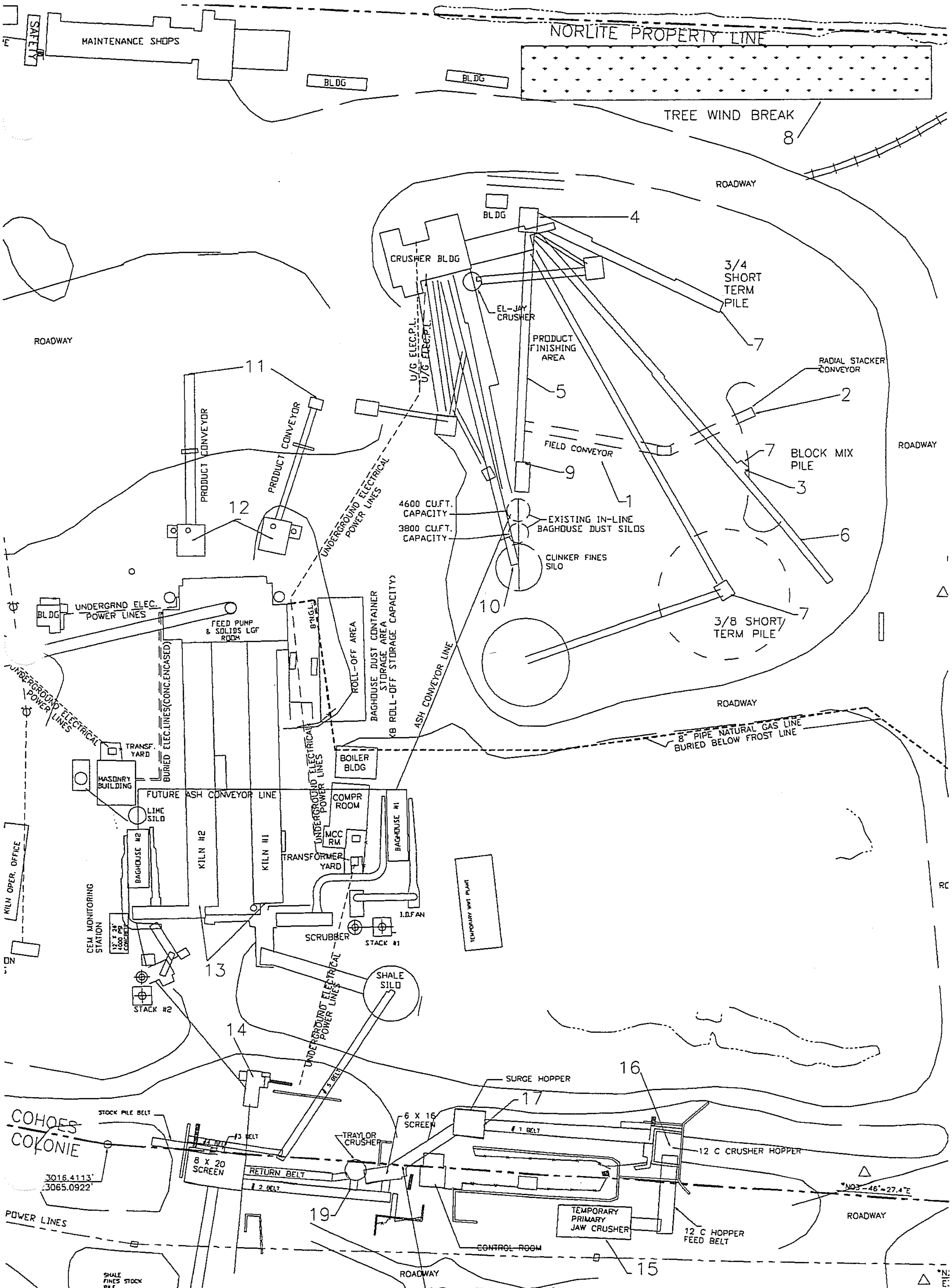
Fig. 8-1



SAFETY
MAINTENANCE SHOPS
BLDG
BLDG
NORLITE PROPERTY LINE
TREE WIND BREAK
8
ROADWAY
BLDG
4
CRUSHER BLDG
3/4 SHORT TERM PILE
7
EL-JAY CRUSHER
U/G ELEC.P.L.
U/G ELEC.P.L.
PRODUCT FINISHING AREA
ROADWAY
RADIAL STACKER CONVEYOR
2
5
11
PRODUCT CONVEYOR
PRODUCT CONVEYOR
FIELD CONVEYOR
7
BLOCK MIX PILE
3
ROADWAY
9
1
12
UNDERGROUND ELECTRICAL POWER LINES
4600 CU.FT. CAPACITY
3800 CU.FT. CAPACITY
EXISTING IN-LINE BAGHOUSE DUST SILOS
6
CLINKER FINES SILO
10
7
3/8 SHORT TERM PILE
BLDG
UNDERGRND ELEC. POWER LINES
FEED PUMP & SOLIDS LGF ROOM
8'HIGH
ROLL-OFF AREA
BAGHOUSE DUST CONTAINER STORAGE AREA
X8 ROLL-OFF STORAGE CAPACITY)
ASH CONVEYOR LINE
ROADWAY
UNDERGROUND ELECTRICAL POWER LINES
BURIED ELEC.LINES(CONC.ENCASED)
TRANSF. YARD
8" PIPE NATURAL GAS LINE BURIED BELOW FROST LINE
UNDERGROUND ELECTRICAL POWER LINES
BOILER BLDG
MASONRY BUILDING
FUTURE ASH CONVEYOR LINE
LIME SILO
COMPR ROOM
MCC RM
KILN OPER. OFFICE
BAGHOUSE #2
KILN #2
KILN #1
TRANSFORMER YARD
BAGHOUSE #1
TEMPORARY WWT PLANT
RC
CEM MONITORING STATION
12' X 24' 4000 PSI CONCRETE
I.D.FAN
ON
SCRUBBER
STACK #1
13
STACK #2
SHALE SILO
UNDERGROUND ELECTRICAL POWER LINES
14
#5 BELT
SURGE HOPPER
16
17
COHOES
COLONIE
STOCK PILE BELT
#3 BELT
#4 BELT
6 X 16 SCREEN
#1 BELT
12 C CRUSHER HOPPER
TRAYLOR CRUSHER
8 X 20 SCREEN
RETURN BELT
#2 BELT
3016.4113'
3065.0922'
N03°-46'-27.4"E
19
POWER LINES
TEMPORARY PRIMARY JAW CRUSHER
12 C HOPPER FEED BELT
ROADWAY
CONTROL ROOM
SHALE FINES STOCK PILE
ROADWAY
15
18

Fig. 8-2

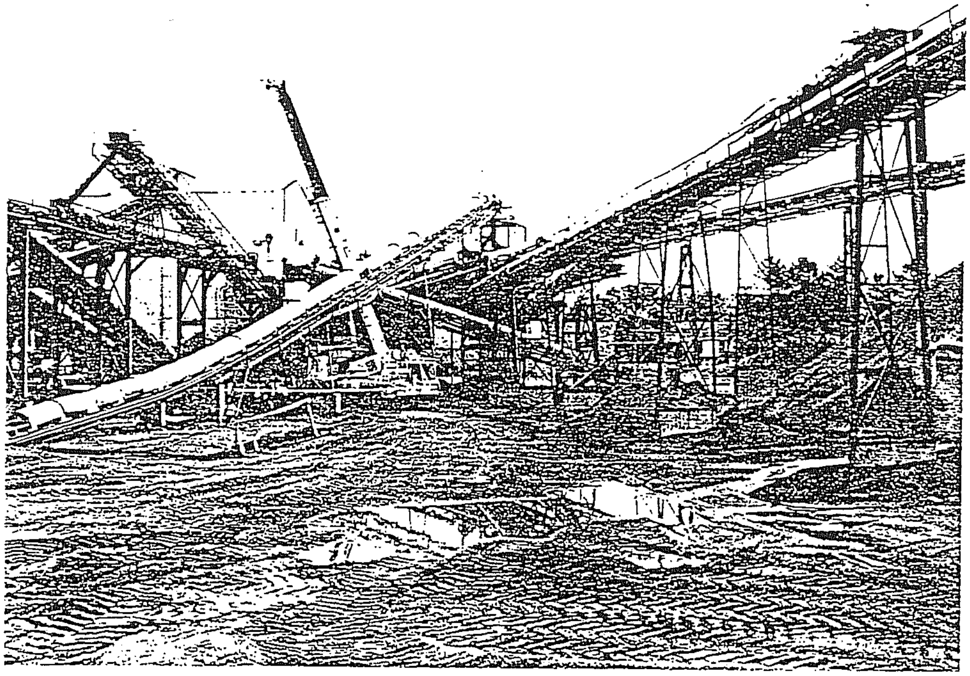


Figure 8-3

The Finish Plant Area
The new block mix field conveyor will be installed in the foreground of this photograph.

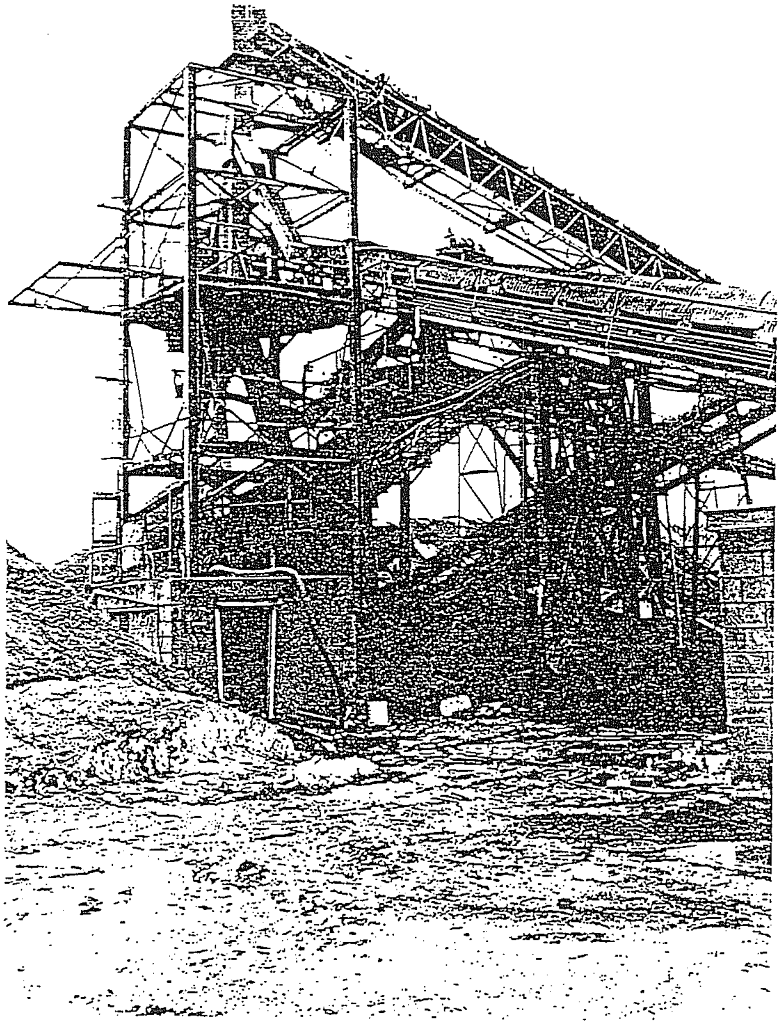


Figure 8-4
The Shipping Tower
This 40 foot high drop chute for block mix will be eliminated.

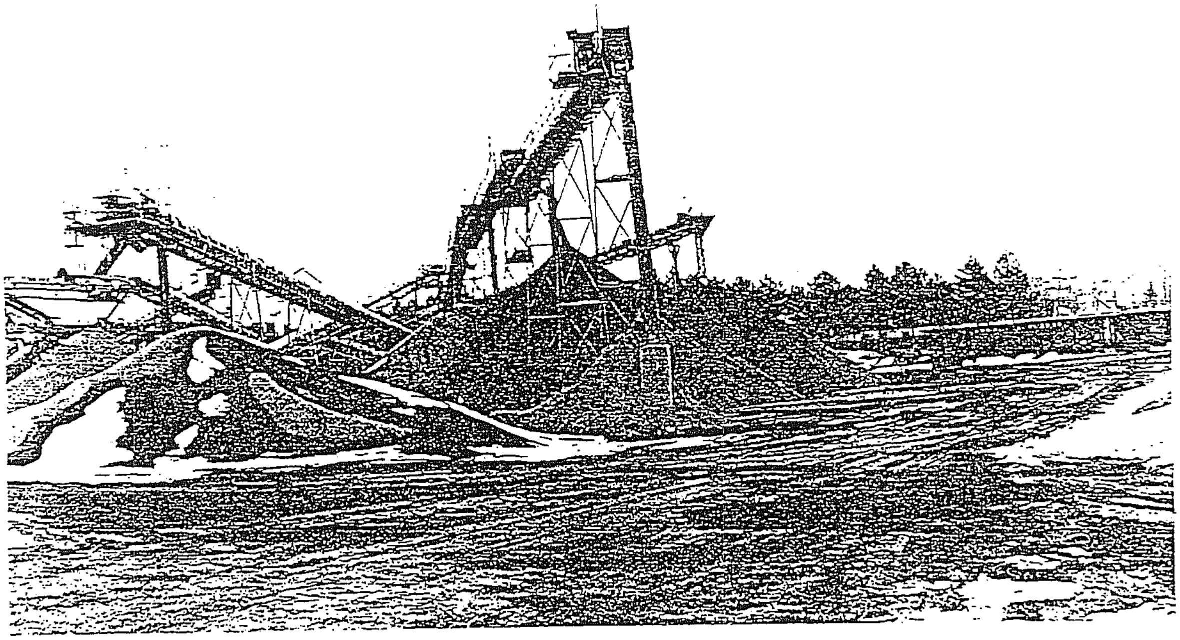


Figure 8-5

The current block mix conveyor and stacking tubes will be removed after the radial stacking conveyor is installed. The stacking tube plugs frequently and causes excessive drop heights. The radial stacker will raise and lower to control the drop height of block mix.

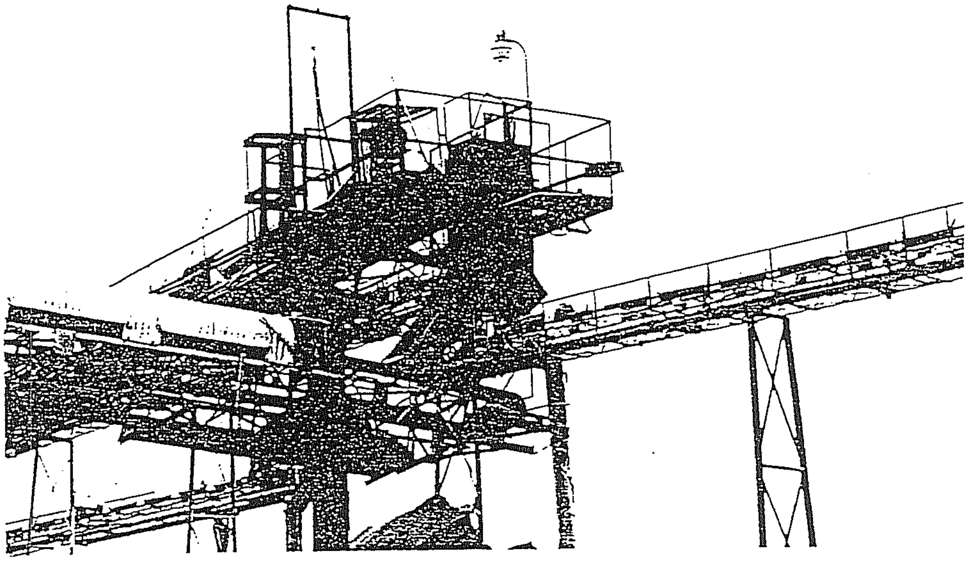


Figure 8-6

The 3/8s conveyor belt head pulley has a Rainbird sprinkler (left of the light) which waters the 3/8s pile and a small area around the pile. This sprinkler will remain in service.

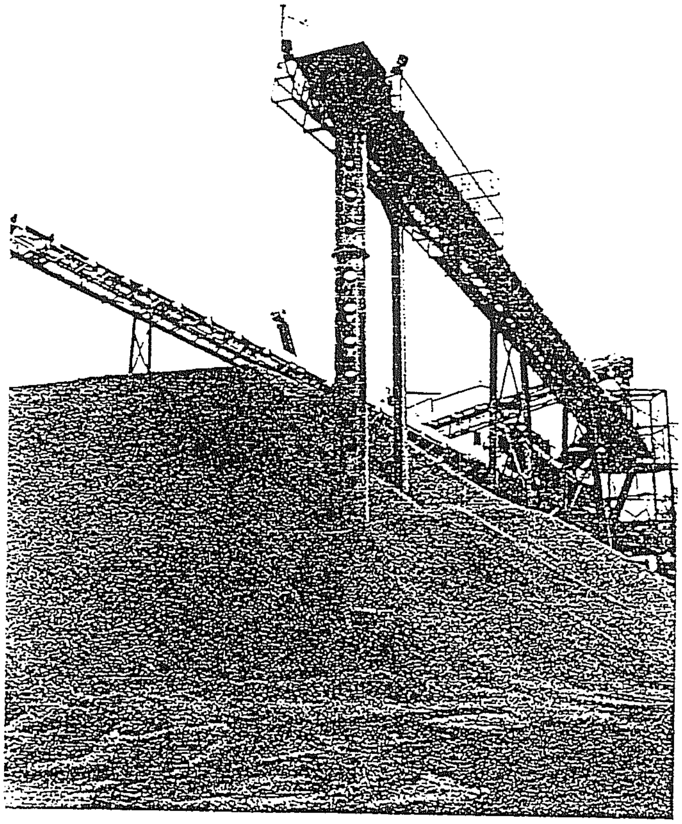


Figure 8-7
The 3/4s conveyor belt and short term pile has a Toro sprinkler located next to the light at the head pulley. The holes in the stacking tube will be partially covered with rubber flaps to reduce wind blown dust.

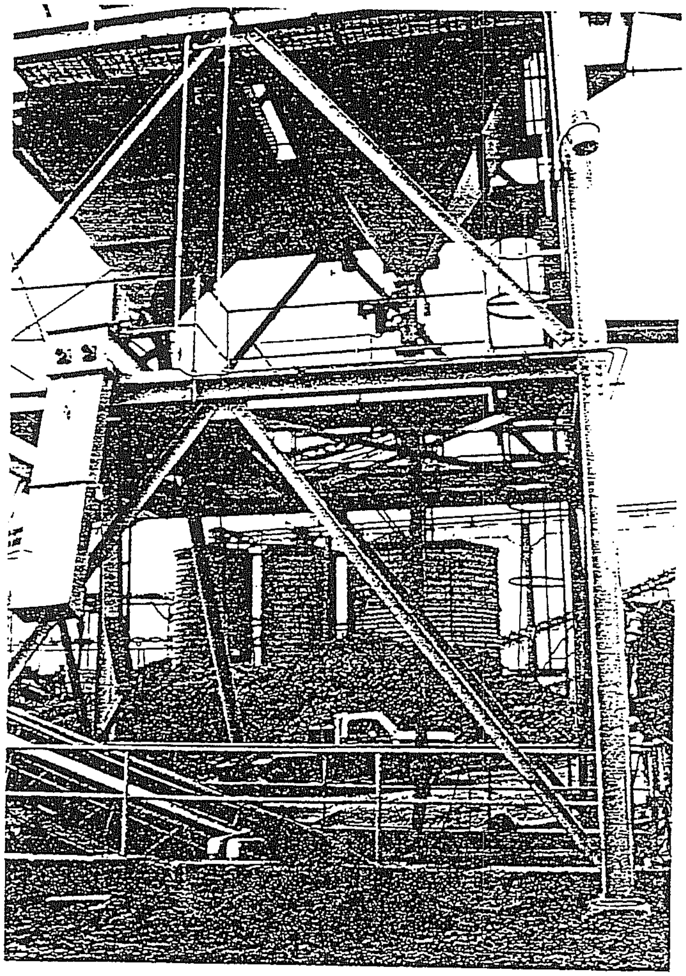


Figure 8-8

Excess air from the clinker cooler passes throught the Barron Fan system (shown).
Dust is removed from the air and is transferred from the hopper on the upper right to the clinker belt via a square chute. Dust will be transferred to a hopper and later mixed into the product piles.

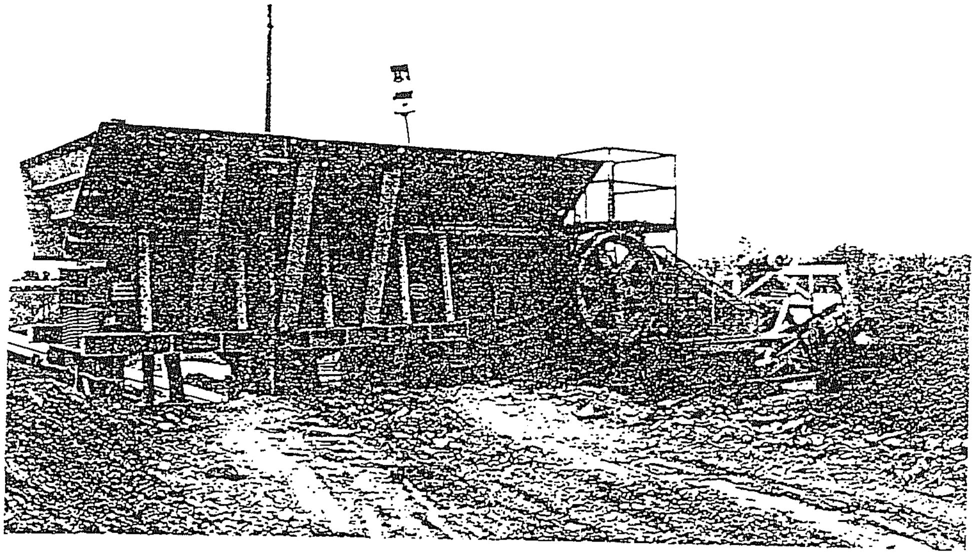


Figure 8-9
Primary Jaw Crusher and Ramp (foreground). Facing East.

Shale (Shot Rock) is dumped into the portable jaw crusher hopper by a front end loader. Crushed shale exits the crusher on the conveyor at the right.

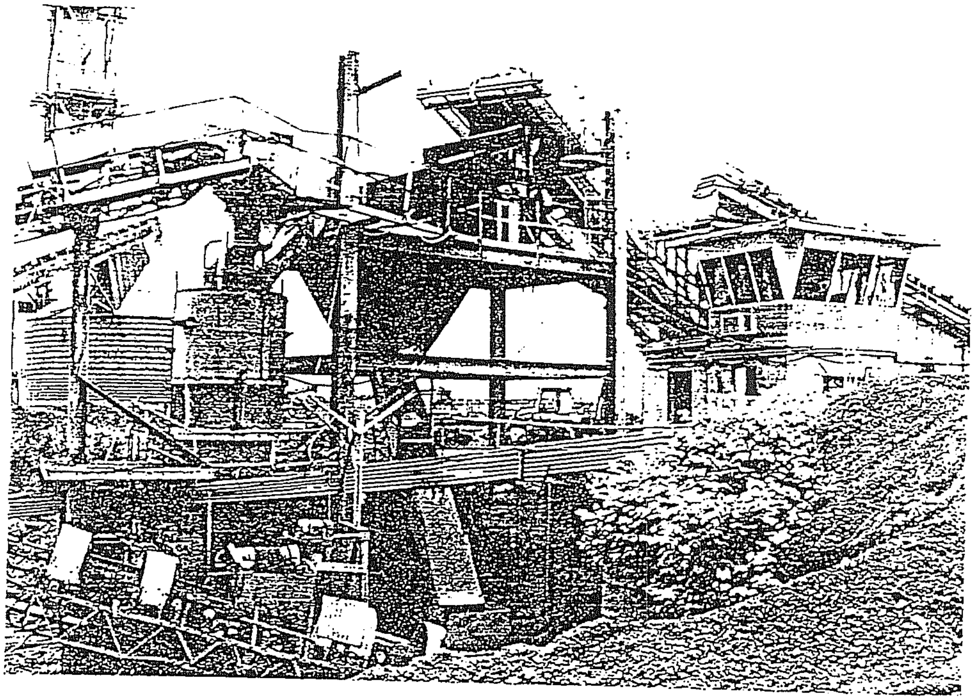


Figure 8-10
Secondary Crushing Operations

Shale from the 12 C Crusher hopper is conveyed to the surge bin (far right) and then to the 6x16 screen (center). Oversize rock is crushed in the Traylor Crusher (left).

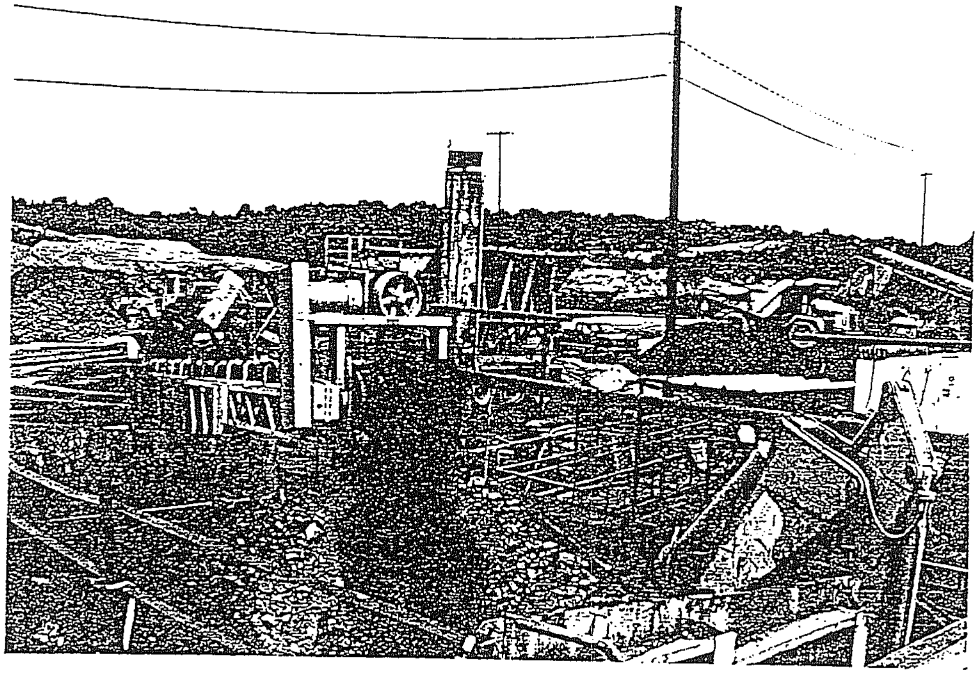


Figure 8-11
12 C Crusher Hopper Facing North-West.

Shale is conveyed to the 12 C Crusher Hopper from the primary jaw crusher via a transfer conveyor. One spray bar will be installed over the center of the hopper to suppress dust. Another spray bar will be installed closer to the head pulley of the transfer conveyor.

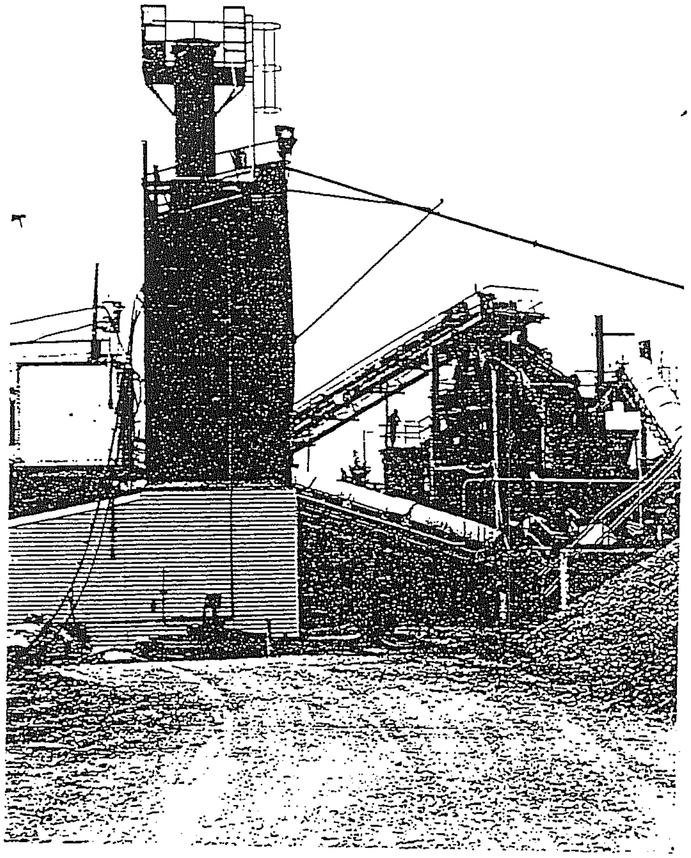


Figure 8-12

The Soda Ash Silo bin vent was replaced with a much larger Aeropulse bin vent (shown).

Clinker Belt Pile Spray System

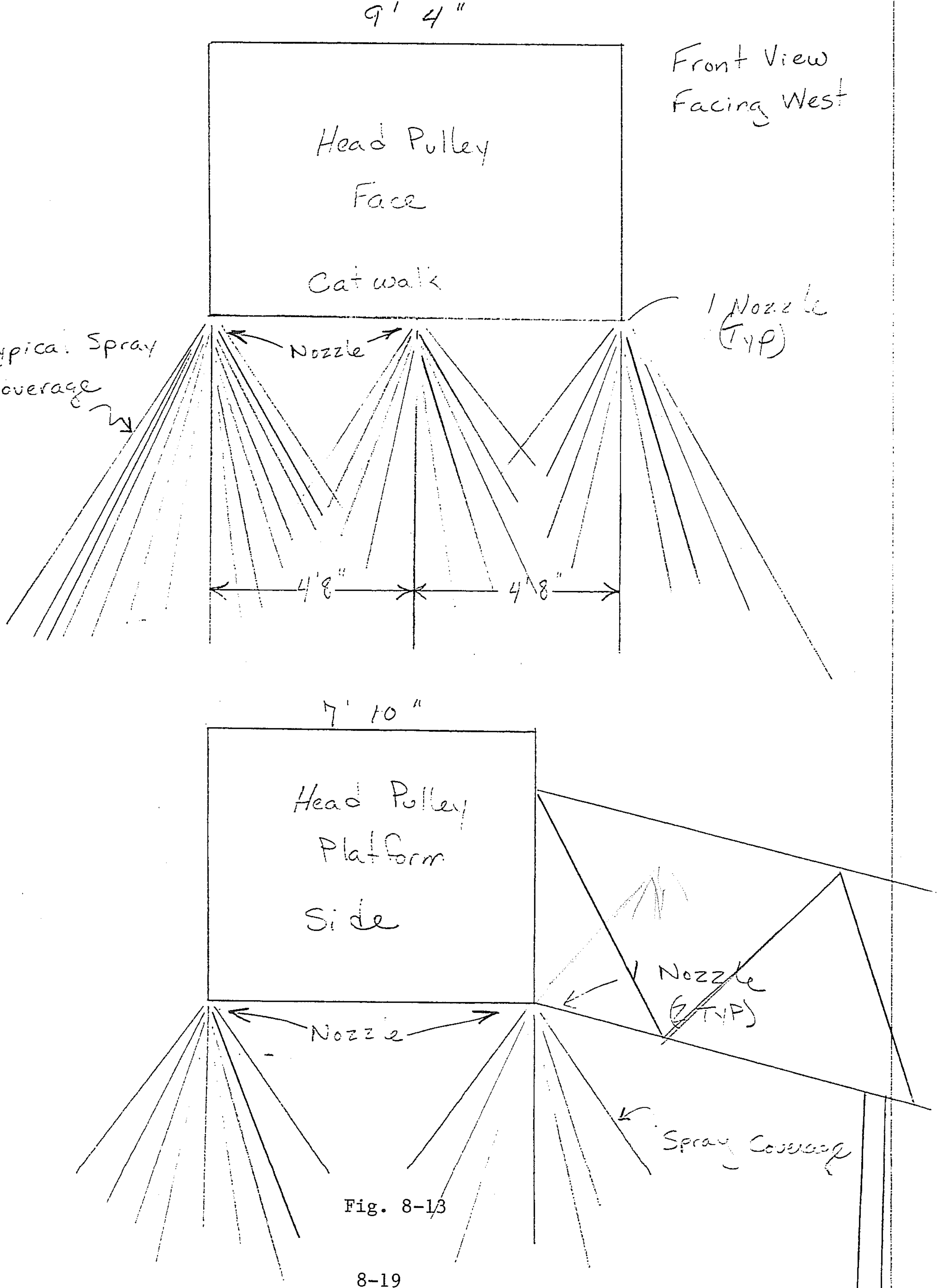
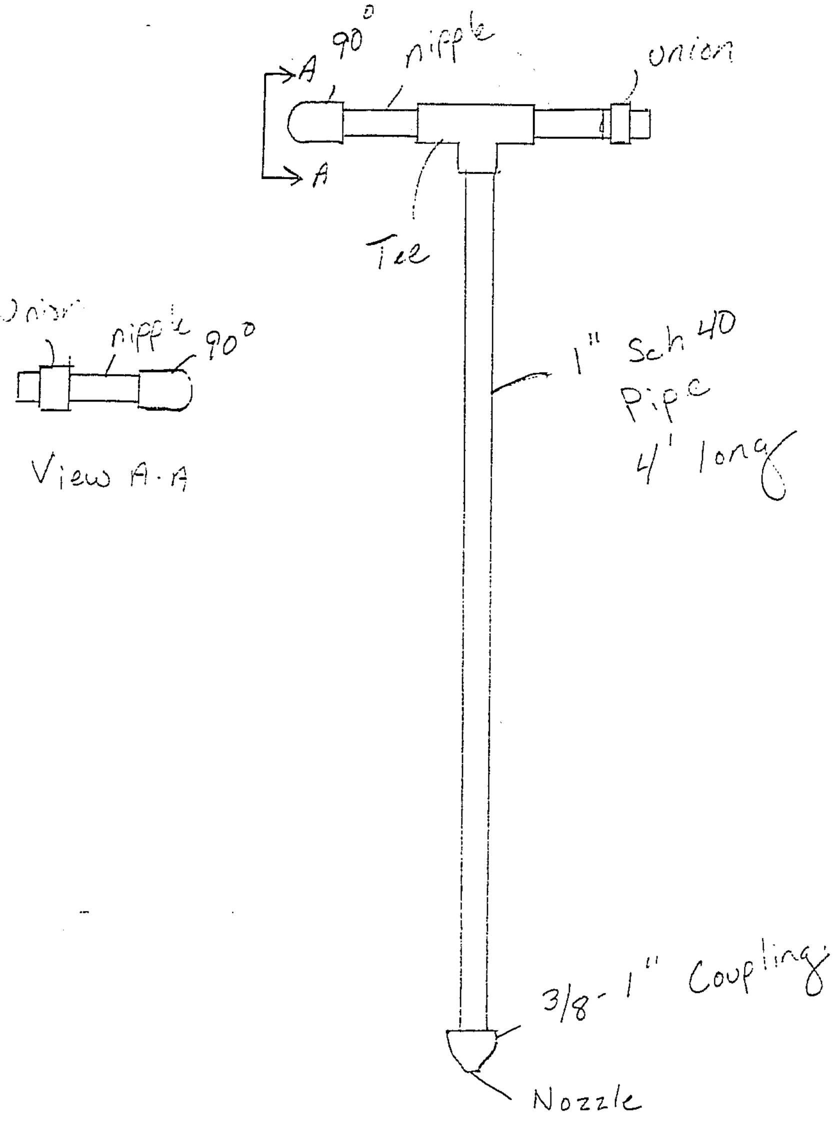


Fig. 8-13

Clinker Belt Pile Spray System



Spray on an intermitent cycle.

Fig. 8-14

Fig 8-14

Clinker Belt Pile Spray System

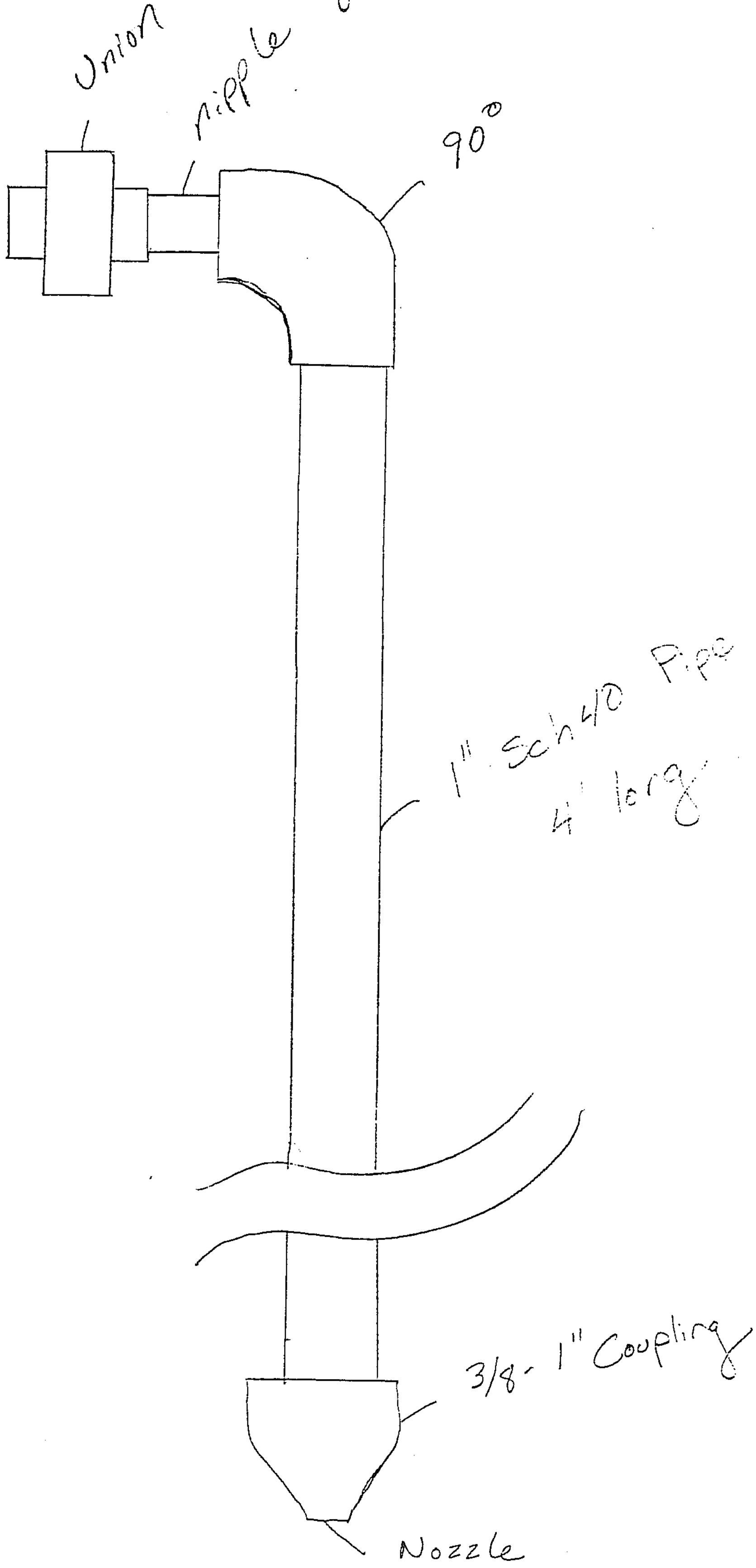


Fig. 8-15

Fig 8-5

Conveyor Dischage Sprays

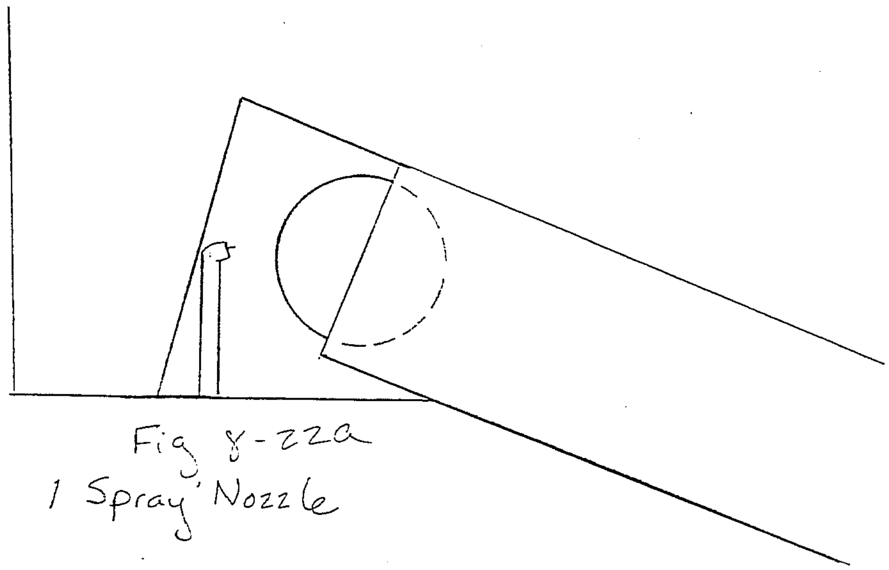
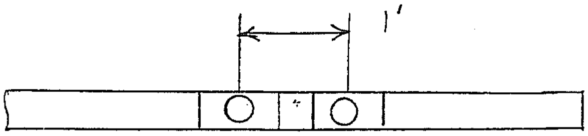


Fig 8-22a

1 Spray Nozzle

Locations: 12 C - 1 Belt (To Surge Hopper)
12 C - 2 Belt (To 6 x 16 Screen)
Clinker Conveyor Head Pulley

Traylor Crusher Dischage



2 Nozzles Directed at Dischage under Traylor Crusher

Fig 8- 22b

Fig. 8-16

Fig 8-16

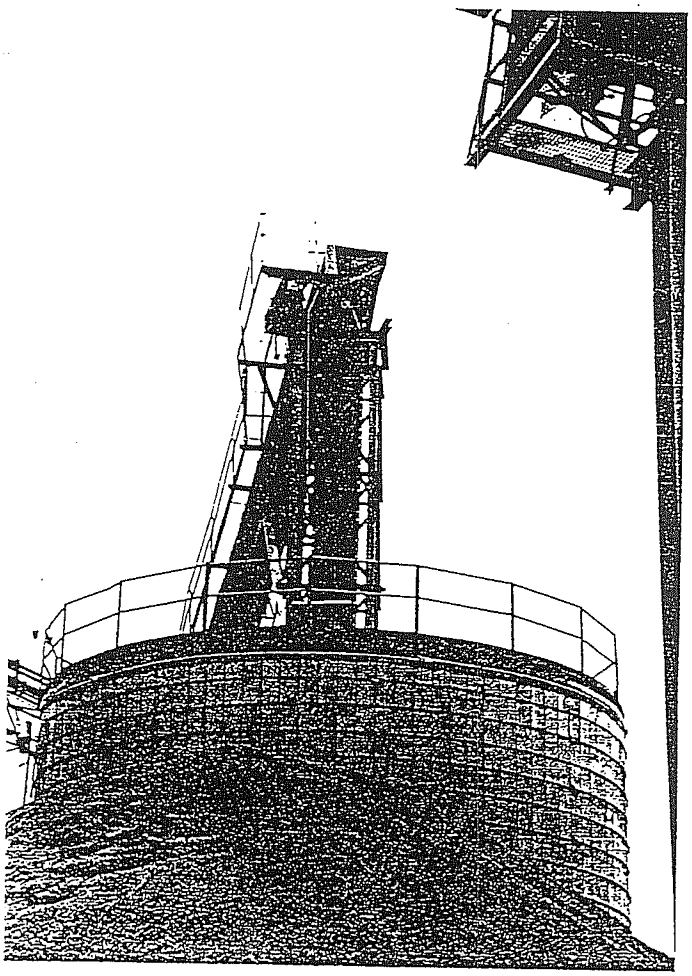


Figure 8-17
Finish Plant Fines Silo and Fines Chute

The West face of the fines silo chute (shown) has been redesigned with easily changed, wear resistant plates (also shown).

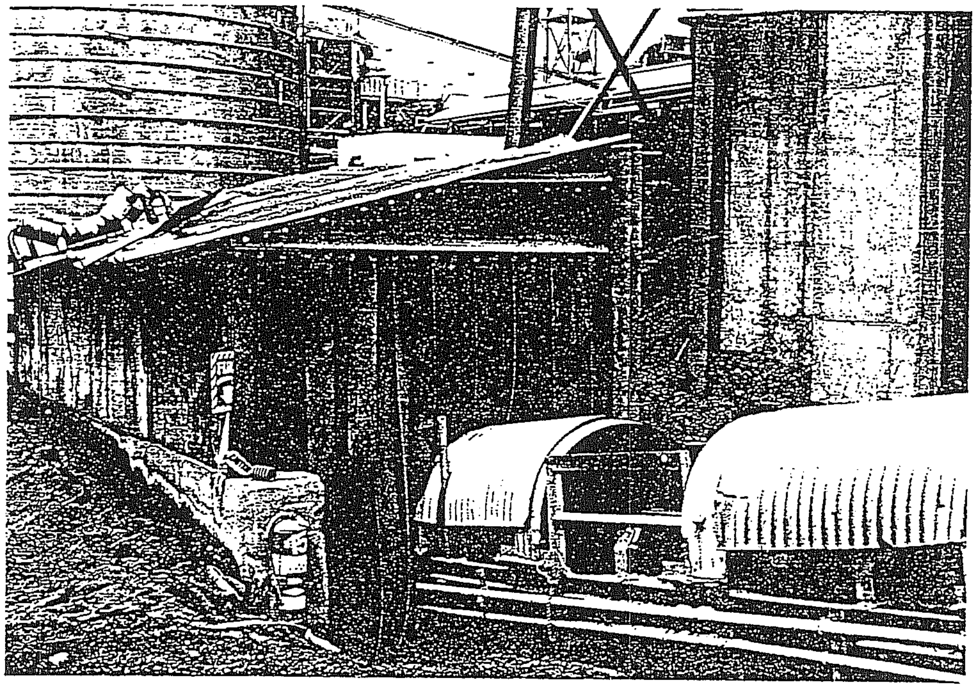


Figure 8-18
Shipping Tunnel Mouth Enclosure

The Shipping conveyor belt (right) extends under the three silos (left, not shown). The enclosure covering the mouth of the tunnel will be improved and sealed.

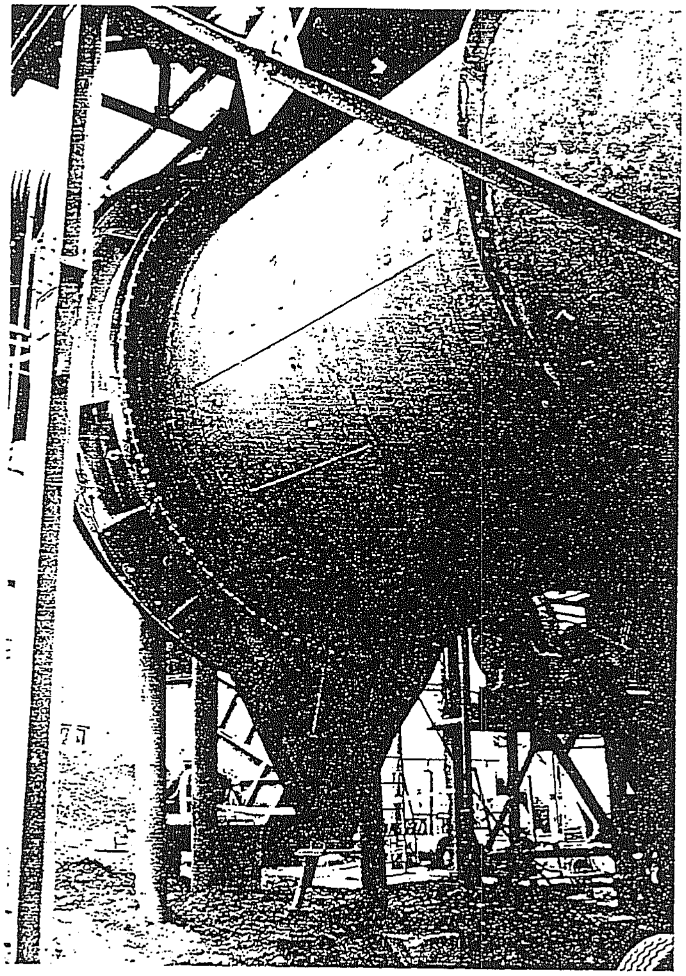


Figure 8-19
Rear Kiln Seals

The seal mechanism and knock out box will be maintained during all planned shutdowns.

APPENDIX A

REVISED PAGES OF THE BMP PLAN

2.2.4.2 Description of Trunnion Apparatus

The trunnions are rollers that the kilns tires ride on as the kiln rotates. The trunnions have a sealed lubrication system. Damage to the seals could result in a release of lubricating oil. The overall preventative maintenance program of the kiln trunnions and bases has been improved to eliminate oil leaks. A system has been installed to prevent contamination from the Trunnion lubricants. Gradual drippings or leakage of lubricating grease from the Trunnion bearings is diverted through specially constructed collection channels with 55-gallon drum receivers for proper storage and disposal. Thus, grease and oils are prevented from leaking into the ground or being transported to surface waters via storm water runoff.

2.2.5 Dust Control

Norlite is improving the strategy for controlling fugitive dust emissions in order to minimize the potential for dust particulate settling on the facility site roads and storage areas from becoming waterborne in storm water runoff. Additional work, initiated by Norlite in conjunction with dust control experts, will further improve the effectiveness of the dust control systems. The following BMP items detail the activities which have either been completed or are planned for dust control on the Norlite Site:

1. Remote area spray system(s):

   All short term storage piles will have water spray systems to control dust.

2. Roads

   Plant roads were graded with railroad ballast in 1992. The south plant entrance road off of Elm Street was paved with light weight aggregate during the summer of 1994 to minimize dust emissions from that road. This paving is still being monitored for dust control effectiveness. A procedure will be written to maintain the mobile road watering system since previous reports by SCI-TECH have stated that continual road watering is not necessary.

   As of June 30, 1992, entrance to the plant through the South Saratoga Street entrance has been restricted to passenger cars and light trucks. In addition the plant speed limit was lowered to 10 miles per hour to further minimize dust.

3. Long-term storage piles:

   All product storage piles will be sprayed with water or shaped with a loader or other machine to control dust. Pile shaping will be done to minimize jagged edges on the leeward side of piles. Jagged edges cause turbulent air which makes loose dust particles airborne.

4. Hard Piping of water lines:

   Hard piping will be installed at fixed emission points to control dust emissions determined by Norlite and SCI-Tech in the Fugitive Dust Plan. Flexible piping will be used to connect sections of hard pipe for ease of installation. All piping will be insulated and drains will be included in the design to allow water suppression systems to operate as long as practically possible in sub-freezing weather.

5. Enclosure Improvements:

   Metal sheeting has been replaced on the screen enclosure buildings and dust covers have been installed on all conveyors as of April 1992.

6. Other Dust Control Improvements:

   i. 1500 cubic yards of coal was removed from the site in February 1992 eliminating this source of dust emissions.

   ii. All baghouse dust piles present at the time of the plant's acquisition by American NuKEM in 1991 were placed in an on site solid waste landfill.

   Iii. All baghouse dust is now pneumatically conveyed to two dedicated silos.

   Iv. The dedicated silos were rebuilt and fitted with new bin vents.

7. New kiln dust seals were designed and installed on both Kiln #1 and Kiln #2.

Area 23 - Dust Control and Associated Control of Groundwater and Storm water Contamination

Norlite is attempting to optimize the strategy for controlling fugitive dust emissions in order to minimize the potential for dust particulate settling on the facility site roads and storage areas from becoming waterborne in storm runoff. The dust control systems will be improved based on recommendations in SCI-TECH's February 1995 Fugitive Dust Plan report. The following BMP details the activities which have been completed or are planned for dust control at the Norlite site:

1. Road Watering: Norlite will develop a plan for maintaining the mobile road watering units. This plan will include the frequency of watering and maintenance procedures. Continuous road watering was deemed impractical and unnecessary by Sci-Tech. To further suppress dust the roads were rebuilt with railroad ballast. A program will be implemented to maintain these roads.

2. Wet Dust Suppression systems: Norlite will upgrade the wet dust suppression systems, including nozzles and hard piping as recommended by Sci-Tech and researched by engineers at Norlite. These systems will be designed to be functional as much as possible in sub-freezing weather by incorporating insulated heat trace systems and drains. Flexible piping will still be used to connect sections of hard pipe, but the hard pipe will run to the emission points. Furthermore, operators will be trained in the proper operation of the wet dust suppression systems in normal and sub-freezing conditions.

3. Traffic Patterns: Traffic through the South Saratoga Street entrance has been closed to all heavy vehicles since June 30, 1992. Only passenger cars and light truck may enter the plant through this entrance.

4. Long Term Storage Piles: Dust will be controlled on long term storage piles by eliminating jagged edges on the leeward side using a loader or other machine. During dry periods the long term storage piles may be sprayed with the mobile water tanker to further suppress dust.

5. Enclosure Improvements: Metal sheeting has been installed and repaired on the permanent screening operations. Metal covers have been installed on all conveyor belts. Drop points have been reduced in height as much as possible. Transfer points and chutes have been enclosed to practical limits.

6. Block mix production: Norlite plans to install a new conveyor system for the production of the block mix. This new system will shorten the conveyor belts by approximately 300 feet, reduce the drop heights in transfer chutes and reduce the drop height to the ground. The drop height will be controlled by a device on the final conveyor belt.

7. Kiln seals: The seals on the shale feed ends of both kilns have been redesigned to minimize emissions and allow for longer mechanical life.

8. Baghouse Dust: Baghouse dust is pneumatically conveyed and stored exclusively in two dedicated silos. These silos were rebuilt and fitted with bin vents which return all dust to the silo. The bag house dust is no longer mixed on the ground with a front end loader to make block mix. A BUD was granted

by NYSDEC for this purpose. All remaining baghouse dust was stored in an on site solid waste landfill.

Other Improvements to be noted:

Norlite has ceased its operation of firing the kilns with coal. The coal storage pile and all associated equipment has been removed from the site.

All equipment has been fitted with high intensity strobe lights and audible alarms for vehicle backing. Audible alarms are used during daylight hours, but the strobe lights are used during night time operation. This program was adopted to reduce noise pollution.

Norlite will investigate computer software modeling and meteorological instruments for future use in characterization of dust emissions to plan loading operations for product.

Norlite is investigating the feasibility and impact on dust emissions of moving the heavy equipment parking from the eastern edge of the plant to the western side of the plant. Dust emissions and heavy vehicle exhaust emissions will be moved further away from the neighboring community.

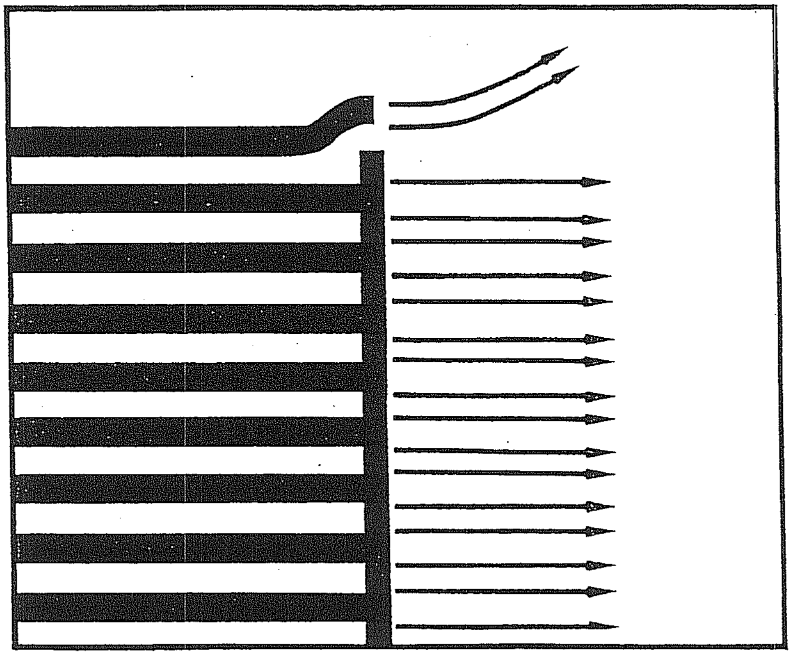
APPENDIX B

MISCELLANEOUS VENDOR INFORMATION ON WIND SCREENS, WATER SPRAYS, AND METEOROLOGICAL SYSTEMS

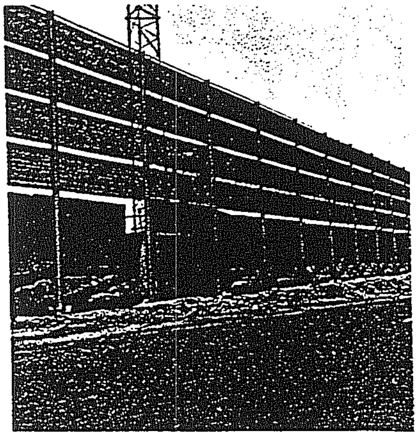
versatile, reliable **DUSTTAMER**™ windscreens. . .

How They Work:

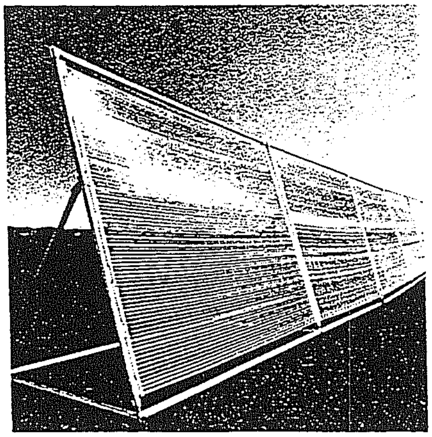
The windscreen exerts a drag force on the oncoming wind field, taking up or deflecting a sufficient amount of wind, thus lowering the velocity below that point required to initiate particle movement. Air passing through the screen is referred to as bleed flow, while air displaced upward and over is referred to as displacement flow. Both are determined by the permeability of the screen.



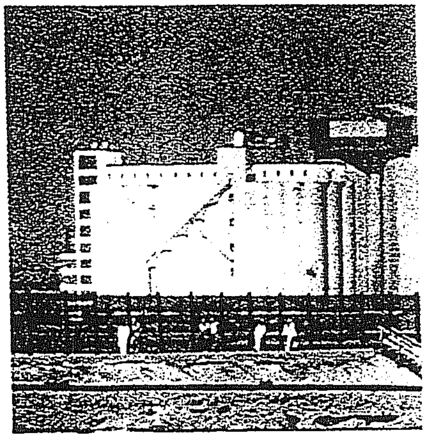
- 100% high tenacity industrial polyester construction.
- Available in a range of porosities to suit the needs of the user.
- Free standing, portable modular, and permanent units.
- Available in a wide range of heights and configurations.



18′ high permanent unit with steel girders

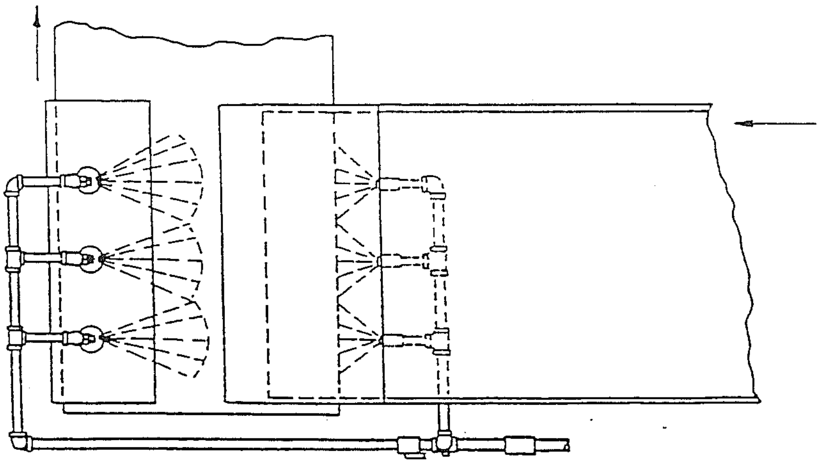


Portable modular units available in 8′ and 12′ heights

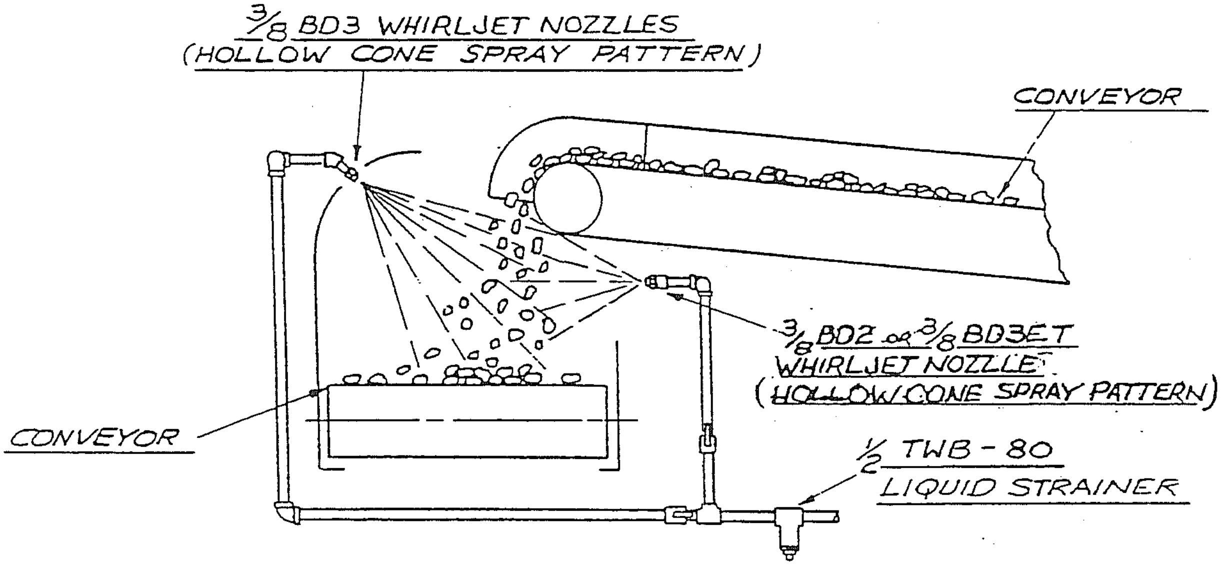


Permanent Windscreen systems of virtually any height and configuration

KPN International, Inc.
POLLUTION ABATEMENT CONSULTANTS
~~19 Pebble Road • Newtown, CT 06470~~
~~(203) 426-3023/3639~~ (203) 426-4440



TOP VIEW



SIDE VIEW

FOR DETAILS ON SPRAY NOZZLES AND ACCESSORIES
SEE INDUSTRIAL CATALOG.

DESCRIPTION

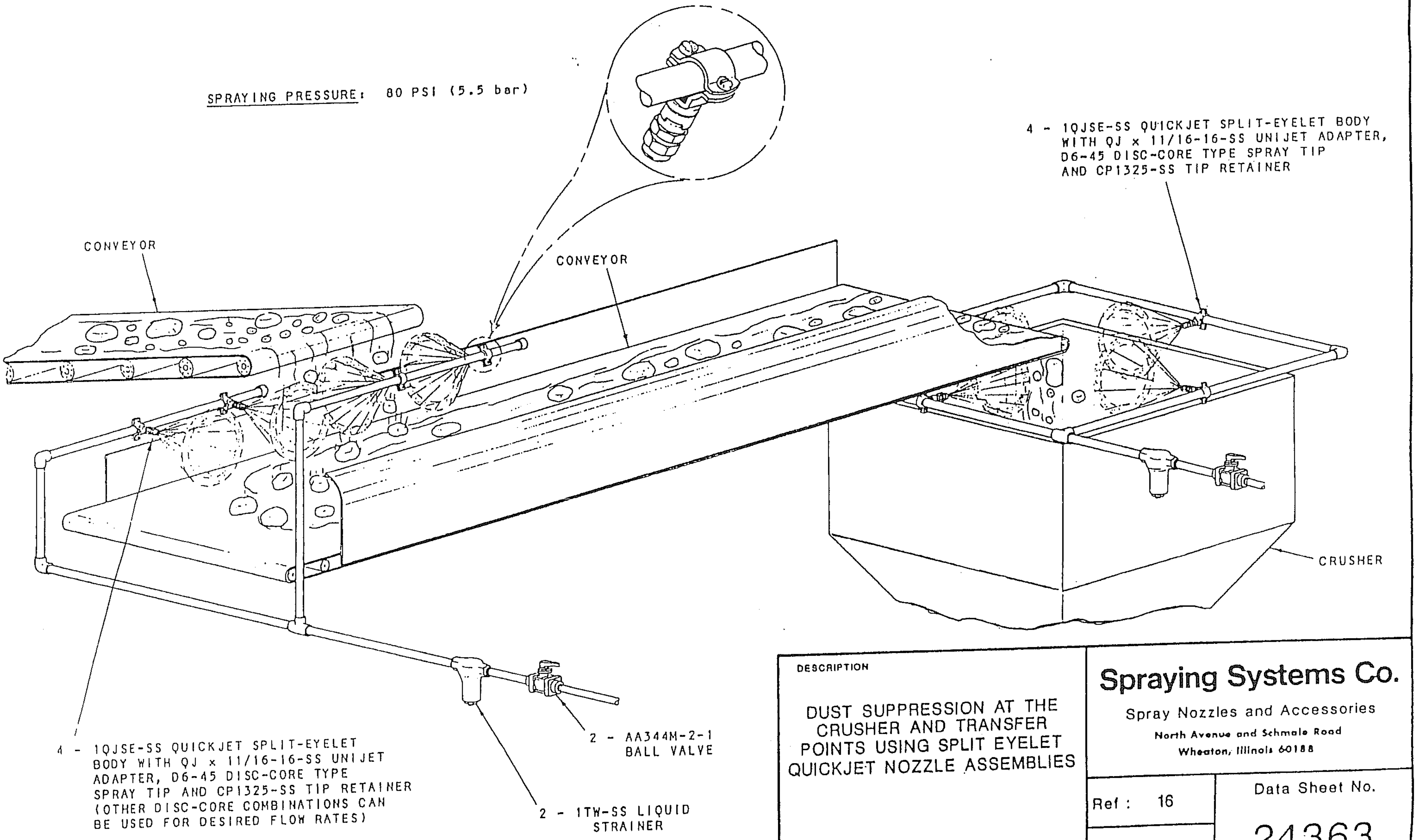
COAL AND ORE DUST CONTROL
AT TRANSFER POINTS ON CONVEYORS
AND SIMILAR APPLICATIONS

SPRAYING SYSTEMS CO.
Engineers and Manufacturers
North Avenue and Schmale Road, Wheaton, Illinois 60187

DATE 2-14-80

DWG. NO. 6426-1

SPRAYING PRESSURE: 80 PSI (5.5 bar)



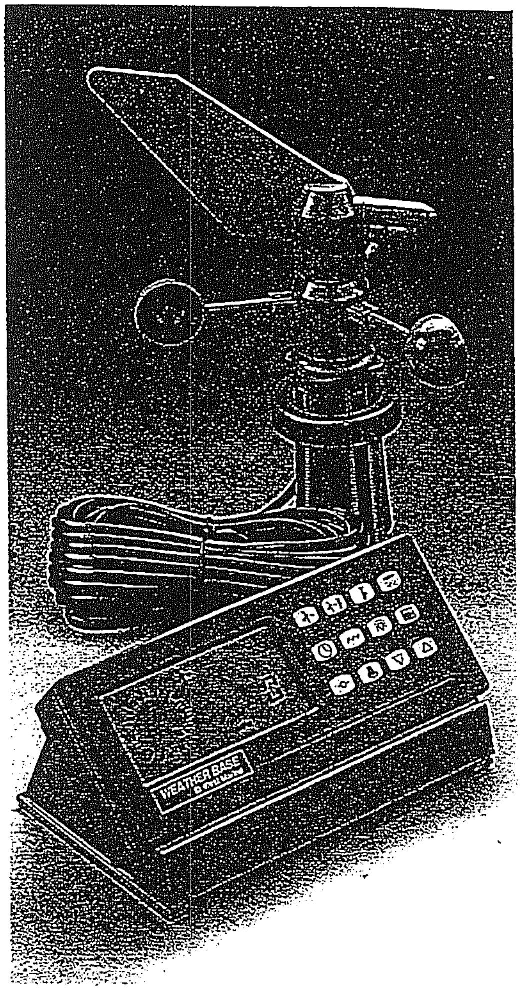
DESCRIPTION

DUST SUPPRESSION AT THE CRUSHER AND TRANSFER POINTS USING SPLIT EYELET QUICKJET NOZZLE ASSEMBLIES

Spraying Systems Co.
Spray Nozzles and Accessories
North Avenue and Schmale Road
Wheaton, Illinois 60188

Ref : 16
Revision No.
Data Sheet No.
24363

West Marine



Weather Base Weather Station

Now you can do something about the weather!

Double your mooring lines or secure the patio furniture before a rising wind becomes too strong. Move sensitive plants indoors before the temperature plunges too low. Monitor the progress of a storm from the comfort of your easy chair. With our Weather Base home weather station, you have access to complete local weather data at the touch of a button! All information is displayed electronically on a large, high-resolution LCD screen that mounts on a wall or in its own desk stand. Easy to mount, easy to hook up, all components are designed and built to perform reliably and accurately for years.

- Shows wind speed and direction, records highest gusts with time and date
- Calculates wind chill factors
- Shows outside temperature and records highs and lows with time and date
- Time and date functions
- Alarms for all functions
- Optional self-voiding rain gauge records daily and monthly totals
- Selectable data scanning
- Includes display unit/keyboard, desk stand, anemometer/windvane, temperature sensor, junction box, AC adaptor, plus required cables and mounting screws.

Model 574871 WWEAT#W-BASE ShWt 5 *Only $179.00*

Optional Accessories

Rain Gauge

Self-voiding gauge empties itself after each 0.1" of rain is collected. Control unit can keep two separate totals. For instance, daily and monthly rainfall totals can be recorded and stored.

Model 576884 WWEAT#R-GAUGE
ShWt 1 List $80.00 *Only $67.00*

40 Ft. Extension Cable

Extend the supplied wind, temperature or rain sensor cable. 4 pin plug-in connectors.

Model 576892 WWEAT#40'CABLE
ShWt 1 List $20.00 *Only $15.00*

50 Ft. Junction Box Extension Cable

8-conductor cable to extend length from junction box to control unit.

Model 576900 WWEAT#50' JUNCTION ShWt 2 List $34.00 *Only $25.00*

Cigarette Lighter Power Adapter

Allows Weather Base to be powered by your 12 volt batteries.

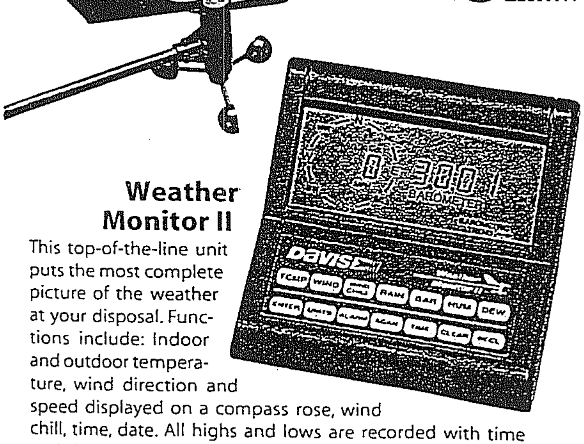
Model 561225 WWEAT#CIG LIGHTER ShWt .5 *Only $9.00*

RS232 Computer Interface Cable

Allows Weather Base to download information to your PC.

Model 561217 WWEAT#I-FACE ShWt .5 *Only $69.00*

DAVIS



Weather Monitor II

This top-of-the-line unit puts the most complete picture of the weather at your disposal. Functions include: Indoor and outdoor temperature, wind direction and speed displayed on a compass rose, wind chill, time, date. All highs and lows are recorded with time and date. Alarms for temperature, wind speed, wind chill and time. Measures 5 1/4" x 5 7/8" x 3" and includes reversible mounting bracket for use on desk, shelf or wall. Complete with anemometer and 40 ft. of cable, external temperature sensor with 25 ft. of cable, junction box with 8 ft. of cable, AC power adapter, and detailed instruction book. Also displays data from optional Rain Collector (Model 561498). Information collected by the instrument can be processed and stored through any IBM compatible PC using the Weatherlink Computer Module (Model 171969).

Model 493122 DAVIS#7440 ShWt 2 List $395.00 *Only $349.00*

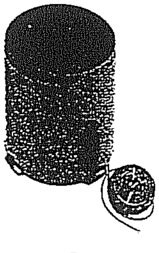
Weather Monitor Accessories

Weatherlink PC Computer Module

Link your Weather monitor to your IBM PC or compatible to create your own weather database. Store data at your choice of sampling rates, for up to 120 days of data accumulation. Comes with both 9-pin and 25-pin RS-232 serial port adapters, 8 ft. of cable, and detailed instructions. Both 5 1/4" and 3 1/2" floppy disks are included.

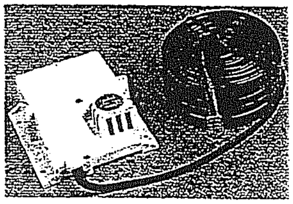
Model 171969 DAVIS#7862
ShWt 2 List $199.00 *Only $165.00*

Rain Collector



When connected to the Weather Monitor II it allows you to read both daily and accumulated rainfall. Measures rainfall in one-tenth inch increments. Self-emptying, tipping bucket design and ruggedly built for minimal maintenance. Comes with 40 ft. plug-in cable, mounting screws and easy installation instructions. Cable runs may be extended up to 160 ft. with optional extension cables.

Model 561498 DAVIS#7852
ShWt 2 List $75.00 *Only $69.95*



Temperature/Humidity Sensor

Replaces standard external temperature sensor of the Weather Monitor II to enable measuring of outside humidity and dew point in addition to temperature. Includes 40 ft. of cable.

Model 561506 DAVIS#7859
ShWt 1 List $125.00 *Only $109.00*

12 Volt Power Cord

Cigarette lighter type plug enables any Davis Weather Station to be run from 12 volt power source. Replaces standard AC adapter included with Weather Stations.

Model 493072 DAVIS#7873
ShWt .5 *Only $9.00*

40 Ft. Extentsion Cable

Lets you extend the length of cables for anemometer, external temperature sensor, rain collector, or Weatherlink.

Model 493064 DAVIS#7876
ShWt 1 *Only $18.00*

APPENDIX C

1990 FDP CALCULATION METHODOLOGY

Note: The ID numbers assigned to the sources listed in this Appendix may not be the same as those given in the body of the report. The information provided in this Appendix is provided solely for the purpose of historical reference.

4.0 EMISSION POTENTIAL ESTIMATES

4.1 Methodology

Emission rates were estimated for all of the fugitive dust sources at the facility having some potential to significantly impact the neighboring community. The sources were identified by a combination of the following activities:

- Discussions with Norlite personnel
- Observations during three site visits in 1990
- Review of Norlite process flow diagrams
- Preparation of simplified process schematics
- Review of schematics by Norlite personnel

The emission factors used in the calculations were taken from the following documents:

- AP-42 Compilation of Air Pollutant Emission Factors
- Fugitive Dust Control Technology
- Control of Open Fugitive Dust Sources

Emission factors specific to the process or source type were preferred over more general emission factors. Emission factor rating (i.e., A to E) was used to select between two or more equally applicable published emission factors. For sources for which no emission factor data was available (e.g., rim seal emissions) engineering judgement was used.

The parameters used in the emission estimate calculations were in general obtained from plant data or tables presented in the documents containing the emission factors. The annual mean wind speed was taken from a set of meteorologic data for the Albany area published by the National Climatic Data Center (NCDC). The wind speeds and directional data shown in Table 3-2 are presented as a point of reference and were prepared from a different set of NCDC data. Material silt content values were taken from sieve analyses of the product sizes (see ~~Appendix B~~ attachment) and typical values for quarried and crushed stone supplied by AP-42.

In many instances emission factors specific to the source and/or of high reliability rating (i.e., A or B) were not available. Additionally, the estimates are based on maximum theoretical production rates. Therefore, the emission rates presented should be treated as conservative estimates to be used for comparative purposes only, and not as absolute values. It was the intent of the authors in preparing these estimates to provide the means by which to determine the relative contribution to community impacts of the individual emission sources, and the percent reduction of impacts different control measures could achieve.

Separate emission estimates for respirable particulate (PM_{10}) were not performed. Controls for TSP are generally as effective for reducing PM_{10} emissions as they are for TSP.

4.2 Potential Impacts

The intent of the fugitive dust control plan is to reduce the impact of the dust on the neighboring community. As noted previously and as evidenced by the local meteorology, the area of greatest concern is the eastern boundary of the plant where there is an apartment complex situated just across the railroad tracks from the facility. Areas to the north, south and west of the plant are far removed from the sources of dust at the facility with extensive buffer regions due to the extent of the plant property. Therefore, these areas will receive negligible impact from plant dust sources and are not of primary concern in the development of the control program.

Since the area of concern is the eastern boundary of the plant, it is reasonable to assume that the relative impact of fugitive dust sources on this area is in proportion to the distance from the boundary. Other factors that affect impact potential are the elevation of the source above or below ground, the presence of natural windbreaks, and the size spectrum of the material.

In order to quantify the relative impacts of each of the dust sources listed in Table 3-1, the concept of impact potential was utilized. Under this concept, a relative impact assessment was made for each dust source based on the factors described above and a "weighting fraction" was assigned. Four qualifiers were selected: high, medium, low, and negligible, with associated weighting fractions of 1.0, 0.5, 0.2, and 0.05, respectively.

TABLE 3-1
Fugitive Dust Emission Sources at Norlite

Source ID	Source Name
1	Drilling at Quarry
2	Blasting at Quarry
3	Formation of Quarried Stone Pile
4	Loading of Stone into Haul Truck
5	Quarry Stone Transport to Crusher
6	Dump into Primary Crusher
7	Primary Crusher
8	Transfer to Primary Sceen Hopper
9	Primary Screen
10	Secondary Crusher
11	Triple Deck Screen for Crushing
12	Discharge onto Cone Crusher Belt
13	Kiln Feed Pile
14	Kiln Feed to Screen Discharge Belt
15	Kiln Feed Transfer to Silo Conveyer
16	Crushing Operations Fines Pile
17	Transfer of Fines to Kiln Feed Pile
18	Loading of Fines into Truck
19	Transport of Fines Off-Site
20	Kiln Feed Transfer to #2 Kiln Belt
21	Kiln Feed Transfer to #1 Kiln Belt
22	#2 Kiln Feed Transfer to Loading Belt
23	Loading of #2 Kiln
24	Loading of #1 Kiln
25	#2 Kiln Rim Seal
26	#1 Kiln Rim Seal
27	Kiln Dust Transfer onto #2 Clinker Belt
28	Kiln Dust Transfer onto #1 Clinker Belt
29	Dishcarge of #2 Clinker onto Pile
30	Dishcarge of #1 Clinker onto Pile
31	#2 Kiln Clinker Pile
32	#2 Clinker Pile Transfer to #1 Pile
33	#1 Kiln Clinker Pile
34	Clinker Transfer to Screen Feed Belt
35	Triple Deck Finish Mill Screen
36	Discharge into Oversize Hopper
37	El Jay Crusher
38	Transfer to El Jay Loadout Belt
39	El Jay Belt Transfer to Screen Belt
40	Fines Silos Screens
41	Transfer from Screen Belt to 3/4" Belt
42	Discharge onto Short-Term 3/4" Pile
43	3/4" Short-Term Storage Pile
44	Transfer from Screen Belt to 3/8" Belt
45	3/8" Short-Term Storage Piles
46	Block Mix Feeder Pile
47	88/12 Block Mix Short-Term Pile

Table 3-1 cnt'd

Source ID	Source Name
48	75/25 Block Mix Short-Term Pile
49	Finish Mill Straight Fines Pile
50	Finish Mill Front-End Loader Travel
51	Loading onto Long-Term Storage Piles
52	Long-Term Product Storage Piles
53	Loading of Product into Railcars
54	Loading of Product into Trucks
55	Transport of Product Off-Site by Truck
56	Travel of Coal Delivery Trucks
57	Unloading of Coal onto Pile
58	Coal Pile
59	Dump into Coal Mill Hopper
60	Travel of LGF Delivery Trucks
61	Baghouse Dust Discharge from Silo
62	Loading of Baghouse Dust onto Pile
63	Baghouse Dust Pile
64	Loading of Baghosue Dust into Trucks
65	Transport of Baghouse Dust Off-Site
66	Maintenance Traffic
67	Passenger Vehicle Traffic

TABLE 3-2
ALBANY COUNTY AIRPORT METEOROLOGICAL DATA
WIND FREQUENCY

Wind Direction	Wind Frequency (%)												
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	All
N	10.6	12.0	9.3	9.4	7.6	6.5	5.6	9.3	9.1	8.6	7.6	10.1	8.8
NNE	3.8	4.5	4.6	4.0	3.3	2.9	2.3	3.3	3.0	3.5	3.2	3.3	3.5
NE	2.1	2.1	2.7	2.6	2.7	1.8	1.6	2.0	1.9	2.2	1.6	2.1	2.1
ENE	1.8	1.6	1.1	1.4	1.6	1.2	1.2	1.8	1.4	1.7	1.5	1.1	1.5
E	0.9	1.0	1.1	1.2	1.6	1.2	1.7	1.8	1.5	1.2	1.0	1.0	1.3
ESE	0.6	1.0	1.0	1.0	1.7	1.6	1.7	1.8	1.6	1.3	0.9	1.0	1.3
SE	1.6	2.3	2.9	3.3	4.0	4.5	4.3	4.1	4.0	3.9	2.7	2.9	3.4
SSE	6.5	6.7	7.7	8.4	10.7	13.1	11.4	11.1	11.6	10.3	9.8	10.3	9.8
S	14.1	14.0	16.8	11.6	21.4	25.6	22.1	18.9	20.6	17.2	15.9	15.7	17.8
SSW	1.5	1.2	1.3	1.5	2.0	2.5	2.5	2.6	2.2	2.0	2.0	1.4	1.9
SW	2.2	1.6	1.1	1.1	2.1	1.8	2.2	1.6	1.6	1.7	2.0	1.3	1.7
WSW	2.9	2.3	1.5	2.2	2.6	2.7	3.7	3.0	2.3	3.1	3.7	2.4	2.7
W	11.5	9.5	9.9	12.7	9.3	9.8	10.0	7.8	8.3	10.0	13.2	9.5	10.1
WNW	17.7	18.7	18.1	20.4	10.5	8.3	8.6	7.7	9.2	10.9	15.3	16.8	13.5
NW	8.3	8.6	9.4	8.6	5.6	3.6	4.9	4.0	4.9	5.7	5.7	6.4	6.3
NNW	4.3	3.5	3.6	3.0	3.0	2.3	2.9	3.0	2.7	2.8	3.3	3.4	3.1
Calm	9.7	9.5	8.0	7.8	10.5	10.6	13.5	16.5	14.0	14.0	10.7	11.3	11.4

TABLE 3-3
ALBANY COUNTY AIRPORT METEOROLOGICAL DATA
MEAN WIND SPEED

Wind Direction	Mean Wind Speed (mph)												
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	All
N	7.6	8.3	7.8	8.0	7.9	7.3	6.8	7.0	7.2	7.3	7.6	7.6	7.6
NNE	7.3	9.1	8.6	8.6	8.0	8.2	7.1	6.7	7.2	7.6	7.3	7.1	7.8
NE	5.5	6.0	7.8	8.1	7.1	7.0	6.0	5.6	5.5	6.4	5.8	5.3	6.4
ENE	5.2	5.0	6.2	6.8	6.1	5.6	5.0	4.7	4.6	4.9	5.1	4.9	5.3
E	4.1	5.6	5.0	6.4	5.9	5.1	4.8	4.5	4.4	4.4	4.3	4.1	4.9
ESE	4.3	7.2	6.3	6.0	6.5	5.5	5.6	5.0	5.1	6.0	5.3	5.4	5.7
SE	7.0	8.2	8.5	9.1	7.7	7.7	7.3	6.3	7.2	7.4	7.8	7.4	7.6
SSE	10.1	9.8	10.6	11.1	9.7	9.4	8.3	8.3	8.9	9.2	10.0	9.8	9.5
S	9.2	9.4	10.2	9.7	8.9	8.5	7.8	7.6	8.0	8.2	9.0	9.1	8.7
SSW	7.7	7.1	8.0	6.3	6.1	6.5	6.5	6.3	6.1	6.4	7.1	5.8	6.6
SW	8.5	7.7	7.0	7.3	6.8	6.1	6.7	6.2	6.6	8.1	7.5	6.9	7.2
WSW	9.8	10.0	8.8	9.6	8.0	8.2	7.4	7.3	7.5	8.9	9.0	8.7	8.5
W	12.1	12.6	12.9	12.7	11.1	10.7	9.9	9.6	10.4	11.0	11.6	12.9	11.6
WNW	13.5	13.9	15.0	13.8	11.6	11.4	9.7	9.7	10.3	11.4	12.4	14.3	12.8
NW	11.4	11.0	12.2	11.3	9.5	9.2	8.5	7.5	8.4	9.0	9.6	10.3	10.2
NNW	7.6	8.0	8.3	8.4	9.1	7.4	7.5	6.6	6.9	7.0	7.2	7.2	7.6
Avg.	9.1	9.4	10.0	9.9	8.1	7.8	6.9	6.3	7.0	7.5	8.5	8.8	8.3

. hysical Properties

Typical Sieve Analysis

Coarse Aggregate

3/4" - No. 4 Size

Sieve No.	Percent Retained (Cumulative)	Percent Passing	ASTM C 330
3/4	3.0	97	90-100
1/2	36.0	64	—
3/8	71.0	29	10-50
No. 4	98.0	2	0-15

Fineness Modulus 7.08

Dry Loose Weight lb./cu. ft. 40.5

Dry Rodded Weight lb./cu. ft. 45.0

Typical Sieve Analysis

Intermediate Aggregate

3/8" - No. 8 Size

Sieve No.	Percent Retained (Cumulative)	Percent Passing	ASTM C 330 C 331
1/2	0.0	100	100
3/8	0.0	100	80-100
4	62.5	37.5	5-40
8	98.5	1.5	0-20
16	99.3	.7	0-10

Fineness Modulus 5.61

Dry Loose Weight lb./cu. ft. 42.0

Dry Rodded Weight lb./cu. ft. 46.6

Typical Sieve Analysis

Fine Aggregate

No. 4 - 0 Size

Sieve No.	Percent Retained (Cumulative)	Percent Passing	ASTM C 330 C 331
3/8"	0.0	100	100
No. 4	0.0	100	85-100
8	11.0	89	—
16	40.0	60	40-80
30	62.0	39	—
50	76.0	24	10-35
100	84.0	16	5-25

Fineness Modulus 2.72

Dry Loose Weight lb./cu. ft. 54.6

Dry Rodded Weight lb./cu. ft. 63.0

Typical Sieve Analysis

- Block Mix

Combined Fine and Coarse Aggregate

3/8" - 0 Size

Sieve No.	Percent Retained (Cumulative)	Percent Passing	ASTM C 331
1/2	0	100	100
3/8	0	100	90-100
4	19.6	80.4	65-90
8	43.8	56.2	35-65
16	66.3	33.7	—
30	80.1	19.9	—
50	87.7	12.3	10-25
100	91.7	8.3	5-15

Fineness Modulus 3.89

Dry Loose Weight lb./cu. ft. 56.5

Average Unit Weights

	Loose Dry	Dry Rodded	ASTM Requirement
Coarse 3/4" - No. 4	40.5	45.0	55
rmediate 3/8" - No. 8	42.0	46.6	55
ines 3/16" - 0	54.6	63.0	70
Block Mix 3/8" - 0	56.5	59.5	65

Absorption - Specific Gravity

	3/4"	3/8"	3/16" - 0
Specific Gravity (0% Moisture)	1.25	1.30	1.55
Percent Absorption (24 Hours)	13.2	11.9	11.9

Current and Uncontrolled
Emission Calculations

Source ID: 1

Source Name: Drilling at Quarry

Description: TSP emissions are generated from drilling in the quarry. The emissions are controlled by a mist suppression device which is part of the drill.

From: AP-42 Section 8.19.2

TSPER (tons/year) = (0.0008)(P)(ton/2000 lb)(1 - CE)

where: TSPER = tons of TSP emitted from source 1 annually

P = tons of stone drilled annually

CE = the control efficiency of the drill mist suppression system

From: EPA-450/3-77-010

CE = 50 percent

TSPER = (0.0008)(350,000)(ton/2000 lb)(1 - 0.50)

= 0.070 ton/year

= 0.14 ton/year without control

Source ID: 2

Source Name: Blasting at Quarry

Description: TSP emissions are generated from blasting in the quarry.

From: Fugitive Dust Control Technology

TSPER (tons/year) = (0.08)(P)(ton/2000 lb)

where: TSPER = tons of TSP emitted from source 2 annually

P = tons of stone blasted annually

TSPER = (0.08)(350,000)(ton/2000)

= 14.0 tons/year

Source ID: 3

Source Name: Formation of Quarried Stone Pile

Description: TSP emissions are generated when blasted stone is stacked into a loading pile.

From: EPA-450/3-77-010 Section 2.1.4

$$\text{TSPER (tons/year)} = (0.04)(S/1.5)(100/PE)^2(P)(\text{ton}/2000\ \text{lb})$$

where: TSPER = tons of TSP emitted from source 3 annually

S = material silt content (%)

PE = Thornthwaite's evaporation-precipitation index

P = tons of stone stacked per year

Assume quarry stone silt content is 0.5 percent.

$$\text{TSPER} = (0.04)(0.5/1.5)(100/136)2(350{,}000)(\text{ton}/2000\ \text{lb})$$

$$= 1.3\ \text{tons/year}$$

Source ID: 4

Source Name: Loading of Quarry Stone into Haul Truck

Description: TSP emissions are generated when quarried stone is loaded into haul trucks using a front-end loader.

From: AP-42 Section 11.2.3

$$\text{TSPER (tons/year)} = (0.002368)(U/5)^{1.3}(2/M)^{1.4}(P)(\text{ton}/2000\ \text{lb})$$

where: TSPER = tons of TSP emitted from source 4 annually

U = mean wind speed (mph)

M = material moisture content (%)

P = tons of stone loaded per year

$$\text{TSPER} = (0.002368)(7.4/5)^{1.3}(2/5)^{1.4}(350{,}000)(\text{ton}/2000\ \text{lb})$$

$$= 0.19\ \text{ton/year}$$

Source ID: 5

Source Name: Transport of Quarry Stone to Crusher

Description: TSP emissions are generated from the travel of haul trucks from the quarry to the primary crusher. The emissions will be controlled from watering the road.

From: AP-42 Section 11.2.1

$$TSPER\ (tons/year) = (4.72)(s/12)(S/30)(W/3)^{0.7}(w/4)^{0.5}(1-p/365)(VMT) \\ *(ton/2000\ lb)(1 - CE)$$

where: TSPER = tons of TSP emitted from source 5 annually

s = silt content of road surface (%)

S = mean vehicle speed (mph)

W = mean vehicle weight (tons)

w = number of wheels

p = annual number of days with at least 0.01 inch of precipitation

VMT = number of vehicle miles travelled annually

CE = control efficiency from watering the road

VMT = (number of trips/year)(miles per trip)

= ((350,000 tons/year)/(25 tons/trip))(0.6 mile/trip)

= 8,400 miles/year

From: EPA 450/3-88-008

CE = 70 percent

$$TSPER = (4.72)(14.1/12)(15/30)(42.5/3)^{0.7}(6/4)^{0.5}(1 - 140/365) \\ *(8,400)(ton/2000\ lb)(1 - 0.70)$$

= 16.9 tons/year

= 56.2 tons/year without control

Source ID: 6

Source Name: Dump into Primary Crusher

Description: TSP emissions are generated when quarried stone is dumped into the primary crusher. The emissions are controlled by a water spray.

From: AP-42 Section 11.2.3

$$\text{TSPER (tons/year)} = (0.002368)(U/5)^{1.3}(2/M)^{1.4}(P)(\text{ton}/2000\ \text{lb})(1 - CE)$$

where: TSPER = tons of TSP emitted from source 6 annually

U = mean wind speed (mph)

M = material moisture content (%)

P = tons of stone crushed per year

CE = control efficiency of the water spray

From: Fugitive Dust Control Technology Section 2.1.3.4

CE = 50 percent

$$\text{TSPER} = (0.002368)(7.4/5)^{1.3}(2/5)^{1.4}(350{,}000)(\text{ton}/2000\ \text{lb})(1 - 0.50)$$

= 0.10 ton/year

= 0.19 ton/year without control

Source ID: 7

Source Name: Primary Crusher

Description: TSP emissions are generated from the crushing of quarried stone in the primary crusher. Emissions are controlled by the same water spray used for source 6.

From: AP-42 Section 8.19.2

TSPER (tons/year) = (0.018)(P)(ton/2000 lb)

where: TSPER = tons of TSP emitted from source 7

P = tons of stone crushed annually

TSPER = (0.018)(350,000)(ton/2000 lb)

= 3.2 tons/year

The water spray is used to wet the stone if it is not already wet when coming from the quarry. Assume half of the time the stone arrives wet.

$TSPER_1$ = (0.018)(P_1)(ton/2000 lb)

where: $TSPER_1$ = tons of TSP emitted when stone arrives wet per year

P_1 = tons arriving wet per year

$TSPER_1$ = (0.018)(175,000)(ton/2000 lb)

= 1.6 tons/year

$TSPER_2$ = (0.28)(P_2)(ton/2000 lb)

where: $TSPER_2$ = tons of TSP emitted when stone arrives dry per year

P_2 = tons arriving dry per year

$TSPER_2$ = (0.28)(175,000)(ton/2000 lb)

= 24.5 tons/year

TSPER = 1.6 tons/year + 24.5 tons/year

= 26.1 tons/year without control

In the future, a further reduction of 50 percent could be achieved with more efficient watering.

Source ID: 8

Source Name: Transfer to Primary Screen Hopper

Description: TSP emissions are generated when crushed stone is conveyed from the primary crusher to the primary screen. The emissions are controlled by a water spray.

From: AP-42 Section 11.2.3

$$TSPER\ (tons/year) = (0.002368)(U/5)^{1.3}(2/M)^{1.4}(P)(ton/2000\ lb)(1 - CE)$$

where: TSPER = tons of TSP emitted from source 8 annually

U = mean wind speed (mph)

M = material moisture content (%)

P = tons of stone crushed per year

CE = control efficiency of the water spray

From: Fugitive Dust Control Technology Section 2.1.3.4

CE = 50 percent

$$TSPER = (0.002368)(7.4/5)^{1.3}(2/5)^{1.4}(350{,}000)(ton/2000\ lb)(1 - 0.50)$$

= 0.10 ton/year

= 0.19 ton/year without control

Source ID: 9

Source Name: Primary Screen

Description: TSP emissions are generated when crushed stone is screened on the primary screen. The emissions are controlled by the same water spray used for source 8.

From: AP-42 Section 8.19.1

TSPER (tons/year) = (0.16)(P)(ton/2000 lb)(1 - CE)

where: TSPER = tons of TSP emitted from source 9 annually

P = tons of crushed stone screened annually

CE = the control efficiency of the water spray

CE = 70 to 95 percent

Assume CE with a good water spray is 95 percent, and the actual efficiency for current operations is only 85 percent due to the quality of the spray nozzle used and not using the spray to its maximum potential benefit.

TSPER = (0.16)(350,000)(ton/2000 lb)(1 - 0.85)

= 4.2 tons/year

Assume the emissions would be reduced 70 percent even without controls because of the inherent water content of the stone as comes out of the quarry.

TSPER = (0.16)(350,000)(ton/2000 lb)(1 - 0.70)

= 8.4 tons/year without control

Source ID: 38

Source Name: El Jay Discharge Belt to El Jay Loadout Belt Conveyor Transfer

Description: TSP emissions are generated from the transfer of crushed product from the El Jay dischrage belt to the El Jay loadout belt.

From: AP-42 Section 8.19.2

TSPER (tons/year) = (0.018)(P)(ton/2000 lb)

where: TSPER = tons of TSP emitted from source 38 annually

P = tons of product crushed annually

TSPER = (0.018)(180,000)(ton/2000 lb)

= 1.6 tons/year

In the future, a water spray will be added to reduce emissions by 50 percent.

Source ID: 39

Source Name: El Jay Loadout Belt to Triple Deck Feed Belt Conveyor Transfer

Description: TSP emissions are generated from the transfer of crushed product from the El Jay loadout belt to the triple deck feed belt.

From: AP-42 Section 11.2.3

$$\text{TSPER (tons/year)} = (0.002368)(U/5)^{1.3}(2/M)^{1.4}(P)(\text{ton}/2000\ \text{lb})$$

where: TSPER = tons of TSP emitted from source 39 annually

U = mean wind speed (mph)

M = material moisture content (%)

P = tons of oversize product transferred per year

$$\text{TSPER} = (0.002368)(7.4/5)^{1.3}(2/3)^{1.4}(180{,}000)(\text{ton}/2000\ \text{lb})$$

$$= 0.20\ \text{ton/year}$$

Source ID: 40

Source Name: Fines Silos Screens

Description: TSP emissions are generated from the screening of fines transferred to the fines silos. Two screens serve the three silos. The emissions are controlled by an enclosure.

From: AP-42 Section 8.19.1

TSPER (tons/year) = (0.16)(P)(ton/2000 lb)(1 - CE)

where: TSPER = tons of TSP emitted from source 40 annually

P = tons of fines produced annually

CE = the control efficiency of the enclosure

From: Fugitive Dust Control Technology Section 2.1.3.4

CE = 70 percent

Assume actual efficiency is 90 percent due to the extent of enclosure

TSPER = (0.16)(85,000)(ton/2000 lb)(1 - 0.90)

= 0.68 ton/year

= 6.8 tons/year without control

Source ID: 41

Source Name: Triple Deck Discharge Belt to 3/4" Drop Belt Conveyor Transfer

Description: TSP emissions are generated from the transfer of 3/4" product from the triple deck discharge belt to the 3/4" drop belt.

From: AP-42 Section 11.2.3

$$\text{TSPER (tons/year)} = (0.002368)(U/5)^{1.3}(2/M)^{1.4}(P)(\text{ton}/2000\text{ lb})$$

where: TSPER = tons of TSP emitted from source 41 annually

U = mean wind speed (mph)

M = material moisture content (%)

P = tons of 3/4" product transferred per year

$$\text{TSPER} = (0.002368)(7.4/5)^{1.3}(2/3)^{1.4}(105{,}000)(\text{ton}/2000\text{ lb})$$

$$= 0.12 \text{ ton/year}$$

Source ID: 42

Source Name: Discharge onto 3/4" Pile from Drop Belt

Description: TSP emissions are generated from the discharge of 3/4" product onto the short-term storage pile from the drop belt. The emissions are controlled by a drop chute and by a water spray.

From: EPA-450/3-77-010 Section 2.1.4

$$\text{TSPER (tons/year)} = (0.04)(S/1.5)(100/PE)^2(P)(\text{ton}/2000\ \text{lb})(1 - CE_1) *(1 - CE_2)$$

where: TSPER = tons of TSP emitted from the loading of 3/4" product onto the pile annually.

S = material silt content (%)

PE = Thornthwaite's evaporation-precipitation index

P = tons of 3/4" product per year

CE_1 = control efficiency of the drop chute

CE_2 = control efficiency of the water spray

From: Fugitive Dust Control Technology Section 2.1.2.4

CE_1 = 80 percent

From: Fugitive Dust Control Technology Section 2.1.3.4

CE_2 = 50 percent

$$\text{TSPER} = (0.04)(0.5/1.5)(100/136)^2(105{,}000)(\text{ton}/2000\ \text{lb})(1-0.8)(1-0.5)$$

= 0.04 ton/year

= 0.38 ton/year without control

Source ID: 43

Source Name: 3/4" Short-Term Storage Pile

Description: TSP emissions are generated from wind erosion of the 3/4" pile.

From: EPA-450/3-77-010 Section 2.1.4

$$\text{TSPER (tons/year)} = (0.11)(S/1.5)(D/90)(100/PE)^2(P)(\text{ton}/2000\ \text{lb})$$

where: TSPER = tons of TSP emitted from wind erosion of the 3/4" short-term pile

S = silt content of the material stored (%)

D = duration of storage (days)

PE = Thornwaite's precipitation-evaporation index

P = tons of 3/4" product per year

D = (size of pile (tons)/tons of product stacked per year)(365 days/year)

= (15,000/105,000)(365 days/year)

= 52.1 days/year

$$\text{TSPER} = (0.11)(0.5/1.5)(52.1/90)(100/136)^2(105{,}000)(\text{ton}/2000\ \text{lb})$$

= 0.60 ton/year

In the future, wind erosion will be reduced by 50 percent from watering of the pile.

Source ID: 44

Source Name: Triple Deck Discharge Belt to 3/8" Drop Belt Conveyor Transfer

Description: TSP emissions are generated from the transfer of 3/8" product from the triple deck discharge belt to the 3/8" drop belt.

From: AP-42 Section 11.2.3

$$\text{TSPER (tons/year)} = (0.002368)(U/5)^{1.3}(2/M)^{1.4}(P)(\text{ton}/2000\ \text{lb})$$

where: TSPER = tons of TSP emitted from source 44 annually

U = mean wind speed (mph)

M = material moisture content (%)

P = tons of 3/8" product per year

$$\text{TSPER} = (0.002368)(7.4/5)^{1.3}(2/3)^{1.4}(70{,}000)(\text{ton}/2000\ \text{lb})$$

$$= 0.08\ \text{ton/year}$$

Source ID: 45

Source Name: 3/8" Short-Term Piles

Description: TSP emissions are generated from the loading of 3/8" product onto the short-term storage piles, and from wind erosion of the piles' surfaces.

From: EPA-450/3-77-010 Section 2.1.4

$$TSPER_1 \text{ (tons/year)} = (0.04)(S/1.5)(100/PE)^2(P)(\text{ton}/2000 \text{ lb})(1 - CE_1) * (1 - CE_2)$$

where: $TSPER_1$ = tons of TSP emitted from the loading of 3/8" product onto the pile annually.

S = material silt content (%)

PE = Thornthwaite's evaporation-precipitation index

P = tons of 3/8" product per year

CE_1 = control efficiency of the drop chute

CE_2 = control efficiency of the water spray

From: Fugitive Dust Control Technology Section 2.1.2.4

CE_1 = 80 percent

From: Fugitive Dust Control Technology Section 2.1.3.4

CE_2 = 50 percent

$$TSPER_1 = (0.04)(0.5/1.5)(100/136)^2(70{,}000)(\text{ton}/2000 \text{ lb})(1-0.8)(1-0.5)$$

= 0.03 ton/year

= 0.25 ton/year without control

$$TSPER_2 \text{ (tons/year)} = (0.11)(S/1.5)(D/90)(100/PE)^2(P)(\text{ton}/2000 \text{ lb})$$

where: $TSPER_2$ = tons of TSP emitted from wind erosion of the 3/8" short-term pile

S = silt content of the material stored (%)

D = duration of storage (days)

PE = Thornwaite's precipitation-evaporation index

P = tons of 3/8" product per year

D = (size of pile (tons)/tons of product stacked per year)(365 days/year)

= (8,000/51,500)(365 days/year)

= 56.7 days/year

$TSPER_2$ = (0.11)(0.5/1.5)(56.7/90)$(100/136)^2$(51,500)(ton/2000 lb)

= 0.32 ton/year

TSPER (tons/year) = $TSPER_1$ + $TSPER_2$

where: TSPER = tons of TSP emitted from source 45 annually

TSPER = 0.03 ton/year + 0.32 ton/year

= 0.35 ton/year

= 0.57 ton/year without control

In the future, wind erosion will be reduced by 50 percent from watering of the pile.

Source ID: 46

Source Name: Block Mix Feeder Pile

Description: TSP emissions are generated from the discharge of 3/8" product onto the block mix feeder pile from the drop belt and from wind erosion of the pile formed. The 3/8" product actually discharges onto a pile from underneath which material is drawn. The emissions are controlled by both a drop chute and a water spray.

From: EPA-450/3-77-010 Section 2.1.4

$$TSPER_1 \text{ (tons/year)} = (0.04)(S/1.5)(100/PE)^2(P)(\text{ton}/2000 \text{ lb})(1 - CE_1) *(1 - CE_2)$$

where: $TSPER_1$ = tons of TSP emitted from the loading of 3/8" product onto the block mix hopperannually.

S = material silt content (%)

PE = Thornthwaite's evaporation-precipitation index

P = tons of 3/8" product to block mix per year

CE_1 = control efficiency of the drop chute

CE_2 = control efficiency of the water spray

From: Fugitive Dust Control Technology Section 2.1.2.4

CE_1 = 80 percent

From: Fugitive Dust Control Technology Section 2.1.3.4

CE_2 = 50 percent

$$TSPER_1 = (0.04)(0.5/1.5)(100/136)^2(18{,}500)(\text{ton}/2000 \text{ lb})(1-0.8)(1-0.5)$$

= 0.007 ton/year

= 0.07 ton/year without control

$$TSPER_2 \text{ (tons/year)} = (0.11)(S/1.5)(D/90)(100/PE)^2(P)(\text{ton}/2000 \text{ lb})$$

where: $TSPER_2$ = tons of TSP emitted from wind erosion of the 3/8" short-term pile

S = silt content of the material stored (%)

D = duration of storage (days)

PE = Thornwaite's precipitation-evaporation index

P = tons of 3/8" product per year

D = (size of pile (tons)/tons of product stacked per year)(365 days/year)

= (3,000/18,500)(365 days/year)

= 59.2 days/year

$TSPER_2$ = (0.11)(0.5/1.5)(59.2/90)$(100/136)^2$(18,500)(ton/2000 lb)

= 0.12 ton/year

TSPER (tons/year) = $TSPER_1$ + $TSPER_2$

where: TSPER = tons of TSP emitted from source 45 annually

TSPER = 0.007 ton/year + 0.12 ton/year

= 0.13 ton/year

= 0.20 ton/year without control

In the future, wind erosion will be reduced by 50 percent from watering of the pile.

Source ID: 47

Source Name: Block Mix 88/12 Short-Term Pile

Description: TSP emissions are generated from the loading of 88/12 block mix product onto the short-term storage pile, and from wind erosion of the pile surface.

From: EPA-450/3-77-010 Section 2.1.4

$TSPER_1$ (tons/year) = $(0.04)(S/1.5)(100/PE)^2(P)$(ton/2000 lb)

where: $TSPER_1$ = tons of TSP emitted from the loading of 88/12 block mix product onto the pile

S = material silt content (%)

PE = Thornthwaite's evaporation-precipitation index

P = tons of 88/12 block mix produced per year

$S = (0.88)(8) + (0.12)(0.5)$

= 7.1 percent

$TSPER_1 = (0.04)(7.1/1.5)(100/136)^2(50{,}000)$(ton/2000 lb)

= 2.6 tons/year

$TSPER_2$ (tons/year) = $(0.11)(S/1.5)(D/90)(100/PE)^2(P)$(ton/2000 lb)

where: $TSPER_2$ = tons of TSP emitted from wind erosion of the 88/12 block mix pile annually

S = silt content of the material stored (%)

D = duration of storage (days)

PE = Thornwaite's precipitation-evaporation index

P = tons of 88/12 block mix produced per year

Assume one-half of the material passing through 100 mesh will pass through 200 mesh.

D = (size of pile (tons)/tons of 88/12 mix stacked per year)(365 days/year)

= (10,000/50,000)(365 days/year)

= 73 days/year

$TSPER_2 = (0.11)(7.1/1.5)(73/90)(100/136)^2(50,000)(ton/2000\ lb)$

$= 5.7$ tons/year

TSPER (tons/year) = $TSPER_1 + TSPER_2$

where: TSPER = tons of TSP emitted from source 47 annually

TSPER = 2.6 tons/year + 5.7 tons/year

= 8.3 tons/year

In the future, wind erosion will be reduced by 50 percent from watering of the pile.

Source ID: 48

Source Name: 75/25 Block Mix Short-Term Pile

Description: TSP emissions are generated from the loading of 75/25 block mix product onto the short-term storage pile, and from wind erosion of the pile surface.

From: EPA-450/3-77-010 Section 2.1.4

$TSPER_1$ (tons/year) = $(0.04)(S/1.5)(100/PE)^2(P)(ton/2000\ lb)$

where: $TSPER_1$ = tons of TSP emitted from the loading of 75/25 block mix product onto the pile

S = material silt content (%)

PE = Thornthwaite's evaporation-precipitation index

P = tons of 75/25 block mix produced per year

$S = (0.75)(8) + (0.25)(0.5)$

= 6.125 percent

$TSPER_1 = (0.04)(6.125/1.5)(100/136)^2(50,000)(ton/2000\ lb)$

= 2.2 tons/year

$TSPER_2$ (tons/year) = $(0.11)(S/1.5)(D/90)(100/PE)^2(P)(ton/2000\ lb)$

where: $TSPER_2$ = tons of TSP emitted from wind erosion of the 75/25 block mix pile annually

S = silt content of the material stored (%)

D = duration of storage (days)

PE = Thornwaite's precipitation-evaporation index

P = tons of 75/25 block mix produced per year

D = (size of pile (tons)/tons of 75/25 mix stacked per year)(365 days/year)

= (10,000/50,000)(365 days/year)

= 73 days/year

$TSPER_2 = (0.11)(6.125/1.5)(73/90)(100/136)^2(50,000)(ton/2000\ lb)$

$= 4.9$ tons/year

$TSPER$ (tons/year) $= TSPER_1 + TSPER_2$

where: TSPER = tons of TSP emitted from source 48 annually

TSPER = 2.2 tons/year + 4.9 tons/year

= 7.1 tons/year

In the future, wind erosion will be reduced by 50 percent from watering of the pile.

Source ID: 49

Source Name: Finish Mill Straight Fines Pile

Description: TSP emissions are generated from the loading of fines product onto the short-term storage pile, and from wind erosion of the pile surface.

From: EPA-450/3-77-010 Section 2.1.4

TSPER1 (tons/year) = (0.04)(S/1.5)(100/PE)2(P)(ton/2000 lb)

where: $TSPER_1$ = tons of TSP emitted from the loading of fines onto the pile

S = material silt content (%)

PE = Thornthwaite's evaporation-precipitation index

P = tons of straight fines produced per year

$TSPER_1$ = (0.04)(8/1.5)(100/136)2(3,500)(ton/2000 lb)

= 0.20 ton/year

$TSPER_2$ (tons/year) = (0.11)(S/1.5)(D/90)(100/PE)2(P)(ton/2000 lb)

where: $TSPER_2$ = tons of TSP emitted from wind erosion of the fines pile annually

S = silt content of the material stored (%)

D = duration of storage (days)

PE = Thornwaite's precipitation-evaporation index

P = tons of straight fines produced per year

D = (size of pile (tons)/tons of straight fines per year)(365 days/year)

= (500/3,500)(365 days/year)

= 52.1 days/year

$TSPER_2 = (0.11)(8/1.5)(52.1/90)(100/136)^2(3{,}500)(\text{ton}/2000\ \text{lb})$

= 0.32 ton/year

TSPER (tons/year) = $TSPER_1 + TSPER_2$

where: TSPER = tons of TSP emitted from source 49 annually

TSPER = 0.20 ton/year + 0.32 ton/year

= 0.52 ton/year

Source ID: 50

Source Name: Finish Mill Front-End Loader Travel

Description: TSP emissions are generated from the travel of the finish mill front-end loader on the plant front road. The emissions are controlled by watering the road.

From: AP-42 Section 11.2.1

$$\text{TSPER (tons/year)} = (4.72)(s/12)(S/30)(W/3)^{0.7}(w/4)^{0.5}(1-p/365)(VMT) \\ *(\text{ton}/2000\text{ lb})(1 - CE)$$

where: TSPER = tons of TSP emitted from source 50 annually

s = silt content of road surface (%)

S = mean vehicle speed (mph)

W = mean vehicle weight (tons)

w = number of wheels

p = annual number of days with at least 0.01 inch of precipitation

VMT = number of vehicle miles travelled annually

CE = control efficiency from watering the road

VMT = (number of trips/year)(miles per trip)

Assume number of trips equals four times the number of trips for product shipping.

VMT = (4)(260,000 tons/year)(0.1 mile/trip)/(27.5 tons/trip)

= 3,782 miles/year

From: EPA 450/3-88-008

CE = 70 percent

$$\text{TSPER} = (4.72)(14.1/12)(15/30)(12/3)^{0.7}(4/4)^{0.5}(1 - 140/365) \\ *(3{,}782)(\text{ton}/2000\text{ lb})(1 - 0.70)$$

= 2.6 tons/year

= 8.5 tons/year without control

In the future, the control efficiency will increase to 85 percent due to more frequent watering.

Source ID: 51

Source Name: Loading of Finished Product onto Long-Term Storage Piles

Description: TSP emissions are generated from the loading of 3/4" and 3/8" product onto long-term storage piles.

From: AP-42 Section 11.2.3

$$\text{TSPER (tons/year)} = (0.002368)(U/5)^{1.3}(2/M)^{1.4}(P)(\text{ton}/2000\ \text{lb})$$

where: TSPER = tons of TSP emitted from source 15 annually

U = mean wind speed (mph)

M = material moisture content (%)

P = tons of product moved to long-term storage annually

$$\text{TSPER} = (0.002368)(7.4/5)^{1.3}(2/2)^{1.4}(75{,}000)(\text{ton}/2000\ \text{lb})$$

$$= 0.15\ \text{ton/year}$$

Source ID: 52

Source Name: Long-Term Product Storage Piles

Description: TSP emissions are generated from wind erosion of the surfaces of the long-term storage piles. Emissions from the 3/4" product portion of the piles are now controlled by a water spray.

From: EPA-450/3-77-010 Section 2.1.4

$$TSPER_1 \text{ (tons/year)} = (0.11)(S/1.5)(D/90)(100/PE)^2(P)(\text{ton}/2000 \text{ lb})$$

where: $TSPER_1$ = tons of TSP emitted from wind erosion of the 3/4" long-term pile

S = silt content of the material stored (%)

D = duration of storage (days)

PE = Thornwaite's precipitation-evaporation index

P = tons of 3/4" product moved to long-term storage per year

CE = control efficiency of the water spray

From: Fugitive Dust Control Technology Section 2.1.3.4

CE = 50 percent

D = (size of pile (tons)/tons of product stacked per year)(365 days/year)

= (20,000/52,500)(365 days/year)

= 139 days/year

$$TSPER_1 = (0.11)(0.5/1.5)(139/90)(100/136)^2(52,500)(\text{ton}/2000 \text{ lb}) *(1 - 0.50)$$

= 0.40 ton/year

= 0.80 ton/year without control

$$TSPER_2 \text{ (tons/year)} = (0.11)(S/1.5)(D/90)(100/PE)^2(P)(\text{ton}/2000 \text{ lb})$$

where: $TSPER_2$ = tons of TSP emitted from wind erosion of the other long-term piles

S = silt content of the material stored (%)

D = duration of storage (days)

PE = Thornwaite's precipitation-evaporation index

P = tons of 3/8" products moved to long-term storage per year

D = (size of pile (tons)/tons of product stacked per year)(365 days/year)

= (20,000/25,750)(365 days/year)

= 283.5 days/year

$TSPER_2$ = (0.11)(0.5/1.5)(283.5/90)$(100/136)^2$(25,750)(ton/2000 lb)

= 0.80 ton/year

TSPER = $TSPER_1$ + $TSPER_2$

where: TSPER = tons of TSP emitted from source 52 annually

TSPER = 0.40 ton/year + 0.80 ton/year

= 1.2 tons/year

= 0.80 ton/year + 0.80 ton/year

= 1.6 tons/year without control

In the future, wind erosion will be reduced by 50 percent from watering of the piles.

Source ID: 53

Source Name: Loading of Product into Railcars

Description: TSP emissions are generated from the loading of product into railcars for delivery off-site.

From: AP-42 Section 11.2.3

$$\text{TSPER (tons/year)} = (0.002368)(U/5)^{1.3}(2/M)^{1.4}(P)(\text{ton}/2000\ \text{lb})$$

where: TSPER = tons of TSP emitted from source 53 annually

U = mean wind speed (mph)

M = material moisture content (%)

P = tons of product shipped by rail per year

$$\text{TSPER} = (0.002368)(7.4/5)^{1.3}(2/2)^{1.4}(60{,}000)(\text{ton}/2000\ \text{lb})$$

$$= 0.12\ \text{ton/year}$$

Source ID: 54

Source Name: Loading of Product into Trucks

Description: TSP emissions are generated from the loading of product into trucks for delivery off-site.

From: AP-42 Section 11.2.3

$$\text{TSPER (tons/year)} = (0.002368)(U/5)^{1.3}(2/M)^{1.4}(P)(\text{ton}/2000\text{ lb})$$

where: TSPER = tons of TSP emitted from source 54 annually

U = mean wind speed (mph)

M = material moisture content (%)

P = tons of product shipped by truck per year

$$\text{TSPER} = (0.002368)(7.4/5)^{1.3}(2/2)^{1.4}(200{,}000)(\text{ton}/2000\text{ lb})$$

$$= 0.39\text{ ton/year}$$

Source ID: 55

Source Name: Transport of Product Off-Site by Truck

Description: TSP emissions are generated from the travel of product delivery trucks on the plant front road. The emissions are controlled by both the paved entrance way and by watering the unpaved portion.

From: AP-42 Section 11.2.6

$$TSPER_1 \text{ (tons/year)} = (3.5)(sL/0.35)^{0.3}(VMT)(ton/2000\ lb)$$

where: $TSPER_1$ = tons of TSP emitted from the paved portion per year

sL = silt loading of the road surface (oz/yd^2)

VMT = vehicle miles travelled per year

VMT = (number of trips/year)(miles per trip)

= ((200,000 tons/year)/(27.5 tons/trip))(0.2 mile/trip)

= 1,455 miles/year

$$TSPER_1 = (3.5)(1.888)^{0.3}(1,455)(ton/2000\ lb)$$

= 3.1 tons/year

From: AP-42 Section 11.2.1

$$TSPER_2 \text{ (tons/year)} = (4.72)(s/12)(S/30)(W/3)^{0.7}(w/4)^{0.5}(1-p/365)(VMT) *(ton/2000\ lb)(1 - CE)$$

where: $TSPER_2$ = tons of TSP emitted from the unpaved portion per year

s = silt content of road surface (%)

S = mean vehicle speed (mph)

W = mean vehicle weight (tons)

w = number of wheels

p = annual number of days with at least 0.01 inch of precipitation

VMT = number of vehicle miles travelled annually

CE = control efficiency from watering the road

VMT = (number of trips/year)(miles per trip)

= ((200,000 tons/year)/(27.5 tons/trip))(0.6 mile/trip)

= 4,364 miles/year

From: EPA 450/3-88-008

CE = 70 percent

$$TSPER_2 = (4.72)(14.1/12)(15/30)(57.5/3)^{0.7}(18/4)^{0.5}(1 - 140/365) *(4,364)(ton/2000 lb)(1 - 0.70)$$

$$= 18.8 \text{ tons/year}$$

$$TSPER = TSPER_1 + TSPER_2$$

where: TSPER = tons of TSP emitted from source 55 annually

$$TSPER = 3.1 \text{ tons/year} + 18.8 \text{ tons/year}$$

$$= 21.9 \text{ tons/year}$$

Without paving the mileage on the unpaved portion would 5,818 miles per year.

$$TSPER = (4.72)(14.1/12)(15/30)(57.5/3)^{0.7}(18/4)^{0.5}(1 - 140/365)(5,818) *(ton/2000 lb)$$

$$= 83.3 \text{ tons/year without control}$$

In the future control of the unpaved portion will increase to 85 percent due to more frequent watering.

Source ID: 56

Source Name: Travel of Coal Delivery Trucks

Description: TSP emissions are generated from the travel of coal delivery trucks to and from the coal drop off pile. The emissions are controlled by both the paved entrance way and by watering the unpaved portion.

From: AP-42 Section 11.2.6

$$TSPER_1 \text{ (tons/year)} = (3.5)(sL/0.35)^{0.3}(VMT)(ton/2000\ lb)$$

where: $TSPER_1$ = tons of TSP emitted from the paved portion per year

sL = silt loading of the road surface (oz/yd^2)

VMT = vehicle miles travelled per year

VMT = (number of trips/year)(miles per trip)

= ((7,000 tons/year)/(27.5 tons/trip))(0.2 mile/trip)

= 50.9 miles/year

$$TSPER_1 = (3.5)(1.888)^{0.3}(50.9)(ton/2000\ lb)$$

= 0.11 ton/year

From: AP-42 Section 11.2.1

$$TSPER_2 \text{ (tons/year)} = (4.72)(s/12)(S/30)(W/3)^{0.7}(w/4)^{0.5}(1\text{-}p/365)(VMT) \\ *(ton/2000\ lb)(1 - CE)$$

where: $TSPER_2$ = tons of TSP emitted from the unpaved portion

s = silt content of road surface (%)

S = mean vehicle speed (mph)

W = mean vehicle weight (tons)

w = number of wheels

p = annual number of days with at least 0.01 inch of precipitation

VMT = number of vehicle miles travelled annually

CE = control efficiency from watering the road

VMT = (number of trips/year)(miles per trip)

= ((7,000 tons/year)/(27.5 tons/trip))(0.2 mile/trip)

= 50.9 miles/year

From: EPA 450/3-88-008

CE = 70 percent

$$TSPER_2 = (4.72)(14.1/12)(15/30)(57.5/3)^{0.7}(18/4)^{0.5}(1 - 140/365) *(50.9)(ton/2000\ lb)(1 - 0.70)$$

$$= 0.22\ ton/year$$

$$TSPER = TSPER_1 + TSPER_2$$

where: TSPER = tons of TSP emitted from source 56 annually

$$TSPER = 0.11\ ton/year + 0.22\ ton/year$$

$$= 0.33\ ton/year$$

Without paving the mileage on the unpaved portion would 101.8 miles per year.

$$TSPER = (4.72)(14.1/12)(15/30)(57.5/3)^{0.7}(18/4)^{0.5}(1 - 140/365)(101.8) *(ton/2000\ lb)$$

= 1.5 tons/year without control

In the future, control of the unpaved portion will increase to 85 percent due to more frequent watering.

Source ID: 57

Source Name: Unloading of Coal onto Pile

Description: TSP emissions are genarated from the unloading of coal onto the drop-off pile.

From: AP-42 Section 11.2.3

$$\text{TSPER (tons/year)} = (0.002368)(U/5)^{1.3}(2/M)^{1.4}(P)(\text{ton}/2000\ \text{lb})$$

where: TSPER = tons of TSP emitted from source 57 annually

U = mean wind speed (mph)

M = material moisture content (%)

P = tons of coal loaded annually

From: AP-42 Section 11.2.3

M = 4.5 percent

$$\text{TSPER} = (0.002368)(7.4/5)^{1.3}(2/4.5)^{1.4}(7{,}000)(\text{ton}/2000\ \text{lb})$$

$$= 0.004\ \text{ton/year}$$

Source ID: 58

Source Name: Coal Pile

Description: TSP emissions are generated from wind erosion of the coal pile surface.

From: EPA-450/3-77-010 Section 2.1.4

$$TSPER\ (tons/year) = (0.11)(S/1.5)(D/90)(100/PE)^2(P)(ton/2000\ lb)$$

where: TSPER = tons of TSP emitted from wind erosion of the coal pile

S = silt content of the material stored (%)

D = duration of storage (days)

PE = Thornwaite's precipitation-evaporation index

P = tons of coal unloaded per year

From: AP-42 Section 11.2.3

S = 2.2 percent

D = (size of pile (tons)/tons of coal unloaded per year)(365 days/year)

= (500/7,000)(365 days/year)

= 26.1 days/year

$$TSPER = (0.11)(2.2/1.5)(26.1/90)(100/136)^2(7,000)(ton/2000\ lb)$$

= 0.09 ton/year

Source ID: 59

Source Name: Dump into Coal Mill Hopper

Description: TSP emissions are generated from the transfer of coal from the storage pile to the coal mill hopper via front-end loader.

From: AP-42 Section 11.2.3

$$\text{TSPER (tons/year)} = (0.002368)(U/5)^{1.3}(2/M)^{1.4}(P)(\text{ton}/2000\ \text{lb})$$

where: TSPER = tons of TSP emitted from source 59 annually

U = mean wind speed (mph)

M = material moisture content (%)

P = tons of coal charged annually

$$\text{TSPER} = (0.002368)(7.4/5)^{1.3}(2/4.5)^{1.4}(7{,}000)(\text{ton}/2000\ \text{lb})$$

$$= 0.004\ \text{ton/year}$$

Source ID: 60

Source Name: Travel of LGF Delivery Trucks

Description: TSP emissions are generated from the travel of LGF delivery trucks to and from the LGF storage tanks. The emissions are controlled by watering the roads.

From: AP-42 Section 11.2.1

$$\text{TSPER (tons/year)} = (4.72)(s/12)(S/30)(W/3)^{0.7}(w/4)^{0.5}(1-p/365)(\text{VMT}) \\ *(\text{ton}/2000\ \text{lb})(1 - \text{CE})$$

where: TSPER = tons of TSP emitted from source 60 annually

s = silt content of road surface (%)

S = mean vehicle speed (mph)

W = mean vehicle weight (tons)

w = number of wheels

p = annual number of days with at least 0.01 inch of precipitation

VMT = number of vehicle miles travelled annually

CE = control efficiency from watering the road

VMT = (number of trips/year)(miles per trip)

= ((20,000 tons/year)/(20 tons/trip))(1 mile/trip)

= 1,000 miles/year

From: EPA-450/3-88-008

CE = 70 percent

$$\text{TSPER} = (4.72)(14.1/12)(15/30)(55/3)^{0.7}(18/4)^{0.5}(1 - 140/365) \\ *(1{,}000)(\text{ton}/2000\ \text{lb})(1 - 0.70)$$

= 4.2 tons/year

= 13.9 tons/year without control

Source ID: 61

Source Name: Discharge of Baghouse Dust Silo into Front-End Loader

Description: TSP emissions are generated from the discharge of baghouse dust into a front-end loader. The emissions are controlled by wetting the dust prior to discharge.

From: AP-42 Section 11.2.3

$$\text{TSPER (tons/year)} = (0.002368)(U/5)^{1.3}(2/M)^{1.4}(P)(\text{ton}/2000\ \text{lb})$$

where: TSPER = tons of TSP emitted from source 61 annually

U = mean wind speed (mph)

M = material moisture content (%)

P = tons of dust discharged annually

Assume the dust moisture content increases from 0.25 percent to 1 percent.

$$\text{TSPER} = (0.002368)(7.4/5)^{1.3}(2/1)^{1.4}(6{,}000)(\text{ton}/2000\ \text{lb})$$

$$= 0.03\ \text{ton/year}$$

$$= 0.22\ \text{ton/year without control}$$

In the future, the dust may be loaded into trucks directly using a vacuum loading spout.

Source ID: 62

Source Name: Transfer of Baghouse Dust to the Storage Pile

Description: TSP emissions are generated from the loading of baghouse dust onto a storage pile. The emissions are reduced from moisture added to the dust from the source 61 water spray.

From: AP-42 Section 11.2.3

$$\text{TSPER (tons/year)} = (0.002368)(U/5)^{1.3}(2/M)^{1.4}(P)(\text{ton}/2000\text{ lb})$$

where: TSPER = tons of TSP emitted from source 62 annually

U = mean wind speed (mph)

M = material moisture content (%)

P = tons of dust transferred annually

Assume the dust moisture content increases from 0.25 percent to 1 percent.

$$\text{TSPER} = (0.002368)(7.4/5)^{1.3}(2/1)^{1.4}(6{,}000)(\text{ton}/2000\text{ lb})$$

= 0.03 ton/year

= 0.22 ton/year without control

In the future, this source may be bypassed.

Source ID: 63

Source Name: Baghouse Dust Pile

Description: TSP emissions will be generated from wind erosion of the baghouse dust pile. The emissions will be reduced due to the moisture added from the source 61 water spray.

From: EPA-450/3-77-010 Section 2.1.4

$$\text{TSPER (tons/year)} = (0.11)(S/1.5)(D/90)(100/PE)^2(P)(\text{ton}/2000\ \text{lb})$$

where: TSPER = tons of TSP emitted from wind erosion of the waste dust pile

S = silt content of the material stored (%)

D = duration of storage (days)

PE = Thornwaite's precipitation-evaporation index

P = tons of waste dust produced per year

CE = control efficiency from adding moisture

Assume the dust is 100 percent silt.

The pile has not been formed yet so assume the size will be approximately 500 tons.

D = (size of pile (tons)/tons of dust unloaded per year)(365 days/year)

= (500/6,000)(365 days/year)

= 30.4 days/year

Assume the emission reduction from adding moisture will be the same for source 63 as source 62.

$$CE = 1 - (0.25/1)^{1.4}$$

$$= 0.86$$

$$\text{TSPER} = (0.11)(100/1.5)(30.4/90)(100/136)^2(6{,}000)(\text{ton}/2000\ \text{lb})(1 - 0.86)$$

$$= 0.56\ \text{ton/year}$$

In the future, this source may be bypassed.

Source ID: 64

Source Name: Loading of Baghouse Dust into Trucks

Description: TSP emissions will be generated from the loading of baghosue dust into trucks for disposal off-site. The emissions will be reduced due to moisture added from the source 61 water spray.

From: AP-42 Section 11.2.3

$$\text{TSPER (tons/year)} = (0.002368)(U/5)^{1.3}(2/M)^{1.4}(P)(\text{ton}/2000\ \text{lb})$$

where: TSPER = tons of TSP emitted from source 64 annually

U = mean wind speed (mph)

M = material moisture content (%)

P = tons of dust transferred annually

Assume the dust moisture content increases from 0.25 percent to 1 percent due to the source 61 water spray. Assume the moisture content further increases by 0.5 percent from atmospheric precipitation.

$$\text{TSPER} = (0.002368)(7.4/5)^{1.3}(2/1.5)^{1.4}(6{,}000)(\text{ton}/2000\ \text{lb})$$

$$= 0.02\ \text{ton/year}$$

$$= 0.05\ \text{ton/year without control}$$

In the future, this operation may be covered by source 61.

Source ID: 65

Source Name: Transport of Baghouse Dust Off-Site

Description: TSP emissions will be generated from the travel of trucks transporting baghouse dust for recycle and/or reuse. The emissions will be controlled by both the paved entrance way and by watering the unpaved portion.

From: AP-42 Section 11.2.6

$$TSPER_1 \text{ (tons/year)} = (3.5)(sL/0.35)^{0.3}(VMT)(ton/2000\ lb)$$

where: $TSPER_1$ = tons of TSP emitted from the paved portion per year

sL = silt loading of the road surface (oz/yd^2)

VMT = vehicle miles travelled per year

VMT = (number of trips/year)(miles per trip)

= ((6,000 tons/year)/(25 tons/trip))(0.2 mile/trip)

= 48 miles/year

$$TSPER_1 = (3.5)(1.888)^{0.3}(48)(ton/2000\ lb)$$

= 0.10 ton/year

From: AP-42 Section 11.2.1

$$TSPER_2 \text{ (tons/year)} = (4.72)(s/12)(S/30)(W/3)^{0.7}(w/4)^{0.5}(1-p/365)(VMT) *(ton/2000\ lb)(1 - CE)$$

where: $TSPER_2$ = tons of TSP emitted from unpaved portion

s = silt content of road surface (%)

S = mean vehicle speed (mph)

W = mean vehicle weight (tons)

w = number of wheels

p = annual number of days with at least 0.01 inch of precipitation

VMT = number of vehicle miles travelled annually

CE = control efficiency from watering the road

VMT = (number of trips/year)(miles per trip)

= ((6,000 tons/year)/(25 tons/trip))(0.4 mile/trip)

= 96 miles/year

From: EPA-450/3-88-008

CE = 70 percent

$$TSPER_2 = (4.72)(14.1/12)(15/30)(50/3)^{0.7}(10/4)^{0.5}(1 - 140/365) *(96)(ton/2000\ lb)(1 - 0.70)$$

$$= 0.28\ ton/year$$

$$TSPER = TSPER_1 + TSPER_2$$

where: TSPER = tons of TSP emitted from source 65 annually

$$= 0.10\ ton/year + 0.28\ ton/year$$

$$= 0.38\ ton/year$$

Without paving the mileage on the unpaved portion would 144 miles per year.

$$TSPER = (4.72)(14.1/12)(15/30)(50/3)^{0.7}(10/4)^{0.5}(1 - 140/365)(144) *(ton/2000\ lb)$$

= 1.4 tons/year without control

In the future, control of the unpaved portion will increase to 85 percent due to more frequent watering.

Source ID: 66

Source Name: Maintenance Traffic

Description: TSP emissions are generated from the travel of maintenance vehicles on the plant roadways. The emissions are controlled by both the paved entrance way, and by watering the unpaved portion.

From: AP-42 Section 11.2.1

$$\text{TSPER (tons/year)} = (4.72)(s/12)(S/30)(W/3)^{0.7}(w/4)^{0.5}(1-p/365)(VMT) *(\text{ton}/2000\ \text{lb})(1 - CE)$$

where: TSPER = tons of TSP emitted from source 66 annually

s = silt content of road surface (%)

S = mean vehicle speed (mph)

W = mean vehicle weight (tons)

w = number of wheels

p = annual number of days with at least 0.01 inch of precipitation

VMT = number of vehicle miles travelled annually

CE = control efficiency from watering the road

VMT = about 20 percent of VMT for source 55

= (0.20)(5,818)

= 1,163.6 miles/year

From: EPA-450/3-88-008

CE = 70 percent

$$\text{TSPER} = (4.72)(14.1/12)(15/30)(10/3)^{0.7}(6/4)^{0.5}(1 - 140/365) *(1{,}163.6)(\text{ton}/2000\ \text{lb})(1 - 0.70)$$

= 0.85 ton/year

= 2.8 tons/year without control

In the future, the control efficiency will increase to 85 percent due to more frequent watering.

Source ID: 67

Source Name: Passenger Vehicle Traffic

Description: TSP emissions are generated from the travel of passenger vehicles on the plant front road. The emissions are controlled by both the paved entrance way and by watering the unpaved portion.

From: AP-42 Section 11.2.6

$$TSPER_1 \text{ (tons/year)} = (3.5)(sL/0.35)^{0.3}(VMT)(ton/2000 \text{ lb})$$

where: $TSPER_1$ = tons of TSP emitted from the paved portion per year

sL = silt loading of the road surface (oz/yd^2)

VMT = vehicle miles travelled per year

VMT = (number of trips/year)(miles/trip)

= (35 employees)(2 trips per day)(0.1 mile/trip)(360 days/year)

= 2,520 miles/year

$$TSPER_1 = (3.5)(1.888)^{0.3}(2,520)(ton/2000 \text{ lb})$$

= 5.3 tons/year

From: AP-42 Section 11.2.1

$$TSPER_2 \text{ (tons/year)} = (4.72)(s/12)(S/30)(W/3)^{0.7}(w/4)^{0.5}(1-p/365)(VMT) * (ton/2000 \text{ lb})(1 - CE)$$

where: $TSPER_2$ = tons of TSP emitted from the unpaved portion

s = silt content of road surface (%)

S = mean vehicle speed (mph)

W = mean vehicle weight (tons)

w = number of wheels

p = annual number of days with at least 0.01 inch of precipitation

VMT = number of vehicle miles travelled annually

CE = control efficiency from watering the road

VMT = (number of trips/year)(miles/trip)

= (35 employees)(2 trips per day)(0.1 mile/trip)(360 days/year)

= 2,520 miles/year

From: EPA-450/3-88-008

CE = 70 percent

$$TSPER_2 = (4.72)(14.1/12)(15/30)(3/3)^{0.7}(4/4)^{0.5}(1 - 140/365) *(2,520)(ton/2000\ lb)(1 - 0.70)$$

$$= 0.65\ ton/year$$

$$TSPER = TSPER_1 + TSPER_2$$

where: TSPER = tons of TSP emitted from source 67 annually

TSPER = 5.3 tons/year + 0.65 ton/year

= 6.0 tons/year

Without paving the mileage on the unpaved portion would be 5,040 miles per year

$$TSPER = (4.72)(14.1/12)(15/30)(3/3)^{0.7}(4/4)^{0.5}(1 - 140/365)(5,040) *(ton/2000\ lb)$$

= 2.2 tons/year without control

In the future, control of the unpaved portion will increase to 85 percent due to more frequent watering.

Source ID: 10

Source Name: Secondary Crusher

Description: TSP emissions are generated from the crushing of screened material in the secondary crusher. The emissions are controlled by a water spray. Half of the crushed material is reciculated to the crusher from the triple deck screen.

The stone is sufficiently moist during its initial pass so that the emissions generated will be small. As moisture is lost within the triple deck screen, however, the stone can become dry enough to produce significant emissions during crushing.

From: AP-42 Section 8.19.2

$TSPER_1$ (tons/year) = (0.018)(P)(ton/2000 lb)

where: $TSPER_1$ = tons of TSP emitted from crushing during the initial pass.

P = tons of stone crushed during initial pass

$TSPER_1$ = (0.018)(140,000)(ton/2000 lb)

= 1.3 tons/year

$TSPER_2$ (tons/year) = (0.28)(P)(ton/2000 lb)(1 - CE)

where: $TSPER_2$= tons of TSP from crushing of recirculated material

P = tons of stone crushed during second pass

CE = control efficiency from the water spray

CE = 70 to 95 percent

Assume CE with a good water spray is 95 percent, and the actual efficiency for current operations is only 85 percent due to the quality of the spray nozzle used and not using the spray to its maximum potential benefit.

$TSPER_2$ = (0.28)(70,000)(ton/2000 lb)(1 - 0.85)

= 1.5 tons/year

TSPER = $TSPER_1$ + $TSPER_2$

where TSPER = tons of TSP emitted from source 10 annually

TSPER = 1.3 tons/year + 1.5 tons/year

= 2.8 tons/year

Assume the emissions would be reduced 70 percent even without controls because of the inherent water content of the stone as comes out of the quarry.

TSPER = (0.28)(210,000)(ton/2000 lb)(1 - 0.70)

= 8.8 tons/year without control

Source ID: 11

Source Name: Triple Deck Screen for Crushing Operations

Description: TSP emissions are generated when crushed stone is screened on the triple deck screen. The emissions are controlled by both the residual water from the source 6, 8, and 10 water sprays, and by an enclosure built around the screen.

From: AP-42 Section 8.19.1

$$\text{TSPER (tons/year)} = (0.16)(P)(\text{ton}/2000\ \text{lb})(1 - CE_1)(1 - CE_2)$$

where: TSPER = tons of TSP emitted from source 11 annually

P = tons of crushed stone screened annually

CE_1 = the control efficiency of the residual water

CE_2 = the control efficiency of the enclosure

Assume CE_1 with a good water spray is 95 percent, and the actual efficiency for current operations is only 85 percent due to the quality of the spray nozzles used and not using the sprays to their maximum potential benefit.

From: Fugitive Dust Control Technology Section 2.1.3.4

CE2 = 70 percent

$$\text{TSPER} = (0.16)(350{,}000)(\text{ton}/2000\ \text{lb})(1 - 0.85)(1 - 0.70)$$

$$= 1.3\ \text{tons/year}$$

Assume the emissions would be reduced 70 percent even without controls because of the inherent water content of the stone coming from the quarry.

$$\text{TSPER} = (0.16)(350{,}000)(\text{ton}/2000\ \text{lb})(1 - 0.70)$$

$$= 8.4\ \text{tons/year without control}$$

Source ID: 12

Source Name: Triple Deck Screen Discharge onto Cone Crusher Feed Belt

Description: TSP emissions are generated from the discharge of screened material from the triple deck screen to the cone crusher feed belt. The emissions are controlled by a partial enclosure around the drop site.

From: AP-42 Section 11.2.3

$$\text{TSPER (tons/year)} = (0.002368)(U/5)^{1.3}(2/M)^{1.4}(P)(\text{ton}/2000\ \text{lb})(1 - CE)$$

where: TSPER = tons of TSP emitted from source 12 annually

U = mean wind speed (mph)

M = material moisture content (%)

P = tons of stone screened per year

CE = control efficiency of the enclosure

From: Fugitive Dust Control Technology Section 2.1.3.4

CE = 70 percent

Assume actual effectiveness of enclosure is only 50 percent due to lack of confinement.

$$\text{TSPER} = (0.002368)(7.4/5)^{1.3}(2/1)^{1.4}(70{,}000)(\text{ton}/2000\ \text{lb})(1 - 0.50)$$

= 0.18 ton/year

= 0.36 ton/year without control

In the future, the enclosure efficiency can be improved to 70 percent and the moisture content be increased 50 percent from improved water spraying.

Source ID: 13

Source Name: Kiln Feed Pile

Description: TSP emissions are generated from the loading of stone onto the kiln feed pile and from wind erosion of the pile surface.

From: EPA-450/3-77-010 Section 2.1.4

$$TSPER_1 \text{ (tons/year)} = (0.04)(S/1.5)(100/PE)^2(P)(\text{ton}/2000 \text{ lb})$$

where: $TSPER_1$ = tons of TSP emitted from the loading of kiln feed annually

S = material silt content (%)

PE = Thornthwaite's evaporation-precipitation index

P = tons of stone stacked per year

Assume kiln feed has a silt content is 0.5 percent.

$$TSPER_1 = (0.04)(0.5/1.5)(100/136)^2(140,000)(\text{ton}/2000 \text{ lb})$$

$$= 0.50 \text{ ton/year}$$

$$TSPER_2 \text{ (tons/year)} = (0.11)(S/1.5)(D/90)(100/PE)^2(P)(\text{ton}/2000 \text{ lb})$$

where: $TSPER_2$ = tons of TSP emitted from wind erosion of the kiln feed pile annually

S = silt content of the material stored (%)

D = duration of storage (days)

PE = Thornwaite's precipitation-evaporation index

P = tons of stone stacked er year (tons)

D = (size of pile (tons)/tons of stone stacked per year)(365 days/year)

= (1,000/140,000)(365 days/year)

= 2.6 days/year

$$TSPER_2 = (0.11)(0.5/1.5)(2.6/90)(100/136)^2(140,000)(\text{ton}/2000 \text{ lb})$$

$$= 0.04 \text{ ton/year}$$

$\text{TSPER (tons/year)} = \text{TSPER}_1 + \text{TSPER}_2$

where: TSPER = tons of TSP emitted from source 13 annually

TSPER = 0.5 ton/year + 0.04 ton/year

= 0.54 ton/year

In the future, wind erosion will reduced by 50 percent from watering of the pile.

Source ID: 14

Source Name: Kiln Feed Pile to Triple Deck Discharge Conveyor Transfer

Description: TSP emissions are generated from the transfer of kiln feed from the kiln feed pile to the triple deck screen discharge conveyor.

From: AP-42 Section 11.2.3

$$\text{TSPER (tons/year)} = (0.002368)(U/5)^{1.3}(2/M)^{1.4}(P)(\text{ton}/2000\ \text{lb})$$

where: TSPER = tons of TSP emitted from source 14 annually

U = mean wind speed (mph)

M = material moisture content (%)

P = tons of kiln feed transferred per year

$$\text{TSPER} = (0.002368)(7.4/5)^{1.3}(2/3)^{1.4}(140{,}000)(\text{ton}/2000\ \text{lb})$$

$$= 0.16\ \text{ton/year}$$

Source ID: 15

Source Name: Triple Deck Discharge to Kiln Feed Silo Conveyor Transfer

Description: TSP emissions are generated from the transfer of kiln feed from the triple deck screen discharge conveyor to the kiln feed silo feed conveyor.

From: AP-42 Section 11.2.3

$$\text{TSPER (tons/year)} = (0.002368)(U/5)^{1.3}(2/M)^{1.4}(P)(\text{ton}/2000\ \text{lb})$$

where: TSPER = tons of TSP emitted from source 15 annually

U = mean wind speed (mph)

M = material moisture content (%)

P = tons of kiln feed conveyed per year

$$\text{TSPER} = (0.002368)(7.4/5)^{1.3}(2/3)^{1.4}(280{,}000)(\text{ton}/2000\ \text{lb})$$

$$= 0.31\ \text{ton/year}$$

Source ID: 16

Source Name: Crushing Operations Fines Pile

Description: TSP emissions are generated from both the loading of fines onto the crushing area fines pile and from wind erosion of the pile surface.

From: EPA-450/3-77-010 Section 2.1.4

$TSPER_1$ (tons/year) = $(0.04)(S/1.5)(100/PE)^2(P)$(ton/2000 lb)

where: $TSPER_1$ = tons of TSP emitted from the loading of fines annually

S = material silt content (%)

PE = Thornthwaite's evaporation-precipitation index

P = tons of fines produced per year

The silt content of the finish mill fines is approximately 8 percent. Fines produced from the crushing operations are much coarser. Assume the finish mill increases the silt content by a factor of 5.

S = 8 percent/5

= 1.6 percent

$TSPER_1 = (0.04)(1.6/1.5)(100/136)^2(70{,}000)$(ton/2000 lb)

= 0.81 ton/year

$TSPER_2$ (tons/year) = $(0.11)(S/1.5)(D/90)(100/PE)^2(P)$(ton/2000 lb)

where: $TSPER_2$ = tons of TSP emitted from wind erosion of the fines pile annually

S = silt content of the material stored (%)

D = duration of storage (days)

PE = Thornwaite's precipitation-evaporation index

P = tons of fines produced per year

D = (size of pile (tons)/tons of stone stacked per year)(365 days/year)

= (35,000/70,000)(365 days/year)

= 182.5 days/year

$TSPER_2 = (0.11)(1.6/1.5)(182.5/90)(100/136)^2(70{,}000)(\text{ton}/2000\ \text{lb})$

$= 4.5\ \text{tons/year}$

$TSPER\ (\text{tons/year}) = TSPER_1 + TSPER_2$

where: TSPER = tons of TSP emitted from source 16 annually

$TSPER = 0.81\ \text{ton/year} + 4.5\ \text{tons/year}$

$= 5.3\ \text{tons/year}$

In the future a water spray will be added to reduce loading emissions by 50 percent, and wind erosion emissions will be cut in half by water spraying.

Source ID: 17

Source Name: Transfer of Fines to Kiln Feed Pile

Description: TSP emissions are generated from the transfer of fines via front-end loader to the kiln feed pile. Approximately 10 percent of the fines produced are transferred to the kiln feed pile.

From: AP-42 Section 11.2.3

$$\text{TSPER (tons/year)} = (0.002368)(U/5)^{1.3}(2/M)^{1.4}(P)(\text{ton}/2000\ \text{lb})$$

where: TSPER = tons of TSP emitted from source 18 annually

U = mean wind speed (mph)

M = material moisture content (%)

P = tons of fines loaded annually

$$\text{TSPER} = (0.002368)(7.4/5)^{1.3}(2/1)^{1.4}(7{,}000)(\text{ton}/2000\ \text{lb})$$

$$= 0.04\ \text{ton/year}$$

Source ID: 18

Source Name: Loading of Fines into Truck

Description: TSP emissions are generated from the loading of fines into trucks for distribution off-site.

From: AP-42 Section 11.2.3

$$\text{TSPER (tons/year)} = (0.002368)(U/5)^{1.3}(2/M)^{1.4}(P)(\text{ton}/2000 \text{ lb})$$

where: TSPER = tons of TSP emitted from source 18 annually

U = mean wind speed (mph)

M = material moisture content (%)

P = tons of fines loaded annually

$$\text{TSPER} = (0.002368)(7.4/5)^{1.3}(2/1)^{1.4}(25,000)(\text{ton}/2000 \text{ lb})$$

$$= 0.13 \text{ ton/year}$$

Source ID: 19

Source Name: Transport of Fines Off-Site

Description: TSP emissions are generated from the travel of trucks transporting fines from the crushing area off-site. The emissions are controlled by both the paved entrance way and by watering the unpaved portion.

From: AP-42 Section 11.2.6

$$TSPER_1 \text{ (tons/year)} = (3.5)(sL/0.35)^{0.3}(VMT)(ton/2000\ lb)$$

where: $TSPER_1$ = tons of TSP emitted from the paved portion per year

sL = silt loading of the road surface (oz/yd^2)

VMT = vehicle miles travelled per year

VMT = (number of trips/year)(miles per trip)

= ((25,000 tons/year)/(10 tons/trip))(0.2 mile/trip)

= 500 miles/year

$$TSPER_1 = (3.5)(1.888)^{0.3}(500)(ton/2000\ lb)$$

= 1.1 tons/year

From: AP-42 Section 11.2.1

$$TSPER_2 \text{ (tons/year)} = (4.72)(s/12)(S/30)(W/3)^{0.7}(w/4)^{0.5}(1-p/365)(VMT) *(ton/2000\ lb)(1 - CE)$$

where: $TSPER_2$ = tons of TSP emitted from the unpaved portion per year

s = silt content of road surface (%)

S = mean vehicle speed (mph)

W = mean vehicle weight (tons)

w = number of wheels

p = annual number of days with at least 0.01 inch of precipitation

VMT = number of vehicle miles travelled annually

CE = control efficiency from watering the road

VMT = (number of trips/year)(miles per trip)

= ((25,000 tons/year)/(10 tons/trip))(0.3 mile/trip)

= 750 miles/year

From: EPA 450/3-88-008

CE = 70 percent

TSPER_2 = (4.72)(14.1/12)(15/30)(25/3)0.7(6/4)0.5(1 - 140/365)
*(750)(ton/2000 lb)(1 - 0.70)

= 1.0 ton/year

$\mathrm{TSPER} = \mathrm{TSPER}_1 + \mathrm{TSPER}_2$

where: TSPER = tons of TSP emitted from source 19 annually

TSPER = 1.1 tons/year + 1.0 tons/year

= 2.1 tons/year

Without paving the mileage on the unpaved portion would 1,250 miles per year.

TSPER = $(4.72)(14.1/12)(15/30)(25/3)^{0.7}(6/4)^{0.5}(1 - 140/365)(1{,}250)$
*(ton/2000 lb)

= 5.8 tons/year without control

In the future more frequent watering will improve the control efficiency to 85 percent.

Source ID: 20

Source Name: Kiln Feed Silo to #2 Kiln Feed Belt Conveyor Transfer

Description: TSP emissions are generated from the transfer of kiln feed from the kiln feed silo discharge belt to the #2 kiln feed belt.

From: AP-42 Section 11.2.3

$$\text{TSPER (tons/year)} = (0.002368)(U/5)^{1.3}(2/M)^{1.4}(P)(\text{ton}/2000\ \text{lb})$$

where: TSPER = tons of TSP emitted from source 20 annually

U = mean wind speed (mph)

M = material moisture content (%)

P = tons of kiln feed conveyed per year

$$\text{TSPER} = (0.002368)(7.4/5)^{1.3}(2/3)^{1.4}(280{,}000)(\text{ton}/2000\ \text{lb})$$

$$= 0.31\ \text{ton/year}$$

Source ID: 21

Source Name: Kiln Feed Silo to #1 Kiln Feed Belt Conveyor Transfer

Description: TSP emissions are generated from the transfer of kiln feed from the kiln feed silo discharge belt to the #1 kiln feed belt.

From: AP-42 Section 11.2.3

$$\text{TSPER (tons/year)} = (0.002368)(U/5)^{1.3}(2/M)^{1.4}(P)(\text{ton}/2000\text{ lb})$$

where: TSPER = tons of TSP emitted from source 21 annually

U = mean wind speed (mph)

M = material moisture content (%)

P = tons of kiln feed conveyed to #2 kiln per year

$$\text{TSPER} = (0.002368)(7.4/5)^{1.3}(2/3)^{1.4}(140{,}000)(\text{ton}/2000\text{ lb})$$

$$= 0.16\text{ ton/year}$$

Source ID: 22

Source Name: #2 Kiln Feed Belt to #2 Kiln Loading Belt Conveyor Transfer

Description: TSP emissions are generated from the transfer of kiln feed from the #2 kiln feed belt to the #2 kiln loading belt.

From: AP-42 Section 11.2.3

$$\text{TSPER (tons/year)} = (0.002368)(U/5)^{1.3}(2/M)^{1.4}(P)(\text{ton}/2000\ \text{lb})$$

where: TSPER = tons of TSP emitted from source 22 annually

U = mean wind speed (mph)

M = material moisture content (%)

P = tons of kiln feed conveyed to #1 kiln per year

$$\text{TSPER} = (0.002368)(7.4/5)^{1.3}(2/3)^{1.4}(140{,}000)(\text{ton}/2000\ \text{lb})$$

$$= 0.16\ \text{ton/year}$$

Source ID: 23

Source Name: Loading of #2 Kiln

Description: TSP emissions are generated from the loading of kiln feed into the #2 kiln. The emissions are controlled by a collection hood.

From: AP-42 Section 11.2.3

$$\text{TSPER (tons/year)} = (0.002368)(U/5)^{1.3}(2/M)^{1.4}(P)(\text{ton}/2000\ \text{lb})(1 - CE)$$

where: TSPER = tons of TSP emitted from source 23 annually

U = mean wind speed (mph)

M = material moisture content (%)

P = tons of kiln feed loaded into #2 kiln per year

CE = the collection efficiency of the hood

From: Fugitive Dust Control Technology Section 2.13.5

CE = 95 percent

$$\text{TSPER} = (0.002368)(7.4/5)^{1.3}(2/3)^{1.4}(140{,}000)(\text{ton}/2000\ \text{lb})(1-0.95)$$

= 0.008 ton/year

= 0.16 without control

Source ID: 24

Source Name: Loading of #1 Kiln

Description: TSP emissions are generated from the loading of kiln feed into the #1 kiln. The emissions are controlled by a collection hood.

From: AP-42 Section 11.2.3

$$\text{TSPER (tons/year)} = (0.002368)(U/5)^{1.3}(2/M)^{1.4}(P)(\text{ton}/2000\text{ lb})(1 - CE)$$

where: TSPER = tons of TSP emitted from source 24 annually

U = mean wind speed (mph)

M = material moisture content (%)

P = tons of kiln feed loaded into #1 kiln per year

CE = the collection efficiency of the hood

From: Fugitive Dust Control Technology Section 2.13.5

CE = 95 percent

$$\text{TSPER} = (0.002368)(7.4/5)^{1.3}(2/3)^{1.4}(140{,}000)(\text{ton}/2000\text{ lb})(1-0.95)$$

= 0.008 ton/year

= 0.16 without control

Source ID: 25

Source Name: #2 Kiln Rim Seal

Description: TSP emissions are generated from leaks through the #2 kiln rim seal.

TSPER (tons/year) = (STER)(F)(34.76)(O)

where: TSPER = tons of TSP emitted from source 25 annually

STER = the short-term emission rate of source 25 (g/s)

F = fraction of the material emitted that is TSP

O = fraction of the year the kiln operates

Based on engineering judgement and observation of the #2 kiln rim seal, roughly 1 g/s of material is emitted. Approximately one-half of this material is TSP and has the potential to remain airborne.

TSPER = (1)(0.5)(34.76)(0.85)

= 14.8 tons/year

In the future, this source will be completely enclosed and pneumatically conveyed to the source 27 discharge point.

Source ID: 26

Source Name: #1 Kiln Rim Seal

Description: TSP emissions are generated from leaks through the #1 kiln rim seal.

TSPER (tons/year) = (STER)(F)(34.76)(O)

where: TSPER = tons of TSP emitted from source 26 annually

STER = the short-term emission rate of source 26 (g/s)

F = fraction of the material emitted that is TSP

O = fraction of the year the kiln operates

Based on engineering judgement and observation of the #1 kiln rim seal, roughly 1 g/s of material is emitted. Approximately one-half of this material is TSP and has the potential to remain airborne.

TSPER = (1)(0.5)(34.76)(0.85)

= 14.8 tons/year

In the future, this source will be completely enclosed and pneumatically conveyed to the source 28 discharge point.

Source ID: 27

Source Name: Kiln Dust Transfer onto #2 Clinker Cooler Discharge Belt

Description: TSP emissions are generated from the transfer of kiln dust collected in the #2 kiln and clinker cooler multiclones to the clinker cooler discharge belt.

TSPER (tons/year) = (STER)(F)(34.76)(O)

where: TSPER = tons of TSP emitted from source 27 annually

STER = the short-term emission rate of source 27 (g/s)

F = fraction of the material emitted that is TSP

O = fraction of the year the kiln operates

Based on engineering judgement and observation of the drop point, roughly 1 g/s of material TSP is emitted. Approximately one-half of this material is TSP and has the potential to remain airborne.

TSPER = (1)(0.5)(34.76)(0.85)

= 14.8 tons/year

In the future, a water spray and enclosure will be added to control the emissions by 85 percent.

Source ID: 28

Source Name: Kiln Dust Transfer onto #1 Clinker Cooler Discharge Belt

Description: TSP emissions are generated from the transfer of kiln dust collected in the #1 kiln and clinker cooler multiclones to the clinker cooler discharge belt.

TSPER (tons/year) = (STER)(F)(34.76)(O)

where: TSPER = tons of TSP emitted from source 28 annually

STER = the short-term emission rate of source 28 (g/s)

F = fraction of the material emitted that is TSP

O = fraction of the year the kiln operates

Based on engineering judgement and observation of the drop point, roughly 1 g/s of material TSP is emitted. Approximately one-half of this material is TSP and has the potential to remain airborne.

TSPER = (1)(0.5)(34.76)(0.85)

= 14.8 tons/year

In the future, a water spray and enclosure will be added to control the emissions by 85 percent.

Source ID: 29

Source Name: #2 Clinker Cooler Conveyor Discharge onto Pile

Description: TSP emissions are generated from the loading of clinker from the #2 kiln onto a pile. The emissions are controlled by a water spray.

From: EPA-450/3-77-010 Section 2.1.4

$$\text{TSPER (tons/year)} = (0.04)(S/1.5)(100/PE)^2(P)(\text{ton}/2000\ \text{lb})(1 - CE)$$

where: TSPER = tons of TSP emitted from the loading of clinker onto the pile annually.

S = material silt content (%)

PE = Thornthwaite's evaporation-precipitation index

P = tons of fines to the kiln pile per year

CE = control efficiency of the water spray

From: Fugitive Dust Control Technology Section 2.1.3.4

$CE = 50$ percent

Assume one half of the material passing through 200 mesh will pass 100 mesh. The silt content of the finished product can therefore be calculated as follows:

$$S = [(85{,}000)(8) + (175{,}000)(0.5)]/(260{,}000)$$

$$= 2.95 \text{ percent}$$

Assume the finish mill increases the material silt content by a factor of 5. The clinker silt content is therfore:

$$S = 2.95 \text{ percent}/5$$

$$= 0.59 \text{ percent}$$

$$\text{TSPER} = (0.04)(0.59/1.5)(100/136)^2(140{,}000)(\text{ton}/2000\ \text{lb})(1 - 0.50)$$

$$= 0.30 \text{ ton/year}$$

$$= 0.60 \text{ ton/year without control}$$

Source ID: 30

Source Name: #1 Clinker Cooler Conveyor Discharge onto Pile

Description: TSP emissions are generated from the loading of clinker from the #1 kiln onto a pile. The emissions are controlled by a water spray.

From: EPA-450/3-77-010 Section 2.1.4

$$\text{TSPER (tons/year)} = (0.04)(S/1.5)(100/PE)^2(P)(\text{ton}/2000\ \text{lb})(1 - CE)$$

where: TSPER = tons of TSP emitted from the loading of clinker onto the pile annually.

S = material silt content (%)

PE = Thornthwaite's evaporation-precipitation index

P = tons of fines to the kiln pile per year

CE = control efficiency of the water spray

From: Fugitive Dust Control Technology Section 2.1.3.4

$CE = 50$ percent

Assume one half of the material passing through 200 mesh will pass 100 mesh. The silt content of the finished product can therefore be calculated as follows:

$$S = [(85{,}000)(8) + (175{,}000)(0.5)]/(260{,}000)$$

$$= 2.95 \text{ percent}$$

Assume the finish mill increases the material silt content by a factor of 5. The clinker silt content is therfore:

$$S = 2.95 \text{ percent}/5$$

$$= 0.59 \text{ percent}$$

$$\text{TSPER} = (0.04)(0.59/1.5)(100/136)^2(140{,}000)(\text{ton}/2000\ \text{lb})(1 - 0.50)$$

$$= 0.30 \text{ ton/year}$$

$$= 0.60 \text{ ton/year without control}$$

Source ID: 31

Source Name: #2 Kiln Clinker Pile

Description: TSP emissions are generated from wind erosion of the #2 kiln clinker pile.

From: EPA-450/3-77-010 Section 2.1.4

$$\text{TSPER (tons/year)} = (0.11)(S/1.5)(D/90)(100/PE)^2(P)(\text{ton}/2000\ \text{lb})$$

where: TSPER = tons of TSP emitted from wind erosion of the #2 kiln clinker pile annually

S = silt content of the material stored (%)

D = duration of storage (days)

PE = Thornwaite's precipitation-evaporation index

P = tons of clinker stacked per year

Assume one half of the material passing through 200 mesh will pass 100 mesh. The silt content of the finished product can therefore be calculated as follows:

$$S = [(85{,}000)(8) + (175{,}000)(0.5)]/(260{,}000)$$

$$= 2.95 \text{ percent}$$

Assume the finish mill increases the material silt content by a factor of 5. The clinker silt content is therfore:

$$S = 2.95 \text{ percent}/5$$

$$= 0.59 \text{ percent}$$

$$D = (\text{size of pile (tons)})/(\text{tons of clinker stacked per year})(365\ \text{days/yr})$$

$$= (30{,}000/130{,}000)(365\ \text{days/year})$$

$$= 84.2\ \text{days/year}$$

$$\text{TSPER} = (0.11)(0.59/1.5)(84.2/90)(100/136)^2(130{,}000)(\text{ton}/2000\ \text{lb})$$

$$= 1.4\ \text{tons/year}$$

In the future, wind erosion will be reduced by 50 percent from watering of the pile.

Source ID: 32

Source Name: Transfer from #2 Kiln Clinker Pile to #1 Kiln Clinker Pile

Description: TSP emissions are generated from the transfer of clinker from the #2 kiln pile to the #1 kiln pile via front-end loader. The emissions are controlled by moisture added to the #2 kiln clinker by the source 27 and source 29 water sprays.

From: AP-42 Section 11.2.3

$$\text{TSPER (tons/year)} = (0.002368)(U/5)^{1.3}(2/M)^{1.4}(P)(\text{ton}/2000\ \text{lb})$$

where: TSPER = tons of TSP emitted from source 32 annually

U = mean wind speed (mph)

M = material moisture content (%)

P = tons of clinker transferred per year

$$\text{TSPER} = (0.002368)(7.4/5)^{1.3}(2/3)^{1.4}(130{,}000)(\text{ton}/2000\ \text{lb})$$

$$= 0.15\ \text{ton/year}$$

Source ID: 33

Source Name: #1 Kiln Clinker Pile

Description: TSP emissions are generated from wind erosion of the #1 kiln clinker pile.

From: EPA-450/3-77-010 Section 2.1.4

$$TSPER\ (tons/year) = (0.11)(S/1.5)(D/90)(100/PE)^2(P)(ton/2000\ lb)$$

where: TSPER = tons of TSP emitted from wind erosion of the #1 kiln clinker pile annually

S = silt content of the material stored (%)

D = duration of storage (days)

PE = Thornwaite's precipitation-evaporation index

P = tons of clinker stacked per year

Assume one half of the material passing through 200 mesh will pass 100 mesh. The silt content of the finished product can therefore be calculated as follows:

$$S = [(85,000)(8) + (175,000)(0.5)]/(260,000)$$

$$= 2.95 \text{ percent}$$

Assume the finish mill increases the material silt content by a factor of 5. The clinker silt content is therfore:

$$S = 2.95 \text{ percent}/5$$

$$= 0.59 \text{ percent}$$

$$D = (\text{size of pile (tons)}/\text{tons of clinker stacked per year})(365\ days/year)$$

$$= (30,000/260,000)(365\ days/year)$$

$$= 42.1\ days/year$$

$$TSPER = (0.11)(0.59/1.5)(42.1/90)(100/136)^2(260,000)(ton/2000\ lb)$$

$$= 1.4\ tons/year$$

In the future, wind erosion emissions will be reduced 50 percent from watering of the pile.

Source ID: 34

Source Name: Clinker Storage Loadout to Triple Deck Feed Belt Conveyor Transfer

Description: TSP emissions are generated from the transfer of clinker from the clinker storage pile loadout belt to the triple deck feed belt.

From: AP-42 Section 11.2.3

$$\text{TSPER (tons/year)} = (0.002368)(U/5)^{1.3}(2/M)^{1.4}(P)(\text{ton}/2000\ \text{lb})$$

where: TSPER = tons of TSP emitted from source 34 annually

U = mean wind speed (mph)

M = material moisture content (%)

P = tons of clinker transferred per year

$$\text{TSPER} = (0.002368)(7.4/5)^{1.3}(2/3)^{1.4}(180{,}000)(\text{ton}/2000\ \text{lb})$$

$$= 0.20\ \text{ton/year}$$

Source ID: 35

Source Name: Triple Deck Finishing Screen

Description: TSP emissions are generated when crushed product is screened on the triple deck screen. The emissions are controlled by both water from the source 29, 30, and clinker cooler exit water sprays, and by an enclosure built around the screen.

From: AP-42 Section 8.19.1

TSPER (tons/year) = (0.16)(P)(ton/2000 lb)(1 - CE_1)(1 - CE_2)

where: TSPER = tons of TSP emitted from source 35 annually

P = tons of crushed stone screened annually

CE_1 = the control efficiency of the residual water

CE_2 = the control efficiency of the enclosure

Assume CE_1 with a good water spray is 95 percent, and the actual efficiency for current operations is only 80 percent due to the quality of the spray nozzles used and not using the sprays to their maximum potential benefit.

From: Fugitive Dust Control Technology Section 2.1.3.4

CE_2 = 70 percent

TSPER = (0.16)(440,000)(ton/2000 lb)(1 - 0.80)(1 - 0.70)

= 2.1 tons/year

Assume the emissions would be reduced 70 percent even without controls because of the inherent water content of the stone coming from the quarry.

TSPER = (0.16)(440,000)(ton/2000 lb)(1 - 0.70)

= 10.6 tons/year without control

In the future residual water will reduce the generation of emissions from the screen by approximately 90 percent due to added watering.

Source ID: 37

Source Name: El Jay Crusher

Description: TSP emissions are generated from the crushing of oversize product in the El Jay crusher.

From: AP-42 Section 8.19.2

TSPER (tons/year) = (0.018)(P)(ton/2000 lb)

where: TSPER = tons of TSP emitted from source 37 annually

P = tons of product crushed annually

TSPER = (0.018)(180,000)(ton/2000 lb)

= 1.6 tons/year

In the future, a water spray will be added to reduce emissions by 50 percent.

Source ID: 36

Source Name: Triple Deck Discharge into Oversize Hopper

Description: TSP emissions are generated from the discharge of oversize material into a hopper from the finish mill triple deck screen. The emissions are controlled by a water spray.

From: AP-42 Section 11.2.3

$$\text{TSPER (tons/year)} = (0.002368)(U/5)^{1.3}(2/M)^{1.4}(P)(\text{ton}/2000\ \text{lb})$$

where: TSPER = tons of TSP emitted from source 36 annually

U = mean wind speed (mph)

M = material moisture content (%)

P = tons of product transferred per year

CE = control efficiency of the water spray

From: Fugitive Dust Control Technology Section 2.1.3.4

CE = 50 percent

$$\text{TSPER} = (0.002368)(7.4/5)^{1.3}(2/3)^{1.4}(180{,}000)(\text{ton}/2000\ \text{lb})(1 - 0.50)$$

= 0.10 ton/year

= 0.20 ton/year without control

SCI-TECH, INC.
Consulting Environmental Engineers

December 14, 2001

Mr. Timothy Lachell
Plant Manager
Norlite Corporation
628 South Saratoga Street
Cohoes, NY 12047

Dear Mr. Lachell

SUBJECT: Fugitive Dust Plan Report
SCI-TECH Project 21062

The purpose of this letter is to present the fugitive dust plan (FDP) report for the Norlite facility in Cohoes, New York. This report is an update of the August 18, 2000 Fugitive Dust Control Evaluation report previously submitted. The update is a result of various meetings, discussions and correspondence between Norlite, SCI-TECH, environmental counsel, and the New York State Department of Environmental Conservation (NYSDEC). This report incorporates the information presented in the August 31, 2001 Comment/Response letter, the October 30, 2001 bucket loader procedure letter, and the November 26, 2001 NYSDEC bucket loader procedure revision letter.

BACKGROUND

In response to an Order on Consent from NYSDEC, Norlite submitted an FDP Addendum in October 1995. SCI-TECH assisted with the evaluation of the dust sources, the design of the various dust control measures, and the preparation of the dust plan. Following acceptance of the plan, Norlite began implementation of the control measures specified. Equipment installation was completed and approved by NYSDEC in November 1996.

According to Norlite personnel, the implementation of the dust control measures dramatically reduced the amount of fugitive dust generated by facility operations. As a result, the incidence of complaints by abutting property owners has been virtually eliminated. However, in late January 2000, a rare combination of meteorological conditions (i.e., no snow cover, dry, strong easterly winds) resulted in dust migrating across the eastern boundary of the facility and complaints were registered. A subsequent follow-up by NYSDEC led to a new Order on Consent (R4-2000-0420-27) in July 2000.

The new Order on Consent stipulated that Norlite conduct a reevaluation of the FDP to ensure that the plan was being properly implemented. The evaluation was to also include any recommendations for revisions to the plan to address new sources or changes in operational procedures. SCI-TECH was retained by Norlite to conduct the evaluation and submit a report on the findings.

SCI-TECH conducted the evaluation and submitted a report dated August 18, 2000. The report was evaluated by NYSDEC and their response was presented to Norlite in a letter dated January 24, 2001. In that response, NYSDEC indicated that the plan was incomplete and that they could not approve it without certain additions and clarifications. A second Order on Consent (R4-2001-0102-2) was issued in July 2001.

Norlite submitted a letter of response to the comments by NYSDEC on August 31, 2001. A subsequent letter from Norlite, dated October 30, 2001 provided additional information requested by NYSDEC. A final letter from NYSDEC, dated November 26, 2001, offered some minor wording suggestions to the procedure presented in the October 30 letter. The report presented below incorporates all of the pertinent information contained in the correspondence.

METHODOLOGY

SCI-TECH conducted the evaluation in the following manner:

1. The October 1995 FDP was reviewed.

2. A site visit was conducted on July 27, 2000. During the visit, the following occurred:

   a) A meeting was held with Norlite personnel to discuss the FDP, changes made to the plan due to operational experience, sources added to the facility since the drafting of the plan, and "problem" areas noted during day to day activities.

   b) A walk through of the facility was conducted and all processes were observed.

   c) A second meeting was held with facility personnel to discuss the observations made during the site inspection and to obtain feedback on possible control schemes.

3. A meeting was held on August 8, 2001 with representatives from NYSDEC to obtain their input regarding dust observations.

4. Input from the community was obtained in the following manner. Norlite consistently monitors the housing complex east of its facility. Tim Lachell, Plant Manager, visits the housing complex on a daily basis to ensure that the plant operations are not having an adverse impact on their property. In the past, Norlite has provided the residents with a phone number and contact to call regarding fugitive dust issues. A log is kept of all phone calls. In addition, in order to address and keep abreast of neighbor's complaints, Norlite has established a line of communication with the Mayor of the City of Cohoes. The Mayor has agreed to keep Norlite abreast of any complaints or

issues arising out of Norlite's operations. In return, Norlite has agreed to be responsive to the Mayor's request for assistance in addressing such complaints. At this time, Norlite believes that its existing community relation program is successful in addressing the concerns of its neighbors.

RESULTS

As a result of the evaluation, it can be concluded that (1) the majority of the dust sources are being effectively controlled in accordance with the FDP, (2) there have been some changes to the implemented controls for a few of the sources due to operational needs or customer requirements, and (3) there are several areas where revised or additional controls are recommended. These three conclusions are discussed below.

Sources Controlled According to the FDP

The following sources are being controlled in accordance with the specifications of the October 1995 FDP Addendum:

- Finish Plant Crusher, Screens and Transfer Points – Baghouses and bin vents installed and maintained.
- Windblown Dust Migrating Across Eastern Boundary – Trees planted on raised berm. Trees healthy and growing.
- Finish Mill Short Term Storage Piles – Sprinklers installed and operating.
- Improved Baghouse on Soda Ash Silo – Installed and maintained.
- Railcar and Truck Loading – Loading of trucks for block mix moved westward, further from the eastern boundary, near the wastewater treatment plant. Railcars only loaded one or two at a time. Loading curtailed during adverse meteorological conditions.
- Finished Product Storage Silo – Bin vent installed and maintained. Drop chutes repaired and maintained.
- Shipping Tunnel Mouth – Maintenance procedures followed. Area enclosed and vented to baghouse.
- Block Mix Storage – Piles properly maintained.
- Kiln Seals – Seals routinely maintained.
- Baghouse Dust Unloading Via Vacuum Truck – Procedure followed.

- Housekeeping and General Items – Inspections being performed.

- Norlite Direct Line – Installed and maintained.

- Finishing Plant Operations – Schedules adhered to.

- Winter Operations – Spraying occurring at all times when temperatures are above freezing. Some operations continue with spraying at below freezing temperatures where possible.

Based on the walk through and discussions with facility personnel, the dust control measures and operational procedures for these sources are sufficient to maintain dust generation at acceptable levels, i.e., contained within the boundaries of the property. There are no recommendations for changes to the dust control methodologies for these sources.

Sources With Changes to the FDP Control Specifications

The following sources have control methodologies that deviate from those specified in the October 1995 FDP. The reasons for the deviations are provided.

- Outdoor Fines Storage – The FDP specified that the lightweight aggregate fines be conveyed from the storage silo using the new radial stacker. The fines would then be loaded onto a truck the same day. This methodology was based on anticipation of only a few orders for this product on a stand-alone basis per year. Subsequent to the plan, a customer came forth that required the fines for a specific product – wallboard. Not only was the customer in need of significant quantities of fines, but the fines had to be free of contamination (i.e., no material greater than number 4 mesh). The use of the radial stacker to place the fines in piles for subsequent loading to trucks had to be eliminated since it was found that this practice could not guarantee contaminant-free product. There was also a problem with the frequent switching of product lines on the conveyor and radial stacker (aggregate fines versus block mix). The only feasible solution at this time is to remove the aggregate fines from the silo through the north hatch of the structure. A short-term storage pile is formed at this location and trucks are loaded from this pile. However, when the hatch is not covered by product, dust boil up in the silo can exhaust through the opening. There is also the possibility of wind blown dust generation from the fines pile. Recommendations for control measures for this source are discussed later in the report.

- Finish Mill Block Mix Production – The field conveyor and radial stacker were installed. Overhead water sprays are used to assist with dust suppression. The operators have been instructed to limit the drop distance from the stacker to the pile. However, rods were not installed on the bottom of the stacker to indicate the drop distance. Likewise, there are problems with end of run situations whereby the stone silos are empty and only baghouse dust is being added to the belt. These problem areas are addressed in the recommendation section of this report.

- Clinker Dust to Clinker Belt – From an operational standpoint, it was found that conveying the Barron system hopper dust to the baghouse dust silos in dry form was not the best solution to the problem. Instead, the dust drops into a sealed drum that is suspended over a pit to the side of the clinker conveyor. When the drum is filled, a valve is opened, and the dust falls into the pit, where it is wetted as needed. The material is then transported via loader to the clinker pile. This method does not result in dust generation.

- Roadways – The control measures specified in the FDP are generally being followed. In addition to these control measures, there are times when both watering trucks are utilized to curtail road dust. Also, in an effort to address winter conditions where the unpaved roads can not be watered due to icing, Norlite is paving various sections of road and will continue to do so where feasible. However, the water truck driver is supposed to be dedicated to watering the roads and nothing else and this is not always the case. Also, the truck loading area between the block mix pile and the portable crusher is sometimes overlooked. These concerns are addressed in the recommendations.

- Primary Crusher Area – The control measures specified in the plan are being followed with one exception. The plan called for fine water sprays to be used in certain areas. However, it has subsequently been determined that the nozzles designed to produce such fine sprays can not be properly maintained to last under the conditions associated with these operations. The nozzles continually plugged and were not as useful in winter conditions, resulting in periods with inadequate water spray. Norlite replaced the fine nozzles with coarse, garden hose type nozzles. Observations of these nozzles indicate that they are effective in controlling the dust generated from this area. In addition, Norlite has found that adequate dust control can be maintained during winter conditions by wetting the quarried rock prior to loading it into the primary crusher.

- Kiln Clinker Conveyors – For reasons similar to those stated above for the primary crusher area, the spray nozzles for the kiln clinker conveyors were changed from fine to coarse. This change also helped to eliminate the redirection of the sprays during windy conditions. The coarse sprays perform at least as well as the fine sprays. However, there are additional recommendations for this area, as discussed later in this report.

- Stacking Tubes – The plan specifies rubber flaps over the holes in the ¾'s stacking tube. The flaps were installed and, in addition, water was introduced into the tube to prevent dust generation. This system was observed to work well in eliminating dust in this area.

- Drilling and Blasting – The plan did not contain any specific control measures for these quarry operations. Subsequent to the plan, Norlite has changed the quarry operations such that drilling and blasting are now performed on fewer days per year. This was accomplished by opening up more rock face. The result of this operational change is that drilling and blasting can now be restricted to days that have meteorological conditions favorable to preventing fugitive dust from leaving the pit area.

Areas Where Controls Need to be Modified or Added

There are several specific dust sources and areas that require new controls, or modifications to existing controls. Recommendations for controls for these sources and areas are discussed below.

- Finishing Plant Operations – Due to the fine nature of the material being processed at the Finish Mill, wind speed becomes a significant factor in dust generation. As part of the original FDP, Norlite installed an anemometer near the eastern property boundary tree line. Currently, the anemometer is monitored every two hours and wind speed, direction, and air temperature are manually recorded. According to facility personnel, this instrument has the capability of triggering an alarm when a pre-set parameter value is reached. Based on a review of the current anemometer location and parameter recording procedures, SCI-TECH recommends the following changes:

    1) Relocate the existing anemometer to the top of the old shipping tower. The vane and cups should be approximately 10 feet above the height of the tower.

    2) Relocate the digital meteorological parameter readout to the finish plant control room.

    3) Connect the wind speed output of the anemometer via splitter to a series of three different alarms. At the time of initial installation, configure the system such that the first alarm is activated at a wind speed of 10 mph, the second alarm at 15 mph, and the third alarm at 20 mph. These nominal wind speed/alarm set points should be adjusted over time to reflect operational experience with wind speed versus dust generation. The goal will be to have the first alarm activated at a wind speed that is

just below that required to generate wind blown dust from the operations of concern. The second alarm should be activated at a wind speed where additional mitigation measures, e.g., water sprays, might be required. The third alarm should be activated at a wind speed where operations may have to be temporarily curtailed.

4) Develop a procedure for the finish plant operator to follow when each different alarm is activated. The procedure should be posted in the control room along with a logbook for recording meteorological parameters. A draft of such a procedure is included herein as Attachment A.

- Block Mix Conveyor to Radial Stacker – During the site investigation, it was noted that fines from this conveyor were falling to the ground as a result of material sticking to the underside of the conveyor and being subsequently removed by scraper bars. The conveyor is covered and the transfer points are controlled with bin vents. However, the underside of the conveyor is exposed and the removed material was observed to be entrained by the wind. According to Norlite personnel, this primarily occurs during humid conditions, which causes the fines to stick to the belt. For this very reason, water can not be added to the material on the belt since this would only result in more material adhering to the underside of the conveyor. To address this potential dust source, it is recommended that improvements to the design of the transfer point between the Block Mix Conveyor and the Radial Stacker be investigated. The goal is to eliminate or minimize any carry back of dust on the conveyor belt. The areas to be investigated include the following: improved belt scrapers and belt cleaners, redesign of the dust tailings hopper to avoid buildup in the dead zone areas, installation of a rotary air seal at the Radial Stacker pivot point, and/or an improved bin vent negative draft system. In addition, it is recommended that the block mix run be stopped after a prescribed length of time, nominally 45 minutes, to prevent the end of run situation whereby the stone silos are empty and only baghouse dust is being added to the belt.

- Radial Stacker – To ensure that the proper drop distance from the radial stacker to the pile is not exceeded, it is recommended that 18 inch long, brightly colored rods be attached to the stacker discharge. It is also recommended that Norlite reeducate their operators and update the training plan to ensure that the operators are aware of and implement the established operating practices required to mitigate dust. The operating practices for the radial stacker should include the wind speed related mitigation procedure presented in Attachment A.

- Portable Crusher – The portable crusher is located to the south of the radial stacker and conveyor. This is a new process that was installed subsequent to the FDP. The crusher is used to generate structural material, as well as number 4 mesh minus fines used in the production of block mix. The material that is fed into the portable crusher is wet. The moisture carries through the process resulting in little or no dust generation. However, it has been noted that under periods of strong winds, the fines at the end of the conveyor where it is being dropped onto the pile can be subject to wind stripping. To prevent this source of dust generation, it is recommended that the end of the conveyor be enclosed in a drop box. After the installation of the drop box, if fines are still being stripped at the bottom of the drop box discharge, then it is recommended that a telescopic chute be added to the bottom of the drop box. In addition to these measures, it is recommended that the operating practices for the portable crusher include the wind speed related mitigation procedure presented in Attachment A.

- Kiln Clinker Storage Piles – The current control system for these piles is a combination of three downward-facing, coarse spray nozzles at the end of the conveyor along with sprays in the head pulley discharge. This system provides adequate control of the material being dropped onto the piles, but does not adequately address the activities associated with the use of a bucket loader for transferring material from clinker pile 2 to clinker pile 1 (pile 1 has an underground feed to the finishing building). On rare occasions, the bucket loader will hit a "dry" pocket of material when digging into pile 2. This situation may result in some dust boil-up when the material is transferred and unloaded onto pile 1. A key to the prevention of the boil-up situation is operator training. It is recommended that a specific bucket loader operational procedure be developed in order to properly train operators. A draft procedure is presented as Attachment B. To further address this dust source, it is recommended that the control system be modified/augmented. First, the downward-facing nozzles should be turned outward approximately 45 degrees so that the area covered by the water sprays is greatly extended outwards. This should address the bucket loader activities. However, if this change does not address all of the dust, then it is recommended that the overhead sprinkler sprays, or other watering mechanism, be used to further extend the coverage. Note, however, that these sprays can not be used in icing conditions. It is also recommended that water sprays on the belt itself be further investigated to cool and clean the clinker prior to the discharge point.

- Aggregate Fines – As discussed in the previous section, the aggregate fines are removed from the storage silo through a hatch on the north side of the structure. This was a change from the October 1995 FDP due to customer requirements. To prevent dust generated within the silo from exhausting through the opening when it is not covered by product, it is recommended that a flexible covering be installed. The covering can be either rubber or plastic strips, or else a lightweight metal door hinged at the top. It is also recommended that a windscreen be installed. Attachment C is a sketch depicting the recommended location and dimensions of the windscreen. The depicted design will mitigate dust generation from the working pile directly below the silo discharge door, as well as the adjacent temporary pile, without significantly interfering with the product handling operations.

- Road Watering – As discussed previously, the road watering for the most part is adequate. However there are two concerns: the dedication of the drivers and the frequency of watering the truck loading area between the block mix pile and the portable crusher. To address these concerns, it is recommended that Norlite have two full-time drivers that are responsible for operating the water trucks from 6 a.m. to 6 p.m. each weekday and partially on Saturday during the peak watering season. The drivers should be instructed to focus on the eastern part of the plant on dry days.

IMPLEMENTATION SCHEDULE

Within 15 days of receipt of Departmental approval, Norlite should prepare and submit a schedule of implementation for the items addressed in this letter. A summary of the implementation items is presented in Attachment D.

Pursuant to Order on Consent R4-2000-0420-27, Schedule of Compliance #2, SCI-TECH will prepare a one-time, final report on the effectiveness of the revisions of the Fugitive Dust Control Plan. The report will be filed by the tenth of the month following the first full calendar month after the items on the implementation schedule have been completed in their entirety.

Sincerely,

SCI-TECH, INC.

Edward T. Brookman, P.E.
Principal Consulting Engineer

ARTHUR BRACKBILL

ATTACHMENT A
WIND SPEED RELATED MITIGATION PROCEDURE TO PREVENT FUGITIVE DUST FROM CROSSING THE EASTERN PLANT BOUNDARY

Level 1: *Normal Operating Conditions*. During the operating hours of the Finish Plant and/or adjacent processes (e.g., portable crusher), the operator should, to the extent practical, record the following parameters on an hourly basis: date, time, wind speed, wind direction, and temperature.

Level 2: *First Alarm Activated*. Operator shall continue with Level 1 activity and additionally record the time of occurrence of the alarm activation, as well as wind speed and direction, and shall, subject to his operational experience and judgement, maintain the procedures set forth below until the alarm is deactivated or the next higher level is attained.

1) Operator shall visually observe the processing area(s) for fugitive dust being generated and record such observations and continue the observation every 30 minutes. Should the alarm deactivate in less than 30 minutes, the operator is to make a record 30 minutes after the initial occurrence.
2) If the operator observes fugitive dust being generated, the operator is to increase and/or add additional water control measures at the area(s) of generation. This may include, but is not limited to, overhead spray and use of the water truck.

Level 3: *Second Alarm Activated*. Operator shall continue with Level 2 activity and additionally record the time of occurrence of the alarm activation, as well as wind speed and direction, and shall, subject to his operational experience and judgement, maintain the procedures set forth below until the alarm is deactivated or the next higher level is attained.

1) Maintain activities in Level 2.
2) Notify the on-site supervisor of the alarm activation.
3) The on-site supervisor shall specify and control additional mitigation measures, direct the operator(s), and will prepare a report for file.

Level 4: *Third Alarm Activated*. Operator shall continue with Level 3 activity and additionally record the time of occurrence of the alarm activation, as well as wind speed and direction, and shall maintain the procedures set forth below until the alarm is deactivated.

1) The on-site supervisor shall determine if operation of a process or processes shall continue and will prepare a report for file.

Regardless of the alarm activation system, the operator shall use his or her operational experience and judgement to mitigate the potential for fugitive dust being carried beyond the area of the finish plant operations to adversely impact the neighboring community.

ATTACHMENT B
BUCKET LOADER OPERATOR PROCEDURES

Purpose:

Provide guidelines to bucket loader operators for moving aggregate type materials to minimize dust "boil-up" to prevent offsite migration of dust during material transfer activities consistent with the principals of the fugitive dust plan.

Weather Conditions and Product Moisture Content :

Bucket loader operators need to maintain awareness at all times of product moisture content, and current wind conditions via visible sightings such as, but not limited, to stack plumes, wind socks, and/or anemometer stations. Bucket loader operators need to alter operations accordingly as wind conditions and product moisture content change up to and including cessation of operations. If the bucket loader operator is creating dust "boil-up" conditions which migrate offsite, the following steps will be taken:

1. Discontinue moving product, or
2. Increase product moisture by adding enough water to product to eliminate offsite migration.

Work Area:

Bucket loader operators need to maintain awareness at all times of visible moisture content of the travel areas in their work area. Bucket loader operators need to alter operations accordingly, to the extent practical, as moisture conditions change.

Material Movement:

As a general work practice, bucket loader operators should follow the good operating procedures described below:

Pile to Pile:

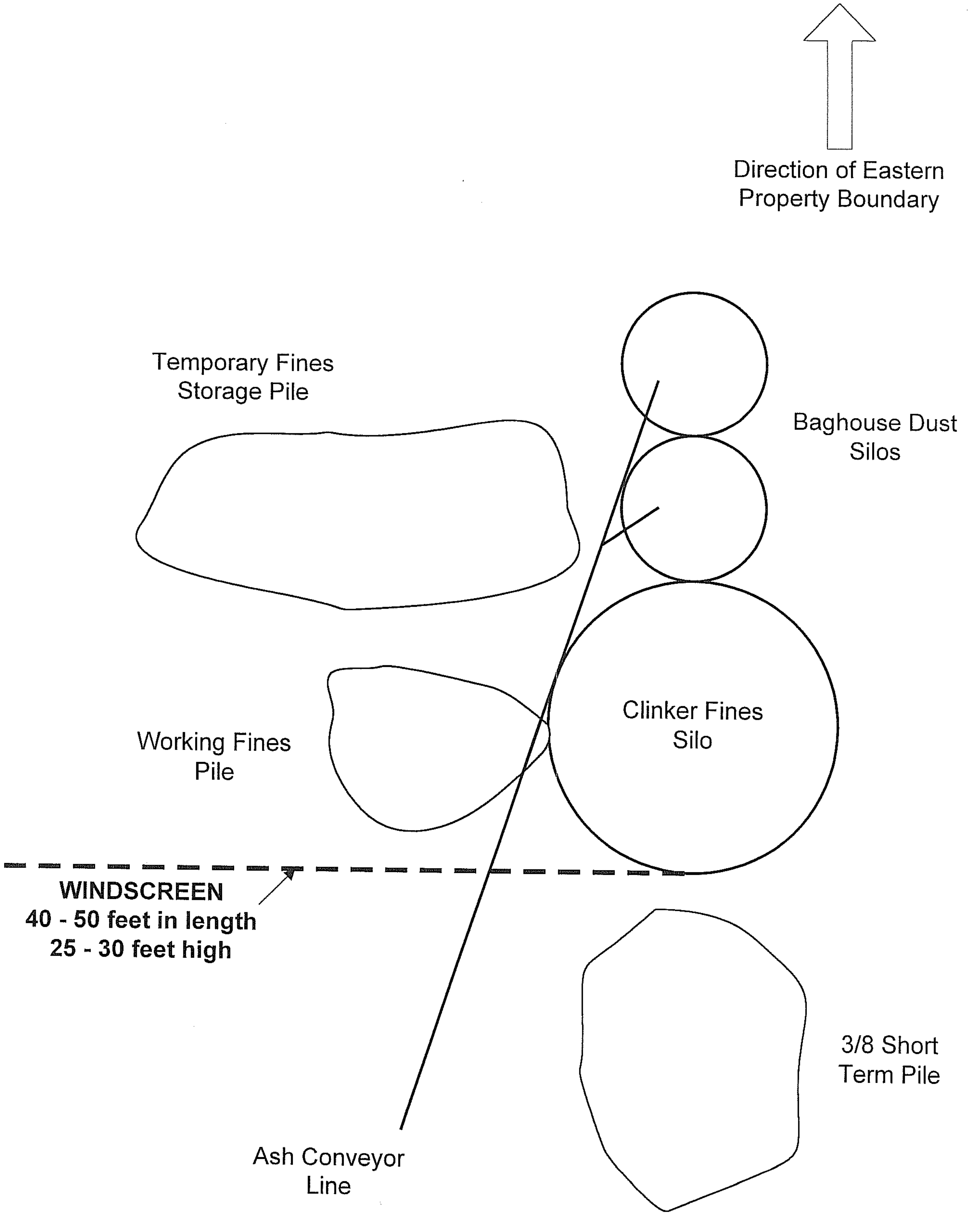
Bucket loader operators should approach stockpiles at ground level with a level bucket. When the bucket has achieved maximum depth into the stockpile, the bucket loader operator will perform a full "roll-back" of the loaded bucket before extracting from the stockpile. While transporting materials, the loaded bucket will be held at the lowest practical point until reaching the receiving stockpile. At the receiving stockpile the bucket loader operator will work at a minimum height to the pile to allow material to "roll-out" of the bucket and onto the pile to minimize dust generation.

Pile to Container:

Containers include, but are not limited to, truck bodies, railcars, feeders, hoppers, etc. Bucket loader operators should approach stockpiles at ground level with a level bucket. When the bucket has achieved maximum depth into the stockpile, the bucket loader operator will perform a full "roll-back" of the loaded bucket before extracting from the stockpile. Bucket loader operators will approach a container with the loaded bucket at the lowest practical point during travel and lift in a fashion as to maintain an even operating plane with the container. Bucket loader operators will achieve a minimum height to allow the material to "roll-out" into the container to minimum dust generation.

The above-described practices are proposed operating procedures to minimize the generation of dust to prevent offsite migration during the movement of the bucket loader and the movement of aggregate type materials. These practices are to be implemented with common sense to minimize the generation of dust.

ATTACHMENT C
SKETCH OF WINDSCREEN INSTALLATION



ATTACHMENT D
SUMMARY LIST OF ITEMS REQUIRING IMPLEMENTATION

1) Installation of a drop box at the head pulley of the fines conveyor on the portable crusher.

2) Extension of Kiln Clinker Belt Spray Headers.

3) Aggregate Fines Storage:

    a) Install door cover on north door.

    b) Install Windscreen.

4) Improve transfer point between the Block Mix Conveyor and the Radial Stacker.

5) Relocate and install anemometer station with alarms and procedures.

6) Incorporate Bucket Loader Operating Procedures.

7) Attach 18 inch long rods to Radial Stacker discharge.

Norlite Corporation

A ROTARY KILN Norlite EXPANDED SHALE AGGREGATE

628 SO. SARATOGA ST.
P.O. BOX 694
COHOES, NY 12047
PHONE (518) 235-0401
FAX (518) 235-0233

May 10, 2002

Mr. Ricky M. Leone, P.E.
Regional Air Pollution Control Engineer
New York State Department of Environmental Conservation
Region 4
1150 North Westcott Road
Schenectady, NY 12306-2014

Via e-mail: *rmleone@gw.dec.state.ny.us*
Via Certified Mail: *7001-0320-0001-8803-2151*

Dear Mr. Leone,

This is in response to your letter dated April 25, 2002 as the approval of Norlite's December 14. 2001 submittal of a report to re-evaluate Norlite's Fugitive Dust Control Plan in accordance with consent order R4-2000-0420-27.

The following is the anticipated implementation schedule for Attachment D of Norlite's December 14, 2001 submittal:

1) Install a drop box at the head pulley of the fines conveyor on the portable crusher. As of January 25, 2002 Norlite has installed a rigid framework and a flexible 3 sided drop box.

2) Extension of Kiln Clinker Belt Spray Headers. As of May 10, 2002 Norlite has angled the 3 spray headers at the heads of Kiln 1 and Kiln 2 clinker conveyors to 45 degrees.

3) Aggregate Fines Storage:

    a) Install door cover on the north door. As of November 20, 2001, Norlite has installed a flexible door cover.

    b) Install Windscreen. Norlite will contract for engineering and construction services to install the windscreen depicted as Attachment C of Norlite's December 14, 2001 submittal. Norlite anticipates the design phase to be 60 days, 30 days for revisions and Norlite approval of design, and approximately 90 days for ordering and construction. Norlite would expect construction to be complete by mid to late October 2002.

4) Improve transfer point between the Block Mix Conveyor and the Radial Stacker. As of November 30, 2001, Norlite has reconfigured the transfer point to include a new tailings hopper with a circular outlet that eliminates dead zones and provides a rotating seal on the pivot point of the Radial Stacker improving the negative draft system of the bin vent.

5) Relocate and install anemometer station with alarms and procedures. As of February 15, 2002 a new anemometer station has been installed. Norlite will have the procedures in place by June 30, 2002.

6) Incorporate Bucket Loader Operator Procedures. As of October 29, 2001 Norlite's Bucket Loader Operators were verbally informed on the content of the tentative Bucket Loader Operator Procedures pending approval of the Department. Norlite will formalize the training of the Bucket Loader Operators by June 30, 2002.

7) Attach 18 inch long rods to Radial Stacker Discharge. As of November 5, 2001, Norlite has installed 18 inch flexible chains at the discharge point.

The above implementation schedule would permit the completion of Compliance Item # 2of consent order R4-2000-0420-27 via an inspection by SCI-Tech Inc. and final report tentatively by January 10, 2003.

If you have any questions, please feel free to contact me.

Sincerely,

Timothy F. Lachell

Timothy F. Lachell
Plant Manager

ecc: Ed Brookman–SCI Tech ebrookman@sci-techinc.com

cc: Ken O'Brien

File:c:\wp60\text\tim\t05100201.wpd

MATERIALS REQUISITION

Norlite Corporation
628 South Saratoga St.
Cohoes, NY 12047

A ROTARY KILN
Norlite
EXPANDED SHALE AGGREGATE

Phone (518) 235-0401
Fax (518) 235-0233

PURCHASING DATA

P.O. # 981487

DATE 9/28/01 DUE 10/15/01

VENDOR Tracey

CONFIRMED? YES TO: Dick Tracey

F.O.B. Dlvd TAX: [✓ EXP] 4% 8%

BUYER TERMS: 1/10 2/10 Net 30

TERMS OTHER THAN NET 30 NEEDS APPROVAL

REQUESTER DATA

DATE 9/28/01 NEEDED 10/15/01

REQUESTER H MARLOW

SUGGESTED VENDOR Tracey

ACCT. # 80000 N F100

WHERE USED STATIONARY BELT

APPROVAL T. Lachell 11/2/01

QTY	DESCRIPTION	UNIT PRICE	TOTAL PRICE
1	Hopper & DUST HOOD FOR FINISH	2316.00	2316.00
	PLANT STATIONARY BELT PER		
	ATTACHED PRINTS		
	HM 061501-01, 02 & 03, and		
	HM 061801-01, 02, 03, 04, 05 & 06		
	Rec'd W.E. 10/26/01		
		TOTAL	2316.00

Comments

MR NO. 26288

July 26, 2001

To: Tim Lachell

From: Herb Marlow

Subject: New Hopper and Dust Hood for Finish Plant Stationary Belt to Radial Stacker Transfer Point

Tim

Tracey Welding came in with a bit of $2316.00 for the new hopper and dust hood for the Stationary Belt discharge to the Radial Stacker Belt.

The other two bids were as follows:

Cardish Machine:	$3,880.00
Fort Ann Fabrication:	$3,475.00

Attached are copies of the sketches which were reviewed with Dick.

Let me know when I can place the order. Delivery is three to four weeks.

Thank you.

Herb

Uncle Sam Piping Solutions, Inc.
60 - 113th Street • Troy, New York 12182
(518) 235-1610 • 235-0469 Fax
-mail: unclesam@albanyonline.net

Job Title

Description

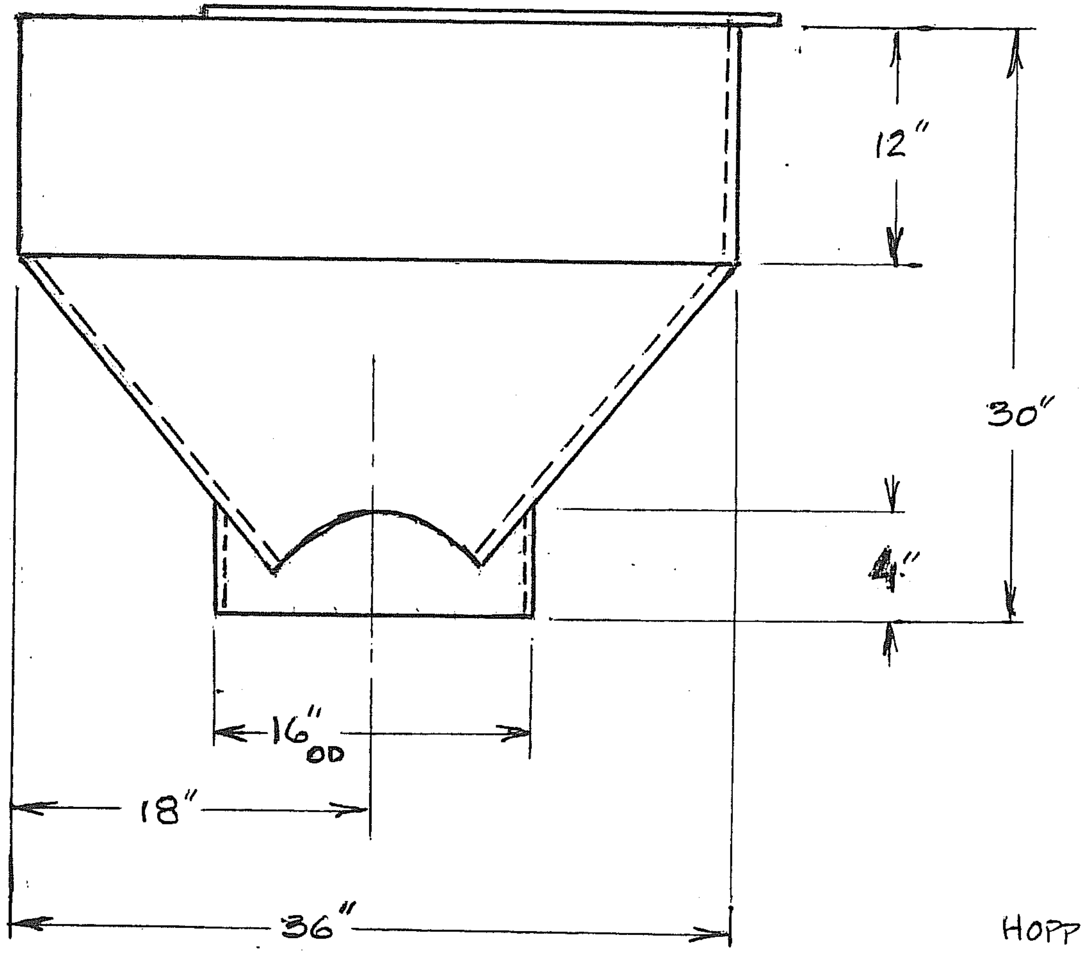
PO #

Date

Date Req.

Emergency Deliveries - 24 Hours - 7 Days a Week

NOTE: ALL MATERIAL 3/8" THICK A36 PLATE



HOPPER, FINISH PLANT
STATIONARY BELT
FRONT VIEW

SK HM C .501-01
ORIG

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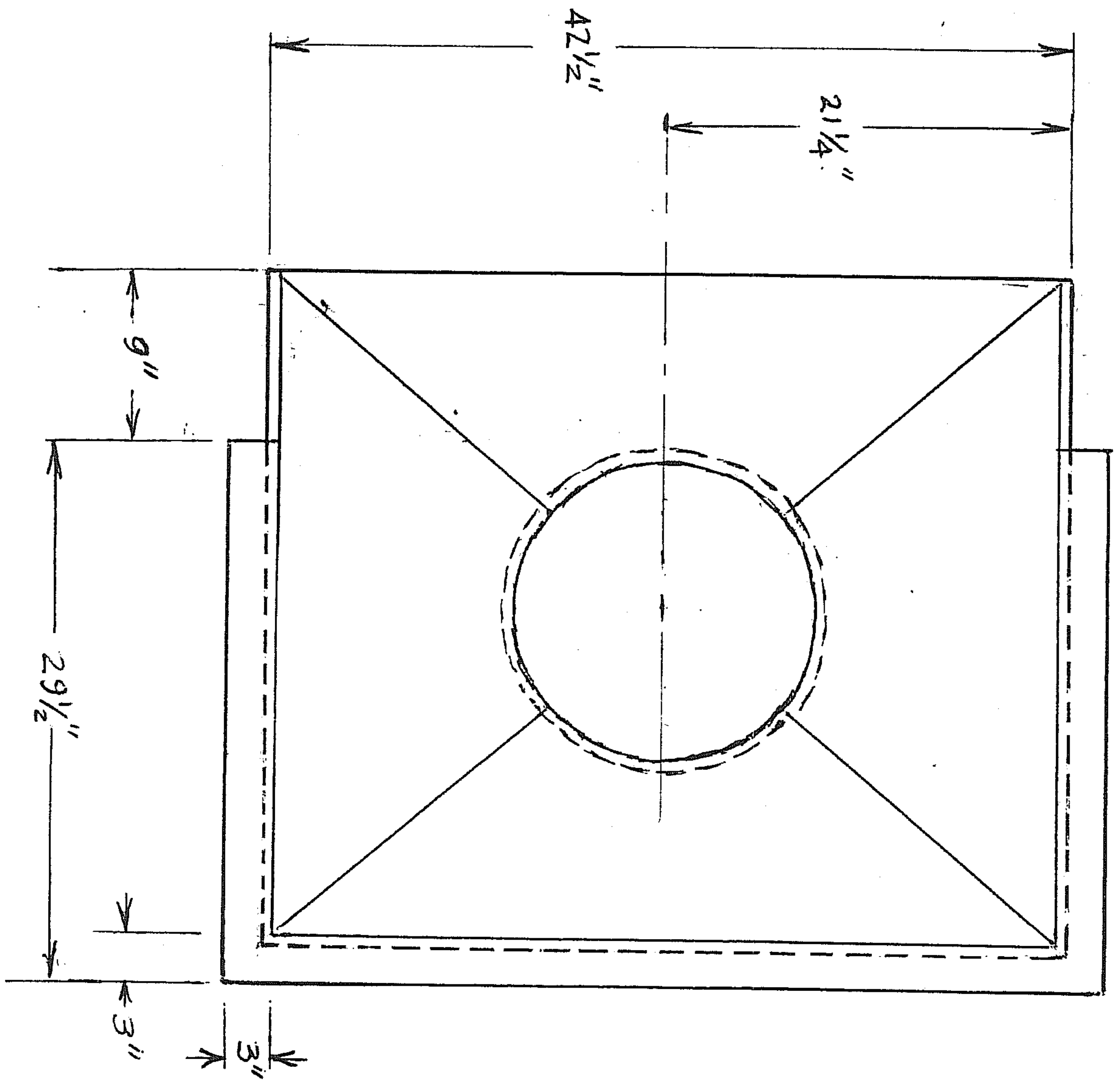
Job Title

Description

PO #

Date Date Req.

Emergency Deliveries - 24 Hours - 7 Days a Week



HOPPER, FINISH PLANT
STATIONARY BELT
TOP VIEW
SK HM 0 501-02
ORIG.

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Job Title

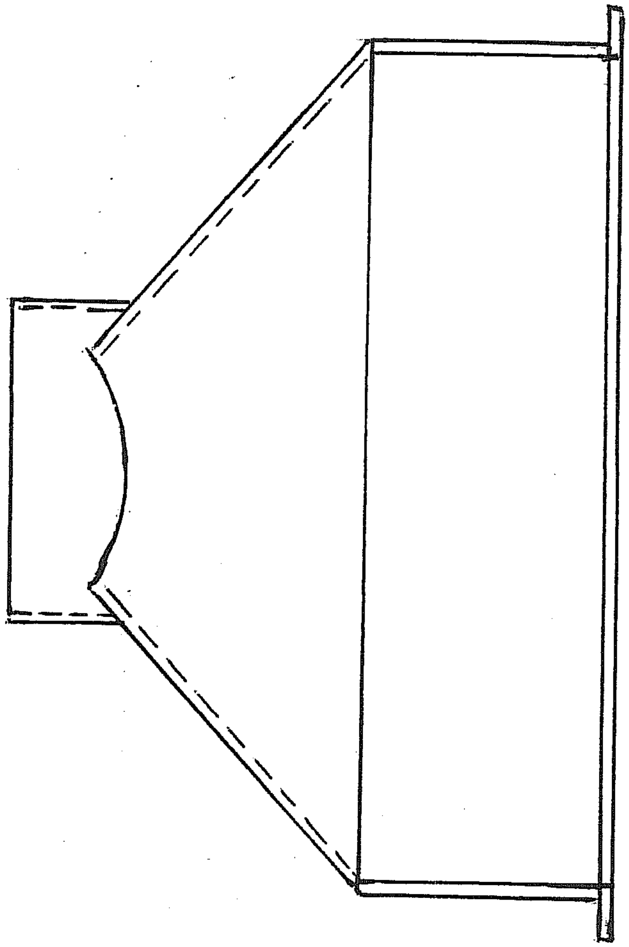
Description

PO #

Date

Date Req.

Emergency Deliveries - 24 Hours - 7 Days a Week



HOPPER, FINISH PLANT
STATIONARY BELT
SIDE VIEW

SK HM 06 01-03
ORIG

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Job Title

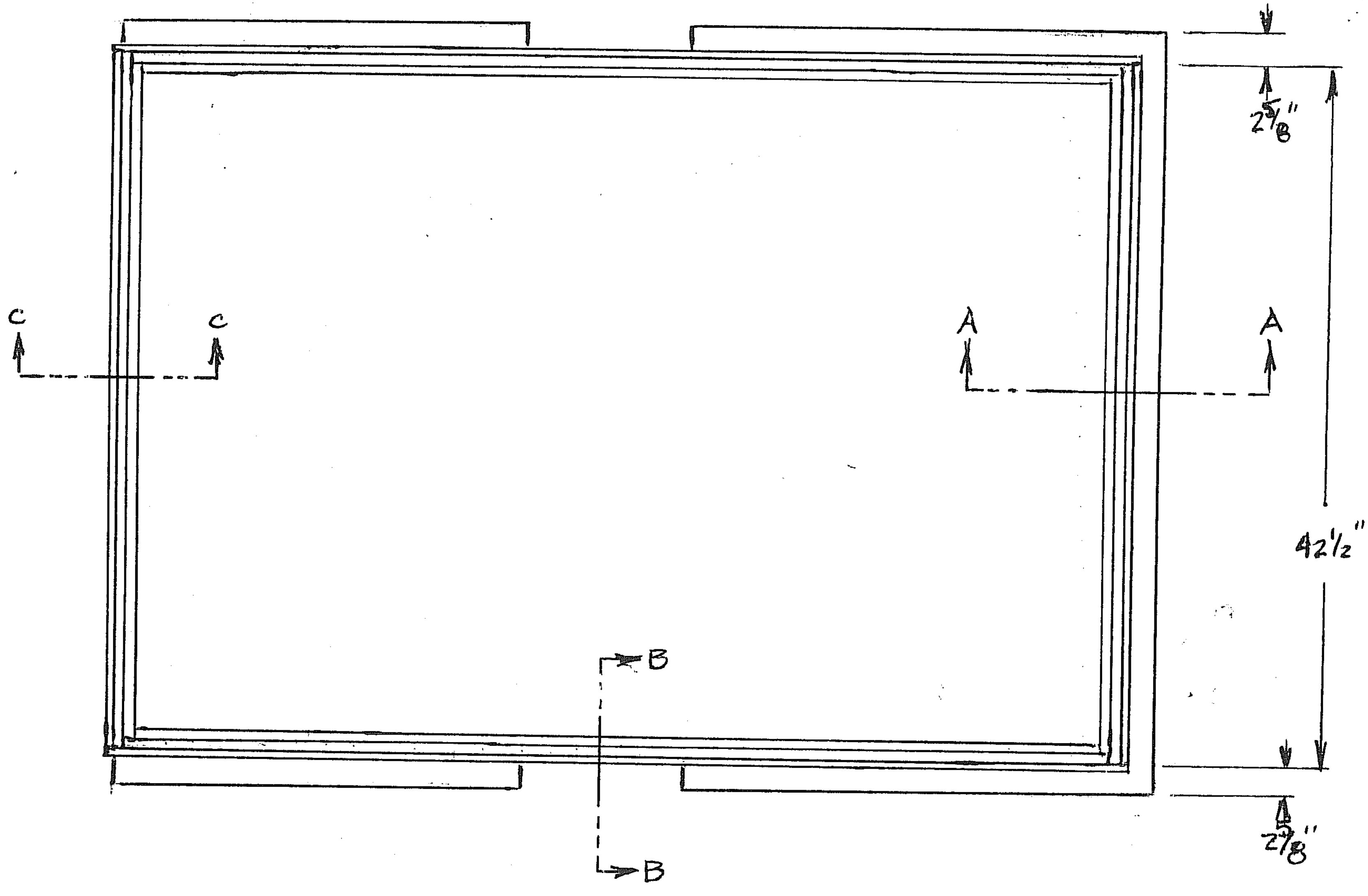
Description

PO #

Date

Date Req.

Emergency Deliveries - 24 Hours - 7 Days a Week



NOTE: ALL MATERIAL 3/8" A36 EXCEPT AS NOTED.

DUST HOOD, FINISH PLANT
STATIONARY BELT
TOP VIEW

SK HM 061-01-01
REV 1 ~~ORIG~~

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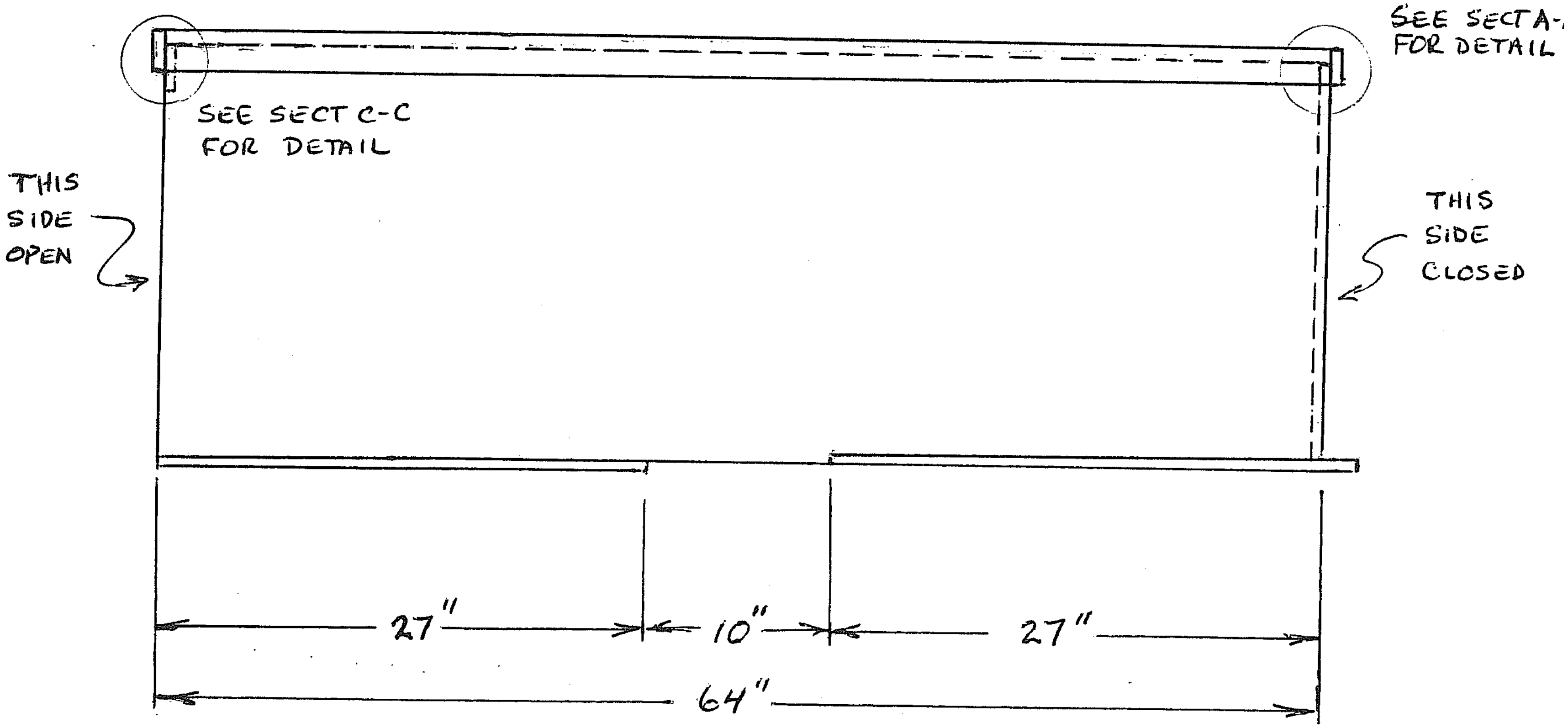
Job Title

Description

PO #

Date Date Req.

Emergency Deliveries - 24 Hours - 7 Days a Week



DUST HOOD, FINISH PLANT
STATIONARY BELT
FRONT VIEW

SK HM06 01-02
orig

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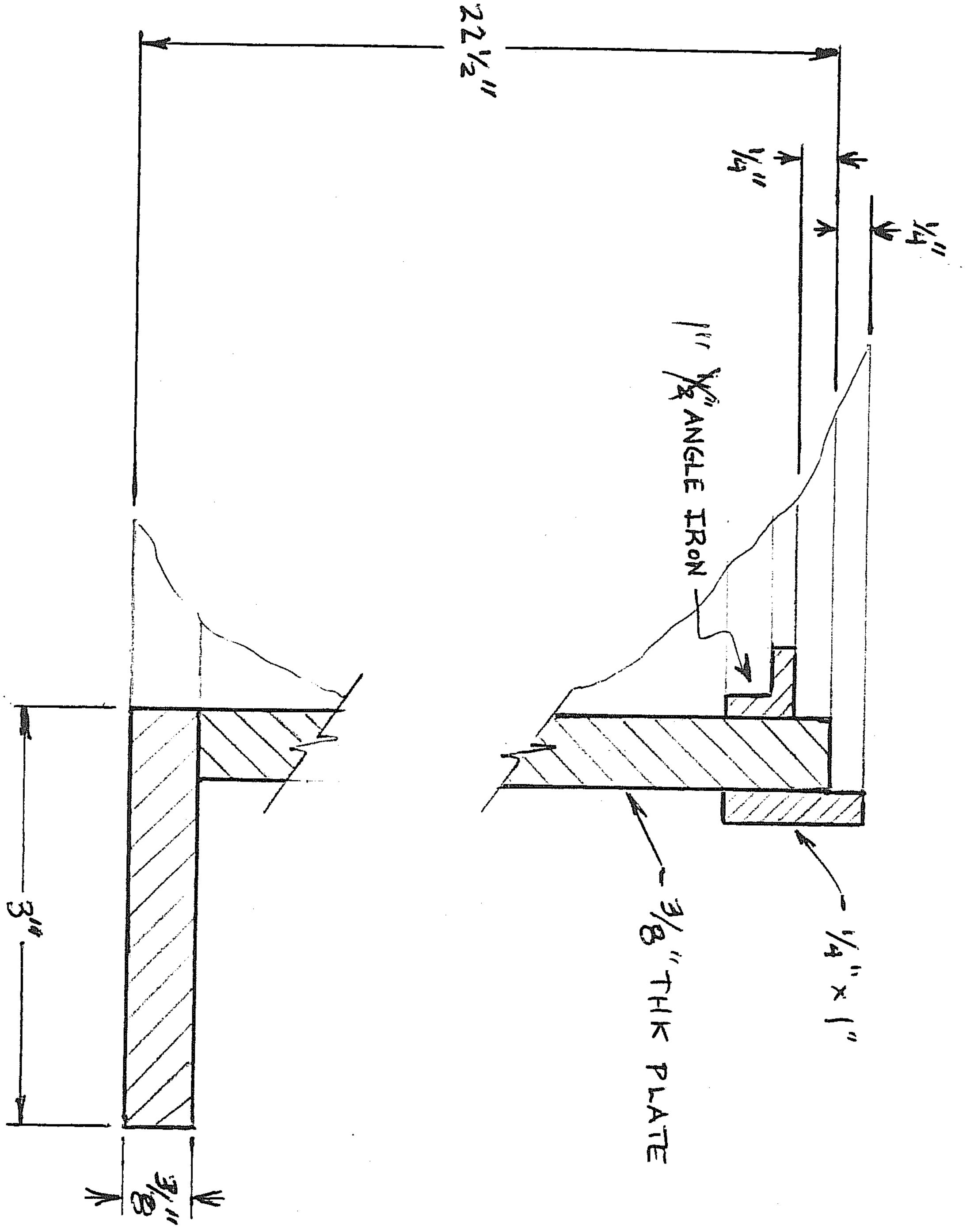
Job Title

Description

PO #

Date Date Req.

Emergency Deliveries - 24 Hours - 7 Days a Week



DUST HOOD, FINISH PLANT
STATIONARY BELT
SECTION A-A
SK HM 06 01-03
REV 1

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Job Title

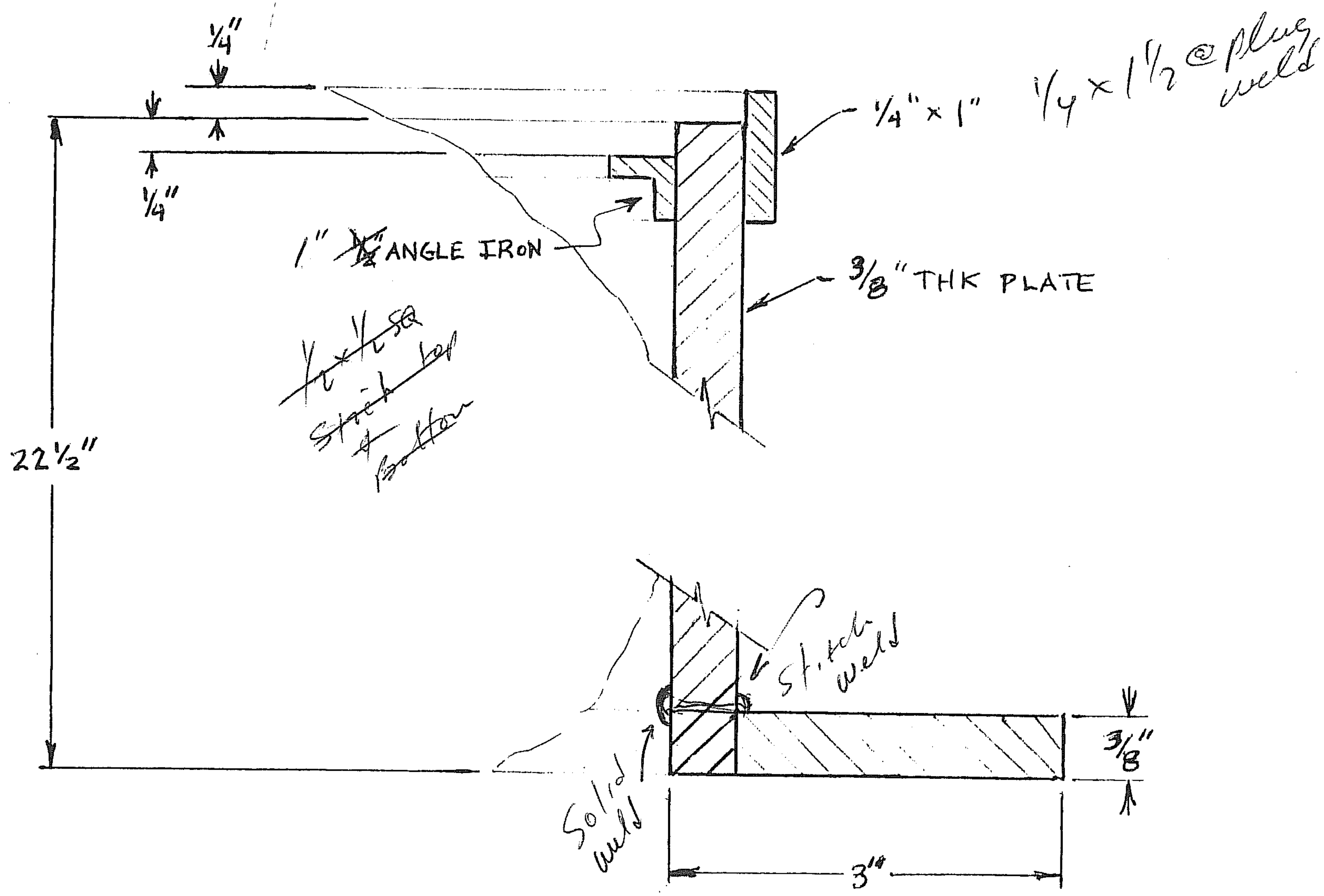
Description

PO #

Date

Date Req.

Emergency Deliveries - 24 Hours - 7 Days a Week



DUST HOOD, FINISH PLANT
STATIONARY BELT
SECTION B-B

SK HM 06. 01- 04
REV 1 ~~ORIG~~

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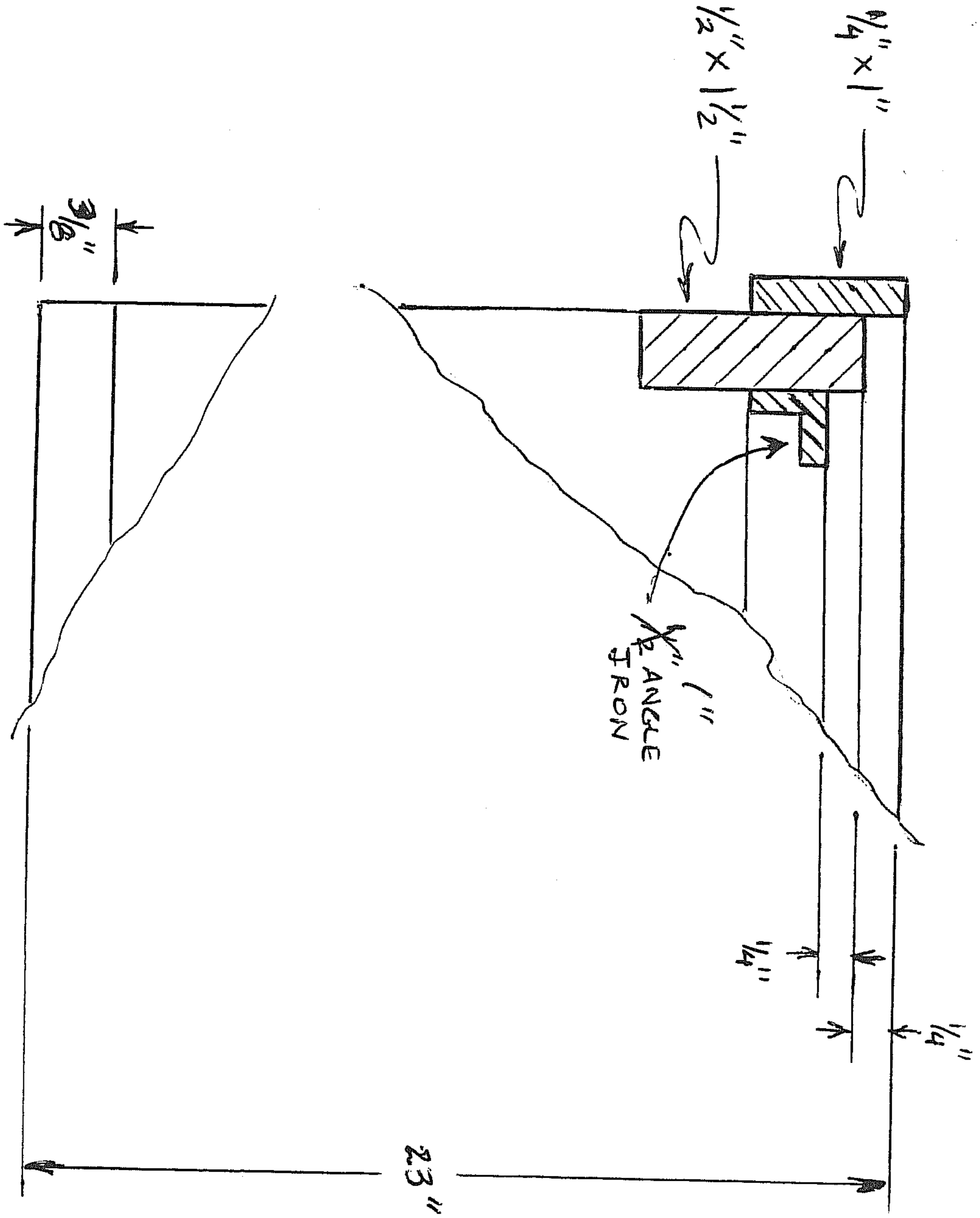
Job Title

Description

PO #

Date Date Req.

Emergency Deliveries - 24 Hours - 7 Days a Week



DUST HOOD, FINISH PLANT
STATIONARY BELT
SECTION C-C

SE HM 061-1-S
REV 1 ~~DATE~~

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-mail: unclesam@albanyonline.net

Job Title ____________________

Description ____________________

PO # ____________________

Date ____________________ Date Req. ____________________

Emergency Deliveries - 24 Hours - 7 Days a Week

EXTRA MATERIAL :

1. ONE 1/8" THK COVER 63 3/4" LONG x 22" WIDE
2. ONE 1/8" THK COVER 63" " LONG x 22" WIDE
3. TWO 8" x 11.5 CHANNELS
4. TWO 6" x CHANNELS
5. TWO BEARINGS

MISC MATERIAL LIST
FINISH PLANT
STATIONARY BELT

SK HM 061L -6
REV 1 ~~ORIG~~

MATERIALS REQUISITION

Norlite Corporation
628 South Saratoga St.
Cohoes, NY 12047

Phone (518) 235-0401
Fax (518) 235-0233

PURCHASING DATA

P.O. # 982 490

DATE 1/21/02 DUE 1/30/02

VENDOR Peet Bros

CONFIRMED? Yes TO: Dave

F.O.B. ______ TAX: EXP. 4% 8%

BUYER ______ TERMS: 1/10 2/10 Net 30

TERMS OTHER THAN NET 30 NEEDS APPROVAL

REQUESTER DATA

DATE 1/21/02 NEEDED ——

REQUESTER Tommasino

SUGGESTED VENDOR Peet Bros.
1-800 872 -7338

ACCT. # 80000 N F100

WHERE USED Finish plant

APPROVAL T. Lachell
1/22/02

QTY	DESCRIPTION	UNIT PRICE	TOTAL PRICE
3	Key Board Assembly	119.00	357.00
1	Splitter	19.00	19.00
3	8' Cables	10.00	30.00
1	250' Anemometer/Wind vane	179.00	179.00
1	Shipping	19.75	19.75
			604.75
	See quote # 220118		

Comments

MR NO. 27003

X. RESETTING LONG TERM MEMORY VALUES

TO RESET A SINGLE LONG TERM HIGH OR LOW MEMORY

NOTE: Only Long Term memory values can be reset; you cannot clear Today's or Yesterday's values. These are automatically reset (updated) by the instrument.

1. First, display the stored Long Term data you wish to clear.
2. Press and hold the -O- key for at least three seconds. The display will flash three times, then change to a display of the current value, the current time, and today's date.

TO RESET ALL LONG TERM HIGH, LOW, & RAIN MEMORIES

Instead of resetting each Long Term high and low memory individually, you may simultaneously reset all Long Term highs and lows, including the Long Term rainfall total. To do so:

Press and hold -O- and ▦ simultaneously for at least three seconds. The display will flash three times, then stop. All Long Term high and low values will be replaced by the current values, and the Long Term rainfall total will be reset to zero.

You may wish to use this "master reset" procedure on the first day of each new month. All Long Term high and low values will then be the highest and lowest values for the month to date.

TIP: If you always use only the master reset (as opposed to individual resets), the date shown on the Long Term rainfall display will be the date when all highs and lows were last reset.

XI. ALARMS

The *ULTIMETER 100* includes the following 15 adjustable alarms: High Wind Speed, High Outdoor Temperature, Low Outdoor Temperature, High Indoor Temperature, Low Indoor Temperature, Low Wind Chill Temperature, Flash Flood Alert, and Time Alarm.

When an alarm setting is exceeded, the display flashes the alarm setting and a high-pitched alarm will sound. The sound will stop automatically after about 30 seconds, but the display will continue flashing until reset.

TO SET AN ALARM (other than Flash Flood Alert)

1. Select the function for which you wish to set an alarm by pressing ✢, ✢🌡, 🌡, or 🕒. If you are setting an alarm for wind speed, wind chill, or time, skip to step (c).
2. This instrument has both a high and a low alarm for temperature. Press △ to set a high alarm or ▽ to set a low alarm.
3. Press and release 🔔 to display the current alarm value.
4. Press and hold △ or ▽ until the display changes, then press repeatedly until desired alarm setting is displayed.

THE FLASH FLOOD ALERT

This instrument provides a rain rate alarm, intended for use where there is danger of local flooding or downstream flash flooding. Flash flooding can result when heavy rainfall occurs at higher elevation, and water rushes toward low-lying areas. The rain rate alarm warns that heavy rainfall has occurred, which could result in impending local flood conditions, or flash flooding within your vicinity (or possibly downstream, outside of your vicinity). Bear in mind that your success in predicting flash flooding depends upon many factors, in addition to rain rate: terrain, elevation, drainage, etc.

Before setting the flash flood alert, be sure to select rainfall units according to the type of rain gauge you are using.

The rain rate alarm is set in inches-of-rain or mm-of-rain per hour. An alarm will sound of a specified minimum amount of rain (called the threshold) falls at a rate equal to or greater than the rain-rate setting. The default threshold value is 0.5 in, or 12.7 mm.

EXAMPLE: If you set an alarm for a rain rate of 2 inches per hour, the alarm will sound if 0.5 inches of rain (the default threshold value) falls within 15 minutes, which equals an hourly rate of 2 inches per hour.

To adjust the Flash Flood Alert rain rate:

1. Press and release 🌧.

2. Press 🔔. The rain, clock, and alarm symbols will appear in the display, and the present rain rate alarm setting will be displayed.

3. Press and hold △ or ▽ until a value is shown and begins to change. The rain rate can be adjusted from 0.1 in/hr to 10 in/hr in 0.1-in increments, or from 2.5 mm/hr to 254.0 mm/hr in increments of 2.5 mm/hr.

4. Press △ or ▽ repeatedly until the desired rain rate setting is shown.

To adjust the Flash Flood Alert threshold value:

1. Press 🌧 and 🕒 simultaneously. The rainfall and alarm symbols will appear in the display, and the present threshold value will be shown.

2. Press and hold △ or ▽ until the threshold value begins to change. The threshold value can be adjusted from 0.1 inch to 0.5 inch in 0.1-inch increments, or from 2.5 mm to 12.5 mm in increments of 2.5 mm.

3. Press △ or ▽ repeatedly until the desired threshold value is shown.

TO MOMENTARILY STOP AN ALARM FROM SOUNDING

With the alarm setting displayed, press the -O- key. The alarm sound will stop temporarily. When you return to normal operation (displaying data), the alarm will sound again when the current value exceeds the alarm setting.

TO DISABLE AN ALARM

First, display the alarm setting. If the alarm has been triggered, the alarm setting will already be displayed.

Then, press and hold the -O- key for at least three seconds. The display will flash three times, then read "OFF".

XII. THE *ULTIMETER* 100 SERIAL PORT

The *ULTIMETER* 100 provides a unique 3-mode serial port to facilitate computer data logging and remote data reporting via telephone, modem, or RF link. Each of the three modes can be accessed by pressing and holding a combination of two keys, or by command into the serial port. The following is a brief description, to provide an idea of the capabilities of each mode. Complete details are available to programmers upon request.

DATA LOGGING MODE

In Data Logging Mode, the instrument puts out a steady stream of records, about one per second. Each record includes all current readings including time and date. Key Combo: Press and hold [-O-] and [✢] for 3 seconds to enter this mode.

PACKET MODE

In Packet Mode, the instrument puts out one record every five minutes. Each record includes all current values, plus the highest wind speed over the past five minutes with the associated wind direction, station calibration numbers, and current time and date. Key Combo: Press and hold [-O-] and [✢🌡] for 3 seconds to enter this mode.

COMPLETE RECORD MODE

In Complete Record Mode, the instrument puts out a steady stream of records, about twenty per minute. Each record includes all current values, today's high and low values, yesterday's high and low values, and long term high and low values, station calibration numbers, and current time and date. Key Combo: Press and hold [-O-] and [🌧] for 3 seconds to enter this mode.

NOTE TO SERIAL PORT USERS: It is essential to make the correct Leap Year setting (see Section VI); otherwise, date data from the serial port may be incorrect.

XIII. Supplemental Wind Vane Calibration Adjustment

Your anemometer/wind vane has been factory-calibrated to correctly indicate wind direction when installed per the instructions on p. 17, and should not require recalibration. However, if you wish to adjust wind direction readings after installation (to correct a difference between display readings and actual wind direction) without physically realigning the sensor, you may use the following procedure.

1. Perform when you have a fairly steady breeze from a known direction.
2. Press [✢] and [🌡] simultaneously to display the wind vane correction constant (the keyboard initially has a correction constant of zero).
3. Press and hold [△] or [▽] to adjust the wind vane correction constant. After approximately 3 seconds the wind vane correction will start changing. Increase the constant if you want the direction diamond on the display to move counter-clockwise 1to match actual wind direction. Decrease the constant if you want the direction-indicating diamond to move clockwise to match actual wind direction.
4. Repeat Step 4 as necessary until the wind direction is correctly displayed. Record the Wind Vane Correction Constant below.
5. Press any function key to leave this operation and retain the correction constant that is displayed.

NOTE: The correction constant is a number from 0 through 255. Each digit represents approximately 1.4 angular degrees of correction (360 ÷ 256) that is added to the uncorrected wind direction.

Record your Wind Vane Correction Constant here__________

Policy #: A-5
Rev. #: 3
Issue Date: 09/24/01

NORLITE CREW SAFETY MEETING ATTENDANCE

Department/Shift: MANAGERS, SUPERVISORS, FINISH PLANT OPERATORS, LOADER OPERATORS

Supervisor (PRINT) NA

Topic (BE SPECIFIC) FUGITIVE DUST PLAN REVIEW (See attached)

Date: 6/27/02 Time: 7:00 am.

NAME (PRINT)	SIGNATURE	SOCIAL SECURITY #
Conducted By:		
TIM LACHELL	Timothy F. Lachell	192-54-7486
KEN O'BRIEN		093-46-7882
Attended By:		
TIMOTHY PASSER		117-46-7122
ARMAND R. DESPRES	Armand R. Despres	366-48-9655
HENRY ST GELAIS	Henry [illegible]	104-32-2892
P Bubb[illegible]	P Bubb[illegible]	183-71-9563
Jered Wait	Jered Wait	101-74-5551
JOE ORTIZ	Joe Ortiz	105-38-8482
		- -
		- -
		- -
		- -

Comments:

NOTE: Return to Safety when completed.

Policy #: A-5
Rev. #: 3
Issue Date: 09/24/01

NORLITE CREW SAFETY MEETING ATTENDANCE

Department/Shift: MANAGERS, SUPERVISORS, FINISH PLANT OPERATORS, LOADER OPERATIONS

Supervisor (PRINT) NA

Topic (BE SPECIFIC) FUGITIVE DUST PLAN REVIEW (See attached)

Date: 6/26/02 Time: 3³⁰ pm

NAME (PRINT)	SIGNATURE	SOCIAL SECURITY #
Conducted By:		
TIM LACHELL	Timothy F. Lachell	192-54-7486
KEN O'BRIEN		093 - 46 - 7882
Attended By:		
Thomas Schmick		073 - 54 - 6659
THOMAS G. BERGHELA	Thomas G.	124 - 58 - 0645
Michael S. Capanell		111 - 72 - 6621
Mike Gilroy	Michael P. Gilroy	052 - 58 - 1968
MIKE ZINNA		066 - 54 - 0958

Comments:

NOTE: Return to Safety when completed.

Policy #: A-5
Rev. #: 3
Issue Date: 09/24/01

Page 2 of 2

NORLITE CREW SAFETY MEETING ATTENDANCE

Department/Shift: MANAGERS, SUPERVISORS, FINISH PLANT OPERATORS, LOADER OPERATIONS

Supervisor (PRINT) NA

Topic (BE SPECIFIC) FUGITIVE DUST PLAN REVIEW (See attached)

Date: 6/26/02 Time: 7:00 am

NAME (PRINT)	SIGNATURE	SOCIAL SECURITY #
Conducted By:		
TIM LACHELL	Timothy F Lachell	192-54-7486
KEN O'BRIEN		093-46-7882
Attended By:		
BRIAN DECATUR	Brian Decatur	118-58-3049
Chris Di Novo		077-44-0734
BRIAN ROBERTS		069-68-9136
Douglas Rivers	Douglas Rivers	133-58-9753.
Mike Radliff	Michael Radliff	076-64-2024
HERBERT MARLOW	H Marlow	258-72-7809
		- -
		- -
		- -
		- -

Comments:

NOTE: Return to Safety when completed.

Policy #: A-5
Rev. #: 3
Issue Date: 09/24/01

NORLITE CREW SAFETY MEETING ATTENDANCE

Department/Shift: MANAGERS, SUPERVISORS, FINISH PLANT OPERATORS, LOADER OPERATORS

Supervisor (PRINT) NA

Topic (BE SPECIFIC) FUGITIVE DUST PLAN REVIEW (See attached)

Date: 8 JULY 02 Time: 1:00PM

NAME (PRINT)	SIGNATURE	SOCIAL SECURITY #
Conducted By:		
KENNETH O'BRIEN		093 - 46 - 7882
Attended By:		
	Timothy Rossi	133 - 66 - 8339
JERRY ACKERMAN	J. Ackerman	087 - 42 - 5785
STANLEY ASHLINE	Stanley Ashline	054 - 42 - 1575
		- -
		- -
		- -
		- -
		- -
		- -
		- -

Comments:

NOTE: Return to Safety when completed.

June 25, 2002

To: See Below

From: Tim Lachell

Re: Training

Ken O'Brien and myself will be conducting training on the Fugitive Dust Plan according to the schedule below. The meetings will be held in the main conference room.

The specific topics to be discussed will be

1) Review a summary of the Fugitive Dust Plan
2) Review Bucket Loader Operator Procedure
3) Review Finish Plant Operator Wind Recordkeeping

<u>Wednesday, June 26, 2002 at 7:00 a.m.</u>

Herb Marlow
Brian Decatur
Brian Roberts
Mike Radcliff
Doug Rivers
Chris Dinova

<u>Wednesday, June 26, 2002 at 3:30 p.m.</u>

Mike Connell
Mike Gilroy
Mike Zinna
Tim Rossi
Tom Berghela
Tom Schmick

<u>Thursday, June 27, 2002 at 7:00 a.m.</u>

Armond Despres
Tim Passer
Jared Wait
Joe Ortiz
Pete Boehkle
Henry St. Gelias
Luigi Cubello

New York State Department of Environmental Conservation
Office of Environmental Quality, Region 4
1150 North Westcott Road, Schenectady, New York 12306-2014
Phone: (518) 357-2045 • **FAX:** (518) 357-2398
Website: www.dec.state.ny.us

Erin M. Crotty
Commissioner

April 25, 2002

Mr. Timothy Lachell
Plant Manager
Norlite Corporation
628 South Saratoga Street
P.O. Box 694
Cohoes, NY 12047

Dear Mr. Lachell:

Our review of Sci-Tech, Inc's December 14, 2001 report of their evaluation of Norlite's 1995 fugitive dust control plan has been completed. The report, submitted as an enclosure to your letter of December 21, 2001, is complete and is approved at this time. You should begin implementing the fugitive dust control plan revisions identified in the report in conjunction with the existing 1995 plan. Please submit an expeditious implementation schedule for the plan revisions.

In accordance with schedule of compliance item #2 of the July 13, 2000 consent order agreement (R4-2000-0420-27), a report of the effectiveness of the fugitive dust control plan shall be submitted by the 10th day of the month following completion of the implemented revisions to the plan.

Sincerely,

R. M. Leone

Ricky M. Leone, P.E.
Regional Air Pollution Control Engineer

cc: E. Brookman

ecc: P. Empie
E. Toomer
B. O'Neill
R. Ostrov
H. Brezner

RL:lg\c:\Leone\Norlite.fugitive.dust.letter.4.wpd

SCI-TECH, INC.
Consulting Environmental Engineers

December 14, 2001

Mr. Timothy Lachell
Plant Manager
Norlite Corporation
628 South Saratoga Street
Cohoes, NY 12047

Dear Mr. Lachell

SUBJECT: Fugitive Dust Plan Report
SCI-TECH Project 21062

The purpose of this letter is to present the fugitive dust plan (FDP) report for the Norlite facility in Cohoes, New York. This report is an update of the August 18, 2000 Fugitive Dust Control Evaluation report previously submitted. The update is a result of various meetings, discussions and correspondence between Norlite, SCI-TECH, environmental counsel, and the New York State Department of Environmental Conservation (NYSDEC). This report incorporates the information presented in the August 31, 2001 Comment/Response letter, the October 30, 2001 bucket loader procedure letter, and the November 26, 2001 NYSDEC bucket loader procedure revision letter.

BACKGROUND

In response to an Order on Consent from NYSDEC, Norlite submitted an FDP Addendum in October 1995. SCI-TECH assisted with the evaluation of the dust sources, the design of the various dust control measures, and the preparation of the dust plan. Following acceptance of the plan, Norlite began implementation of the control measures specified. Equipment installation was completed and approved by NYSDEC in November 1996.

According to Norlite personnel, the implementation of the dust control measures dramatically reduced the amount of fugitive dust generated by facility operations. As a result, the incidence of complaints by abutting property owners has been virtually eliminated. However, in late January 2000, a rare combination of meteorological conditions (i.e., no snow cover, dry, strong easterly winds) resulted in dust migrating across the eastern boundary of the facility and complaints were registered. A subsequent follow-up by NYSDEC led to a new Order on Consent (R4-2000-0420-27) in July 2000.

The new Order on Consent stipulated that Norlite conduct a reevaluation of the FDP to ensure that the plan was being properly implemented. The evaluation was to also include any recommendations for revisions to the plan to address new sources or changes in operational procedures. SCI-TECH was retained by Norlite to conduct the evaluation and submit a report on the findings.

SCI-TECH conducted the evaluation and submitted a report dated August 18, 2000. The report was evaluated by NYSDEC and their response was presented to Norlite in a letter dated January 24, 2001. In that response, NYSDEC indicated that the plan was incomplete and that they could not approve it without certain additions and clarifications. A second Order on Consent (R4-2001-0102-2) was issued in July 2001.

Norlite submitted a letter of response to the comments by NYSDEC on August 31, 2001. A subsequent letter from Norlite, dated October 30, 2001 provided additional information requested by NYSDEC. A final letter from NYSDEC, dated November 26, 2001, offered some minor wording suggestions to the procedure presented in the October 30 letter. The report presented below incorporates all of the pertinent information contained in the correspondence.

METHODOLOGY

SCI-TECH conducted the evaluation in the following manner:

1. The October 1995 FDP was reviewed.
2. A site visit was conducted on July 27, 2000. During the visit, the following occurred:
    a) A meeting was held with Norlite personnel to discuss the FDP, changes made to the plan due to operational experience, sources added to the facility since the drafting of the plan, and "problem" areas noted during day to day activities.
    b) A walk through of the facility was conducted and all processes were observed.
    c) A second meeting was held with facility personnel to discuss the observations made during the site inspection and to obtain feedback on possible control schemes.
3. A meeting was held on August 8, 2001 with representatives from NYSDEC to obtain their input regarding dust observations.
4. Input from the community was obtained in the following manner. Norlite consistently monitors the housing complex east of its facility. Tim Lachell, Plant Manager, visits the housing complex on a daily basis to ensure that the plant operations are not having an adverse impact on their property. In the past, Norlite has provided the residents with a phone number and contact to call regarding fugitive dust issues. A log is kept of all phone calls. In addition, in order to address and keep abreast of neighbor's complaints, Norlite has established a line of communication with the Mayor of the City of Cohoes. The Mayor has agreed to keep Norlite abreast of any complaints or

issues arising out of Norlite's operations. In return, Norlite has agreed to be responsive to the Mayor's request for assistance in addressing such complaints. At this time, Norlite believes that its existing community relation program is successful in addressing the concerns of its neighbors.

RESULTS

As a result of the evaluation, it can be concluded that (1) the majority of the dust sources are being effectively controlled in accordance with the FDP, (2) there have been some changes to the implemented controls for a few of the sources due to operational needs or customer requirements, and (3) there are several areas where revised or additional controls are recommended. These three conclusions are discussed below.

Sources Controlled According to the FDP

The following sources are being controlled in accordance with the specifications of the October 1995 FDP Addendum:

- Finish Plant Crusher, Screens and Transfer Points – Baghouses and bin vents installed and maintained.
- Windblown Dust Migrating Across Eastern Boundary – Trees planted on raised berm. Trees healthy and growing.
- Finish Mill Short Term Storage Piles – Sprinklers installed and operating.
- Improved Baghouse on Soda Ash Silo – Installed and maintained.
- Railcar and Truck Loading – Loading of trucks for block mix moved westward, further from the eastern boundary, near the wastewater treatment plant. Railcars only loaded one or two at a time. Loading curtailed during adverse meteorological conditions.
- Finished Product Storage Silo – Bin vent installed and maintained. Drop chutes repaired and maintained.
- Shipping Tunnel Mouth – Maintenance procedures followed. Area enclosed and vented to baghouse.
- Block Mix Storage – Piles properly maintained.
- Kiln Seals – Seals routinely maintained.
- Baghouse Dust Unloading Via Vacuum Truck – Procedure followed.

- Housekeeping and General Items – Inspections being performed.

- Norlite Direct Line – Installed and maintained.

- Finishing Plant Operations – Schedules adhered to.

- Winter Operations – Spraying occurring at all times when temperatures are above freezing. Some operations continue with spraying at below freezing temperatures where possible.

Based on the walk through and discussions with facility personnel, the dust control measures and operational procedures for these sources are sufficient to maintain dust generation at acceptable levels, i.e., contained within the boundaries of the property. There are no recommendations for changes to the dust control methodologies for these sources.

Sources With Changes to the FDP Control Specifications

The following sources have control methodologies that deviate from those specified in the October 1995 FDP. The reasons for the deviations are provided.

- Outdoor Fines Storage – The FDP specified that the lightweight aggregate fines be conveyed from the storage silo using the new radial stacker. The fines would then be loaded onto a truck the same day. This methodology was based on anticipation of only a few orders for this product on a stand-alone basis per year. Subsequent to the plan, a customer came forth that required the fines for a specific product – wallboard. Not only was the customer in need of significant quantities of fines, but the fines had to be free of contamination (i.e., no material greater than number 4 mesh). The use of the radial stacker to place the fines in piles for subsequent loading to trucks had to be eliminated since it was found that this practice could not guarantee contaminant-free product. There was also a problem with the frequent switching of product lines on the conveyor and radial stacker (aggregate fines versus block mix). The only feasible solution at this time is to remove the aggregate fines from the silo through the north hatch of the structure. A short-term storage pile is formed at this location and trucks are loaded from this pile. However, when the hatch is not covered by product, dust boil up in the silo can exhaust through the opening. There is also the possibility of wind blown dust generation from the fines pile. Recommendations for control measures for this source are discussed later in the report.

- Finish Mill Block Mix Production – The field conveyor and radial stacker were installed. Overhead water sprays are used to assist with dust suppression. The operators have been instructed to limit the drop distance from the stacker to the pile. However, rods were not installed on the bottom of the stacker to indicate the drop distance. Likewise, there are problems with end of run situations whereby the stone silos are empty and only baghouse dust is being added to the belt. These problem areas are addressed in the recommendation section of this report.

- Clinker Dust to Clinker Belt – From an operational standpoint, it was found that conveying the Barron system hopper dust to the baghouse dust silos in dry form was not the best solution to the problem. Instead, the dust drops into a sealed drum that is suspended over a pit to the side of the clinker conveyor. When the drum is filled, a valve is opened, and the dust falls into the pit, where it is wetted as needed. The material is then transported via loader to the clinker pile. This method does not result in dust generation.

- Roadways – The control measures specified in the FDP are generally being followed. In addition to these control measures, there are times when both watering trucks are utilized to curtail road dust. Also, in an effort to address winter conditions where the unpaved roads can not be watered due to icing, Norlite is paving various sections of road and will continue to do so where feasible. However, the water truck driver is supposed to be dedicated to watering the roads and nothing else and this is not always the case. Also, the truck loading area between the block mix pile and the portable crusher is sometimes overlooked. These concerns are addressed in the recommendations.

- Primary Crusher Area – The control measures specified in the plan are being followed with one exception. The plan called for fine water sprays to be used in certain areas. However, it has subsequently been determined that the nozzles designed to produce such fine sprays can not be properly maintained to last under the conditions associated with these operations. The nozzles continually plugged and were not as useful in winter conditions, resulting in periods with inadequate water spray. Norlite replaced the fine nozzles with coarse, garden hose type nozzles. Observations of these nozzles indicate that they are effective in controlling the dust generated from this area. In addition, Norlite has found that adequate dust control can be maintained during winter conditions by wetting the quarried rock prior to loading it into the primary crusher.

- Kiln Clinker Conveyors – For reasons similar to those stated above for the primary crusher area, the spray nozzles for the kiln clinker conveyors were changed from fine to coarse. This change also helped to eliminate the redirection of the sprays during windy conditions. The coarse sprays perform at least as well as the fine sprays. However, there are additional recommendations for this area, as discussed later in this report.

- Stacking Tubes – The plan specifies rubber flaps over the holes in the ¾'s stacking tube. The flaps were installed and, in addition, water was introduced into the tube to prevent dust generation. This system was observed to work well in eliminating dust in this area.

- Drilling and Blasting – The plan did not contain any specific control measures for these quarry operations. Subsequent to the plan, Norlite has changed the quarry operations such that drilling and blasting are now performed on fewer days per year. This was accomplished by opening up more rock face. The result of this operational change is that drilling and blasting can now be restricted to days that have meteorological conditions favorable to preventing fugitive dust from leaving the pit area.

Areas Where Controls Need to be Modified or Added

There are several specific dust sources and areas that require new controls, or modifications to existing controls. Recommendations for controls for these sources and areas are discussed below.

- Finishing Plant Operations – Due to the fine nature of the material being processed at the Finish Mill, wind speed becomes a significant factor in dust generation. As part of the original FDP, Norlite installed an anemometer near the eastern property boundary tree line. Currently, the anemometer is monitored every two hours and wind speed, direction, and air temperature are manually recorded. According to facility personnel, this instrument has the capability of triggering an alarm when a pre-set parameter value is reached. Based on a review of the current anemometer location and parameter recording procedures, SCI-TECH recommends the following changes:

  1) Relocate the existing anemometer to the top of the old shipping tower. The vane and cups should be approximately 10 feet above the height of the tower.

  2) Relocate the digital meteorological parameter readout to the finish plant control room.

  3) Connect the wind speed output of the anemometer via splitter to a series of three different alarms. At the time of initial installation, configure the system such that the first alarm is activated at a wind speed of 10 mph, the second alarm at 15 mph, and the third alarm at 20 mph. These nominal wind speed/alarm set points should be adjusted over time to reflect operational experience with wind speed versus dust generation. The goal will be to have the first alarm activated at a wind speed that is

just below that required to generate wind blown dust from the operations of concern. The second alarm should be activated at a wind speed where additional mitigation measures, e.g., water sprays, might be required. The third alarm should be activated at a wind speed where operations may have to be temporarily curtailed.

4) Develop a procedure for the finish plant operator to follow when each different alarm is activated. The procedure should be posted in the control room along with a logbook for recording meteorological parameters. A draft of such a procedure is included herein as Attachment A.

- Block Mix Conveyor to Radial Stacker – During the site investigation, it was noted that fines from this conveyor were falling to the ground as a result of material sticking to the underside of the conveyor and being subsequently removed by scraper bars. The conveyor is covered and the transfer points are controlled with bin vents. However, the underside of the conveyor is exposed and the removed material was observed to be entrained by the wind. According to Norlite personnel, this primarily occurs during humid conditions, which causes the fines to stick to the belt. For this very reason, water can not be added to the material on the belt since this would only result in more material adhering to the underside of the conveyor. To address this potential dust source, it is recommended that improvements to the design of the transfer point between the Block Mix Conveyor and the Radial Stacker be investigated. The goal is to eliminate or minimize any carry back of dust on the conveyor belt. The areas to be investigated include the following: improved belt scrapers and belt cleaners, redesign of the dust tailings hopper to avoid buildup in the dead zone areas, installation of a rotary air seal at the Radial Stacker pivot point, and/or an improved bin vent negative draft system. In addition, it is recommended that the block mix run be stopped after a prescribed length of time, nominally 45 minutes, to prevent the end of run situation whereby the stone silos are empty and only baghouse dust is being added to the belt.

- Radial Stacker – To ensure that the proper drop distance from the radial stacker to the pile is not exceeded, it is recommended that 18 inch long, brightly colored rods be attached to the stacker discharge. It is also recommended that Norlite reeducate their operators and update the training plan to ensure that the operators are aware of and implement the established operating practices required to mitigate dust. The operating practices for the radial stacker should include the wind speed related mitigation procedure presented in Attachment A.

- Portable Crusher – The portable crusher is located to the south of the radial stacker and conveyor. This is a new process that was installed subsequent to the FDP. The crusher is used to generate structural material, as well as number 4 mesh minus fines used in the production of block mix. The material that is fed into the portable crusher is wet. The moisture carries through the process resulting in little or no dust generation. However, it has been noted that under periods of strong winds, the fines at the end of the conveyor where it is being dropped onto the pile can be subject to wind stripping. To prevent this source of dust generation, it is recommended that the end of the conveyor be enclosed in a drop box. After the installation of the drop box, if fines are still being stripped at the bottom of the drop box discharge, then it is recommended that a telescopic chute be added to the bottom of the drop box. In addition to these measures, it is recommended that the operating practices for the portable crusher include the wind speed related mitigation procedure presented in Attachment A.

- Kiln Clinker Storage Piles – The current control system for these piles is a combination of three downward-facing, coarse spray nozzles at the end of the conveyor along with sprays in the head pulley discharge. This system provides adequate control of the material being dropped onto the piles, but does not adequately address the activities associated with the use of a bucket loader for transferring material from clinker pile 2 to clinker pile 1 (pile 1 has an underground feed to the finishing building). On rare occasions, the bucket loader will hit a "dry" pocket of material when digging into pile 2. This situation may result in some dust boil-up when the material is transferred and unloaded onto pile 1. A key to the prevention of the boil-up situation is operator training. It is recommended that a specific bucket loader operational procedure be developed in order to properly train operators. A draft procedure is presented as Attachment B. To further address this dust source, it is recommended that the control system be modified/augmented. First, the downward-facing nozzles should be turned outward approximately 45 degrees so that the area covered by the water sprays is greatly extended outwards. This should address the bucket loader activities. However, if this change does not address all of the dust, then it is recommended that the overhead sprinkler sprays, or other watering mechanism, be used to further extend the coverage. Note, however, that these sprays can not be used in icing conditions. It is also recommended that water sprays on the belt itself be further investigated to cool and clean the clinker prior to the discharge point.

- Aggregate Fines – As discussed in the previous section, the aggregate fines are removed from the storage silo through a hatch on the north side of the structure. This was a change from the October 1995 FDP due to customer requirements. To prevent dust generated within the silo from exhausting through the opening when it is not covered by product, it is recommended that a flexible covering be installed. The covering can be either rubber or plastic strips, or else a lightweight metal door hinged at the top. It is also recommended that a windscreen be installed. Attachment C is a sketch depicting the recommended location and dimensions of the windscreen. The depicted design will mitigate dust generation from the working pile directly below the silo discharge door, as well as the adjacent temporary pile, without significantly interfering with the product handling operations.

- Road Watering – As discussed previously, the road watering for the most part is adequate. However there are two concerns: the dedication of the drivers and the frequency of watering the truck loading area between the block mix pile and the portable crusher. To address these concerns, it is recommended that Norlite have two full-time drivers that are responsible for operating the water trucks from 6 a.m. to 6 p.m. each weekday and partially on Saturday during the peak watering season. The drivers should be instructed to focus on the eastern part of the plant on dry days.

IMPLEMENTATION SCHEDULE

Within 15 days of receipt of Departmental approval, Norlite should prepare and submit a schedule of implementation for the items addressed in this letter. A summary of the implementation items is presented in Attachment D.

Pursuant to Order on Consent R4-2000-0420-27, Schedule of Compliance #2, SCI-TECH will prepare a one-time, final report on the effectiveness of the revisions of the Fugitive Dust Control Plan. The report will be filed by the tenth of the month following the first full calendar month after the items on the implementation schedule have been completed in their entirety.

Sincerely,

SCI-TECH, INC.

Edward T. Brookman

Edward T. Brookman, P.E.
Principal Consulting Engineer

OF NEW YORK
THUR BRACKELL
7555
LICENSED PROFESSIONAL ENGINEER

ATTACHMENT A
WIND SPEED RELATED MITIGATION PROCEDURE
TO PREVENT FUGITIVE DUST FROM CROSSING THE EASTERN PLANT BOUNDARY

Level 1: *Normal Operating Conditions.* During the operating hours of the Finish Plant and/or adjacent processes (e.g., portable crusher), the operator should, to the extent practical, record the following parameters on an hourly basis: date, time, wind speed, wind direction, and temperature.

Level 2: *First Alarm Activated.* Operator shall continue with Level 1 activity and additionally record the time of occurrence of the alarm activation, as well as wind speed and direction, and shall, subject to his operational experience and judgement, maintain the procedures set forth below until the alarm is deactivated or the next higher level is attained.

1) Operator shall visually observe the processing area(s) for fugitive dust being generated and record such observations and continue the observation every 30 minutes. Should the alarm deactivate in less than 30 minutes, the operator is to make a record 30 minutes after the initial occurrence.
2) If the operator observes fugitive dust being generated, the operator is to increase and/or add additional water control measures at the area(s) of generation. This may include, but is not limited to, overhead spray and use of the water truck.

Level 3: *Second Alarm Activated.* Operator shall continue with Level 2 activity and additionally record the time of occurrence of the alarm activation, as well as wind speed and direction, and shall, subject to his operational experience and judgement, maintain the procedures set forth below until the alarm is deactivated or the next higher level is attained.

1) Maintain activities in Level 2.
2) Notify the on-site supervisor of the alarm activation.
3) The on-site supervisor shall specify and control additional mitigation measures, direct the operator(s), and will prepare a report for file.

Level 4: *Third Alarm Activated.* Operator shall continue with Level 3 activity and additionally record the time of occurrence of the alarm activation, as well as wind speed and direction, and shall maintain the procedures set forth below until the alarm is deactivated.

1) The on-site supervisor shall determine if operation of a process or processes shall continue and will prepare a report for file.

Regardless of the alarm activation system, the operator shall use his or her operational experience and judgement to mitigate the potential for fugitive dust being carried beyond the area of the finish plant operations to adversely impact the neighboring community.

ATTACHMENT B
BUCKET LOADER OPERATOR PROCEDURES

Purpose:
Provide guidelines to bucket loader operators for moving aggregate type materials to minimize dust "boil-up" to prevent offsite migration of dust during material transfer activities consistent with the principals of the fugitive dust plan.

Weather Conditions and Product Moisture Content :
Bucket loader operators need to maintain awareness at all times of product moisture content, and current wind conditions via visible sightings such as, but not limited, to stack plumes, wind socks, and/or anemometer stations. Bucket loader operators need to alter operations accordingly as wind conditions and product moisture content change up to and including cessation of operations. If the bucket loader operator is creating dust "boil-up" conditions which migrate offsite, the following steps will be taken:

1. Discontinue moving product, or
2. Increase product moisture by adding enough water to product to eliminate offsite migration.

Work Area:
Bucket loader operators need to maintain awareness at all times of visible moisture content of the travel areas in their work area. Bucket loader operators need to alter operations accordingly, to the extent practical, as moisture conditions change.

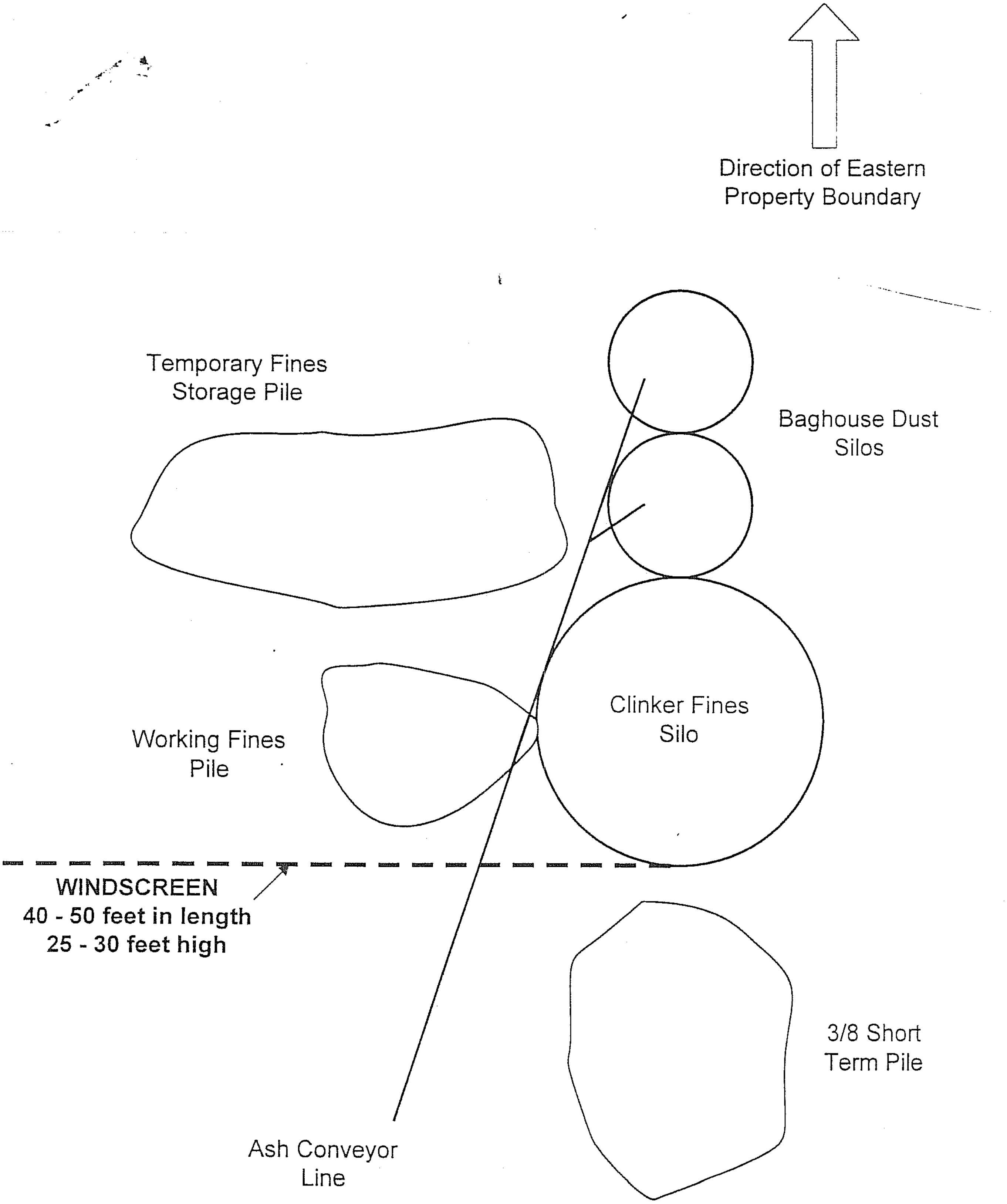
Material Movement:
As a general work practice, bucket loader operators should follow the good operating procedures described below:

Pile to Pile:
Bucket loader operators should approach stockpiles at ground level with a level bucket. When the bucket has achieved maximum depth into the stockpile, the bucket loader operator will perform a full "roll-back" of the loaded bucket before extracting from the stockpile. While transporting materials, the loaded bucket will be held at the lowest practical point until reaching the receiving stockpile. At the receiving stockpile the bucket loader operator will work at a minimum height to the pile to allow material to "roll-out" of the bucket and onto the pile to minimize dust generation.

Pile to Container:
Containers include, but are not limited to, truck bodies, railcars, feeders, hoppers, etc. Bucket loader operators should approach stockpiles at ground level with a level bucket. When the bucket has achieved maximum depth into the stockpile, the bucket loader operator will perform a full "roll-back" of the loaded bucket before extracting from the stockpile. Bucket loader operators will approach a container with the loaded bucket at the lowest practical point during travel and lift in a fashion as to maintain an even operating plane with the container. Bucket loader operators will achieve a minimum height to allow the material to "roll-out" into the container to minimum dust generation.

The above-described practices are proposed operating procedures to minimize the generation of dust to prevent offsite migration during the movement of the bucket loader and the movement of aggregate type materials. These practices are to be implemented with common sense to minimize the generation of dust.

ATTACHMENT C
SKETCH OF WINDSCREEN INSTALLATION



ATTACHMENT D
SUMMARY LIST OF ITEMS REQUIRING IMPLEMENTATION

1) Installation of a drop box at the head pulley of the fines conveyor on the portable crusher.

2) Extension of Kiln Clinker Belt Spray Headers.

3) Aggregate Fines Storage:

    a) Install door cover on north door.

    b) Install Windscreen.

4) Improve transfer point between the Block Mix Conveyor and the Radial Stacker.

5) Relocate and install anemometer station with alarms and procedures.

6) Incorporate Bucket Loader Operating Procedures.

7) Attach 18 inch long rods to Radial Stacker discharge.

SR SCHODER RIVERS ASSOCIATES
CONSULTING ENGINEERS, P.C.

Prospect's Rise Professional Offices
2315-2 Route 9N
Lake George, NY 12845

FAX COVER SHEET

September 10, 2002

Project: Wind Screen
Sender: Shaun Rivers

ATTENTION

COMPANY **Norlite Corporation**
NAME **Brian Decatur**
ADDRESS **Cohoes, NY 12047**
FAX # **235-0233**

SENDING 2 PAGES.

COMMENTS: Brian, Attached is a sketch and some notes for the installation of the wind screen support poles.

CC:

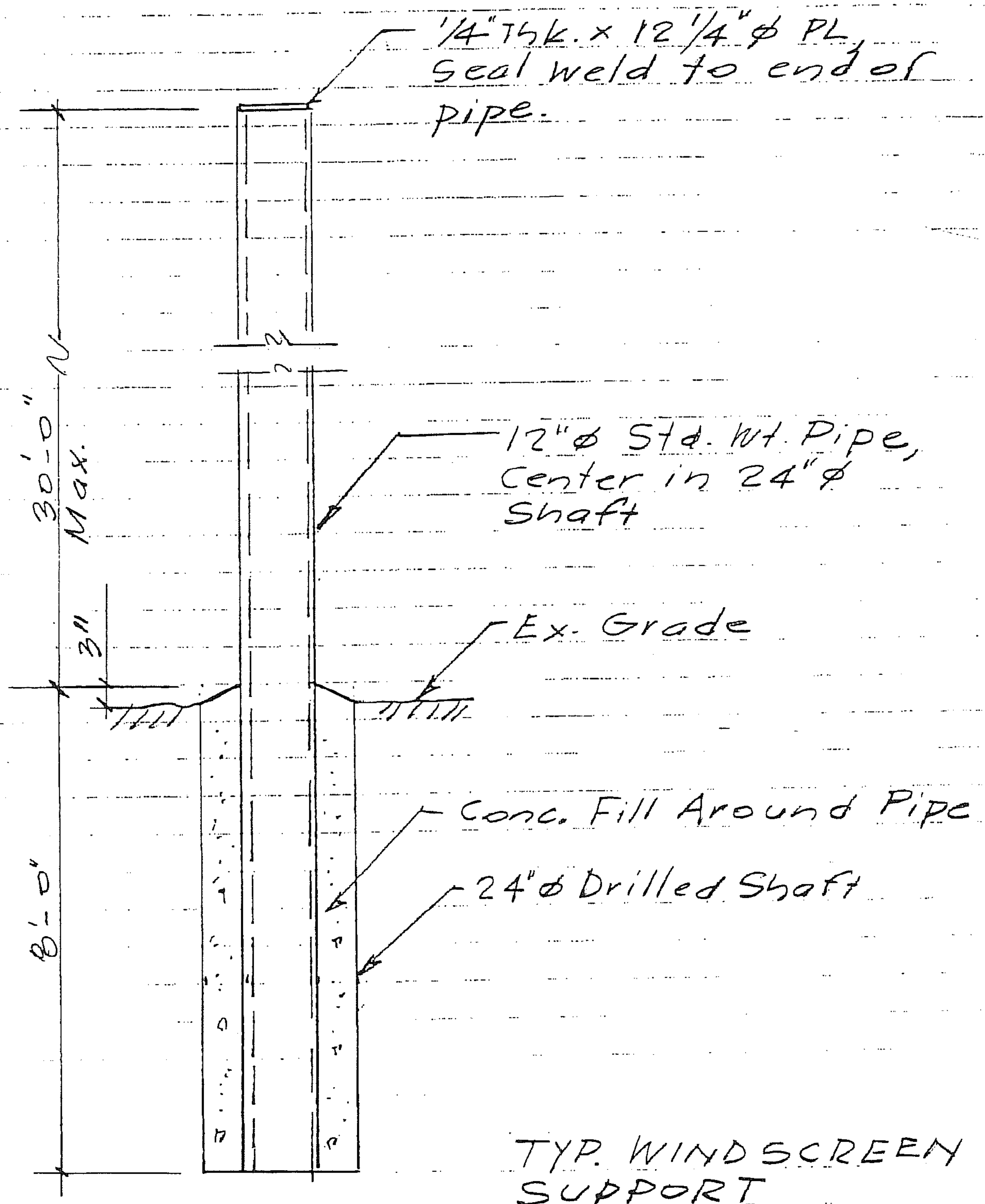
SCHODER RIVERS ASSOCIATES
CONSULTING ENGINEERS, P.C.
2315-2 Route 9N
Lake George, New York 12845
T: (518) 668-2918
F: (518) 668-2919

PROJECT TITLE: Norlite Wind Screen

SHEET TITLE: Typ. Wind Screen Support

Proj. No.: 02-202
Date: 9-10-02
Scale: None
Drawn By: SMR
Chk. By: –
Modifies Dwg. No.: –

DRAWING NO. SK-1



TYP. WINDSCREEN SUPPORT

SCHODER RIVERS ASSOCIATES
CONSULTING ENGINEERS, P.C.
2315-2 Route 9N
Lake George, New York 12845
(518) 668-2918
(518) 668-2919

PROJECT TITLE Norlite Wind Screen		DRAWING NO. SK-2
SHEET TITLE Wind Screen Support Notes		
Proj. No.: 02.202	Date: 9.10.02	Scale: N.A.
Drawn By: SMR	Chk. By: —	Modifies Dwg. No.: –

GENERAL NOTES

1. SUPPORT POST FOR WIND SCREEN SHALL BE SPACED AT A MAXIMUM CENTER TO CENTER DISTANCE OF 13 FEET.

2. WIND SCREEN FENCE SHALL BE ATTACHED TO STEEL PIPE IN ACCORDANCE WITH THE FENCE MANUFACTURER'S RECOMMENDATIONS.

3. MATERIAL REQUIREMENTS FOR VARIOUS STEEL SHAPES ARE AS FOLLOWS:

   PIPES – ASTM A53
   MISC. PLATES – ASTM A36

4. WELDING SHALL BE IN CONFORMANCE WITH THE LATEST AWS CODE. WELDING ELECTRODES SHALL CONFORM TO E70 SERIES.

5. PORTION OF PIPE WHICH IS ABOVE GRADE STEEL SHALL BE CLEANED AND PAINTED AS FOLLOWS:

   CLEAN STEEL IN ACCORDANCE WITH SSPC–SP3, POWER TOOL CLEANING. ALL STEEL SHALL BE SHOP COATED WITH ONE COAT, 2 – 3 mils D.F.T. ALKYD PRIMER/FINISH , CARBOLINE MULTI–BOND 150 OR EQUIVALENT. TOP COAT IN THE FIELD WITH ONE COAT OF THE SAME PRODUCT AT 2–3 mils D.F.T.

6. ALL CONCRETE SHALL HAVE A COMPRESSIVE STRENGTH f'c @ 28 DAYS OF 4000 PSI. MAXIMUM SLUMP SHALL BE 3". ALL CONCRETE SHALL BE AIR–ENTRAINED TO AN AIR CONTENT OF 4% TO 6%. ALL CONCRETE SHALL BE PLACED IN ACCORDANCE WITH ACI 304 "GUIDE FOR MEASURING, MIXING, TRANSPORTING AND PLACING CONCRETE". CONSOLIDATE PLACED CONCRETE BY MECHANICAL VIBRATION.

Centaur
The Horse Friendly Fence

September 12, 2002

Request for Quotation:
Brian Decatur
Norlite
United Industrial Services

50' long, 25' high, 50% porosity Wind Control Fence, on 13' post centers.

50' run of 25' high wind fence on 13' post centers will require the following Centaur product and components:

30 runs of wind fence, every five inches apart equals 1,515 linear feet of fence, or three rolls of Centaur, 660' each.

Three rolls @$289 per roll	$867.00

50' run on 13' centers would be two terminations or end post and three line-post. Each run would require two one-way end post Tensioners, and each run would require a bracket per line post.

90 Steel brackets @ $.77 each, min. 100 bracket purchase	$77.00
60 One-way end post Tensioners @ $29 each	$1,740.00
Grand total, FOB: Muscle Shoals, AL	$2,684.00

Delivery: Two Weeks ARO (after receipt of order)

Centaur HTP® Fencing Systems
2802 E. Avalon Avenue, Muscle Shoals, AL 35661-3748 (256) 248-2403 • 1-800-368-7635 • FAX: 1-800-942-3397
Visit our Web Site at www.centaurhtp.com

Norlite Corporation

628 SO. SARATOGA ST.
P.O. BOX 694
COHOES, NY 12047
PHONE (518) 235-0401
FAX (518) 235-0233

January 9, 2003

Mr. Ricky M. Leone, P.E.
Regional Air Pollution Control Engineer
New York State Department of Environmental Conservation
Region 4
1150 North Wescott Road
Schenectady, NY 12306-2014

Via Certified Mail: 7001-0320-0001-8803-1925

Dear Mr. Leone,

This submittal is pursuant to Consent Order R4-2001-0102-2, Schedule of Compliance # 7 and in conjunction with Consent Order R4-2000-0420-27. The attached report is pursuant to Consent Order R4-2000-0420-27 Item # 2. This report completes the Fugitive Dust Plan Amendments according to the above referenced Consent Orders.

For your records, I have enclosed 2 original PE stamped copies of the report.

If you have any questions, please feel free to contact me.

Sincerely,

Timothy F Lachell

Timothy F. Lachell
Plant Manager

cc: Ed Brookman—SCI Tech

File:c:\wp60\text\tim\t01090301.wpd

SCI-TECH, INC.
Consulting Environmental Engineers

December 31, 2002

Mr. Timothy Lachell
Plant Manager
Norlite Corporation
628 South Saratoga Street
Cohoes, NY 12047

Dear Mr. Lachell

SUBJECT: Inspection Report – Fugitive Dust Plan
SCI-TECH Project 21062

This letter presents the results of an inspection conducted at the Norlite facility in Cohoes, New York on December 30, 2002. The purpose of the inspection was to review the effectiveness of the dust controls implemented in accordance with the NYSDEC-approved December 14, 2001 Fugitive Dust Plan (FDP) report. The inspection and this report complete Compliance Item #2 of consent order R4-2000-0420-27.

BACKGROUND

In response to an Order on Consent from NYSDEC, Norlite submitted an FDP Addendum in October 1995. SCI-TECH assisted with the evaluation of the dust sources, the design of the various dust control measures, and the preparation of the dust plan. Following acceptance of the plan, Norlite began implementation of the control measures specified. Equipment installation was completed and approved by NYSDEC in November 1996.

According to Norlite personnel, the implementation of the dust control measures dramatically reduced the amount of fugitive dust generated by facility operations. As a result, the incidence of complaints by abutting property owners has been virtually eliminated. However, in late January 2000, a rare combination of meteorological conditions (i.e., no snow cover, dry, strong easterly winds) resulted in dust migrating across the eastern boundary of the facility and complaints were registered. A subsequent follow-up by NYSDEC led to a new Order on Consent (R4-2000-0420-27) in July 2000.

The new Order on Consent stipulated that Norlite conduct a reevaluation of the FDP to ensure that the plan was being properly implemented. The evaluation was to also include any recommendations for revisions to the plan to address new sources or changes in operational procedures. SCI-TECH was retained by Norlite to conduct the evaluation and submit a report on the findings.

SCI-TECH conducted the evaluation and submitted a report dated August 18, 2000. The report was evaluated by NYSDEC and their response was presented to Norlite in a letter dated January 24, 2001. In that response, NYSDEC indicated that the plan was incomplete and that they could not approve it without certain additions and clarifications. A second Order on Consent (R4-2001-0102-2) was issued in July 2001.

Norlite submitted a letter of response to the comments by NYSDEC on August 31, 2001. A subsequent letter from Norlite, dated October 30, 2001 provided additional information requested by NYSDEC. A letter from NYSDEC, dated November 26, 2001, offered some minor wording suggestions to the procedure presented in the October 30 letter. The report submitted on December 14, 2001 incorporated all of the pertinent information contained in the correspondence. NYSDEC granted approval of the plan in a letter dated April 25, 2002.

Following plan approval, Norlite began to implement the dust control measures specified in the December 14, 2001 report. The implementation was completed by October 2002.

INSPECTION METHODOLOGY AND RESULTS

The December 14, 2001 FDP specified seven areas where new/additional controls/procedures needed to be implemented. These seven areas were the following:

- Finishing plant operations
- Block mix conveyor to radial stacker
- Radial stacker
- Portable crusher
- Kiln clinker storage piles
- Aggregate fines storage
- Road watering

The specific recommendations for each of these areas are given in the attachments to this letter. Also presented in the attachments are Norlite's responses to these recommendations.

On December 30, 2002, SCI-TECH visited the Norlite facility. Prior to examining the newly installed controls and procedures, a meeting was held with Mr. Timothy Lachell, Plant Manager, and Mr. Kenneth O'Brien, Aggregates Production Manager, to discuss the implementation of the recommendations and to obtain their feedback on the overall effectiveness. SCI-TECH then inspected each of the controls and procedures implemented by Norlite for the seven areas identified in the FDP. The observations made by SCI-TECH are presented in the attachments.

CONCLUSIONS

The recommendations contained in the December 14, 2001 FDP have been implemented. Based on an inspection conducted by SCI-TECH on December 30, 2002, in conjunction with discussions with facility personnel, the new controls and procedures appear to adequately address the dust generated by the identified sources. It should be noted, however, that there was insufficient wind during the time of the inspection to properly determine the effectiveness of the windscreen in reducing windblown dust in the area of the aggregate fines storage pile.

If you have any questions or comments regarding the information presented in this letter, please do not hesitate to give me a call at (860) 257-0767, ext. 214.

Sincerely,

SCI-TECH, INC.

Edward T. Brookman

Edward T. Brookman, P.E.
Principal Consulting Engineer

State of New York
Eugene Arthur Brackbill
Licensed Professional Engineer

Eugene A. Brackbill

FINISHING PLANT OPERATIONS

FDP RECOMMENDATIONS:

- Relocate anemometer to top of old shipping tower
- Locate vane and cups approximately ten feet above height of tower
- Locate digital meteorological parameter readout to finishing plant control room
- Establish procedure with alarms for various windspeed regimes
- Post procedure in control room
- Establish logbook for recording meteorological parameters

NORLITE RESPONSE:

- Installed new anemometer approximately ten feet above the top of the old shipping tower
- Installed meteorological readouts in finishing plant control room with alarms set at 10 mph, 15 mph, and 20 mph
- Put approved procedure in place
- Established a logsheet for recording meteorological parameters and a logsheet for recording the occurrence of any alarm and the response by facility personnel

OBSERVATIONS:

The location of the anemometer was noted. The anemometer is adequately sited.

The control room operator was interviewed to determine his knowledge of the approved procedure. The operator appeared to be properly trained and understood the procedure to be followed should an alarm sound.

The logsheets were examined and appeared to represent adequate documentation of meteorological conditions, alarm situations, and facility responses.

Note that discussions with the operator and supervisor indicated that windblown dust essentially does not occur until the indicated windspeed reaches about 17 to 18 mph

BLOCK MIX CONVEYOR TO RADIAL STACKER

FDP RECOMMENDATIONS:

- Redesign/improve transfer point
- Prevent end of run situation by stopping block mix run after a set length of time (e.g., 45 minutes)

NORLITE RESPONSE:

- Installed new tailings hopper with circular outlet and rotating seal, thus improving bin vent negative draft system
- Trained operators such that all block mix runs are stopped prior to end of run situation
- Replaced old belt scrapers with new "Gorden" belt scrapers that are designed for ultrafine screening

OBSERVATIONS:

The conveyors and transfer points were examined during typical operations. The new hopper, seal and scrapers appeared to be doing an exceptional job of eliminating visible dust from the transfer point and any carry-back of dust on the bottom of the conveyor.

RADIAL STACKER

FDP RECOMMENDATIONS:

- Install 18 inch long brightly colored rods to maintain drop distance

NORLITE RESPONSE:

- Attached 18 inch long rods coated with fluorescent paint to the bottom of the radial stacker using short sections of chain

OBSERVATIONS:

The radial stacker was observed in operation. The drop distance was maintained at less than the length of the rods. The radial stacker operator had a clear view of the rods from the control room.

It was noted that the short pieces of chain that were used to attach the rods to the stacker prevented the rods from being jammed back into the stacker, thus eliminating the possibility of equipment damage.

PORTABLE CRUSHER

FDP RECOMMENDATIONS:

- Enclose end of conveyor in a drop box to prevent wind stripping

NORLITE RESPONSE:

- Installed a rigid framework and flexible 3-sided boot around the end of the conveyor
- Operators trained to keep the pile height as near to the bottom of the boot as possible
- Operators trained to shut down portable crusher during excessive wind conditions

OBSERVATIONS:

The combination of the boot and the pile height appeared to adequately address the problem of wind stripping of material exiting the end of the conveyor.

KILN CLINKER STORAGE PILES

FDP RECOMMENDATIONS:

- Establish operating procedure and training for bucket loader operators
- Turn downward-facing nozzles outwards approximately 45 degrees

NORLITE RESPONSE:

- Angled the three spray headers at the heads of Kilns 1 and 2 clinker conveyors to 45 degrees
- Put bucket loader operating procedure in place and trained all operators
- Water sprays are kept on all weekend long as the piles rebuild from the end of week low levels

OBSERVATIONS:

The spray nozzles at the ends of the two conveyors were noted as being angled out approximately 45 degrees. Discussions with facility personnel indicated that this change greatly improved the wetting of the piles.

The continuous wetting of the piles during the weekend was noted as significantly reducing the hot spots that used to form during this period of inactivity; thus significantly reducing the "boil-up" that used to occur when a bucket entered that area of the pile.

AGGREGATE FINES STORAGE

FDP RECOMMENDATIONS:

- Install a flexible covering over the silo hatch
- Install a windscreen

NORLITE RESPONSE:

- Installed a flexible door cover made of rubber strips on the north silo door
- Installed a windscreen approximately 25 feet high and approximately 60 feet long. The screen consists of five inch wide rubber strips placed so that there is a gap of approximately six or seven inches between strips.

OBSERVATIONS:

The rubber flaps over the silo door appear to be adequate to prevent any windstripping of dust from the doorway.

The effectiveness of the screen could not be determined during the site investigation since the ambient windspeed was only in the 5 to 10 mph range. However, a few observations regarding the overall design of the windscreen can be made. Historical windscreen design has typically targeted a maximum porosity of approximately 50 percent. The screen installed at Norlite has porosity in the range of 55 to 58 percent, which is slightly above the targeted value. Also, historical windscreen design typically includes minimal gaps between the bottom of the screen and the ground. The screen installed at Norlite has a fairly wide gap between the bottom of the screen and the ground. The length and height of the screen appear to be adequate to effect reduced windspeeds in the area where fines are stored.

It is recommended that no changes be made to the windscreen at this time. An observational history of its effectiveness must first be established. If the effectiveness of the screen as installed proves to be inadequate to significantly reduce dust generation in the fines storage area, then changes to the screen design will be necessary. Such design changes might include the following: reducing the spacing between the rubber slats by replacing the five inch wide strips with six or seven inch wide strips, adding additional rubber strips between the existing strips, or placing woven "snow fence" on top of the existing strips. It also might be necessary to place concrete barriers or some similar type of obstruction at the base of the fence to prevent accelerated airflow that might occur between the bottom of the last rubber strip and the ground.

ROAD WATERING

FDP RECOMMENDATIONS:

- Have two full-time drivers dedicated to road watering each weekday from 6 a.m. to 6 p.m. and partially on Saturday
- Address truck loading area between block mix pile and the portable crusher

NORLITE RESPONSE:

- Two full-time drivers are dedicated to road watering as conditions may dictate

OBSERVATIONS:

Road watering was not observed during the site investigation since the roads were already wet due to recent snow storms. However, discussions with facility personnel indicated that this recommendation had been adequately addressed.

Norlite Corporation

A ROTARY KILN
Norlite
EXPANDED SHALE AGGREGATE

628 SO. SARATOGA ST.
P.O. BOX 694
COHOES, NY 12047
PHONE (518) 235-0401
FAX (518) 235-0233

February 09, 20111

NYSDEC- Region 4
1130 North Westcott Road
Schenectady, NY 12306

CERTIFIED MAIL#: 7009 0080 0001 4598 5794
RETURN RECEIPT REQUESTED

RE: Order on Consent R4-2009-0610-101
Schedule of Compliance Paragraph 4

Ms. Winterberger:

Norlite is in receipt of your letter dated November 10, 2010 to Thomas Van Vranken of Norlite Corporations. The letter indicates the Department has not approved the Fugitive Dust Plan addendum submitted to the Department on July 16, 2010 to satisfy Paragraph 4 of the Schedule of Compliance. Included with the letter were several comments and questions from the Department regarding plant operations and how the operations affect the Fugitive Dust Plan. Norlite and Department staff met on January 25, 2011 to address the Department's questions and comments. Norlite is submitting a revised 2010 Fugitive Dust Plan Addendum based on the comments from the meeting held on January 25, 2011. The revision has more clearly identified the processes, equipment, and fugitive dust control measures used at the Elm Street Access Road- Gate 1. As the Fugitive Dust Plan is updated and evolves with plant operations, where practical, Norlite will employ a plan structure more consistent with other facility plans.

Should you have any questions regarding the submitted report, please feel free to contact me at 518-235-0401. I can also be reached by email at tvanvranken@norlitecorp.com.

Sincerely,

Thomas M. Van Vranke

Thomas M. Van Vranken
Environmental Manager

2010 Addendum to the Norlite Fugitive Dust Plan

1. INTRODUCTION

An evaluation was made of the activities at the south side of the Norlite facility, generally referenced as Elm Street Access Road Area – Gate 1, with regard to fugitive dust control in accordance with New York State Department of Environmental Conservation (NYSDEC) Order on Consent R4-2009-0610-101. The areas of operation include LWA fines processing, block mix storage and screening, and operation of the Southern Overburden Storage Area. All other areas of the facility will continue to be operated under the 1995 Fugitive Dust Plan (1995 Plan) and the 2002 Addendum. The focus of the 2010 Addendum is to identify the processes, the equipment and fugitive dust control methodology at the Elm Street Access Road – Gate 1.

Exclusive of the Southern Overburden Storage Area the activities at the Fines and Block Mix processing areas are comprised of bucket loader operations as detailed in Attachment B of the 2002 Addendum. The loader operator is to operate in a manner to minimize dust “boil-up” to prevent offsite migration of dust.

The storage and operational areas are approximately ¼ mile from the nearest eastern residential area. On the downwind side (eastern side) is a heavy treed and vegetated buffer, which is an acknowledged dust control mechanism as discussed in the 1995 Plan Section 5.3 on Page 5-9. See attached facility overview photo Figure 1.

All fugitive dust control measures are implemented and construction is complete.

2. FINES PROCESSING AREA

2.1) Process Description

In the fall of 2007 the Astec 2618 Fines Screen was placed into service at the southeastern end of the facility. The process screens lightweight aggregate (LWA) fines, known as 4 X 0 i.e. 4 mesh by 0 mesh, to produce a product known as 8 X 0, i.e. 8 mesh by 0 mesh, with rejects being 4 mesh. The 8 X 0 product is stored for shipment and the 4 mesh rejects are returned to the Finish Plant to be re-incorporated into the lightweight finishing process.

Figure 2 shows the production and location of the 4 X 0 LWA fines at the Finish Plant. The LWA fines are transferred, via haul truck, to the Fines Processing Area shown in Figure 3 at the southeastern end of the facility. Figure 3 shows the complete screening process of the LWA fines including the Screen Feed Hopper, the Astec 2618 Fines Screen, and the feed and discharge piles. Figure 4 shows a close up of the Astec 2618 Fines Screen with a Cedarapids feed hoper used to process the 4 X 0 LWA fines.

The unit operates generally 1 shift per day, Monday through Friday. During peak demand periods additional run hours may be required including weekends.

2.2) Fugitive Dust Control Methodology

Following the Bucket Loader Operating Procedures in Attachment B of the 2002 Addendum, minimizing the amount of storage of uncovered material, and general housekeeping are the most suitable practices for fugitive dust control. The 4 X 0 LWA fines are fed by bucket loader to a feed hopper which then runs the material across a screen and generates 2 streams, the product 8 X 0 and the reject of 4 mesh.

Figure 3 shows the 4 X 0 feed pile, the 4 mesh reject pile, and the 8 X 0 pile.

The 4 X 0 feed pile is filled to maintain enough material to operate for the shift, approximately 100 to 200 tons, to minimize the amount of material in open storage potentially subject to unfavorable wind conditions as described in Attachment A of the 2002 Addendum.

The 4 mesh rejects are moved via haul truck during the work shift to be re-incorporated into the lightweight finishing process and to minimize the volume of stored material. Material produced during the afternoon, evening or weekend shifts may not be moved until the next day or Monday for the weekend shifts.

A covered storage structure was installed and completed in June 2010 for the 8 X 0 product to minimize the exposure of the product to wind effects that may cause dust generation and migration. The storage structure is 55 feet wide by 80 feet long with an arch height of 25 feet tall and is comprised of a steel tube arch structure with a rubberized canvas covering. The storage capacity of the structure is approximately 1,200 tons which is approximately a 2 week supply of product at current demand. As the 8 X 0 mesh product is produced it is moved directly into the storage structure maintaining no outdoor storage of the product.

Figure 5 shows the 8 X 0 storage tent with the 8 X 0 material inside.

The storage structure has allowed more 8 X 0 product to be stored which gives the operation significantly more flexibility to adjust operating schedules should the unit need to be shutdown due to unfavorable wind conditions as described in Attachment A of the 2002 Addendum.

Routine housekeeping activities are to remove belt tailings and spillage.

Water carry through in the LWA material can also be effective in dust control. Norlite balances customer specifications and adequate moisture for dust control of the LWA fines. Customer specification for the 8 X 0 material is 10% or less combined pore bound and surface moisture. Pore bound moisture is more favorable than surface moisture because excessive surface moisture will cause clumping of the material. Therefore adding water to the product by direct spray is detrimental to the product and renders the material unusable (reference the 1995 Plan Section 5.1 on page 5-8).

See Figure 9 to follow the moisture carry through as the 4 X 0 material is screened.

3. BLOCK MIX PROCESSING AREA

3.1) Process Description

This area is used for the storage of block mix and for screening of the material, to remove clumped material caused by excess surface moisture from precipitation or intentional watering activities, prior to shipment. A portable screen was introduced into the operation in 2001 known as the “Reade” Screen. In the fall of 2007 a second screen, known as the “Astec 710T” was introduced as a backup screen to the operation. The screens can be used interchangeably.

Figure 6 shows the Block Mix Processing Area at the Elm Street Access Road. Figure 7 shows a close up photo of the Reade screen. Figure 8 shows a close up photo of the Astec 710T screen also used for screening block mix.

The storage and handling, including the use of heavy loading equipment, of Block Mix at the Elm Street Access Road Area - Gate 1 has been reviewed and incorporated in the Fugitive Dust Plan since 1995, see Section 5.3 on page 5-9. Additionally this area was reviewed in the 2002 Addendum see page 3.

3.2) Fugitive Dust Control Methodology

Pile contouring is important as referenced in the 1995 Plan on page 8-2. The storage piles are shaped to minimize sharp edges which minimizes turbulence and dust entrainment. The working face of the pile should be on the leeward side of the piles namely the northern and eastern side. While minimizing fugitive dust is a primary goal, Norlite must follow safety rules put in place by the Mine Safety & Health Administration (MSHA). MSHA requires berms to be in place on the edge of roadways and ramps to guide equipment away from the edge. The requirement requires the berms to be axle high of the largest piece of equipment which travels the roadway. In many places in the facility, berms may be as high as 3-4 feet.

The Block Mix processing operation is a “pile to container” activity with subsequent “pile to pile” activity and operation according to Attachment B of the 2002 Addendum is required to minimize dust “boil up”. Additionally, the operation in this area is governed by wind conditions as outlined in Attachment A of the 2002 Addendum.

Water carry through in the Block Mix material can also be effective in dust control. Norlite balances customer specifications and adequate moisture for dust control of the Block Mix material. There are generally no maximum limits on the moisture content of the Block Mix. The Block Mix material is wetted as it is produced in the Finish Plant prior to movement to storage at the Gate 1 Area. Pore bound moisture is more favorable than surface moisture because excessive surface moisture will cause clumping of the material. Therefore, adding water to the product by direct spray is detrimental to the product and renders the material unusable (reference the 1995 Plan Section 5.1 on page 5-8).

See Figure 9 to follow the moisture carry through as the Block Mix material is screened.

4. SOUTHERN OVERBURDEN STORAGE AREA

4.1) Process Description

The Southern Overburden Storage Area is approximately a 34 acre parcel on the southwest side of the facility. Clay which is removed from the quarry to expose new shale areas is moved to this area under Norlite's Mine Permit. The clay is placed in a series of compacted berms with a fill area behind each berm. The active work area is typically less than 5 acres. The construction of the berms and fill areas is anticipated to take approximately 10+ years. Work began on this project in the spring of 2008.

The potential for fugitive dust from this area is in the travel ways leading in and out of the construction area as well as the internal travel ways between the quarry and the Southern Overburden Storage Area. The areas where the placement of clay is occurring does not generate fugitive dust due to the high moisture content of the clay, typically 25 to 50%, and the fact that the material is compacted. The compaction process seals the top surface and as it dries forms a hardened crust with little potential for dusting. During the idle seasons the clay berm and fill areas are stabilized with straw or grass.

4.2) Fugitive Dust Control Methodology

Road watering is the best dust control methodology for this construction area. Norlite maintains 2 water trucks and 2 drivers to water the roads as recommended on page 9 of the 2002 Addendum.

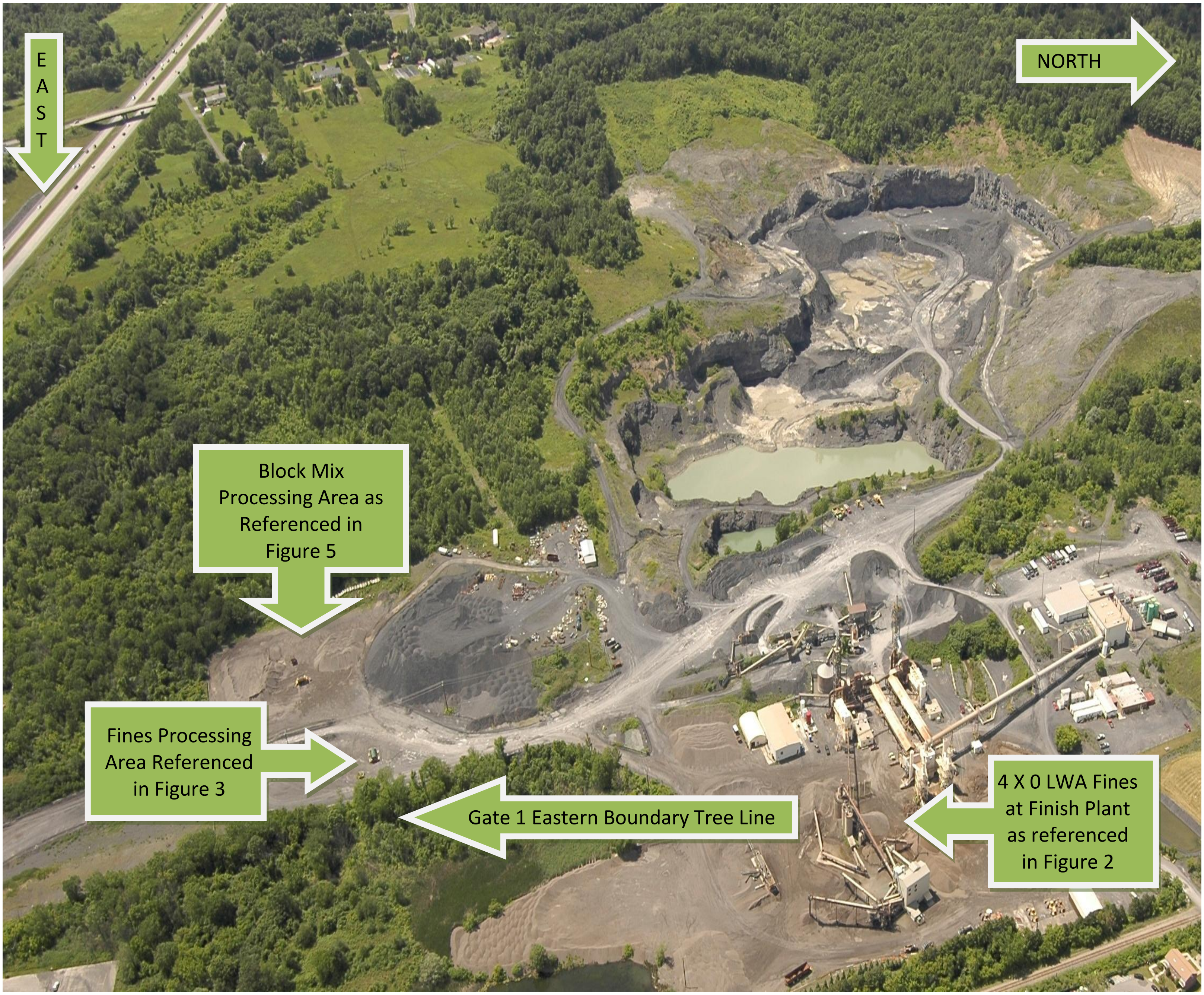


Figure 1. Facility Overview

Figure 2. The 4 X 0 LWA fines are stored at the silo located at the southeast portion of the facility just south of Kiln 1. To minimize dust generation, a 50 % porosity wind screen was installed as part of the 2002 Fugitive Plan Addendum.

Figure 3. 4 X 0 LWA fines processing area. The 4 X 0 LWA fines are brought up from the Finish Plant and placed into a feed pile. The material is then fed into the screen feed hoper. A pile of 4 mesh reject material is created as well as a pile of 8 X 0 material which is placed inside the storage tent.

Figure 4. This is a close up photo of the Cedarapids Feed Hoper and the Astec 2618 Fines Screen used to process the 4 X 0 LWA fines.

Figure 5. 8 X 0 LWA Fines storage tent. The tent allows for up to two weeks of storage of material. The increased covered storage allows the Fines Processing Area to be shutdown during unfavorable wind conditions.

Figure 6. Block Mix Screening area. Block Mix is screened using either the Reade Screen or the Astec 710T to remove large chunk material. It should also be noted the working face of the long term storage pill is on the east side (leeward). The prevailing winds are out of the west and south.

Figure 7. The Reade screen is used to screen material from the long term block mix storage pile to remove clumped material or large frozen material. The Reade screen and the Astec 710T can be used interchangeably.

Figure 8. The Astec 710T screen is used to screen material from the long term block mix storage pile to remove clumped material or large frozen material. The Astec 710T and the Read screen can be used interchangeably.

Figure 9.

Aggregate Moisture Carry Through

Fines Aggregate Materials

Material	Location	Total Typical Percent Moisture (%)	Figure Reference
4 X 0 LWA Fines	Finish Plant	5-8	Figure 2
4 mesh reject	Fines Processing Area	5-8	Figure 3
4 X 0 LWA Fines	Feed Pile	5-8	Figure 4
8 x 0 material	Fines Processing Area	5-8	Figure 5

Block Mix Aggregate Materials

Material	Location	Total Typical Percent Moisture (%)	Figure Reference
Block Mix Long Term Storage Pile	Block Mix Processing Area	10-15	Figure 6
Block Mix Ready for Shipment	Block Mix Processing Area	10-15	Figure 6