Norlite Corporation

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REGION IV HEADQUARTERS
SCHENECTADY, N.Y. 12306

February 9, 1996

Mr. Peter Mack
Regional Engineer
New York State Department of
Environmental Conservation
Region 4
1150 North Westcott Road
Schenectady, New York 12306

Re: Revisions to Norlite Corporation Best Management Practices Plan

Dear Mr. Mack:

Norlite Corporation's records indicate that you are the holder of three (3) copies of Norlite's Best Management Practices Plan that was submitted to the Department on September 25, 1995. Therefore, Norlite is forwarding the enclosed three (3) copies of January 1996 revisions to Norlite's Best Management Practices Plan (BMPP) so that your copies can be updated appropriately.

As noted in Section 1.0 of the document, Norlite's BMPP has been developed as a "living" document and as such requires that the plan be updated to reflect improvements in plant operations or updates to more effectively address operating practices by the plant. In the routine follow-up review of the minor oil spill into the Truck Staging Area containment basin on January 18, 1996, it was found that the BMPP did not fully address the management of the Truck Staging Area with regard to potential stormwater impacts from routine facility operations in this area. Therefore, the BMPP committee met several times during the past three weeks to update the plan relative to stormwater management and control in the Truck Staging Area. The BMPP was also updated to reflect the recent changes in plant management and ownership resulting from the transfer of ownership from American NuKEM Corporation to United Oil Recovery, Inc.

If Norlite has incorrectly identified you as the holder of the BMPP, please let me know so that any future updates can be addressed properly. Please feel free to contact me if you have any questions regarding this transmittal or require additional information.

Sincerely,

Norlite Corporation

Edward C. Burgher
Director of Compliance

cc: D. Carabetta (w/o encl.)
W. Morris
T. Lachell
S. Milos
S. Goss
M. Burger
A. Popp
R. Whallen

file: NCO96010.LTR

BEST MANAGEMENT PRACTICES PLAN

NORLITE CORPORATION
628 SOUTH SARATOGA STREET
COHOES, NY 12047

REVISION 1
SEPTEMBER, 1995

BEST MANAGEMENT PRACTICES PLAN

NORLITE CORPORATION
628 SOUTH SARATOGA STREET
COHOES, NY 12047

REVISION 1
SEPTEMBER, 1995

REVIEWED BY THE MANAGEMENT

Dennis Venters,
Vice-President,
Operations

William Ziegler,
Vice-President,
Health, Safety, and Environmental Affairs

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APPENDICES

1. INTRODUCTION

At the request of the New York State Department of Environmental Conservation (NYS DEC), Norlite Corporation has developed a Best Management Practices Plan, herein referred to as the BMP Plan or the Plan. Following transfer of ownership of the Norlite facility to American NuKEM Corporation, Revision 0 of the Plan, dated 4/30/92, was prepared to comply with the terms of the new SPDES permit issued in January, 1992. This revision complied with requirements of 40 CFR Part 125, Subpart K and guidelines established in EPA's NPDES Best Management Practices Guidance Document (EPA-600 9-79-045, December 1979). Per this document, any facility that uses, manufactures, stores, handles or discharges any pollutant listed as toxic under Section 307(a)(1), or as hazardous under Section 311 of the Clean Water Act (CWA), is required to prepare and implement a BMP Plan. During September 1995, the Plan was revised (Revision 1) to provide additional information requested by DEC and to update the Plan to comply with storm water management requirements contained in 40 CFR 122.

Revision 0 of the BMP Plan was developed following numerous facility reviews by ENSR Consulting and Engineering (ENSR). ENSR investigated the site hydrological characteristics and conducted an in-depth manufacturing area assessment to identify equipment function, operational procedures, health and safety standards, inspection records and potential sources of hazardous materials contamination. Revision 1 of the Plan was prepared exclusively by Norlite Corporation.

The BMP Plan addresses the following key areas in which storm water runoff has the potential to come in contact with hazardous materials:

- Low Grade Fuel (LGF) Storage;
- Process Operations (Kiln);
- SPDES Process Water Outfalls (001), 004, 005 and Quarry Water Discharge 003, all to the Salt Kill Creek, and Process Water Outfall 006 to the Mohawk River ;
- Shales Fines Landfill Leachate;
- Bghouse Dust Processing;
- Waste Water Treatment; and
- General Facility Site Runoff from product piles.

Since the SPDES permit was issued in 1992, Norlite Corporation has implemented several Best Management Practices related to dust control, general housekeeping and facility access. These established practices, and additional practices that Norlite Corporation plans to implement, are presented herein.

Revision 0 of the BMP Plan described storm water and other recommended management practices based on facility conditions in existence on April 30, 1992. Since that time, but prior to preparation of Revision 1, the following capital improvements were made to Norlite's facility:

- Kiln 1 Air Pollution Control System Upgrades.
- Construction of an interim Wastewater Treatment Plant.
- Construction of a New LGF Tank Farm and aboveground line.
- Addition of Office and Laboratory Facilities.
- Addition of pneumatic lines for APC dust conveyance.
- Construction of new roads and seeding of unused portion of the facility for dust. control.

- Filling in of the mid-pond and former surface impoundment.
- Relocation of plant entrances and security points.

Concurrent with preparation of Revision 1 to the Plan, construction of a permanent Wastewater Treatment Plant was nearing completion. Additionally, to comply with a separate provision of Order on Consent R4-1734-94-08, Norlite has adopted improved practices, and will make additional improvements to the plant, that will substantially reduce emission of fugitive dusts.

Further improvements to the BMP Plan will be identified as the BMP Committee continues its work and implements this Plan. As improvements or modifications are identified, the BMP Plan will be revised by the Committee, and revisions will be forwarded to NYS DEC. For this reason, this Plan should be viewed as a "living" document that is subject to improvements and updates as more is learned through its implementation. The BMP Committee will forward any revisions to the Plan to NYS DEC within 10 working days of making a revision.

1.1 Contents of the BMP Plan

The BMP Plan is divided into the following four sections:

Section 2.0, This section presents a description of the Norlite facility, the existing hydrology/drainage characteristics of the site, and the existing industrial operation. In addition it identifies potential areas where hazardous materials may come in contact with storm water runoff or where the slightest potential exists for a spill or release to migrate to surface or ground water.

Section 3.0, This section presents baseline BMPs that are generally applicable to industrial sites and describes how Norlite meets or exceeds industrial standards. These BMPs require personnel commitments and procedural actions, and are usually incorporated by reference into other environmental programs (e.g., Contingency Plans, Safety Programs, etc).

Section 4.0, This section describes the plant BMP compliance manufacturing area assessment, compliance improvements, and a storm water management plan for the site.

Appendices, The Appendices contains BMP reference information such as a list of drawings, site drainage maps, Personnel Organization and Training documentation, Contingency Plan, etc.

1.2 Statement of Norlite Coporation's Environmental Policy

Through implementation of the BMP Plan, Norlite Corporation will demonstrate a commitment to comply with NYS DEC concerns and BMP standards. It is the intent of Norlite Corporation to operate the facility in a safe and environmentally sound manner. Norlite will operate the facility in accordance with all applicable state and federal environmental regulations. To achieve this goal, Norlite will conduct appropriate training, develop and implement proper emergency procedures, use good engineering practices, and frequently and formally inspect facility operations.

As a part of this review process, Norlite has established a BMP Committee. This Committee is charged with reviewing existing and proposed equipment, procedures, documentation, practices and the preparation of recommendations relating to control of pollutants. Norlite Corporation management has made a decision to fully support the BMP Committee and assures NYS DEC that all facility resources are available for the Committee's use.

1.3 General Best Management Practices

Norlite's BMP Plan specifies two categories of practices, baseline and advanced. Baseline BMPs are defined as those management practices generally considered to be standard practices that are practical and broad in scope. They are independent of specific chemicals or groups of chemicals and physical site conditions. Baseline BMPs include Spill Prevention Containment and Control (SPCC) Plans for oil and hazardous materials or products, Occupational Health and Safety Programs, Spill Control Committee functions, and procedures relating to fire protection, spill reporting, employee training, inspection, preventative maintenance, good housekeeping, materials compatibility and security. Baseline BMPs require personnel commitments and procedural actions.

Advanced BMPs are defined as practices that are specific to groups of toxic or hazardous substances, and are related to one or more ancillary sources. These BMPs include site specific procedures for prevention, containment, mitigation, and transport of hazardous materials. Advanced BMPs are identified in Section 4.

2. FACILITY DESCRIPTION

Section 2.1 describes the Norlite facility, the baseline or existing environment, the types of processing and product manufactured on the 200-acre site, and identifies specific operations which handle hazardous materials. Section 2.2 describes present Norlite BMPs concerning hazardous materials handling and spill prevention.

2.1 Description of the Norlite Facility

The Norlite facility is located on the southern boundary of the City of Cohoes, New York. The Norlite site is located in Cohoes, New York, as shown in Figure 2-1. The facility layout is depicted on Figure 2-2. The tributary stream, called the Salt Kill, traverses the facility site from the northwest. The basic industrial operations conducted on the site are: mining of shale from an active quarry, and the production of lightweight aggregate building material for construction industries.

Norlite also practices energy recovery by incineration of low grade fuel (LGF) to provide radiant heat energy to expand the shales in kiln operations, producing the lightweight aggregate. The lightweight aggregate is produced by heating crushed shale in a rotary kiln. The heating process generates a gas that expands the mineral to a porous substance having physical properties useful to the construction industry as an additive to cement. When cooled, this material has different physical strength and lighter unit weight than its parent shale form. This 'aggregate' material is the product Norlite provides for sale to customers. The product is useful in certain construction activities, such as bridges and high rise buildings, where a lightweight concrete mix is desirable. The potential for hazardous materials release from the operational areas is described in Section 2.2.

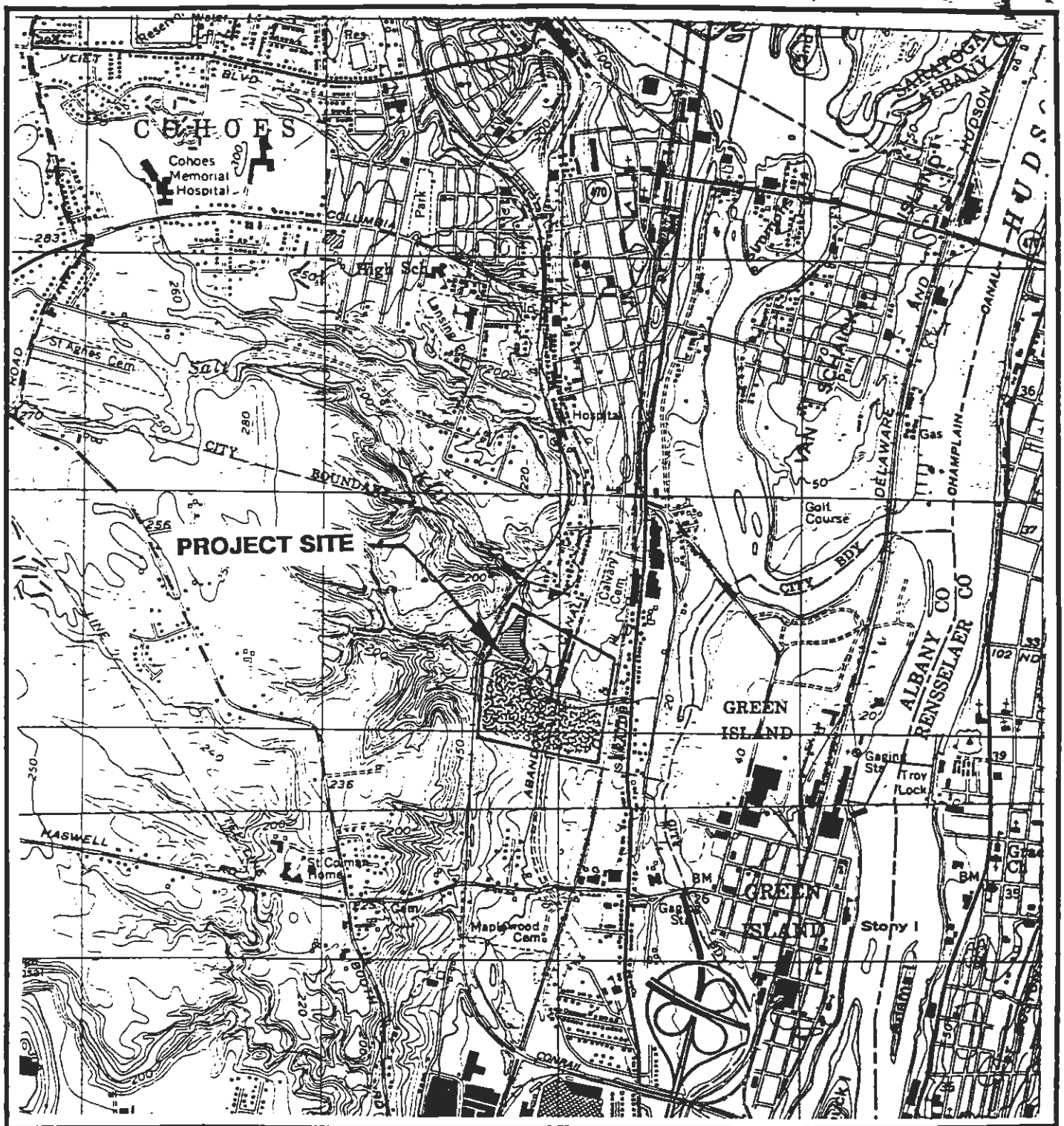
Since December 1995, Norlite has been operated by United Oil Recovery, Inc. There are two independent organizations at the facility, each one reports independently to the corporate President. Norlite Operations Staffing consists of a a director of operations and department managers responsible for key operational areas of the Norlite facility. In addition, as part of Norlite's commitment to health, safety and environmental compliance, Norlite maintains an independent compliance organization with a dedicated staff of compliance professionals. The organizational charts for this department and the Norlite Operations and Compliance Staff are shown in Figure 2-3 and 2-4.

Since a new SPDES permit was issued February 1, 1992, Norlite has undertaken a number of best management practices (BMP) to improve safety, and protect down-stream receiving waters. Examples of steps taken include:

- Removal of a large coal pile near the Salt Kill Creek;
- Placement of gravel in parking areas, entrance roads and some work areas to reduce runoff collection, erosion and dust;
- Relocation of truck entrance roads and weigh scale to eliminate truck traffic near residences, restrict trucks to only prepared road surfaces, and minimize truck passage through the facility site;
- Placement of covers on raw material and product conveyor units to control dusting;
- Installation of pneumatic conveying systems to transfer baghouse dust;
- Placement of roadside berms to reduce runoff and erosion storm water;
- Closure of a shale fines settling pond and placement of settled residues in a permitted landfill with an SPDES permitted leachate Outfall 004;

- Removal and filling in of mid-pond system;
- Construction of wet scrubber system secondary containment units;
- Construction of a surface runoff drainage trench/silt trap system at Salt Kill on the east side of facility;
- Relocation of long-term product storage piles to area away from Salt Kill drainage zone;
- Removal and closure of old underground and uncontained vehicle fuel storage tanks near the eastern facility boundary.

These BMP improvements are detailed in Section 4.



SOURCE: USGS 7½ Minute Topographic Quadrangle, Troy South, Troy North, NY

SCALE

0 1/4 1/2 1 MILE

N

ENSR

ENSR Consulting and Engineering

NORLITE SITE LOCATION

Norlite Corporation
628 South Saratoga St.
Cohoes, NY 12047

DRAWN: SPD	DATE: April 30, 1992	PROJECT NO.: 9514-005	REV: 0
FILE NO.: NORFIG.	CHECKED:		

Fig. 2-1

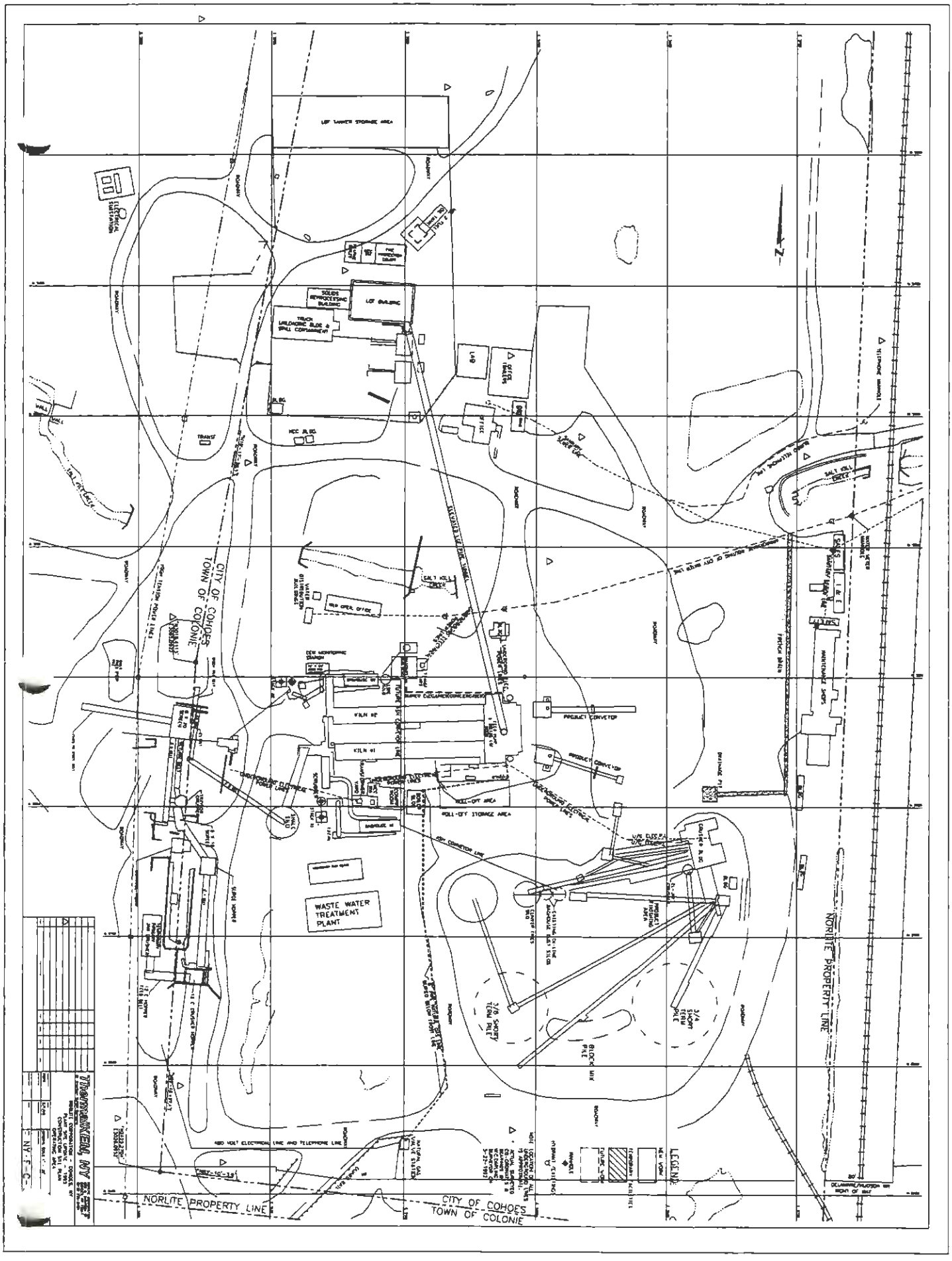

WASTE WATER TREATMENT PLANT
NORLITE PROPERTY LINE
CITY OF COHOES
TOWN OF COLONIE
NORLITE PROPERTY LINE
CITY OF COHOES
TOWN OF COLONIE
LEGEND

Fig. 2-2

Figure 2-3

Norlite Operations
Staffing

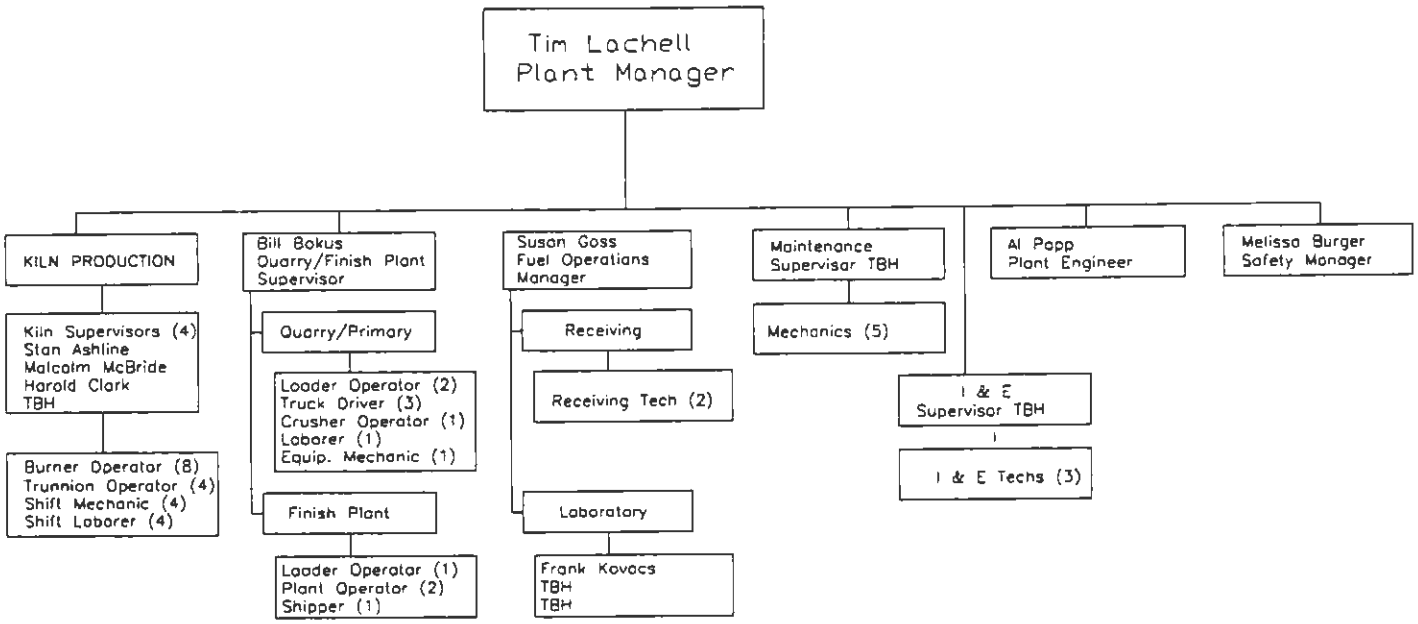
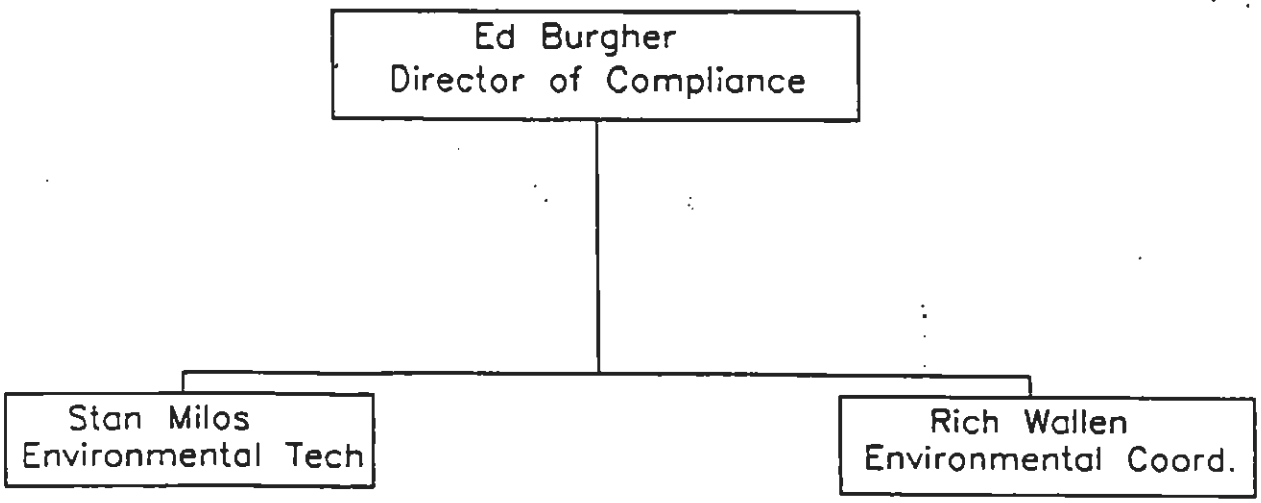


Figure 2-4

Norlite HSEA Staffing



2.1.1 Types of Facility Operations

2.1.1.1 Quarry Operations

The raw material for the aggregate, shale, is quarried from a 75 acre area west of the kiln operation on the site. The quarry has been in operation for over 35 years and is currently under license to operate in accordance with NYSDEC mining regulations. Equipment operated in the quarry area includes large front-end loaders drill rigs and dump trucks. Since raw shale is a non-hazardous mineral composed of about 95 percent silicon, aluminum, iron, magnesium and calcium oxides, the quarry operation does not pose hazardous material handling concerns. Storm water and groundwater control in the quarry pits is managed by controlled pumping to the Salt Kill via an SPDES permitted Outfall 003.

2.1.1.2 Shale Crushing Operation

The shale mined on site is transported to crusher hoppers where the raw material is crushed to uniform particles and moved by covered conveyors as feed stock to a storage silo. From the feed silos, the raw material is introduced to the kiln. The shale crushing operation is located west of the kiln area as shown on Figure 2-2. The shale crushing operation does not involve hazardous materials handling operations. Dusting and particulate emissions from the crushing operation are controlled by water sprays at the discharge of the crushed shale conveying system. The design of the spray nozzle system is being upgraded to reduce the volume of runoff water generated by this operation.

2.1.1.3 Kiln Operation

The kiln receives crushed raw shale material for firing to temperatures between 1,700 F and 2,100 F, at which point the heated shale reaches the heat of incipient fusion. In a semi-plastic state, internal gases expand, creating an aggregate (product) with voids. There are two kilns operational. The kilns are fired with fuel oil, natural gas and a recycled fuel called low grade fuel (LGF). Both kilns have identical emission control systems with wet and dry emission control devices for the collection of particulate matter, hydrogen chloride (HCL), and other gaseous species. Details concerning kiln operations and related environmental controls are included in Appendix A. BMPs for kiln operations are discussed in Section 2.2 and Appendix C.

2.1.1.4 Product Pile and Finish Plant

The short-term product pile area is located in the southeast corner of the site. This four-acre temporary storage area receives final sorted aggregate product which is removed from the site continuously by large haul trucks or railcars. The product is conveyed to the product pile area by conveyors from crusher/sorter areas. Front-end loaders are operated in the area to load product onto trucks or railcars and manage product piles. Because of the crushing and conveying

operations carried out in this area, fugitive dust emissions are the primary BMP concern in this area.

Dusting and particulate emissions are controlled by water sprays at the discharge of the product conveyor systems. These are undergoing design changes to reduce the volume of product pile runoff by approximately 50 percent.

A long-term product storage pile is located near the Elm Street entrance gate. This storage area allows for larger inventories of product material to be stored while minimizing contact with storm water runoff drainage to the Salt Kill. It also reduces the potential for dust transport to the neighboring apartment complex at the eastern boundary of the facility.

2.1.1.5 LGF Storage Area

LGF is transported to the site by truck. Trucks are directed to the sampling station near the truck staging area and are sampled. After sampling has been performed, trucks are parked in the truck staging area until waste characterization has been completed and offloading has been approved by the laboratory manager or his/her designee. The truck is then directed to the offloading pad and the contents of its tanker are pumped into storage tanks with a total capacity of 144,000 gallons permitted for hazardous waste storage by the NYSDEC and the EPA. The LGF is a recycled waste fuel which is monitored as received in order to comply with specifications contained in the facility "Waste Analysis Plan." Norlite does not manage reactive wastes, only wastes that are flammable and combustible. Also located in the LGF storage area are filter and tank sludge wastes generated from filtering the LGF before storage and particulate material that settles in the storage tanks. This material is stored in 55 gallon drums prior to shipment to an off-site licensed hazardous waste disposal facility. No waste drums are delivered to the site. Sludge storage drums are removed from the site two to four times annually with a total volume ranging from 8,000 to 16,000 gallons. The annual combined volume of the sludge stored on the site is approximately 40 tons. Approximately four to six bulk tank trucks deliver LGF to the storage areas daily, amounting to 20,000 to 30,000 gallons per day. Details concerning Norlite BMPs for the LGF area are provided in Section 2.2

2.1.1.6 Scale Area

A new scale area is located near the Elm Street entrance on the southern boundary portion of the site. Previously, the scale was directly east of the three vehicle fuel underground storage tanks. The fuel stored in this area was used to supply on-site mining and product moving equipment and plant vehicles. These tanks did not have secondary containment, and were removed by July 1995. The replacement tanks for these fuel storage needs (i.e., diesel and gasoline for site vehicles) has been relocated to the Elm Street entrance of the facility. These are aboveground storage tanks.

2.1.1.7 Truck Staging Area

The Truck Staging Area (or Staging Area) is the area in which trucks containing LGF, SLGF, waste oil, hazardous waste, non-hazardous waste and / or other chemicals are parked prior to being processed into proper plant storage facilities or prior to transfer to off-site facilities. This Staging Area has been graded, sloped and engineered to maintain secondary containment for the contents of at least 10 fully loaded LGF tank wagons. The secondary containment consists of a graded, sloped base of 12 - 18" compacted clays, covered with a 40 mil HDPE liner. The HDPE liner is with a protective layer of shale fines materials to protect the liner from truck and vehicle traffic. The containment is graded and sloped towards the northeast corner to provide for collection and removal of storm water.

2.1.2 Norlite Site Hydrology

The purpose of this section is to present existing runoff conditions and to identify potential sources of contamination within the site area.

2.1.2.1 Hydrology Assessment

The 200-acre Norlite site lies in the watershed of the Salt Kill. This small stream has a watershed drainage area of approximately 2.5 square miles. Average annual runoff for the Troy region is approximately 1.3 inches per square mile. Therefore, the average annual discharge for the Salt Kill is approximately 3 cubic feet per second. The Salt Kill has been observed during the summer months with nearly no flow. The Salt Kill meanders east of the facility shale quarries and traverses the site between the LGF area and the kilns. It flows from west to east exiting the facility near the Saratoga Street entrance. A small dam was constructed (during previous ownership) north of the kiln area to provide cooling tower makeup water. This was the location for former Discharge Outfalls 001 and 005. These outfalls have been taken out of service since the installation of a new SPDES Outfall 006 discharging directly to the Mohawk River was installed in September 1994. Sections of the Salt Kill above and below the pond flow through culverts. The areas above the culverts have been back filled and graded to accommodate truck traffic on the facility site. Embankments along the dam and pond section of the Salt Kill have been leveled off and regraded to prevent a majority of roadway and site runoff into the Salt Kill at this location.

Norlite Corporation commissioned ENSR Consulting and Engineering, Acton, MA. to do an analysis of runoff conditions observed during storm events throughout 1992. Based on field observations of runoff conditions and drainage patterns, the 1.3-inch storm event was selected to predict the 0.5-inch runoff volume within drainage areas identified on the site. For the Norlite site, a 1.3-inch storm over a 24-hour period generates approximately 0.5 inches of runoff, or the "first flush" storm event.

Based on information tabulated by the National Climatic Data Center of the National Oceanic and Atmospheric Administration (NOAA), 24-hour rain events with greater than 1.3 inches occurred less than two percent of the time during 1991. In addition, yearly rainfall for 1991 compared equally with the 30 year average (1951-1980) for the Albany, New York area.

The occurrence of the 0.5 inch runoff, or the "first-flush" pollutant loading characteristics has been well-documented by numerous EPA non-point pollution field studies over the past 15 to 20 years, and is now a widely accepted principle for designing runoff control measures. These field studies conducted by the EPA and other federal and state agencies indicated that appropriate runoff control measures are able to capture 70 to 90 percent of the total pollution loadings from impervious areas. Therefore, Norlite initially selected the 1.3-inch storm event to capture the majority of potential pollutants during the first flush runoff period.

Since 1992, however, Norlite has observed that much of the facility surface is highly pervious and first flush runoff is quite limited especially after several weeks of dry weather. As a result, Norlite is reassessing the practicality of installing first flush volume retention systems and providing, instead, flow velocity reducing, silt-trap systems such as french drains.

2.1.2.2 Runoff Analysis

The U.S. Department of Agriculture (USDA) Soil Conservation Service (SCS) TR-55 Urban Hydrology Method was used to determine runoff volumes on the Norlite site. This method is accepted by the NYSDEC for calculating runoff conditions for storm water management features for proposed land development projects (Storm water Management Guidelines for New Development, April 1990). A summary of the hydrology of the Norlite site follows.

Existing Runoff Conditions

The watershed boundaries within the Norlite parcel can be divided into sub-drainage basins, as shown on Figure 2-5. These basins are referred to as:

Drainage Area 1 - south of the Eastern Watershed
Drainage Area 2 - the southern portion within the Eastern Watershed
Drainage Area 3 - the Western Watershed

As depicted, these sub-drainage areas indicate where runoff flows are divided by topographic gradients and the direction in which runoff flows on site. The runoff discharge rates for the 1.3-inch storm in the Troy area for the sub-drainage areas in the Eastern Watershed are:

Drainage Area 1 = 5.2 cfs
Drainage Area 2 = 3.0 cfs
Drainage Area 3 = TBD

Drainage Area 1

Drainage Area 1 encompasses 8.37 acres and is located south of the Eastern Watershed. Facility components located in Drainage Area 1 include portions of the rotary kilns and outside aggregate-processing areas. The majority of surface runoff within this drainage area flows toward the off-site wetland located southeast of the site. Runoff generally flows as sheet flow towards the southeast and into an emergent wetland area. An existing railroad, located east of the emergent wetland, impedes drainage flows from the wetland.

Recent and on-going construction activities in this area are changing the topography which may change runoff patterns and volumes. Improvements planned for this area are described in Section 4.3.

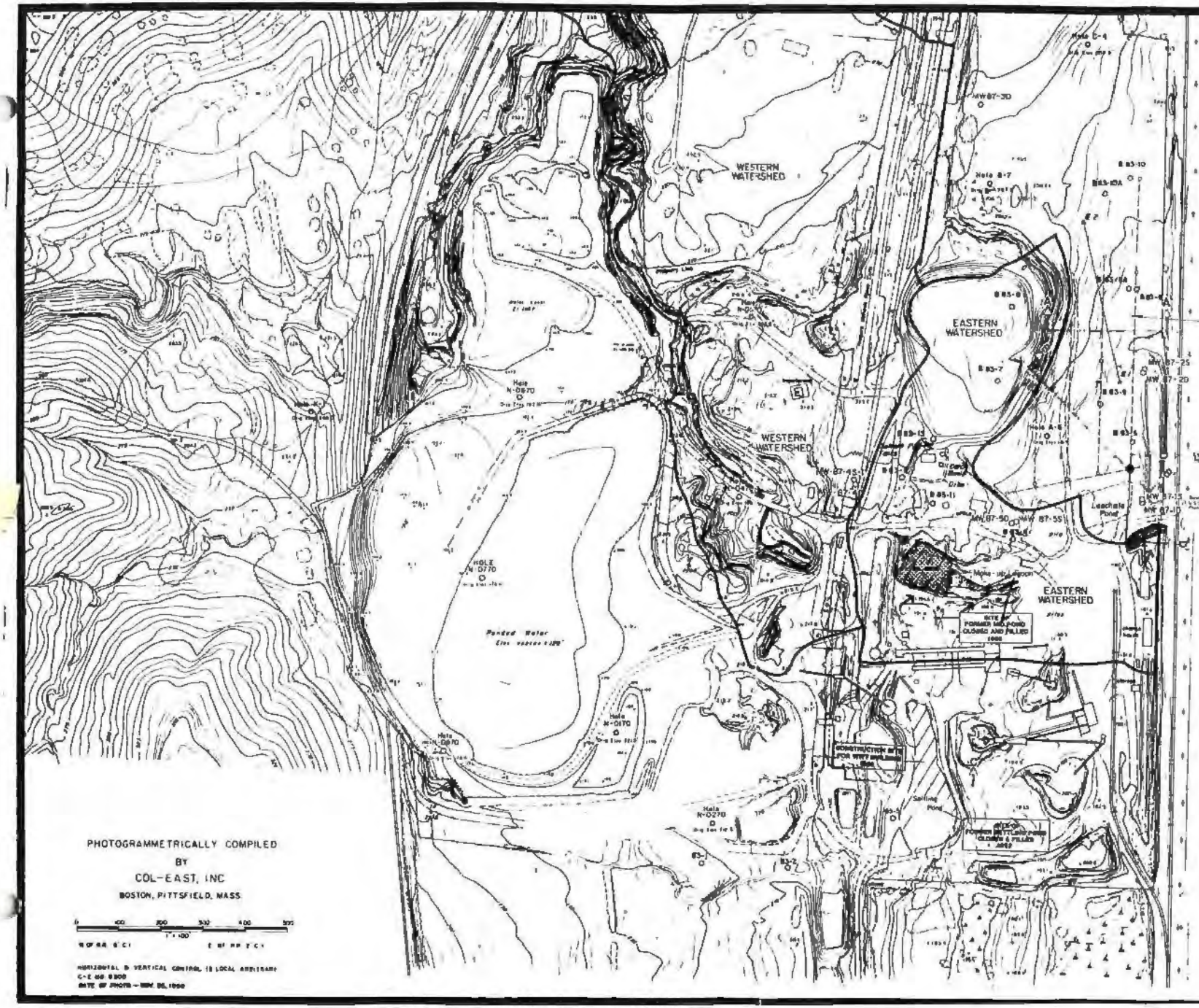


Figure 2-5

NORLITE SITE HYDROLOGY BMP PLAN (1995 Rev.)

LEGEND

Salt Kill 100 Year Flood Plain

Wetland of the SALT KILL

Watershed Boundaries

Runoff Pathways

NOTES

1. All grades are approximate and should not be used for construction without verification.
2. All grades are referenced to plant datum.

DATE	REVISION	BY

DUNN GEOSCIENCE ENGINEERING CO., P.C.
12 Metro Park Road
Albany, N.Y. 12205

STORM WATER RUNOFF MAP
NORLITE CORPORATION
Cohoes Operation
CITY OF COHOES ALBANY COUNTY, N.Y.

Drainage Area 2

Drainage Area 2 is approximately 6.1 acres in area. Facility components located within the watershed area include the general management offices, maintenance facilities, parking areas, laboratory, low grade fuel storage area, and portions of the rotary kiln and lightweight aggregate processing areas.

A new silt trap-drainage trench system has been installed in Drainage Area 2. These improvements for storm water control are described in Section 4.3. Based on field observations since 1991, runoff from the roads and outside processing areas flows to the Salt Kill near the existing dam or to the downstream end of the Salt Kill prior to exiting the site. This new trench system intercepts these runoff flows and reduces silt and suspended solids discharges to Salt Kill Creek.

Erosion channels have been minimized on roads by providing berms and placement of heavy gravel on surfaces. These roads presently convey storm flows to the Salt Kill as it exits the western boundary of the site.

Drainage Area 3

Drainage Area 3 is comprised of approximately 23.70 acres. This area contains the quarry pits and undeveloped areas to the north of the quarry. Surface runoff during storm events enters the Salt Kill by overland flow along its banks. Runoff is conveyed along quarry access roads to the Salt Kill or to the inactive quarries. A discussion of site storm water runoff control is provided in Section 4.3.

2.2 Description of Potential Sources of Hazardous or Toxic Materials

The objective of the BMP Plan is to describe the primary sources of toxic and hazardous pollutants and define control measures that will minimize the potential of such theoretical releases. On the Norlite site, if there were no proper engineering controls and good management practices, the following would be potential theoretical sources of release of chemical materials:

- three SPDES permitted Outfalls (Outfalls 003,004 and 006) discharged at specific locations shown on Figure 2-2;
- site storm water runoff from the LGF area;
- spillage or leaks from tanker trucks, storage tanks, or storage drums of LGF; release of sludge or waste disposal of filtered solids stored in tanks or drums;
- drainage from product piles which may have contact with baghouse fines; and
- chemical and sludge handling areas of the APCS scrubber wastewater treatment plant (see Section 4.2).

2.2.1 SPDES Outfalls

2.2.1.1 Description of the Existing SPDES Outfalls

The Norlite facility produces collected runoff water, groundwater and wastewater which is managed on-site and discharged to the Salt Kill or Mohawk River pursuant to New York SPDES permit #-0004880. The sources of each effluent outfall are described as follows:

Outfall 003 - Quarry Water discharge - includes storm water and groundwater from the quarry area which is periodically discharged by controlled pumping to the Salt Kill.

Outfall 004 - Landfill Leachate - leachate generated from rainfall which has come in contact with the non-hazardous 'rock/rubble' landfill collected in the facility leachate collection system and drains to the existing permitted leachate collection basin. This is periodically discharged via Outfall 004 to the Salt Kill.

Outfall 006 - Air Pollution Control Saline Water - Blowdown and non-contact cooling water from the kiln air emissions treatment and scrubber water systems is discharged to the Mohawk River. An existing wastewater treatment plant treats the blowdown discharges and non-contact cooling water from two kiln systems.

Descriptions of the discharge limits imposed under the current conditions of the NYSDEC SPDES permit are provided in Appendix H.

2.2.1.2 SPDES Permit Compliance Issues

SPDES Outfalls 001 and 005, which were previously used to discharge cooling waters, boiler water and scrubber blowdowns to the Salt Kill, have been taken out-of-service.

SPDES Outfalls 001 and 005 have been replaced by a single Outfall 006 which discharges to the Mohawk River through an NYSDEC permitted force main pipeline.

An interim (modular) wastewater treatment system has been installed to pretreat scrubber blowdown and non-contact cooling waters prior to discharge through Outfall 006.

A new NYSDEC approved WWTP is being constructed to permanently replace the interim WWTP and is scheduled for completion in the fall of 1995.

Outfalls 003 (quarry) and 004 (leachate collection system) are intermittent discharges used only when storm water accumulation necessitates.

2.2.2 Description of Principal Sources of Potential Hazardous Releases

This section describes the principal hazardous materials handling areas, and the potential for spill, release and/or migration of these materials into the nearest water body, the Salt Kill. Causes of releases, such as equipment failure, improper operation, or contact with site runoff are discussed. Existing good operating practices are incorporated with the present level of

protection provided by the best management practices implemented by Norlite to prevent release of hazardous materials to the Salt Kill.

2.2.2.1 Low Grade Fuel (LGF) Area

Norlite's primary hazardous waste activity consists of the receiving and storage of low grade fuel from customers who are individually responsible for transport handling. There are numerous sources for the LGF which are described in the facility Part 373 Permit waste analysis plan. As previously noted, the LGF is stored in tanks located in the LGF area. The transportation, storage and burning of this recycled hazardous waste in industrial furnaces is regulated under 40 CFR 261-266 of the Federal RCRA regulations and New York State under Hazardous Waste Regulations 6 NYCRR Part 373. As such, the characteristics and identification of the original source of the recycled material is made by the generators or blenders of the material, and these characteristics are confirmed by analysis in Norlite's laboratory. All shipments must be analyzed by a New York Department of Health Certified laboratory. In accordance with regulations (40 CFR Section 266.44 and 261.20(e)), Norlite must notify each generator with a written and signed notice that Norlite has the appropriate permit(s) and that Norlite has notified EPA under Section 3010 of RCRA to operate the LGF area and beneficially reuse these wastes as fuels.

The LGF area is located to the north of the kiln area as shown on Figure 2-2. LGF is transported to the Norlite site in licensed tankers and directed to the Truck Unloading area which has provisions for spill containment. The material is pumped into storage tanks. There are ten (10) storage tanks of varying sizes with nominal capacities ranging from 7,300 gallons to 26,000 gallons. The total LGF storage tank capacity at the Norlite facility is 144,000 gallons. Four LGF storage tanks are glassed-lined (corrosive resistant) carbon steel shell constructed in accordance with ASME Code Section VIII. Six new agitated tanks were installed to replace previous Tanks 100 and 200. The characteristics of these tanks are described in Appendix D.

2.2.2.1.1 LGF Spill Control and Containment BMP

All the tanks have identical loading, unloading, and control systems. The LGF tanks are filled with nitrogen gas to displace oxygen in the tanks and prevent ignition of the LGF; this is called "nitrogen blanketing". To prevent LGF tank overflow during pumping (unloading) operations from trucks, a high level switch shuts the pump off before the tank is full. Each tank is equipped with a level indicator, pressure and vacuum rupture discs. The interior tanks are constructed with secondary containment consisting of a concrete dike area with a capacity of 158,000 gallons or 110% of the volume of waste in storage. The exterior tanks are imbedded in two feet of coarse sand compacted with a vibrating plate to provide uniform support along the entire length of the tank. There are three impermeable layers beneath the sand, an impermeable liner consisting of several layers, i.e. 40 mil HDPE geo-membrane, 6 to 12 inch compacted clay, 40 mil HDPE geo-membrane and 12 inches of clay.

The exterior tank system also includes two networks of leak detection piping consisting of perforated drain pipes wrapped with filter fabric installed above each HDPE geo-membrane. The lower set of drain pipes discharges to the secondary spill containment area. The liner is sealed to the drain pipes at the locations where the pipes pass through the liner. There is extensive detail concerning the storage tanks in the Norlite document 6 NYCRR Part 373 Renewal Permit Application and, therefore, will not be elaborated upon herein. The truck unloading area is constructed of eight inches of reinforced concrete, the load bearing thickness adequate for the largest truck. The unloading area is equipped with 110 percent

containment area totaling 7,250 gallons (the largest tank truck volume is 6,500 gallons). The piping for these tanks is within the containment system including the LGF and vent lines that go to the kilns.

The LGF off loading pumps are equipped with filters to remove particulate. These LGF filters are cleaned as needed during truck off loading and the material stored in 55-gallon drums. The LGF tanks are cleaned on an as needed basis or at least annually. Tank cleaning generates from 20 to 180 drums of LGF sludge which are temporarily stored in the truck unloading area or the Solids Processing Building while arrangements are made for disposal.

Cathodic protection has been installed for corrosion protection and the tanks are installed with "grounded loop" to protect against static electric charges. All openings, joints and gaskets on the tanks are sealed with chemically compatible materials such as Teflon. Also, the tanks were imbedded in slightly alkaline sand material to further inhibit corrosive activity. The clay cap and liner installed as part of the tank system prevents groundwater from seeping into the medium surrounding the tanks. Tank leak detection systems are in place.

Inlet and outlet valving is manually operated except for the fire safe valve and solenoid valve on the tank outlet. Tank level is indicated by a Brooks Model 5310 or equivalent level indicator. There is also a tank level indicator meter that can be inspected by the tank operator at all times. Tank pressure is also monitored with gauges (PI 103) mounted on the vent nozzle of the tank and pressure relief is provided by 6-inch rupture disc (150# ANSI).

During the kiln fueling operation, a manual valve on the tank outlet is opened and the outlet pump is activated. Flow rates are operated manually, however, pressure is monitored to sense a pressure drop in the line, with a pressure switch activated to shut down the system by closing the tank outlet solenoid valve (FCV 101) and shutting off the pump.

In the truck unloading station, the tank filling operation is accomplished using quick-disconnect hose fittings attached at the truck outlet and the pump inlet. One of two off loading pumps are used to discharge the material to the storage tanks . Grounding cables are attached to the tank truck to prevent any static electric charges.

2.2.2.1.2 Release Assessment for LGF Area

A spill in the LGF area would occur on concrete, contained and diked area. There is, therefore, no potential for runoff or contact with soil or storm water. Small spills are contained in the 100-gallon curbed area around the pump/strainer and collected with absorbent. The contaminated absorbent is placed in a 55-gallon drum and stored in the drum storage area. For larger spills, absorbent booms and pads would be used to contain and remove the liquid; cleanup materials are stored in 55-gallon drums. Spills greater than 100 gallons will overflow into the drum storage area providing secondary containment. For even larger spills, tertiary containment is provided by the scupper overflowing into the truck unloading area (7,250 gallons). Any spills or leaks in the kiln supply pump area will be contained in the 400-gallon, curbed spill containment slab. The pump containment slab has a new secondary containment culvert which directs flow to the containment area in the LGF building. This containment is sufficient to hold the entire contents of the LGF tanks. The total secondary containment for any spill is 158,000 gallons or 110% of the LGF quantity stored in the tanks. Therefore, in the event of failure of any or all of the tanks, no release of LGF to storm water or groundwater would occur.

In the unlikely event of a rupture of any one or more of the four LGF tanks resulting in a release greater than 24,000 gallons, the material would be contained within the sand layer of

the secondary containment system below the four tanks. Only if the top HDPE synthetic liner were also ruptured would LGF flow to the pump pad containment culvert tied in with the LGF building. The LGF storage building provides complete containment for any of the six 7,300 gallon agitated inside tanks. The LGF tanks are equipped with liquid level controllers (described in the Part 373 Renewal Permit Application). If there is breach in the first liner, a leak would be detected by liquid flowing to the existing pump slab from the tell-tale pipe under the tank. This pipe is a 4-inch perforated drain pipe that is positioned under the center of the tank and directly on top of the clay liner. The perforations face downward, and any liquid leaking from a tank and through the synthetic liner enters the pipe and runs out onto the pump containment slab. This system essentially provides detection and leak prevention of LGF release resulting from relatively slow leaks. A rupture or large leak or release is directed by grading the tank substrate, a clay and polyethylene liner system, to the containment area. Details concerning the LGF spill containment system and calculations on containment capacity are provided in the Norlite Part 373 Renewal Permit Application for the new tank farm, containment system, and LGF building submitted January 23, 1992. Portions of this are also included in Appendix D.

2.2.2.1.3 BMP Improvements to the LGF Tank Storage Area

The LGF tank farm was improved as required by the New York State Part 373 permit, Condition VI (A). The improvements include six (6) 7,300 gallon tanks within a contained building. The LGF storage building is also sufficient secondary containment for the four tanks outside of the building. The below-ground LGF line to the kiln was replaced with new above-ground lines that are enclosed in a 90-inch secondary containment pipe tunnel located between the LGF storage area and the kiln. The tunnel and lines are sloped back to the LGF building such that a leak in a line will be collected in the secondary containment system in the LGF building. With the new tank farm and feed lines, there is virtually no potential for a significant release of LGF to the Salt Kill or other areas of the facility. Details concerning these LGF best management practices are included in Section 4.1, 4.2 and Appendix D.

2.2.2.2 Truck Staging Area

2.2.2.2.1 Description

The Truck Staging Area (or Staging Area) is used to temporarily stage incoming hazardous waste, used oil and plant chemicals deliveries (if necessary) for the time necessary to complete waste acceptance procedures. This area has been designed to ensure that in the event that a leaking delivery tanker or trailer is received, the leaking tanker or containers can be managed in a manner to prevent releases to the environment. This area is located immediately to the north of the LGF off-loading and fuel farm area and is shown on Figure 2-2.

2.2.2.2.2 Truck Staging Area Spill Control and Containment

In the event that a spill does occur, Norlite will isolate the leaking tanker in the Truck Staging Area to minimize the potential for impacting other vehicles that may be present in the Staging Area. The source of the spill will then be stopped and in accordance with Norlite's Contingency Plan, appropriate measures will be taken to minimize migration of spilled materials in the

containment area. After the situation has been stabilized, Norlite will remove and manage any contaminated materials in accordance with the Contingency Plan and Norlite's Safety Policy.

2.2.2.2.3 Release Assessment for Truck Staging Area

A spill in the Truck Staging Area will be contained by the lined, bermed, containment area thereby preventing any runoff or contact will surrounding areas. Smaller spills will be contained in the immediate area of the spill since the shale fines cover acts as an absorbent and will effectively prevent the migration of small spills. Larger spills may migrate downslope towards the northeast corner where it can be collected for subsequent treatment and disposal. Any contaminated shale fines cover will be removed for proper treatment and/or disposal.

As noted above, the containment area has been designed with capacity sufficient to hold the contents of at least 10 bulk tankwagons. Norlite will manage the staging of shipments in the Truck Staging Area so that the RCRA containment volume standards are not exceeded.

2.2.2.2.4 Truck Staging Area BMP

The Truck Staging Area is an area in the Norlite plant in which there is a potential for stormwater to contact LGF or non-hazardous waste materials. Accordingly, Norlite's Staging Area spill control procedures require that all spills be removed in a timely fashion to prevent the potential for contact with stormwater. Through proper maintenance of the Staging Area, Norlite can manage the stormwater as non-contaminated media.

Norlite will remove stormwater in accordance with the procedures described below to help ensure that any stormwater that does collect in the Staging area will not be impacted in the event of a spill.

To ensure that stormwater removed from the Staging Area does not contain any significant contaminants, prior to any discharge of stormwater, the collected water will be checked to determine presence of a sheen which may indicate the presence of contaminants. If no sheen is detected, the stormwater will be discharged to the north and west of the Staging Area. If a sheen is detected, the stormwater can either be treated using a carbon adsorption system or by removing the contaminated water for subsequent treatment at an approved facility.

In the event that the carbon system is used to treat the stormwater, a water sample will be taken from the system discharge at least once for every storm event that the discharge occurs. The sample is to be analyzed for EPA Method 624 / 625 parameters that are indicative of petroleum hydrocarbons. Also, the system operator will collect a sample and examine at least once per hour during all discharges to check for sheen or other visible contaminates. If contamination is observed, the discharge will be immediately terminated until the cause of the contamination is identified and corrected. All discharge events are to be logged on the Stormwater Discharge Log Sheet (see Figure 2-6).

To ensure that the carbon system maintains effective treatment, the results of sample analyses will be reviewed to determine the proper frequency for changing or refreshing the carbon system.

Figure 2-6

Storm Water Discharge Check Sheet

Discharge Date _____

Start Time _____

End Time _____

Discharge Location _____

Reporting Person _____

Approval to Discharge _____ (Compliance Coordinator or Supervisor Signature)

(Note: Discharge Approval Must Be Obtained Prior To Discharge)

Description of Impounded Water Prior to Discharge

(Describe color, any presence of sheen, turbidity, etc.)

Note: If sheen is present notify Supervisor or Compliance for approval to discharge.

_____

_____

_____

_____

_____

Condition of Remaining Water in Impoundment

(Note color, presence of sheen, turbidity, etc.)

_____

_____

_____

_____

_____

Comments

_____

_____

_____

_____

_____

Compliance Review _____ Date _____

Note: Return Completed Form to Compliance

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Figure 2-6 (cont.)

Discharge Observation Log

Date / Time	Observer	Observation (Sheen or Oil Residue*)	Date / Time	Observer	Observation (Sheen/Oil Residue*)

Note: * If sheen or evidence of contamination is observed, stop discharge and notify supervisor or Compliance.

This Area Intentionally Blank.

2.2.3 Drum Storage Area

2.2.3.1 Description

As mentioned previously, filter sludge material is generated by straining the LGF before storage. The strained material is transferred to drums and moved to the drum storage tank area. The drums stored in this area contain filtered LGF solids and any incidental hazardous waste materials separated from the LGF tank operation. The drum storage area is located at the north side of the truck unloading area as shown on Figure 2-2. This area is separated from the unloading area by a concrete berm equipped with a scupper sloped at 1/10 inches per foot and joints sealed with SIKAFLEX-1A elastic. The drum storage area has the capacity to store (214) 55-gallon drums. The drum storage area incorporates the existing concrete slab adjacent to the existing truck unloading pump plus a new extension to this slab and pump. A containment area has been constructed to contain up to 72 percent of the expected drums or 6,350 gallons. SIKAFLEX has been selected because it is chemically compatible with the constituents of LGF.

2.2.3.2 Drum Storage Spill Control and Containment BMP

LGF filter sludge is stored in steel or fiber 55-gallon drum which meet U.S. Department of Transportation specifications (Nos. 17C or 17H and 21C respectively). Drums are identified with a label with the dates marked on the drums when filling occurred. The drum storage area is coated with a protective phenolic finish called Phenoline 300. In addition, the area is constructed with reinforced concrete. There are no sources of ignition in the vicinity of the drum storage area. The drums are all stored together in one area. Drum handling is minimized by storing the empty removable head type drums next to the truck unloading area where the sludge is removed from the storage tanks when needed. All drums remain sealed at all times. Full drums remain in place until arrangements are made to remove the lot. Should a leaking drum be discovered during daily inspection procedures, it would be removed from the drum storage area to the truck containment area using a manual hand-truck and its contents transferred to another drum or the entire leaking drum would be placed into an overpacked drum.

Run-on between the truck storage area and the drum storage area is prevented by the presence of a 3 ½ inch curb at the perimeter of the storage area. In addition, the drum containment area is graded to divert run-on drainage away from the drums but prevent it from leaving the area by the 3 ½ inch curb. The drum storage area is totally enclosed, therefore rainwater contact of the drum storage operation is prevented. There is no potential for spills or leaks from drum storage to reach storm water or groundwater.

2.2.4 Kiln Area

There are two potential contacts with hazardous material handling associated with the kiln area; the LGF tunnel & equalization building and the Trunnion apparatus. Each area is described as follows.

2.2.4.1 Description of LGF Tunnel & Equalization Building

Waste fuel is transferred from the LGF building to the kiln burners via the LGF tunnel. The LGF piping system is contained in an above ground walk-through tunnel that is ninety inches in diameter. This tunnel provides for primary and secondary protection from accidental leaks and rupture. The primary piping system is constructed with a corrosion resistant material with a pipe wall thickness that meets ANSI standards. Secondary protection of this pipe is provided by a second 90-inch diameter pipe that houses the primary piping. Tertiary protection is provided by a stiffening pipe, also 90 inches in diameter and enclosed within the secondary system. Within the tunnel leak detection sensors monitor LEL (Lower Explosive Limit) continuously, thereby insuring that any leak in the LGF piping system fuel will be identified. The LGF tunnel is sloped toward the LGF building, in the event of a release in the LGF tunnel all fuel would drain into the LGF building containment.

The equalization room is located in between the kiln control rooms. The tunnel pipe work system enters this building overhead. In this area LGF may be transferred into four (4) 1000 gallon equalization tanks or fed directly to the kilns. This building has secondary containment in case of a release, and is continuously monitored by the LEL sensors.

Additional details concerning BMP improvements to be made by Norlite are provided in Section 4.1.

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.

3. Baseline Best Management Practices

Norlite is committed to operating in full compliance, being a good neighbor and controlling, if not eliminating, dust emissions. The reduction in fugitive emissions resulting from the above improvements will also improve site runoff water quality.

3.1 Spill Control Committee

The Spill Control Committee at Norlite is responsible for implementing and maintaining the Best Management Practices (BMP) program. The committee's responsibility and authority are assigned by Norlite's management for carrying out management policy and achieving BMP program objectives. The committee is responsible for identifying the toxic and hazardous materials handled at the Norlite facility.

Norlite's hazardous waste activity consists of receiving and storing Low Grade Fuel (LGF) to be burned in Norlite's rotary kilns for energy recovery. The heat processes the crushed shale, obtained from the site's quarry, in the kiln to expand the shale. The resulting product is a lightweight aggregate. The committee is also responsible for identifying any potential spill sources including the following:

- Low Grade Fuel Storage (tank farm)
- Air Pollution Control Dust (Baghouse Dust)
- Vehicle/Equipment Maintenance Materials
- Wastewater Treatment Plant (see Section 4.0)
- Tanker Staging Area
- Equalization Building
- Ancillary Piping (Tunnel, etc . . .)

The Spill Control Committee shall set up spill reporting procedures and inspection programs as described in later sections of this plan. The committee shall advise management on the technical aspects of environmental incident control and shall coordinate activities for spill cleanups. Procedures, for the notification of authorities in case of a spill, are maintained by the committee. The committee shall recommend and help establish training and education programs for facility personnel to carry out all procedures.

The BMP program shall evaluated and reviewed by the Spill Control Committee on an annual basis or whenever potential spill sources change. The committee will meet regularly to evaluate the effectiveness of the complete BMP program. Recommendations for changes to the program shall be made to management in support of Norlite's policy on BMP related matters.

The Spill Control Committee/BMP Committee is comprised of the Norlite personnel listed in Table 3-1.

Table 3-1

Spill Control Committee/BMP Committee

NAME	TITLE	DEPT	HOME TELEPHONE
Ed Burgher	Director of Compliance	Compliance	(518) 583-6040
Melissa Burger	Health & Safety Manager	Safety	(518) 479-0201
Susan Goss	Laboratory Manager	Operations	(518) 584-4573
Al Popp	Project Engineer	Engineering	(518) 272-9664
Stan Milos	Environmental Technician	Compliance	(518) 663-5113
Tim Lachell	Director of Operations	Operations	(518) 373-9569

Committee membership shall be reviewed annually by the Committee. The committee shall recommend new members or changes in membership as necessary to keep this aspect of the BMP Plan functional. Committee membership is subject to Norlite management approval. It is intended to keep key individuals from various disciplines and responsibilities actively involved as committee members.

3.2 Spill Reporting Procedures

In an event involving a significant release of LGF, fuel oil or other hazardous materials, Norlite personnel must follow the RCRA Part 373 Permit Contingency Plan (See Appendix H, Norlite Contingency Plan).

Wastewater treatment chemical spills (a BMP improvement detailed in Section 4.0) are summarized as follows:

The Wastewater building itself serves as a containment area. Therefore there will not be any opportunity for the hazardous materials to migrate out of the wastewater area. These materials will not flow into the Salt Kill Therefore the reporting procedures shall differ slightly from the other hazardous material on site.

The chemicals include:

Hydrochloric Acid
Sodium Hydroxide
Polymer - Flocculent
Carbamate compound - Metal precipitate

As soon as a spill is identified the WWT and Kiln Supervisors shall be notified. The spill will be contained and cleaned up following WWT procedures delineated in the WWT Operating Manual. Any additional reporting to comply with permit requirements will be determined via the Spill report by the Emergency Coordinator and the Director of Compliance.

Once the primary or secondary emergency coordinator has been notified, he/she will:

A. Immediately identify the character, exact source, amount and extent of release. In the event that the released material cannot be identified, samples will be obtained for chemical analysis. Reporting of analytical results of these samples will be based on an objective turn-around time of two (2) working days.

B. If the release of toxic or hazardous materials poses a potential or immediate threat to site personnel, sound the warning alarm system. The Norlite facility has a warning system with a specific alarm signal consisting of a loud horn to initiate evacuation of all plant areas. The evacuation signal will be a continuous three (3) minute blast from an air horn readily available on the company's major earthmoving equipment. In addition to the alarm, the internal telephone system can be used to notify plant personnel as to the emergency's nature and recommended action plan. Total plant evacuation is initiated only by the Emergency Coordinator.

C. Notify the following of the incident:

	HOME PHONE NO.
Director of Operations - Norlite Tim Lachell 31 Cooks Court Waterford, NY 12188	(518) 373-9569
Director of Compliance - Norlite Edward C. Burgher 328 Burgoyne Road Saratoga Springs, NY 12866	(518) 583-6040

D. Report to the facility to coordinate emergency action.

TABLE 3-2
EMERGENCY COORDINATOR'S NUMBERS

Emergency Coordinators	Ext.	Off-Site #	Page #
Primary Emergency Coordinator: Safety Manager - Melissa Finn RR1 Box 191B, Burden Lake Road East Greanbush, NY	4032	479-0201	422-9872
Alternate Emergency Coordinators: Dir. of Compliance Edward C. Burgher 328 Burgoyne Road Saratoga Springs, NY	4029	583-6040	495-9239
Initial Emergency Coordinators*: Environmental Tech. Stan Milos *Are responsible in this capacity only on their appointed shift and only until Primary or Alternate Emergency Coordinator arrives on site.	4049		422-6202
Other Mandatory Contacts**: Dir. of Operations Tim Lachell 31 Cooks Court Waterford, NY 12188 **Must be contacted at first available time after the Contingency Plan is implemented.	4037	373-9569	342-0037
Operations Emergency Contacts: Sue Goss (First Alternate) Al Popp (Second Alternate)	4048	584-4573	422-4347
Initial Operations Emergency Contacts***: TBH Stanley Ashline, Jr. Malcolm McBride Harold Clark ***Emergency Contacts only on their appointed shift.	4073		422-9873

TABLE 3-3

MEMO OF EMERGENCY CALL

DATE: _____ TIME: _____
PERSON CALLING: NAME - _____
TITLE - _____

AGENCY CALLED: (check one)
[ ] USCG [ ] NYS DOT
[ ] USEPA [ ] OTHER
[ ] NYS DEC

GOVERNMENT PERSON SPOKEN TO:
NAME: _____
TITLE: _____

SUBSTANCE OF MESSAGE
LOCATION _____

_____

TYPE OF EMERGENCY _____

_____

WATERWAYS EFFECTED _____

_____

NATURE OF MATERIALS INVOLVED _____

_____

POTENTIAL HAZARDS _____

_____

ACTIONS BEING TAKEN _____

_____

PERSONNEL PRESENT _____

_____

PERSONNEL SUMMONED _____

OTHER (Use back if necessary)

TABLE 3-4
REPORTING FORM FOR EMERGENCY EVENTS
(Note: This table for BMP Plan reference only)

_____

Name, address and phone number of owner or operator

_____

Name, address and phone number of facility

_____

Date, time and type of incident (e.g., fire, explosion, etc.)

_____

Name and quantity of material(s) involved

_____

Extent of injuries (if any)

_____

Assessment of actual or potential hazards to human health or the environment (if applicable)

_____

Estimated quantity and disposition of material recovered from the incident

_____

Send to:

(1) U.S. EPA, Region II
Regional Administrator (EPA)
26 Federal Plaza
New York, NY 10278

(2) Commissioner
N.Y.S. DEC
50 Wolf Road
Albany, NY 12201

3.3 Source Identification and Assessment

Section 2 of this document identifies and assesses all manufacturing areas, hazardous materials handling areas, and the primary sources for possible releases. Norlite also maintains MSDS listings containing specific descriptions of physical, chemical, toxicological and health information on the toxic and hazardous substances handled at the facility. The Spill Control Committee will periodically review the facility operations to identify and assess all the hazardous material spill risks at Norlite.

In summary, the specific areas identified as potential spill/release source at the Norlite facility are as follows:

- Low Grade Fuel Storage Area
- Process Operations Area - Salt Kill Dam Area
- Quarry Water Discharge - Outfall 003
- Shale Fines Leachate - Outfall 004
- Air Pollution Control Saline Water (Scrubber Blowdown) - Outfall 006
- Waste Treatment Facility

Under the existing Spill Prevention, Containment and Countermeasures Plan, Norlite provides information on the procedures that will be taken to prevent accidents during loading and unloading operations, procedures to prevent undue contamination from the surface water runoff from hazardous waste handling areas, procedures to prevent groundwater contamination and procedures to mitigate the releases from an equipment failure or power outage. Detailed information is provided in Section of the New York State Part 373 permit application.

All new materials that are brought into the operations at the Norlite facility must first be evaluated for compatibility with storage and transfer materials of construction. MSDS information will be reviewed and maintained at the facility. The Spill Control Committee will also review and discuss spill prevention and control of new materials. The committee will evaluate the potential of toxic and hazardous substances for discharging into receiving waters.

3.4 Employee Training

Norlite provides initial 24 hour training to all employees actively involved with in-plant job functions. In addition, Norlite conducts on-the-job training for specific work tasks. All new employees are familiarized with specific duties and Norlite's standard operating procedures (SOP's) by experienced supervisory staff. During the initial 24 hour training program, employees are instructed on (1) the hazardous nature of chemicals and chemical wastes in general, (2) the purpose of RCRA and the importance of maintaining compliance with RCRA regulations, (3) the hazardous nature of the wastes being stored in the facility, (4) proper handling and storage procedures, as described in Sections D and F of the RCRA Part B permit, (5) emergency procedures and contingency plan (6) Safety and Hazard Communication. A copy of the Norlite Training Program is included in Appendix I.

All new employees are made familiar with Norlite's BMP program, safety requirements, the Contingency Plan and the specific responsibilities under the New York State Environmental Conservation Law and the New York Department of Environmental Conservation (DEC) regulations which are relevant to their positions. A copy of the Norlite Contingency Plan is included in Appendix H.

Norlite personnel receive regular supervision and continuing training as required. Training sessions are conducted, at a minimum, annually. As needed, supervisory staff review job requirements and duties with personnel and provide additional training for expanded duties.

In addition, each employee involved in hazardous waste/mining operations receives eight (8) hours annually of continuing health and safety training (hereafter referred to as "OSHA/MSHA training"). Supervisory personnel involved in hazardous waste operations receive an additional eight (8) hours of initial training.

The objectives of the BMP training policy is to instill in all facility personnel a complete understanding of the following:

a) The BMP program
b) Processes and materials with which they are working
c) Safety hazards
d) Practices for preventing accidental and unintentional discharges
e) Procedures for responding properly and rapidly to toxic and hazardous materials incidents

The BMP training program can be covered in (or along with) other related training programs required by OSHA, RCRA, etc. At a minimum, the employees shall be trained in the following Best Management Practices:

a) Source Identification and Assessment

Identification and awareness of critical equipment and systems
Reporting incidents and potential dangers

b) Material Storage

Hazard Communications Program
Materials compatibility
Proper uses and purpose of materials
Health risks and safe handling procedures for chemicals used (MSDS)

c) Loading and Unloading Operations

Good housekeeping
Material handling
Ergonomics (relationships between employee and equipment)

d) Plant Run-off

Emergency operations - Spill response drills
Spill response teams and equipment
Absorbents, jelling agents, foams and neutralizing agents
Spill reporting procedures
Maintaining containment areas and spill pumps
Proper disposal of containment area discharges
Procedures for off-site spill clean-up

e) Preventive Maintenance

Lock-out procedures
Equipment inspection procedures and practices
Procedures for equipment decontamination and certification

f) Inspection Records and Reports

In-plant operating records
Critical parameters concerned with LGF and hazardous waste storage/transfer areas
Safety and security (OSHA, RCRA, In-house)
Tank inspection reports

g) Periodic Meetings

Employee awareness of their roles in plant operations
Emergency operations and equipment
Medical considerations
Incident prevention and control
Review of past performance (spills and causes)

h) Individual Training Programs

Contractors
Employees
Supervisors
Temporary Personnel

Details concerning Norlite's training policy and procedures is included in Appendix I.

3.5 Visual Inspection

Norlite personnel inspect the facility to detect spills or evidence of potential spills or other conditions that could lead to an environmental incident. Formal inspections of hazardous waste management facilities are the responsibility of the following Norlite personnel:

- Environmental Manager
- Compliance Coordinators
- Trunnion Operator
- Fuel Operator
- Burner Operator
- Lab Technicians

Each person is responsible for regular inspections of hazardous waste management facilities and the initiation of corrective action if deficiencies are noted. Appendix J contains the inspection forms used by Norlite personnel. These inspection procedures are thoroughly described in Section F of the Part 373 permit application.

3.5.1 Areas that need to be inspected on a regular basis

Regular visual inspections shall be performed by area supervisors and include visual observations of loading and unloading areas, storage areas, process equipment secondary containment areas, runoff from the aggregate piles, storm water collection system, detention basins and leachate pond for the detection of (or potential for) leaks and spills. The inspections shall be made routinely. Potential spill problems shall be reported to the Spill Control Committee for review. Visual inspection program considerations relative to each of the ancillary sources are discussed below.

For loading and unloading operations, visual inspections shall be performed during transfer of hazardous chemicals to permit immediate response if a spill occurrs. The condition of pipelines, pumps, valves and fittings for liquid transfer systems (and pneumatic conveying systems used for transferring dry materials) shall be inspected. Visual inspections together with monitoring shall be used to ensure that the transfer of material is complete before flexible or fixed transfer lines are disconnected prior to vehicle departure. Before any tank car or tank truck is unloaded or filled, the lower-most drain valve and all outlets of such vehicles shall be closely examined for evidence of leakage/deterioration and, if necessary, tightened, adjusted or replaced. Before departure, all tank cars or tank trucks shall be closely examined to ensure that all transfer lines are disconnected and that there is no evidence of leakage from any outlet.

Raw-material storage areas for dry chemicals shall be inspected for evidence of or the potential for wind-blowing of materials to other areas and possibly to a receiving body of water or for evidence of the buildup of solids on the ground due to poor housekeeping. Liquid (LGF) storage areas shall be inspected for leaks in or corrosion of tanks, for deterioration of foundations and/or supports, and for closure of drain valves in containment facilities. Inspection shall include an examination of seams, rivets, nozzle connections, valves and pipelines directly connected to a tank. Internal examination or inspection of storage tanks shall involve identifying evidence of corrosion, pitting, cracks, abnormalities and deformations. Such evidence shall then be evaluated and presented to the Spill Control Committee. Pressure testing and thickness determination of tanks shall be performed on a scheduled basis in accordance with Section D and F of the Part 373 permit application.

For runoff from aggregate piles, visual inspections shall be used to examine the integrity of the storm water collection system and diversion or overflow structures and for ensuring that drain valves and pumps for diked areas are properly closed. The quality of runoff from aggregate piles shall be verified by visual and/or testing procedures specifically developed for runoff control systems as they are installed.

The storm water collection systems, detention basins and leachate pond shall be inspected for potential spills from the deterioration of containment structures or overflows.

3.5.2 Areas that may require detailed investigations

Detailed inspections shall be performed by facility personnel responsible for the individual processes. During normal operations these inspections shall include examinations of valves, pipe fittings and containment structures. Other areas that shall require detailed inspections are the Trunnions on the rotary kilns and the pumps from the collection basins and leachate liner. These inspections are also utilized to evaluate the adequacy of the preventive maintenance and good housekeeping best management practices.

3.6 Preventive Maintenance

The Norlite Preventative Maintenance (PM) has been implemented to eliminate or minimize spills of hazardous or toxic substances to the ground, air or water. The Spill Control Committee shall identify equipment and systems to which the PM program should apply by analysis of potential for failures, spills and spill impacts. Additionally, the PM program has been developed to provide a safe work environment and provide upkeep of the capital investments in plant equipment. The equipment and systems shall be maintained by repair, adjustments or replacement of worn parts before the equipment or system fails. The BMP preventive maintenance program is part of the overall Norlite PM program.

The equipment and systems included in the preventative maintenance program along with their maintenance schedule are contained in Figure F-1 of the Part 373 permit application.

All Preventative Maintenance records for equipment and systems shall be maintained in the main office at the Norlite facility.

3.7 Good Housekeeping

The BMP good housekeeping is essentially the maintenance of a clean and orderly work environment and must be practiced by all facility personnel. A clean and orderly work area reduces the possibility of accidental spills caused by mishandling equipment and therfore reduces the safety hazards to facility personnel.

The methods for achieving good housekeeping goals are to maintain regular housekeeping inspections by supervisors and/or operators and to discuss housekeeping at safety meetings. Examples of good housekeeping include the following:

- Neat and orderly storage of chemicals and materials.
- Prompt removal of small spillage.
- Regular garbage and rubbish pickup and disposal.
- Maintenance of dry and clean floors by use of brooms, vacuum cleaners, etc.
- Proper pathways and walkways and no containers and drums that protrude onto walkways.
- Minimum accumulation of liquid and solid materials on the floor in a building.

The specific sources of potential spills or releases of toxic or hazardous materials shall be managed with good housekeeping practices as described above. During daily operations, facility personnel shall be maintaining a neat and orderly work environment.

3.8 Material Compatibility

Material compatibility at Norlite shall focus on:

The compatibility of the container with its contents and the environment.

Precautions taken in the container storage area to prevent accidental fire and explosion include: the proper storage of containers (e.g., stacking, aisle space, and labeling and sealing of containers); dikes; sump areas and sump pumps; and, appropriate warning signs (e.g., signs with legends - "NO SMOKING" and "DANGER - UNAUTHORIZED PERSONNEL KEEP OUT").

Details of the container storage systems are included in the Part 373 permit application.

Ensuring that the materials of construction are appropriate for the contents of the container.

The Norlite BMP shall review and approve material's compatibility prior to the installation of new equipment and systems used for handling toxic and hazardous materials. Norlite shall also periodically check material safety data sheets (MSDS) to review the physical and chemical properties of the chemicals being handled at the site for compatibility with the materials of construction of containers, pipelines, tanks, valves, etc.

The compatibility of different chemicals and Low Grade Fuel is evaluated when blending.
The procedure for acceptance of all Low Grade Fuel is described in the permit, Part 373, Section C - the Waste Analysis Plan. The Waste Analysis Plan covers which waste codes are acceptable at the facility and SOP #3 describes in detail the

Compatibility tests that are performed prior to unloading a tanker and prior to tank-to-tank blending.

A main safety concern is the potential hazard of an accidental ignition of the LGF. Therefore flammable wastes are only stored in the protective enviroments of the LGF storage tanks, the container storage building, and in the Equalization room at the kilns. Norlite has taken numerous precautions to prevent an accidental ignition in the tank storage area including oxygen monitoring, nitrogen blanketing in the tanks, tank grounding and other requirements under NFPA 30. (The particulars of the tank design features and the management practices aimed at preventing accidental ignition are described later in this document and in the RCRA Part 373 permit under Sections D-2c, D-2d, F-1b and F-4a.)

3.9 Security

Norlite operates with a security system to prevent accidental or intentional entry into the facility. Protection measures against vandalism, theft, sabotage or other improper or illegal use of the facility includes: routine patrols of the facility by security and compliance personnel; fencing to prevent intruders from entering the LGF handling facility site; good lighting; vehicular traffic control; a guardhouse (Elm street entrance) and controlled entrances to the facility.

Security personnel are instructed to monitor for leaks from tanks, valves or pipelines while patrolling the facility and are required to notify the Primary Eemergency Coordinator or Compliance Coordinator if such a leak or spill is detected.

Norlite operates its facility 24 hours per day, 7 days per week, 365 days per year. During periods of normal kiln operation, at least three (3) employees are on duty at all times. During periods when the kilns are not operated, at least one (1) employee is on duty at the site at all times. The Trunnion Operator makes an inspection of the LGF areas three (3) times each shift (six (6) times daily) to check security and to inspect the items listed in the Trunnion Operator's Shift LGF Inspection Report.

Ample lighting is provided throughout Norlite's facility except for the quarry area which does not contain hazardous waste and which usually does not operate at night. In addition, most facility areas are connected to an internal telephone system which is also used for communications outside the facility.

Due to the large area of the site (approximately 260 acres), a facility security fence is not practical. However, Norlite has installed a security fence to control entry to the hazardous waste storage area which includes bulk storage, drum storage and loading/unloading areas. Fenced areas shall remain locked at all times except during periods of loading and unloading. During these times, Norlite personnel will be in attendance.

The kiln area will not be provided with a security fence. However, this area is continuously monitored by Norlite personnel to prevent unauthorized access, 24 hours per day, seven days per week. A concrete building at the tank farm is used for the storage of safety equipment, as well as a telephone to provide direct internal and external communication.

In addition to the 24-hour surveillance system, Norlite has posted warning signs in the active portions of the facility. The signs are legible from a distance of 25 feet and are posted at the LGF storage tank area and at the LGF pump house. These signs are visible from all angles of approach and bear the legend: "DANGER - UNAUTHORIZED PERSONNEL KEEP OUT", and

"NO SMOKING". Signs have also been posted at appropriate locations in the kiln area, drum storage area and unloading area and shall be maintained.

Television monitoring cameras are located in appropriate places on the Norlite site to facilitate site security at entrances and in work areas requiring a higher degree of surveillance.

4. BMP IMPROVEMENTS

Section 4 is comprised of the following three subsections:

4.1 Norlite Facility Compliance Improvements
4.2 Plant BMP Committee Manufacturing Area Assessment
4.3 Storm water Runoff Control Improvements

4.1 Norlite Compliance Improvements

The Norlite Facility located at 628 Saratoga Street in Cohoes, New York manufactures two types of products. These are:

1. Expanded LWA (light-weight aggregate) for use in structural applications such as concrete flooring, soil drainage enhancement, and roadway sub-bases.

2. Block mix additive for structural block production.

Two drawings, Simplified Block Diagram (Figure 4-1) and Site Plan of Operating Area (Figure 2-2) define the manufacturing process steps and define the products manufactured.

Norlite operates two kilns each capable of feeding 27 tons per hour of shale to produce LWA. Up to 10.1 gallons per minute of liquid LGF (low grade fuel) and 114 pounds per hour of solid LGF is fired to manufacture the expanded LWA. Supplemental commercial fuels such as off-spec fuel oil and used oil, #4 fuel oil, and natural gas are fired to augment insufficient supplies or heat contents of LGF.

Appendix A: APCD, Scrubber and Block Mix Additive

As per NYSDEC Permit Part 373, the #1 Kiln Air Pollution Control Devices were upgraded similarly to Unit #2. Norlite installed a baghouse, modified the scrubber, and added a new dispersing stack. Appendix A defines the existing baghouses, scrubber systems, and dust handling systems

Appendix B: Wastewater Treatment Improvements

Norlite currently operates a temporary waste water treatment plant (WWTP) to remove metals and suspended solids from the scrubber blowdown streams. The temporary plant is capable of treating a total of 30 to 40 gpm of combined kiln blowdown water and trunnion cooling water. The permanent WWTP, which will be completed in September 1995, will be capable of processing 60 gallons per minute of combined blowdown and trunnion cooling water and comply with NYSDEC Order on Consent R4-1680-94-05 and Norlite's SPDES Permit. Appendix B includes a process narrative for the new WWTP and a simplified PID.

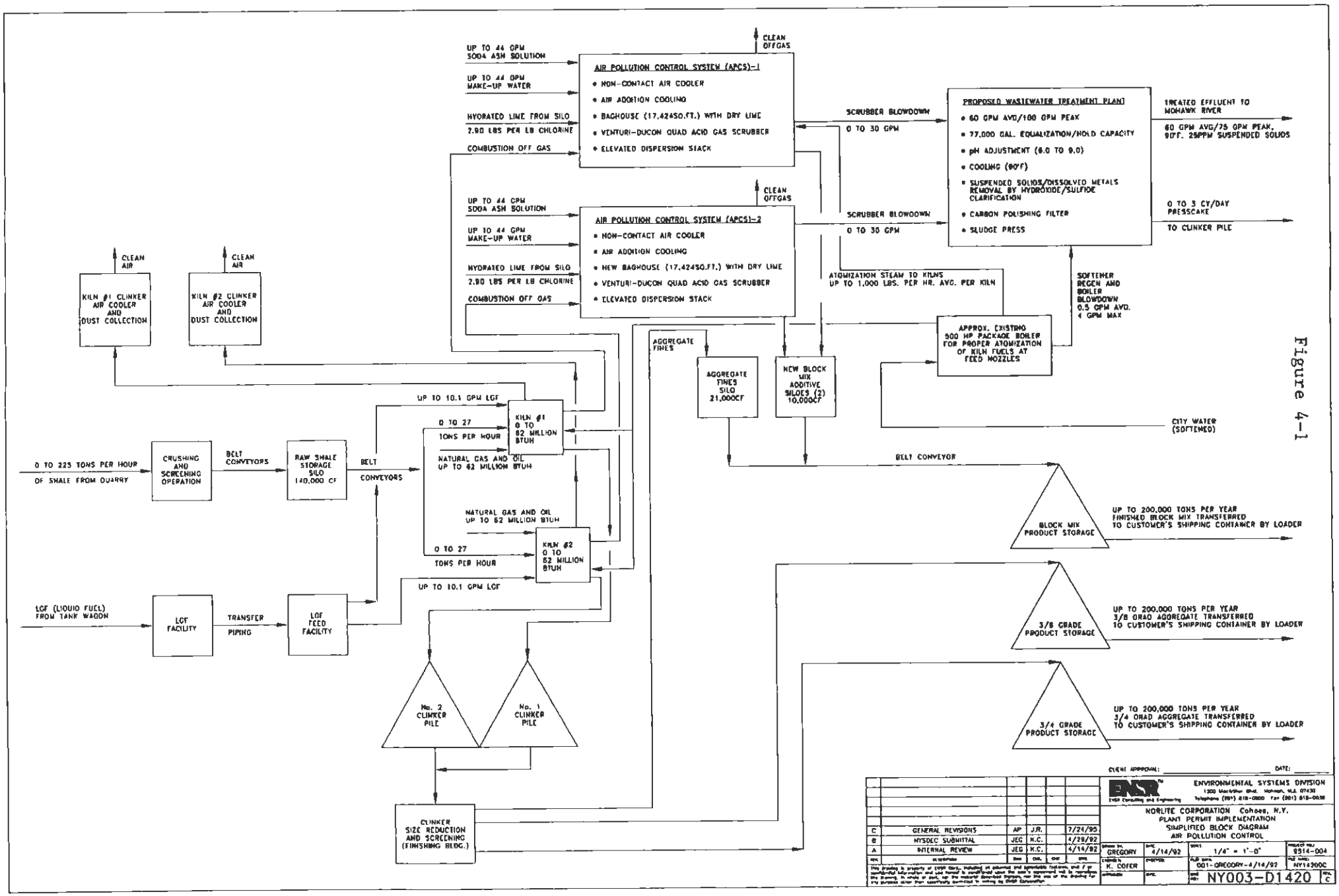

Figure 4-1

CLIENT APPROVAL: _____ DATE: _____

C	GENERAL REVISIONS	AP	J.R.		7/24/95
B	NYSDEC SUBMITTAL	JEG	K.C.		4/29/92
A	INTERNAL REVIEW	JEG	K.C.		4/14/92
mk	description	init.	chk.	appr.	date

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NORLITE CORPORATION Cohoes, N.Y.
PLANT PERMIT IMPLEMENTATION
SIMPLIFIED BLOCK DIAGRAM
AIR POLLUTION CONTROL

drawn by: GREGORY	date: 4/14/92	scale: 1/8" = 1'-0"	project no.: 8914-004
engineer in charge: K. COFER	approved:	file name: 001-GREGORY-4/14/92	file no.: NY14300C
	date:	dwg. no.: NY003-D1420	rev. no.: C

Appendix C: Instrument and Control (WFCO) Improvements for Kiln, APC, and Scrubber Systems

Appendix C defines the instrument and control improvements to be provided for these systems to support LGF firing at 10.1 gpm per kiln as per Norlite's March 20, 1992 public notice relating to New York State Part 373 Permit and EPA Region II HWSA permit.

Appendix D: LGF Improvements

The existing Norlite LGF facility was replaced in part by an improved facility which complies with RCRA Part B, NFPA fire regulations and OSHA safety standards. This upgrade was performed in 1992 as part of Project 9511-003 managed by ENSR C&E.

The RCRA Part B requirements for the LGF Facility have been previously approved by NYSDEC (1/92). Appendix D defines the details of these improvements. Appendix D includes a description of the LGF Storage and Feed Systems.

The following LGF improvements were initially installed as part of Project 9511-003:

1. RCRA Part B compliance relating to secondary containment.

2. Improved the fire safety of the operations as per NFPA regulations.

3. Removed existing in place LGF systems associated with 25,000 gallon tanks TK-100 and TK-200 which lacked secondary containment.

4. Improved the 55 gallon drum LGF/ Solid Fuel Storage Facility capacity to 214 drums. Subject to NYSDEC approval, this facility could be expanded more than 100 percent by adding storage racking systems in the future.

Table 4-1

Drawing List for
Section 4 of Norlite
BMP Plan

The drawings listed below present the key information required for the BMP Plan. Other drawings are available in other documents in NYS DEC's possession, such as the Part 373 Permit Application, air permit applications, and SPDES Permit applicaiton documents.

Narrative	
NY003-D-1420	Simplified Block Diagram
NY-F-C-3039	Construction Site Plan
Appendix A	
NY003-D1403	P&ID - APC Multiclone/Heat Exchanger/Baghouses Kiln
NY003-E-1404	P&ID - APC: Fan/Scurbber/Stack
NY003-D1405	P&ID - Lime Storage Silo
NY003-D1406	P&ID - Carbonate Silo
Appendix B	
NY029-1003	New WWT Plant
NY029-1004	New WWT Plant
Appendix D	
NY-D-M-6002	Arrangement - LGF and Equalization Tanks
NY-E-D-5003	P&ID - Unloading and F.O. Storage
NY-E-D-5004	P&ID - LGF Storage and Feed Transfer
NY-E-D-5006	P&ID - Waste Feed Cut Offs
NY-E-D-5008	P&ID - LGF Equalization and Feed - Kiln #1
NY-E-D-5010	P&ID - Solids Reprocessing
NY-E-D-5011	P&ID - Solid LGF Feed
NY-E-D-5013	P&ID - LGF Equalization and Feed - Kiln #2

4.2 Plant BMP Committee Manufacturing Area Assessment

The following 27 pages summarize the results of an in plant evaluation of BMP Manufacturing areas requiring future action. To the best of its knowledge, the BMP Comittee, managed by E. Burgher, Director of Compliance and R. Schlauch, Director of Water Permitting, addressed all plant operations in detail to identify all potential problems. The BMP Committee reviewed both new project work as per Section 3.1 and all other operating and manufacturing support areas. Storm water runoff and upgrades were evaluated separately and necessary corrective actions are defined in Section 4.3.

The members of the BMP Management Committee are listed in Table 3-1.

Table 4-2

IN PLANT BMP COMMITTEE
AREA ASSESSMENT

AreaDescription	
Area 1	Shale Fines Landfill/Leachate System
Area 2	LGF
Area 3	Mid Pond
Area 4	Baghouse Silo Kiln #2
Area 5	Coal Area
Area 6	Kiln #2 Baghouse
Area 7	Off gas Coolers/Kiln #2 Baghouse
Area 8	Kiln #2 Scrubber
Area 9	Kiln #2 Trunnions
Area 10	Kiln #1 Trunnions
Area 11	Lube Oil Room
Area 12	Fuel Oil (#4), Diesel Fuel
Area 13	Boiler Room
Area 14	Air Compressor/MCC Room
Area 15	Scrubber Kiln #1
Area 16	Pump House
Area 17	Railroad Steel Loading Operations
Area 18	Lime and Soda Ash Operations
Area 19	Used Equipment, Debris
Area 20	Aggregate Finishing
Area 21	Shale Storage Silo
Area 22	Garage/Maintenance
Area 23	Rainwater, Dust Control
Area 24	By-Product System (Block Mix)

Area 1 - Shale Fines Landfill/Leachate System

The existing leachate system for the shale fines landfill shall remain in service for the immediate future. Monitoring of the leachate is reported to NYSDEC as part of Outfall 004 monitoring for the SPDES permit. It is believed that at some future date, the leachate will diminish to an extent representative of clear storm water, once the landfill is capped. At this point in time, Norlite may request NYSDEC to authorize Norlite to remove this system from service.

All shale fines were removed from the impoundment and placed in a solid waste landfill on site permitted by DEC prior to January 1, 1992. The removal of the shale fines were done in accordance with procedures approved by NYSDEC.

Nothing remains in the lagoon or dewatering ridge along the perimeter of the lagoon. ENSR has completed sampling the soil remaining in the former lagoon to document removal of all of the shale fines. The sampling and analytical plan was submitted to and approved by NYSDEC Division of Solid Waste, Region 4 (James Sacco, P.E.). Likewise, at a point directly north of the LGF Storage area, waste piles consisting of baghouse dust had been stored. These waste piles were moved to the non-hazardous solid waste landfill prior to January 1, 1992 along with the shale fines. ENSR is also in the process of sampling and testing the soil remaining below the former dust piles to document that all dust was moved to the landfill. This sampling and testing was completed in July, 1992 as part of the RFI required under the Part 373 Permit.

Since 1992, the shale fines and relocated topsoil piles that were previously located to the north and west of the kiln area have been placed in an on site, secure, permitted landfill. The landfill has been capped and seeded to provide a grass cover. The area has also been improved by reshaping and resloping the LGF storage area and present office building sites.

All this work was performed in regulatory compliant manner under the observation of the Norlite compliance staff, and DEC's regional solid waste engineer.

Area 2 - LGF Storage

The LGF improvement plan implemented by Project 9511-003 is defined by Section 4.1 of this BMP. In addition to these improvements, the perimeter around the LGF unloading and storage area was regraded to provide an unlined, earthen containment dike in the unlikely event of receipt of a leaking tank wagon. This supplements the tank unloading area which is already provided with secondary containment of non earthen materials, sufficient to contain an entire tank wagon volume. A spill control station (i.e. absorbent, sand, booms, polyethylene 6 mil. sheet, lime, clean DOT 55 gallon drums, shovels, etc.) shall be maintained in the area for emergency response to leaking drums or tank wagons. A low point drainage opening will be provided in the earthen dike's south and/or east sides to allow uncontaminated storm water runoff. Spill control maintenance will assure that chemical and engine truck fluids are not normally existent on the ground coincident with periods of precipitation or snow/ice melt runoff. Dry sandbags, polyethylene liner, weight blocks, and shovels shall be maintained at the runoff opening in the dike so the dike can be sealed in 15 minutes by 3 men in the unlikely event an emergency spill coincident with receipt of a leaking tank wagon of fuel. Procedures, personnel training, and emergency response teams will be instituted to assure essentially no groundwater or storm water contamination in the area.

Any soils removed will be disposed of in a RCRA compliant manner. Compliance monitoring will assure that operations satisfies these requirements.

The new LGF tank building provides tertiary containment for the LGF tanks 300-600. In addition, Norlite has replaced the below ground line with a new above ground LGF line totally enclosed within a pipe tunnel. The tunnel provides secondary containment for the LGF line which slopes back to the containment structure within the LGF storage building. Leak detection systems have been installed at intervals along the length of the LGF pipe tunnel.

Area 3 - Mid Pond

The Mid-Pond has been decommissioned in a compliant manner. All of the silt has been placed in a secure, on-site, permitted, lined and capped landfill.

Area 4 - Baghouse Silo Kiln #2

The baghouse silo for Kiln #2 is no longer in use. Dust collected in the Kiln #2 Baghouse is pneumatically conveyed to the dedicated dust silos. See section 4.1 for a complete description of the dust handling system.

Area 5 - Coal Area

The coal transfer, attrition, and feed systems were removed from Norlite in 1992. The coal reserves were removed from site. The remaining concrete storage vaults and footings cleaned of coal and removed from site and disposed of in a regulatory compliant manner.

Any earth laden with significant traces of coal was removed from site and disposed of in a regulatory compliant manner.

Resultant holes were refilled with clean earth and re-compacted to medium proctor.

The elimination of the use of coal at Norlite represents a significant improvement with regard to abating a fugitive dust source, SO_2 emissions, and storm water runoff control issue.

Area 6 - Kiln #2 Baghouse

Appendix A which defines the APC system (including the baghouse) improvements completed by the Norlite Compliance Improvement Project. The maintenance and housekeeping for this area will be maintained as follows

a) All bahouse dust will be removed and transferred by a system of rotary airlocks and pneumatic lines.
b) Non-routine cleanout of the baghouse modules by vacuum truck will be performed to minimize fugitive dust.
c) All Maintenance activity requiring placement of filter bags or any equipment contaminated with baghouse dust on the ground will be done on poly lined surface.
d) Any dust, scrap equipment, and maintenance components will be removed from site and disposed of in a regulatory compliant manner as overseen by the compliance staff.

The compliance staff will routinely monitor operations and maintenance to assure conformance to these procedures. Compliance monitoring shall also assure the baghouse is not operated in a method which results in contamination of the atmosphere or ground by baghouse dust from faulty equipment (seals, etc.)

Area 7 - Off gas Coolers

Dust is removed from the excess clinker cooler air by the Barron fan and multiclone system. Currently the dust removed from the air by the multiclone is transferred to the clinker conveyor belt via a chute. SCI-TECH and Norlite have identified this area for the implementation of more elaborate dust control in The Addendum Fugitive Dust Plan, February, 1995.

The transfer chute will be modified to allow dust to be conveyed to a sealed hopper. The hopper will be moved with a fork lift or other machinery to the clinker pile area. The dust in the hopper will be wetted and mixed into the clinker pile so it can be recycled for beneficial use.

Area 8 - Kiln #2 Scrubber

A spill containment curbing around the perimeter of the Kiln #2 concrete pad prevents the release of scrubber water. The scrubber piping and containment is enclosed with aluminum siding. The inside of the enclosure is heated and insulted for winter time operation. All lines that exit the enclosure are heat traced and insulated.

Scrubber maintenance and clean out is performed in accordance with a standard operating procedure. When maintenance is remediating and maintaining the scrubber system, compliance monitoring will assure no earth is contaminated with hazardous debris or scale.

Area 9 - Kiln #2 Trunnions (3)

A solution to the leaking lubricating oil from the bearing houses has been installed. Oil flows into a perimeter channel collection launder (all 4 sides) and then into a DOT drum via hose.

The oil is disposed of in a RCRA compliant manner. This oil can also be blended with LGF for supplemental kiln fuel use. Lubricating greases are collected should they inadvertently fall on earth or concrete and are then disposed of, along with any contaminated earth, in a RCRA compliant manner. The compliance staff monitors the operation to assure operations complies.

Area 10 - Kiln #1 Trunnions (2)

The solutions, procedures, and monitoring programs identified for Area 9 will also be followed for Area 10.

Area 11 - Lube Oil Room Under Kiln #1

1. A curb is provided in the doorway to keep mud and storm water out of this room. The earth around the entrance is graded to eliminate introduction of rainwater. Retaining walls guard the entrance of the doorway against introduction of rainwater.

2. The floor of this building will be kept free of oil and grease through routine inspection and housekeeping by the kiln operators.

Area 12 - Underground process and Fuel Oil Tanks

Any abandoned in place tanks will be removed from service in a RCRA compliant manner. TK-100 and TK-200 plus associated subsystems, the Kiln #1 pump house and the shales fines settling lagoon were identified as abandoned and have been removed from service. All these systems were not being used for their as designed process application because none of them had secondary containment.

The 3 below grade vehicular fuel tanks have been removed from service in a RCRA compliant manner. These tanks shall be replaced with above ground tanks which meet state and local building code requirements and have a secondary containment.

Two below grade fuel oil tanks (supplemental kiln fuel) which were located south of Kiln #1 were cleaned and removed in a RCRA compliant manner. These two tanks were replaced in 1992 by TK-9, an above-ground off-spec oil tank with a secondary containment.

One remaining below grade tank, also located south of Kiln #1 shall contains virgin oil for supplemental kiln fuel. This tank, TK-6 shall be removed by December, 1996.

Area 13 - Boiler Room

This system is not currently in operation. When this system is returned to service, operators will routinely monitor this area to ensure that all materials in the boiler room do not impact the surrounding environment.

The ground outside the boiler room was graded so that stormwater will run away from the entrances.

Area 14 - Air Compressor/MCC Room

1. No problems were identified in the MCC rooms.

2. Clean oil spills from concrete floors in the compressor rooms.

3. Maintenance and operational procedures are in place to minimize and eliminate leaks and accumulation of oil on the floor.

Area 15 - Scrubber, Kiln #1

Kiln 1 scrubber is constructed and maintained in a manner similar to Kiln # 2. Both of these systems are described in Section 4 of this BMP.

Area 16 - Pump House/Shale Settling Lagoon

The pump house, shale fines settling lagoon, and associated drainage and piping systems were historically used by Norlite as a Kiln #1 scrubber recirculation system.

This system was replaced by an air pollution control device (baghouse/recirculated caustic scrubber) system comparable to the one permitted by NYSDEC for Kiln #2.

The pump house, settling lagoon, associated underground gravity culverts, and piping system have been decommissioned and removed from service in a RCRA compliant manner.

Area 17 - Railroad Steel Loading Operations

Railroad cars are no longer loaded with steel at Norlite.

Area 18 - Lime and Soda Ash Operations

Both the lime and soda ash make-up systems provide alkali treatment chemicals for removing acid off-gases (such as sulfur oxides from the shale) from the kiln flue gases. Lime is added prior to the baghouses by pneumatic transfer. The baghouse removes the lime and lime by products (gypsum, etc.). Up to 50 tons of lime is stored in a 2,500 cubic foot silo which is equipped with a fabric filter bin vent to relieve pressure and capture dust while the silo is being filled by a bulk truck.

Lime is gravity fed into feed hoppers located directly under the silo. The mass flow of the lime is controlled by a rotary airlock and screw feed mechanism. The auger screw feeds the lime into the pneumatic system which injects the lime into the baghouse duct work.

The motor speeds of the airlock and screw are calibrated to the required lime mass feed rate. The on/off switches for the lime feeders and pneumatic blowers and the motor speed controllers are in on the lime feed control panel in Kiln #2 MCC.

The soda ash solution and make-up system supplies 5% to 10% by weight solution to the kiln 1 and 2 scrubber systems. An improved fabric filter bin vent was installed on top of the soda ash silo in May 1995. The new bin vent was designed to collect dust and return it to the soda ash silo. The bin vent filter bags are automatically cleaned "on demand" by pulsed compressed air. Cleaning is controlled by a Photohelic differential pressure gauge.

The level of the soda ash solution tank and the addition of soda ash are controlled automatically by tank level switches. When the level of the tank reaches the low level an electronic switch opens a solenoid valve causing clean water to fill the tank until the high level is reached. While water is being added a screw conveyor pushes crystalline soda ash out of the silo hopper and into the solution tank. The screw conveyor turns off automatically after a set time. The operating time of the screw has been set based on previous experience and is sufficient to maintain a consistent solution concentration. Additionally the tank is agitated by mixers to assure consistency.

The level of the soda ash silo is checked and recorded twice daily. The concentration of the soda ash solution is checked frequently by the kiln personnel.

The base of the soda ash silo and the tank are covered by a building to minimize ground water and storm water contact. The building is heated in the winter to prevent freezing.

Two pumps are housed in the soda ash building. These pumps feed soda ash solution into the suction lines of the scrubber recycle pumps to maintain a minimum pH of 8.0. The pH set point of the scrubber solution may be changed by the burner operator in the Genesis Data Acquisition System. There is a manual Caustic Boost option in the Genesis system to allow the burner operator to correct for pH upset conditions.

Area 19 - Used Equipment, Debris

1. A systematic, plant wide centralization and evaluation of plant equipment has been performed. Equipment that is unusable will be decontaminated and/or removed from site.

   A substantial amount of unusable equipment was removed from site since 1992. As equipment becomes unusable, either it will be decontaminated (as appropriate) and removed from site or stored in the common area.

2. Any contaminated debris or earth shall be disposed of in a RCRA compliant manner.

3. Valuable used equipment shall be:

   a) stored either in an area with secondary containment (indoor or out),

   b) and/or cleaned in regulatory compliant manner and stored in one common area.

4. Any contaminated storm water from a concrete storage containment shall be treated in the WWTF or disposed of in a regulatory compliant manner.

5. Norlite's compliance staff will routinely monitor maintenance and operations to insure conformance with these commitments. It will be the responsibility of the Compliance Department to determine the acceptable methods of disposal, equipment remediation, and storage.

Area 20 - Aggregate Finishing Building

1. Propane and gas cylinders shall be secured according to OSHA and MSHA standards. The Compliance and Safety staff will monitor routinely to assure conformance.

2. Good housekeeping shall be maintained. Compliance staffing shall monitor routinely to assure compliance.

3. The roof shall be maintained so that precipitation does not enter the building and cause run-off problems.

Area 21 - Raw Shale Storage Silo

1. The holes in the roof will be sealed or covered to assure precipitation does not come in contact with the shale.

2. A new fabric filter dust collection system will be installed in accordance with the recommendations of the Fugitive Dust Plan Addendum.

Area 22 - Vehicle Repair Garage/Plant Maintenance

Norlite has many vehicles (front end loaders, dump trucks, earth movers, etc.) which are used to operate the quarry. In addition, the plant operations (kilns, LGF, aggregate finishing) are maintained.

Lubricants, oils, transmission fluids, and greases are housed at the maintenance facility. Various methods of secondary containment have been installed to prevent contamination of earth, storm water, and groundwater.

When maintenance of engines is performed, it will be done with temporary or permanent spill containment. Outside maintenance will not be performed during periods of excessive precipitation. When engines are cleaned, mechanical methods will be used to the maximum. Hot water washes will be performed in contained areas, collected to DOT containment and disposed of in a RCRA compliant manner.

Hot water washes will not be performed outdoors during periods of precipitation. Organic solvent cleaners shall not be used outdoors.

The plant maintenance area is described in the other areas. Maintenance is performed, in general, in the operations areas. See other areas. Any equipment to be cleaned of chemicals shall be cleaned in a manner consistent with that described in the previous paragraphs for vehicle engines. The waste and wash waters thus generated shall be disposed of in a RCRA compliant manner.

The compliance staff will routinely monitor the maintenance operations to assure conformance to procedures and standards. All maintenance personnel will receive on the job training by their supervisors to assure conformance to prevent contamination of groundwater and storm water. The maintenance staff and supervision will be expanded and improved to assure compliance.

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.

Area 24 - By-Product System

In the processing of light weight aggregate (LWA) Norlite generates two main by-products. Both of these by-products, WWT filter press cake and baghouse dust, have beneficial use determination (BUD) grants from NYSDEC. The BUD allows bag house dust to be converted into block mix. Filter cake is returned to the hot clinker pile and blended into the finished product.

The bag house dust is collected and pneumatically conveyed to one of two dust silos at the finish plant. There is a third, slightly larger silo at the finish plant to store light weight aggregate fines. Block mix, a combination of 3/8's, light weight aggregate fines, and bag house dust, is produced in the Shipping Tunnel under the three silos. Each constituent is fed onto a conveyor belt by a rotary air lock on the bottom of the silo. When the material is dropped from the conveyor belts to the production pile it is sufficiently mixed to form the product known as block mix.

Solids in the scrubber blowdown water are precipitated and filtered in the WWT plant. Sludge from the clarifier is pumped through a filter press. The filter press separates the solids from the water leaving a hard, dry cake in the filter press. The cake is removed from the filter press and taken in a bin or loader bucket and blended into the clinker pile. The filter cake is then processed in the finish plant and ultimately ends up in the 3/4's, 3/8's or the block mix.

4.3 Storm water Runoff Control Improvements

A. Stormwater Runoff

This section presents proposed runoff features that are designed to control peak runoff velocities, sedimentation, and provide adequate conveyance into receiving water bodies for the typical storm events.

Drainage Area 1

Since 1992, Norlite has constructed earthen berms along facility roads to prevent run-on/run-off and erosion. Facility roads were regraded, reshaped and resurfaced with crushed stone. Modifications to facility roads as well as to other parking areas will minimize dust accumulation, gully formation and uncontrolled runoff. Norlite applies water spray from mobile tanker trucks to all facility roadways and other vehicle access surfaces on a daily basis during dry weather to minimize dusting and transport of airborne particulates. (The road watering areas are highlighted in Figure E-3, Appendix E). This is an effective procedure that is performed several times daily, when required and will be continued. Water spray application to facility roadways helps keep road surfaces compact and rigid so erosion and washout during storm events is minimized.

In addition, Norlite proposes to construct a sediment trapping structure that will provide adequate detention time for silt and shale fines that can become waterborne to settle out, and thus improve water quality.

Since a new wastewater treatment facility is being constructed in this area (scheduled for completion in September 1995) and removal of product piles from this drainage area has recently taken place, resulting drainage pattern alterations and silt transport potentials to the wetland area will be further studied. These effects will be evaluated over a period of at least one year after completion of these site modifications (to allow for seasonal changes). It is possible that no further control measures will be required. Then, site improvements to reduce silt transport potential to the wetland area will be proposed if necessary. Either a french drain system, silt screen system or combination of the two may be proposed. An evaluation of effectiveness of the existing french drain/trench system already constructed in Drainage Area 2 will be a major factor in the selection of the proposed runoff control system.

The sediment trap will be inspected and maintained in accordance with the New York Guidelines for Urban Erosion and Sediment Control dated October 1991. Appendix E contains engineering design specifications for runoff control improvements that have been made and for proposed future improvements.

Drainage Area 2

Significant site improvements have been made in Drainage Area 2 which includes regrading, resurfacing and berming of roads and filling in of the mid-pond to reduce erosion and transport of silt and sediments to the Salt Kill. In addition, a french drain type silt trap-trench system has been constructed at the outfall of this drainage area to the Salt Kill. This system works well to reduce both sediment discharges and erosion at this outfall.

This facility drainage point receives a majority of stormwater surface drainage from at least six acres of the active industrial activity area including:

- Portions of the kiln operations, primary crusher and short-term product piles to the west.
- Portions of the product finishing operations and maintenance shop areas to the south end.
- Facility roadways, LGF storage and office parking areas to the northwest.

Objectives of Trench System

- To eliminate ponding of water in low elevation approaches to the Salt Kill at east side of facility.
- To trap surface runoff fines and silt in discharges to Salt Kill Creek.
- To control erosion of creek bank by runoff from Norlite facility.

Narrative Description of Trench System

The main trench is approximately 300 feet long with an average width of about 30 inches and depth of about 4.5 feet. A typical cross-section of the trench is shown in Appendix E, Figure E-1 with the approximate dimensions and depths of fill materials. The location of this trench system is sketched on facility site plan shown in Figure E-2 of Appendix E. The earthen trench is lined with geofabric and filled with two grades of stone as follows;

1. A bottom support layer of 6 to 8 inch diameter crushed stone is 30 to 48 inches deep to support the upper (sediment trap) layer and functions as an under drain to conduct water drainage downgradient toward the Salt Kill.

2. An upper "renewable" walking surface layer consists of #2 washed stone at about 12 to 18 inches deep. This layer functions as a walking and vehicle support surface as well as a silt and sediment trap for solids carried over the runoff surface by stormwater drainage.

The drainage flow proceeds by gravity through the trench in a south to north direction and discharges to the Salt Kill through the layer of 6 to 8 inch diameter crushed stone. At the southern end of the trench (opposite the maintenance building) a branch of the trench extends across the gravel road at an approximate 60° angle to the main trench and terminates in a 20 ft. diameter collection pit adjacent to the product finishing crusher building. Both the branch and collection pit contain the same fill layers of stone as the main trench.

Operational Procedure for Trench System

The trench is sloped from south to north to conduct flow by gravity from the facility surface to the Salt Kill. As the surface runoff flow enters the trench system, water drains through the upper layer of stone and traps silt and sediment in the interstitial spaces between the stones.

It is estimated that this system will continue to trap silt and sediment for approximately 9 months to 1 year on a typical basis. Silt accumulation will reach a point where flow through this layer will become impeded and the runoff drainage from the land/road surface will become noticeably slower. At this point, the upper layer of fill is removed with a backhoe. The geofabric liner is then repaired or replaced and a new layer of #2 washed stone is placed into the trench system.

Engineering design specifications are presented in Appendix E (i.e., Figures E-1 and E-2).

B. Process Area Stormwater/Groundwater Improvements

The facility operating process area specified for stormwater and groundwater runoff improvements is shown in Figure E-3 of Appendix E. This area covers the majority of site drainage areas No. 1 and No. 2.

In addition to the stormwater runoff and groundwater control improvements to be performed as per Sections 4.1 and 4.2, Norlite plans to implement some in plant improvements to reduce runoff and groundwater collected in existing process tunnels. The following improvements are scheduled to be provided within the next one year period.

- Installation of redesigned wet spray systems at product conveyor systems and storage piles to reduce volume of surface runoff and seepage caused by water sprays.

- Collection of tunnel waters for recycle/reuse and elimination of runoff from these sources.

1. **Material Process Wet Dust Suppression Systems**

The following material handling and product pile operations use stationary water sprays to reduce dusting and airborne particulate transport to on-site and off-site locations.

- Primary jaw crusher discharge conveyor
- Block mix conveyor belt head pulley
- 3/8" product finishing plant conveyor belt head pulley
- 3/4" product finishing plant conveyor belt head pulley
- Clinker belt pile
- Clinker conveyor belt head pulley
- 12C crusher hopper
- Primary crusher plant surge bin
- Traylor crusher (feed and discharge)

These stationary water spray systems are currently undergoing proposed design changes that will improve effectiveness as dust supressors and reduce the volume of water used.

Proposed improvements to the clinker belt spray systems are described in further detail in Section 8.0 of Norlite's Fugitive Dust Plan Addendum (FDP), revised September, 1995, and will replace the lawn sprinkler type spray heads with fine mist sprays and patterns based on coverage of only the areas actually occupied by product/material instead of extending to all areas within a circular pattern. Figures E-4 and E-5 (i.e., Figures 8-13 and 8-24 from the FDP) in Appendix E show the equipment specified to make these modifications.

Modifications were made to the "Global" spray system at the finish plant in 1994. Each sprinkler operates in series with a current cycle of approximately 5 minutes on and 15 minutes off. This change has helped to reduce volume of runoff in this area.

Reduction in volume of spray water is beneficial to control of site surface water runoff that is generated as a result of both direct product pile runoff and tunnel drainage sump pumping. When a NESCO spray system is added to the various drop points, all other garden hose spray nozzles will be eliminated. The reduction in water volume will be dramatic.

2. **Containment Tunnel Discharge Proposed Water Reuse**

Both south and east of the kilns, several tunnels for material conveyor systems exist. These include:

a. Kiln #1 Clinker cooler tunnel
b. Kiln #2 Clinker cooler tunnel
c. Primary shale crusher tunnel
d. Finishing building tunnel #1
e. Shipping tunnel

Sump water is discharged from these tunnels on a regular basis as groundwater, spray water runoff and stormwater seep into these tunnels. These tunnel water discharges have been sampled to evaluate quality and composition

for reuse and recycle purposes within the facility. Figure E-6 in Appendix E shows these tunnel sampling locations. On a continuous basis the following average flow rates have been determined for each sump discharge:

a. Kiln #1 and #2 clinker cooler tunnels combined = 9.3 gpm
b. Primary shale crusher tunnel = 5.3 gpm
c. Finishing tunnel #1 = 0.7 gpm
d. Product shipping tunnel - 6 gpm

Therefore, an average daily flow rate of approximately 16 gpm of combined tunnel drainage is generated. The maximum daily flow rate estimate for these discharges is 24 gpm. It is feasible to reuse these discharge flows for the following facility process water requirements:

- Product pile and conveyor spray water
- Road surface spray water
- Wet scrubber system make-up water
- Wastewater treatment plant and scrubber process chemical solution make-up water
- Wastewater treatment system filter backwash and equipment washdown supply waters
- Other possible uses, such as boiler make-up and trunnion cooling water.

The preceding facility operations (combined) use more than either the average or maximum tunnel sump combined discharges. To be practical, these combined tunnel discharges will have to be collected in a common supply tank and distributed to these users on an as needed basis from a common supply pump. City water make-up would also be supplied to the same supply tank (for non-potable use) to provide water requirements above the amount that can be supplied by tunnel water recovery.

Existing tunnel water sampling and discharge sump locations are described in Appendix E. These water discharges are compliant with existing SPDES outfall limitations with the exception of total suspended solids concentration for the combined sources and (for some tunnel discharges) for pH values. Therefore, a filtration step is proposed for the collected combined water sources that will reduce TSS to concentrations appropriate for designated plant uses. Since the water would be reused for plant processes, instead of discharged directly, there is no need to readjust the pH value if it exceeds pH 9.0.

APPENDICIES

APPENDIX A:	APCD, SCRUBBER, AND BLOCK MIX ADDITION IMPROVEMENTS
APPENDIX B:	WWT PROCESS NARRATIVE
APPENDIX C:	ELECTRICAL POWER, INSTRUMENTATION, AND CONTROLS
APPENDIX D:	LGF STORAGE & FEED SYSTEMS
APPENDIX E:	STORMWATER CONTROL DETAILS
APPENDIX F:	AIR POLLUTION CONTROL SYSTEM MAINTENANCE MANUAL
APPENDIX G:	NORLITE CONTINGENCY PLAN
APPENDIX H:	NORLITE SPDES PERMIT
APPENDIX I:	DESCRIPTION OF PERSONNEL TRAINING
APPENDIX J:	NORLITE INSPECTION REPORT FORMS

APPENDIX A:

APCD, SCRUBBER, AND BLOCK MIX ADDITION IMPROVEMENTS

Contents

APPENDIX A:

APCD, SCRUBBER, AND BLOCK MIX ADDITION IMPROVEMENTS

A.1 PROCESS NARRATIVE

Air Pollution Control System: Gas Handling

Both Kilns have similar emission control systems describe herein and as shown in Drawings NY003-D1403, NY003-E-1404, NY003-D1405, and NY003-D1406. The systems include both wet and dry emission control devices for the collection and removal of particulate matter, hydrogen chloride (HCl), metals and other gaseous species. The principal collection mechanisms affected are sedimentation, condensation, impaction, filtration and interception for particulate and metals and absorption for HCl and other gaseous species.

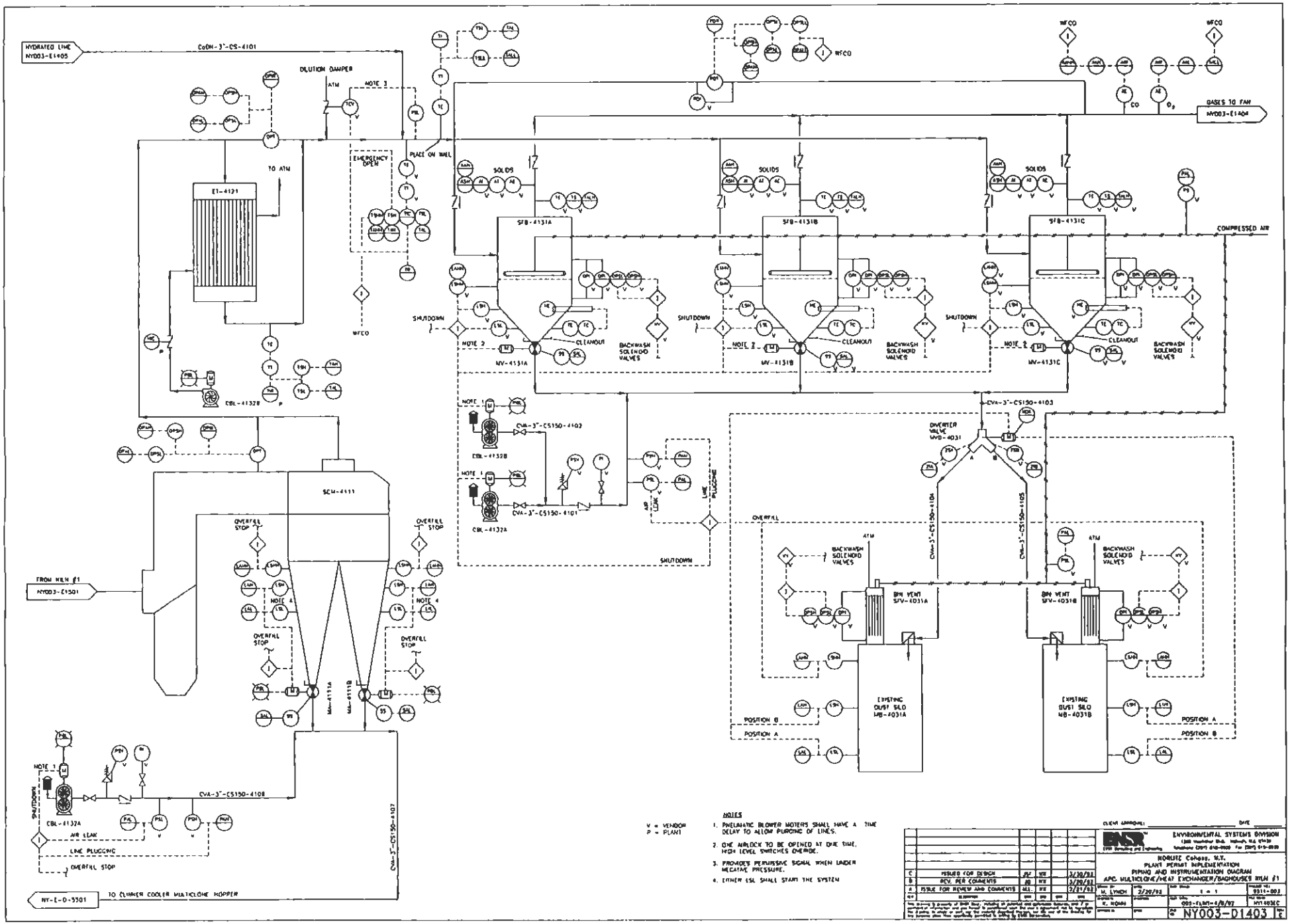
Kiln emissions first pass through a knockout box to capture large particulate matter and a Barron low pressure multiple cyclone unit (multiclone). The multiclone incorporates relatively small diameter cyclones operating in parallel with an inlet and outlet to remove coarse particulate matter. Dust collected in the multi-clone accumulates in a hopper and is pneumatically conveyed to one of two silos where it is stored and later mixed with other products to form block mix.

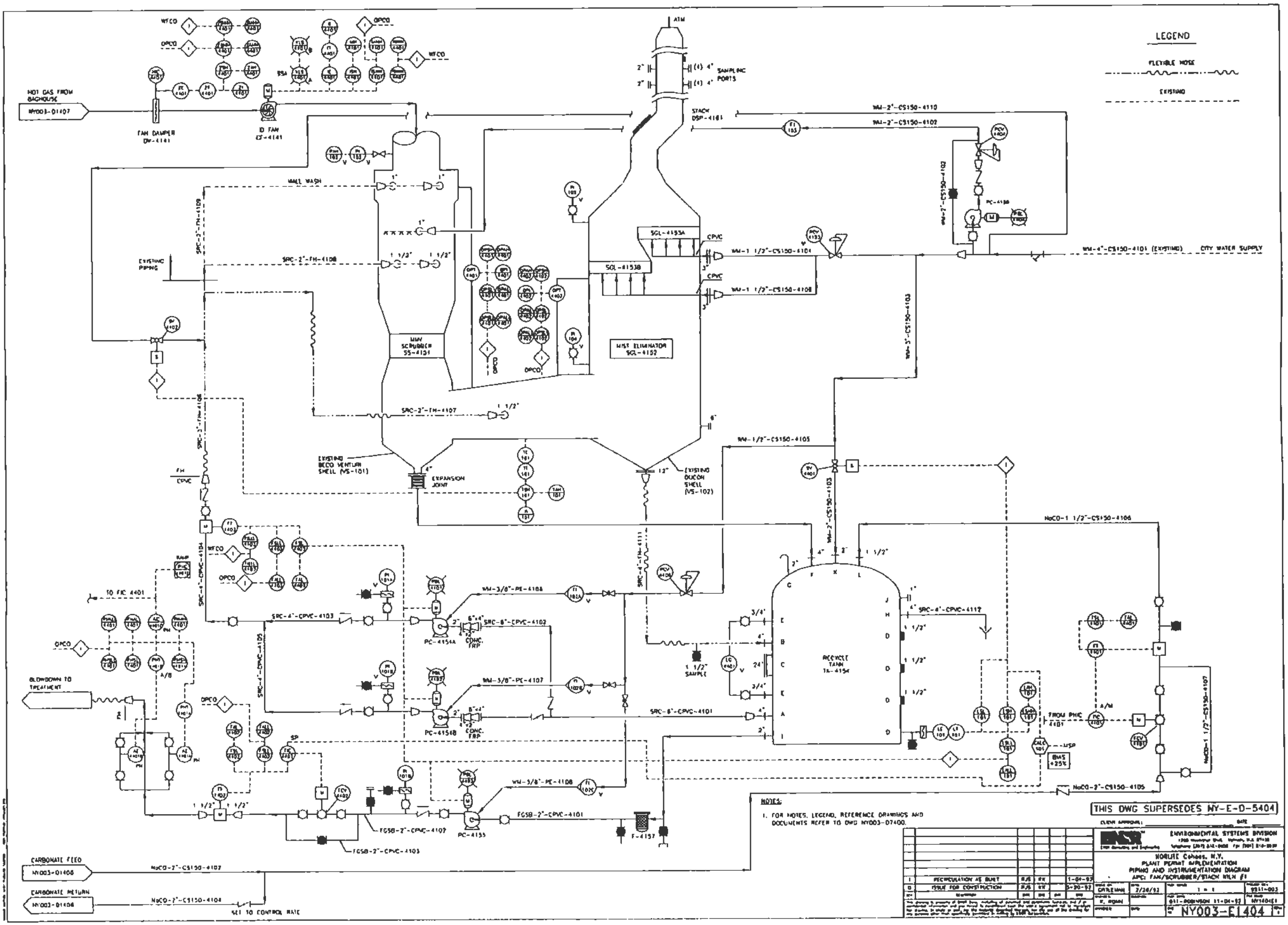
The flue gases then pass through the air to air, single pass tube bundle heat exchanger rated at 65,000 ACFM. This unit uses forced draft ambient air as the cooling medium. Gases enter the heat exchanger at approximately 900 F and exit at approximately 450 F with a 2-3 inch w.c. pressure drop across the unit.

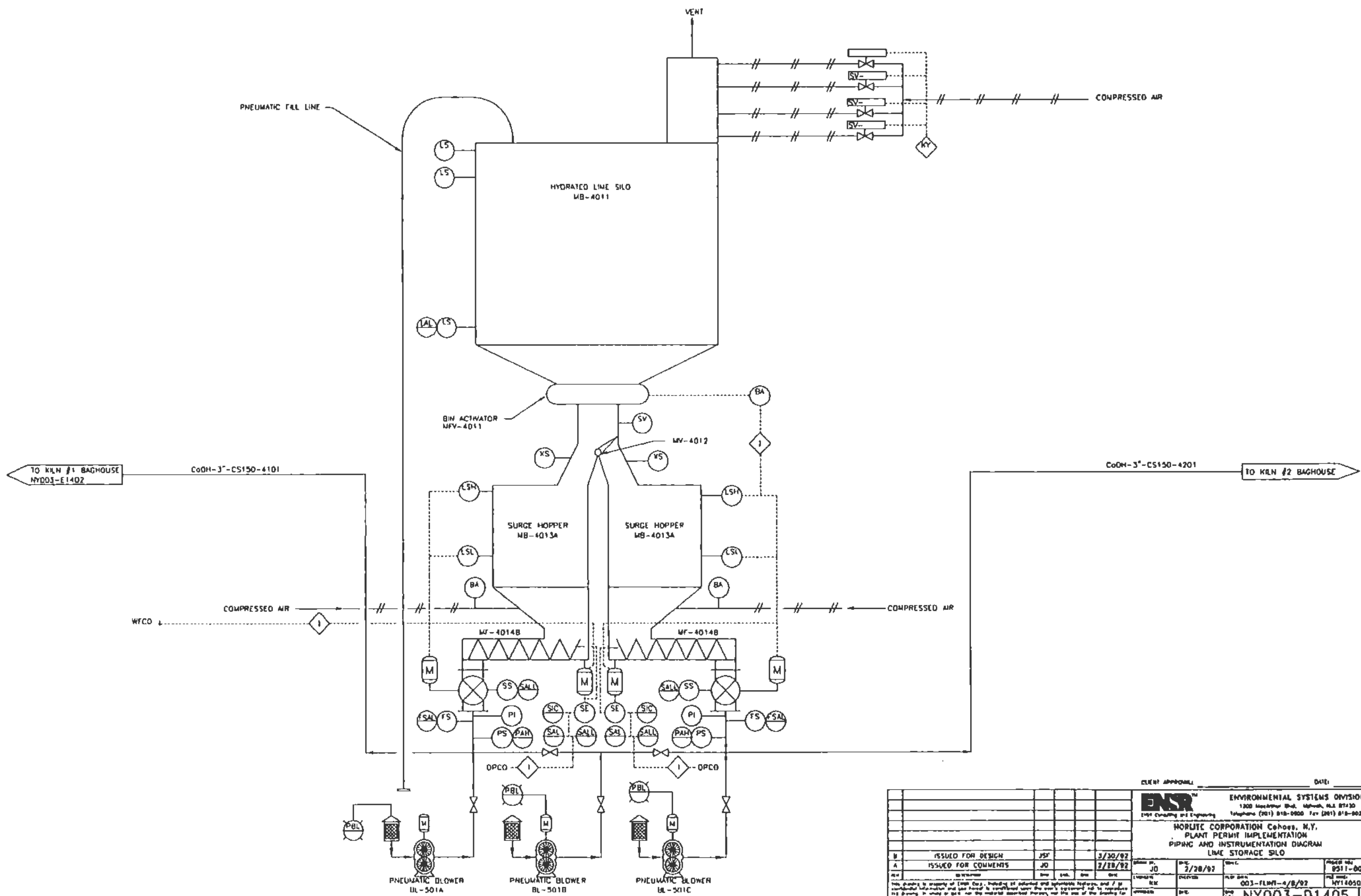
Following the heat exchanger is an Aeropulse, Inc. Power Pulse Collector (fabric filter) with three modules. Each unit is rated for 52,700 ACFM at 450 F. Kiln 1 has 1200 filter bags that are 12 feet in length and 4 5/8 inches in diameter. Kiln 2 has 810 filter bags that are 17 feet, 3 inches in length and 4 5/8 inches in diameter. Kiln 1 has an air to cloth ratio of 3.02:1 with all three modules operating and 4.53:1 with one down for maintenance. Kiln 2 has an air to cloth ratio of 3.11:1 with all three modules on line and 4.67:1 with one module down for maintenance.

Each module is cleaned independently to maintain a differential pressure range. The differential pressure range is set on the photohelic gauges in the motor control center. When the differential pressure exceeds the photohelic's high set point compressed air cleaning will commence. The filter media is pulsed one row at a time until the differential pressure drops to the photohelic's low set point. Pressure drop across the unit is rated between 3-6 in. w.c., with all three modules on-line.

A modulating air damper automatically adjusts inlet gas temperature (if required) by bleeding in ambient air. The inlet gas temperature is automatically controlled to a set point between 400^{0}F and 440^{0}F.


HYDRATED LINE NY003-E1405
CaOH-3"-CS-4101
DILUTION DAMPER
ATM
NOTE 3
TO ATM
E1-4121
EMERGENCY OPEN
PLACE ON WAIL
WFCO
SFB-4131A
SFB-4131B
SFB-4131C
SOLIDS
SHUTDOWN
NOTE 2
MV-4131A
MV-4131B
MV-4131C
CLEANOUT
BACKWASH SOLENOID VALVES
COMPRESSED AIR
GASES TO FAN NY003-E1404
CBL-41328
CBL-41327
CVA-3"-CS150-4102
CVA-3"-CS150-4101
CBL-41326
AIR LEAK
LINE PLUGGING
CVA-3"-CS150-4103
DIVERTER VALVE MVD-4031
CVA-3"-CS150-4104
CVA-3"-CS150-4105
OVERFILL
BACKWASH SOLENOID VALVES
ATM
BH VENT SFV-4031A
BH VENT SFV-4031B
EXISTING DUST SILO MB-4031A
EXISTING DUST SILO MB-4031B
POSITION B
POSITION A
SCM-4111
OVERFILL STOP
NOTE 4
FROM KILN #1 NY003-E1501
MSV-4111A
MSV-4111B
CVA-3"-CS150-4108
CVA-3"-CS150-4107
NY-E-0-5501
TO CLINKER COOLER MULTICLONE HOPPER
V = VENDOR
P = PLANT
NOTES
1. PNEUMATIC BLOWER MOTORS SHALL HAVE A TIME DELAY TO ALLOW PURGING OF LINES.
2. ONE AIRLOCK TO BE OPENED AT ONE TIME. HIGH LEVEL SWITCHES OVERRIDE.
3. PROVIDES PERMISSIVE SIGNAL WHEN UNDER NEGATIVE PRESSURE.
4. EITHER LSL SHALL START THE SYSTEM
C ISSUED FOR BIDDING AV WE 3/30/93
B REV. PER COMMENTS AB WE 3/26/93
A ISSUE FOR REVIEW AND COMMENTS MLL WE 7/21/92
ENSR ENVIRONMENTAL SYSTEMS DIVISION
NORLITE Cohoes, N.Y.
PLANT PERMIT IMPLEMENTATION
PIPING AND INSTRUMENTATION DIAGRAM
APC, MULTICLONE/HEAT EXCHANGER/BAGHOUSE'S KILN #1
M. LYNCH 7/20/93
K. HOANN
NY003-D1403


LEGEND
FLEXIBLE HOSE
EXISTING
HOT GAS FROM BAGHOUSE
NY003-01407
FAN DAMPER DV-4141
ID FAN CF-4141
WALL WASH
EXISTING PIPING
SRC-2"-FH-4108
SRC-2"-FH-4107
MMV SCRUBBER SS-4151
MIST ELIMINATOR SGL-4152
SGL-4153A
SGL-4153B
STACK DSP-4181
SAMPLING PORTS
ATM
WM-2"-CS150-4110
WM-2"-CS150-4102
WM-1 1/2"-CS150-4101
WM-1 1/2"-CS150-4108
WM-4"-CS150-4101 (EXISTING)
CITY WATER SUPPLY
WM-3"-CS150-4103
WM-1/2"-CS150-4105
EXISTING BECO VENTURI SHELL (VS-101)
EXPANSION JOINT
EXISTING DUCON SHELL (VS-102)
NaCO-1 1/2"-CS150-4106
RECYCLE TANK TK-4154
SRC-4"-CPVC-4112
SRC-4"-CPVC-4103
SRC-8"-CPVC-4102
SRC-8"-CPVC-4101
WM-3/8"-PE-4106
WM-3/8"-PE-4107
WM-3/8"-PE-4108
PC-4154A
PC-4154B
PC-4155
CONC. FRP
1 1/2" SAMPLE
FROM PHC 4101
TO FIC 4401
BLOWDOWN TO TREATMENT
FGSB-2"-CPVC-4101
FGSB-2"-CPVC-4102
FGSB-2"-CPVC-4103
F-4157
NaCO-2"-CS150-4105
NaCO-2"-CS150-4107
NaCO-2"-CS150-4104
SET TO CONTROL RATE
CARBONATE FEED
NY003-01408
CARBONATE RETURN
NY003-01408
NOTES:
1. FOR NOTES, LEGEND, REFERENCE DRAWINGS AND DOCUMENTS REFER TO DWG NY003-07400.
THIS DWG SUPERSEDES NY-E-D-5404
ENVIRONMENTAL SYSTEMS DIVISION
NORLITE Cohoes, N.Y.
PLANT PERMIT IMPLEMENTATION
PIPING AND INSTRUMENTATION DIAGRAM
APC: FAN/SCRUBBER/STACK KILN #1
RECIRCULATION AS BUILT
ISSUE FOR CONSTRUCTION
NY003-E1404



CLIENT APPROVAL: ______ DATE: ______

REV	DESCRIPTION				DATE
B	ISSUED FOR DESIGN	JSF			3/30/92
A	ISSUED FOR COMMENTS	JO			2/28/92

ENSR Consulting and Engineering

ENVIRONMENTAL SYSTEMS DIVISION

NORLITE CORPORATION Cohoes, N.Y.
PLANT PERMIT IMPLEMENTATION
PIPING AND INSTRUMENTATION DIAGRAM
LIME STORAGE SILO

JO	2/28/92		8511-003
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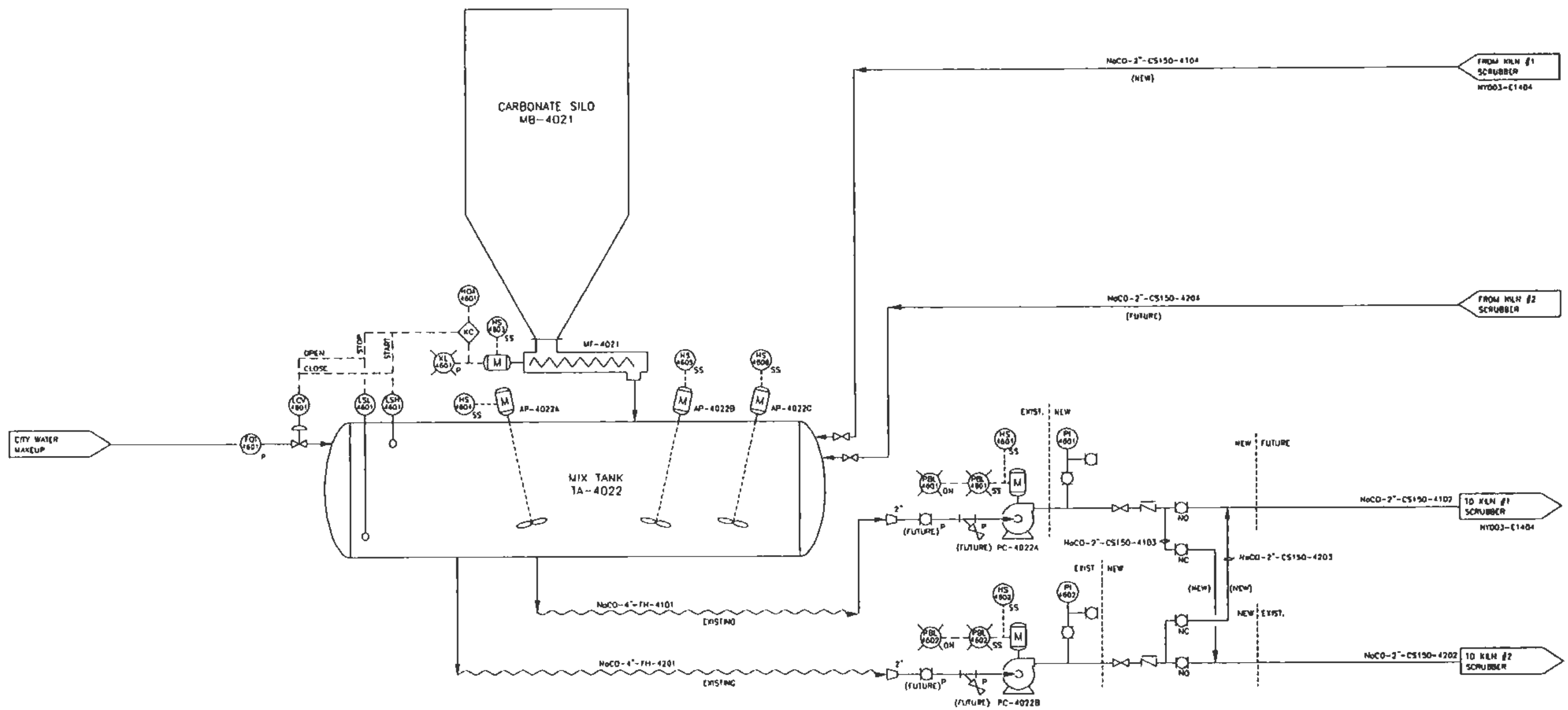
		NY003-D1405	B



LEGEND:
P-PLANT SUPPLIED

NOTE:
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ENSR
ENVIRONMENTAL SYSTEMS DIVISION

NORLITE CORPORATION Cohoes, N.Y.
PLANT PERMIT IMPLEMENTATION
PIPING AND INSTRUMENTATION DIAGRAM
CARBONATE SILO

0	ISSUE FOR CONSTRUCTION			5-20-92

NY003-E1406

Hydrated lime ($Ca(OH)_2$), stored in a 2,500 cubic foot silo, is injected into the air pollution control system immediately prior to the baghouse. This is primarily to control sulfur dioxide and sulfuric acid mist from the combustion of LGF in the kiln and to protect the baghouse from resulting corrosion. The lime also neutralizes hydrogen chloride, providing approximately 80% of the removal prior to the wet scrubber. Lime feed will vary from near zero to 1,100 pounds per hour. Norlite's operating permit requires lime feed at a minimum ratio of 2.7 pounds per hour of lime for each pound per hour of chlorine. However, Norlite operates at a 3.3:1 lb./hr of lime per lb./hr chlorine ratio to maintain a factor of safety.

Dust from the baghouse is collected and pneumatically conveyed to one of two refurbished concrete dust silos. These silos have been weatherproofed and sealed. Filter fabric bin vents have been installed on top of each dust silo to capture dust in the displaced air and return it to the silo.

The baghouse is followed by a 400 HP system fan which induces draft through the kiln, knock-out box, multi-clone, heat exchanger and baghouse and provides forced draft on the exhaust gases through the venturi and Ducon mist eliminator shell. Additionally, the fan provides induced draft for a hood installed over the kiln shale feed chute, designed and installed to capture any fugitive emissions emanating from this area.

The induced draft fan carries exhaust gases to a BECO Venturi (MMV) scrubber for acid gas removal. This unit is rated for 53,000 ACFM at 450 F at the inlet and 38,600 ACFM at 138 F at the outlet, with 2 to 6 in. w.c. pressure drop. The scrubber is a rod design that has tubular alloy rods installed in the rows across the throat to provide a series of smaller throats. The intent is to provide the effect of a small venturi throat without incurring the high pressure drop typically associated with conventional high efficiency venturi scrubbers. Additionally, the tubes provide additional impaction surfaces for enhanced particulate and HCl collection. The entire air pollution control system is designed for 99% HCl and 68% SO_2 removal efficiencies.

Clean (city) water headers are located directly above the venturi to provide evaporative cooling to the exhaust system. Caustic sodium carbonate (soda ash) solution, comprised of a maximum of 10% dissolved solids (sodium carbonate, sodium chloride and/or sodium sulfate), is recycled through the unit at minimum of 184 gpm. It is partially introduced through tangentially positioned nozzles located above the MMV module. Scrubbing solution is also injected into the transition segment located between the venturi MMV and Ducon mist eliminator shell.

Excess water drains from the venturi exit elbow to the 1,000 gallon settling/recycle tank. The pH of the solution in the recycle tank is automatically maintained at 8.0 or greater by the introduction of 5% to 10% sodium carbonate solution to the venturi feed. The feed rate of the sodium carbonate solution varies with the halogen concentration in the LGF. A minimum of 4.4 gpm blowdown is taken from the recycle tank to maintain a level set point.

Following the BECO unit is a BECO MMV "quad" mist eliminator installed in the bottom of the Ducon mist eliminator shell. The unit, manufactured of PVC, is designed to capture entrained droplets of recycle solution exiting the BECO scrubber. This unit is rated for a pressure drop of 1.5 to 5 in. w.c. This mist eliminator drains into the recycle tank. Above the "quad" mist eliminator is a mesh-type mist eliminator rated at 48,000 ACFM at 140 F with a minimal pressure drop. Kiln exhaust passes to the atmosphere via a 60 inch diameter FRP stack 120 feet above grade at approximately 41,000 ACFM at 130 F and 10% moisture (v/v).

A.2 System Upgrades

Baghouse

Several design changes were made to the baghouses in order to provide for higher cleaning efficiency and easier maintenance.

The inlet gas enter at the bottom and exit at the top on Kiln 1 dust collector. This will eliminate the abrasive inlet dust from hitting the bags at the sides. With this changed flow pattern, bag breakage due to impacting will be eliminated. Baffle plates have been added to the inlet sides of Kiln #2 dust collector to eliminate impacting.

Access to bags on Kiln 1 is by opening walk-in plenums, rather than using top-loading doors.

The venturi seals have been eliminated. The filter bags have a snap band collar which forms a contact seal with a hole in the tube sheet. After the bag is snapped into the tube sheet, a one-piece wire cage and venturi is inserted into the bag.

Both inlet and outlet isolation dampers are butterfly type, for quicker operation. The original guillotine dampers tended to clog with dust.

Slide gates have been motorized for Kiln 1. Excessive dust will not accumulate in the air locks when turned off. This will reduce seal abrasion, which is a source of leakage.

The rotary air locks have been upgraded to ones with adjustable vanes and shoes to eliminate a high maintenance airlock with costly replacement parts.

Scrubber

Several components of the scrubber have been similarly upgraded as follows:

- The quench header is fabricated from corrosion resistant alloy.
- The MMV venturi is fabricated from Allegheny Ludlum AL 6XN alloy. This material will allow greater corrosion resistance than the original stainless steel.
- The MMV mist eliminator is fabricated of reinforced plastic.
- There are two segmented mist eliminator pads, fabricated of polypropylene, to eliminate any corrosion. To wash out particulate, a spray of fresh water was placed under the mist eliminator pads. This spray drains into the recycle tank.
- Fresh water makeup is introduced directly into the makeup tank, rather than impinging on the mist eliminator.
- The fresh carbonate supply is introduced into the suction line of the recycle pump to allow for a more effective treatment of the scrubber gasses.
- Fresh carbonate solution is controlled by a modulated valve. This ensures a more stable scrubber pH. Maximum design flow rate is 30 gpm, in order to accommodate higher chlorine feed levels.

- Blowdown is taken from the recycle tank, through a pump and discharged to the WWTP.

Stack

To improve dispersion of the exhaust gases, the scrubber stacks were replaced with identical 120 ft. high caged steel FRP units. The gas velocity at the tip will be a minimum of 60 ft/sec. The new stacks are equipped with two test platforms, four 4" test ports each.

APPENDIX B

WWT PROCESS NARRATIVE

Contents

WWT PROCESS NARRATIVE

This narrative summarizes the proposed wastewater treatment facility (WWTF) to comply with the SPDES permit requirements for Outfall 006. See PID NY029-D1003, Rev. B and NY029-D1004, Rev B.

B.1 Untreated Wastewater Collection and Transfer

The sources of untreated wastewaters include:

A. Kiln #1 scrubber blowdown
B. Kiln #2 scrubber blowdown
C. Boiler blowdown *
D. Stormwater from process secondary containments

* Note: The boiler is presently out-of-service.

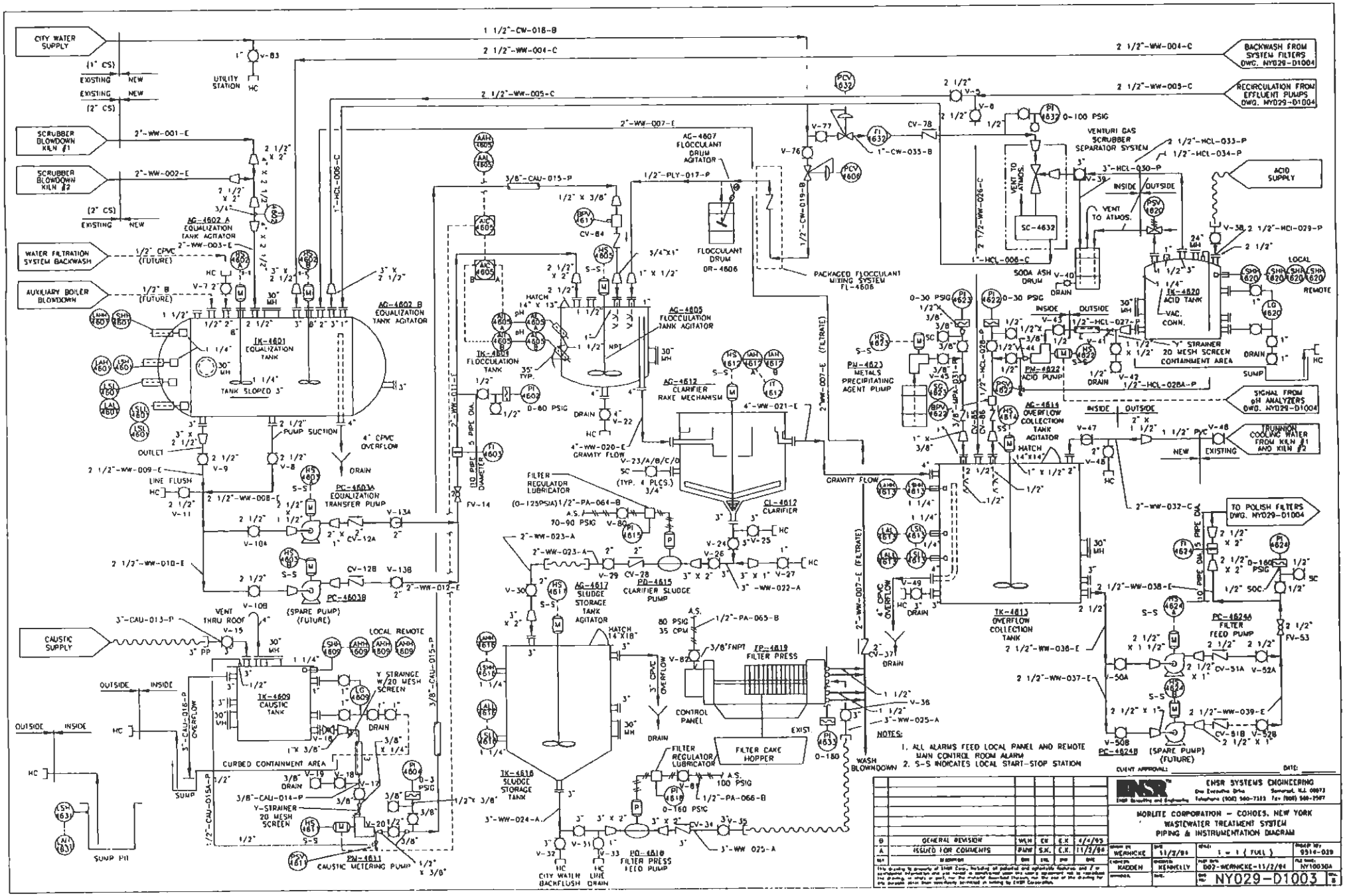
The combined wastewaters are continuously transferred from these sources to a 25,000 gallon agitated equalization tank T-4501. The combined wastewater flow ranges from 60 gpm average to 103 gpm peak.

B.2 Overview of Process Design

The Norlite wastewater treatment process is designed to treat primarily the blowdown from the two kiln flue gas scrubbing systems and the trunnion cooling water system. The treatment process utilizes physical/chemical unit operations to treat the blowdown to a degree required for discharge to the Mohawk River. Table B-1 displays the typical and maximum concentrations of metals in the blowdown along with the Mohawk River discharge requirements. Treatment of the blowdown will require removal of dissolved metals, suspended solids, pH adjustment and temperature reduction.

The treatment process includes influent equalization to prevent sudden flow, temperature or constituent surges to the system. Primary removal of the metals in the equalized blowdown stream is via alkaline precipitation of metal hydroxides and carbonates followed by settling/removal of both precipitated metals and suspended solids in a clarifier. These sludge solids are then volume reduced in a filter press.

The clarified scrubber blowdown stream is combined with the trunnion cooling water as part of a pH and temperature reduction step to meet discharge limitations. This combined flow is then passed through a polishing filter and a carbon filter for final removal of minute quantities of suspended solids and organics. For upset conditions, a parallel carbon contact unit filled with sulfur impregnated carbon and a precipitating carbamate addition system is available to ensure final removal of any metals to below discharge limitations.
The treated stream of scrubber blowdown and trunnion cooling water is then stored in an effluent equalization tank to prevent flow and constituent surges in the discharge. This system also provides retention time for process monitoring
to ensure compliance with effluent limitations. The effluent is then discharged to an underground pipeline that directs it to the Mohawk River.


CITY WATER SUPPLY
SCRUBBER BLOWDOWN KILN #1
SCRUBBER BLOWDOWN KILN #2
WATER FILTRATION SYSTEM BACKWASH
AUXILIARY BOILER BLOWDOWN
CAUSTIC SUPPLY
BACKWASH FROM SYSTEM FILTERS DWG. NY029-D1004
RECIRCULATION FROM EFFLUENT PUMPS DWG. NY029-D1004
ACID SUPPLY
SIGNAL FROM pH ANALYZERS DWG. NY029-D1004
TRUNNION COOLING WATER FROM KILN #1 AND KILN #2
TO POLISH FILTERS DWG. NY029-D1004
AG-4602 A EQUALIZATION TANK AGITATOR
AG-4602 B EQUALIZATION TANK AGITATOR
TK-4601 EQUALIZATION TANK
PC-4603A EQUALIZATION TRANSFER PUMP
AG-4605 FLOCCULATION TANK AGITATOR
TK-4605 FLOCCULATION TANK
AG-4607 FLOCCULANT DRUM AGITATOR
FLOCCULANT DRUM DR-4606
PACKAGED FLOCCULANT MIXING SYSTEM FL-4608
AG-4612 CLARIFIER RAKE MECHANISM
CL-4617 CLARIFIER
PD-4615 CLARIFIER SLUDGE PUMP
AG-4617 SLUDGE STORAGE TANK AGITATOR
TK-4618 SLUDGE STORAGE TANK
FP-4619 FILTER PRESS
PD-4618 FILTER PRESS FEED PUMP
FILTER CAKE HOPPER
CONTROL PANEL
SC-4632 VENTURI GAS SCRUBBER SEPARATOR SYSTEM
TK-4620 ACID TANK
PW-4622 ACID PUMP
PW-4623 METALS PRECIPITATING AGENT PUMP
AG-4619 OVERFLOW COLLECTION TANK AGITATOR
TK-4613 OVERFLOW COLLECTION TANK
PC-4625A FILTER FEED PUMP
PC-4625B (SPARE PUMP) (FUTURE)
TK-4609 CAUSTIC TANK
PW-4611 CAUSTIC METERING PUMP
SODA ASH DRUM
SUMP
SUMP PIT
CURBED CONTAINMENT AREA
NOTES:
1. ALL ALARMS FEED LOCAL PANEL AND REMOTE MAIN CONTROL ROOM ALARM
2. S-S INDICATES LOCAL START-STOP STATION
ENSR SYSTEMS ENGINEERING
NORLITE CORPORATION – COHOES, NEW YORK
WASTEWATER TREATMENT SYSTEM
PIPING & INSTRUMENTATION DIAGRAM
GENERAL REVISION
ISSUED FOR COMMENTS
NY029-D1003

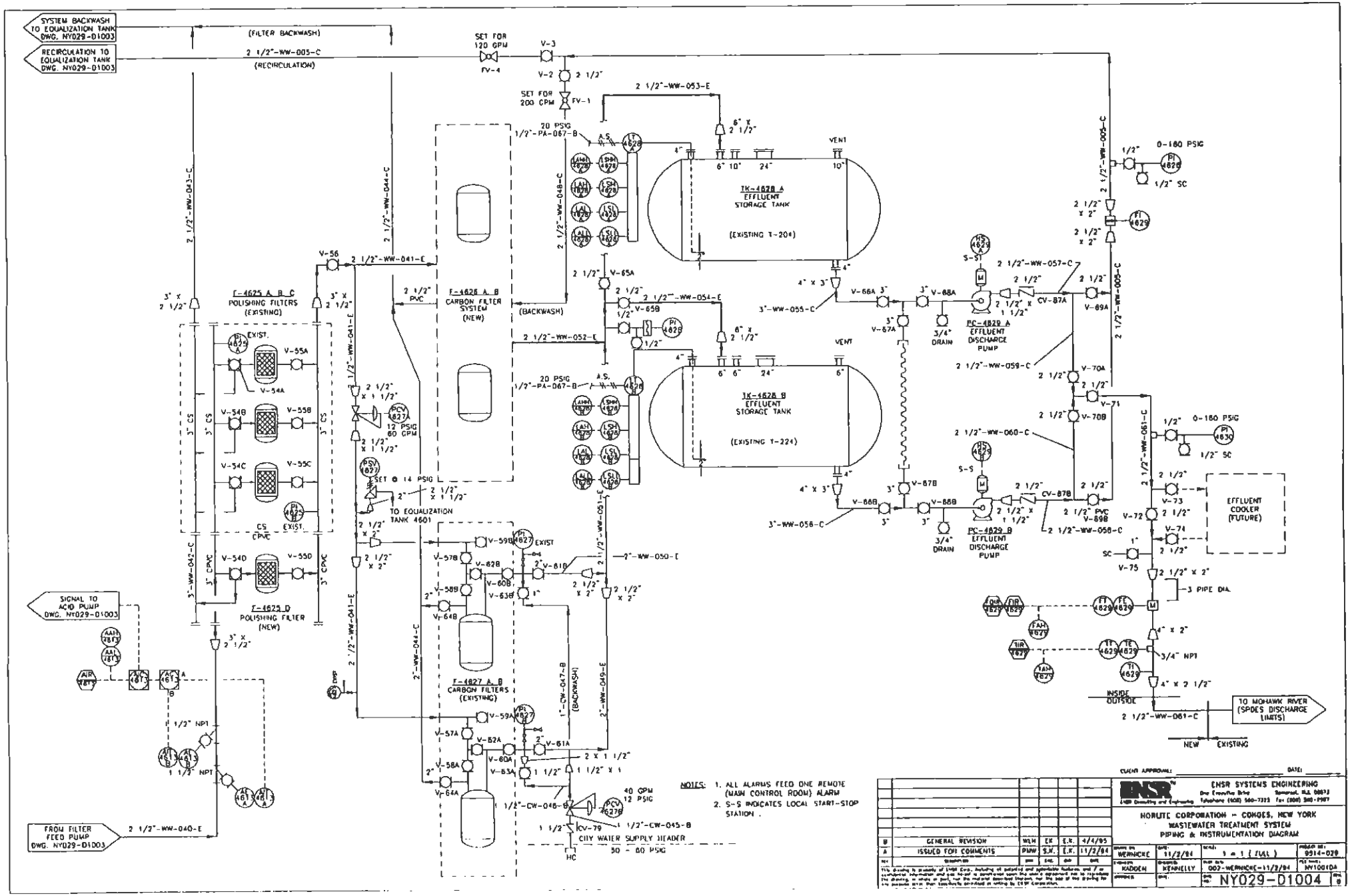

SYSTEM BACKWASH TO EQUALIZATION TANK DWG. NY029-D1003
RECIRCULATION TO EQUALIZATION TANK DWG. NY029-D1003
(FILTER BACKWASH)
2 1/2"-WW-005-C
(RECIRCULATION)
SET FOR 120 GPM
FV-4
V-3
V-2
SET FOR 200 GPM
FV-1
2 1/2"-WW-053-E
20 PSIG
1/2"-PA-067-B
TK-4628 A EFFLUENT STORAGE TANK
(EXISTING T-204)
TK-4628 B EFFLUENT STORAGE TANK
(EXISTING T-224)
VENT
0-160 PSIG
1/2" SC
F-4625 A, B, C POLISHING FILTERS (EXISTING)
F-4626 A, B CARBON FILTER SYSTEM (NEW)
(BACKWASH)
2 1/2"-WW-043-C
2 1/2"-WW-044-C
2 1/2"-WW-041-E
2 1/2"-WW-048-C
2 1/2"-WW-052-E
2 1/2"-WW-054-E
2 1/2"-WW-005-C
2 1/2"-WW-057-C
2 1/2"-WW-059-C
2 1/2"-WW-060-C
2 1/2"-WW-061-C
3"-WW-055-C
3"-WW-056-C
3"-WW-058-C
3"-WW-042-C
2"-WW-050-E
2"-WW-049-E
2"-WW-051-E
1"-CW-047-B
1"-CW-046-B
1 1/2"-CW-045-B
PC-4629 A EFFLUENT DISCHARGE PUMP
PC-4629 B EFFLUENT DISCHARGE PUMP
3/4" DRAIN
CV-87A
CV-87B
CV-79
TO EQUALIZATION TANK 4601
12 PSIG 80 GPM
SET @ 14 PSIG
40 GPM 12 PSIG
CITY WATER SUPPLY HEADER
50 - 80 PSIG
EFFLUENT COOLER (FUTURE)
3 PIPE DIA.
3/4" NPT
INSIDE
OUTSIDE
TO MOHAWK RIVER (SPDES DISCHARGE LIMITS)
NEW
EXISTING
SIGNAL TO ACID PUMP DWG. NY029-D1003
FROM FILTER FEED PUMP DWG. NY029-D1003
2 1/2"-WW-040-E
F-4627 A, B CARBON FILTERS (EXISTING)
F-4625 D POLISHING FILTER (NEW)
CS CPVC
3" CPVC
EXIST.
V-54A
V-54B
V-54C
V-54D
V-55A
V-55B
V-55C
V-55D
V-56
V-57A
V-57B
V-58A
V-58B
V-59A
V-59B
V-60A
V-60B
V-61A
V-61B
V-62A
V-62B
V-63A
V-63B
V-64A
V-64B
V-65A
V-65B
V-66A
V-66B
V-67A
V-67B
V-68A
V-68B
V-69A
V-69B
V-70A
V-70B
V-71
V-72
V-73
V-74
V-75
S-ST
S-S
NOTES: 1. ALL ALARMS FEED ONE REMOTE (MAIN CONTROL ROOM) ALARM
2. S-S INDICATES LOCAL START-STOP STATION.
CLIENT APPROVAL:
DATE:
ENSR SYSTEMS ENGINEERING
HORUTE CORPORATION - CONOES, NEW YORK
WASTEWATER TREATMENT SYSTEM
PIPING & INSTRUMENTATION DIAGRAM
B GENERAL REVISION WLH EK E.R. 4/4/95
A ISSUED FOR COMMENTS PWW S.W. E.R. 11/2/84
DRAWN BY: WERNICKE
DATE: 11/2/84
SCALE: 1 = 1 (FULL)
PROJECT NO: 0914-029
ENGINEER: KADDEN
DESIGNED: KENNELLY
FILE NAME: 002-WERNICKE-11/2/84
FILE NO.: NY10010A
NY029-D1004
REV: B

TABLE B-1

NORLITE SCRUBBER BLOWDOWN METALS CONCENTRATION FOR COMBINED KILN #1 AND KILN #2 SAMPLE COLLECTED JUNE 22, 1994

TYPICAL AND WORST CASE SAMPLES OF WASTEWATER USED IN LABORATORY TREATABILITY TESTS 6/29 TO 7/13/94
(REF; LAB NOTEBOOK #APCSS-1 AND SAMPLES #78303-1, #78454-1 AND #78433-1, APPENDIX C)

METALS	CONCENTRATION (mg/L)			
	Proposed Mohawk Limit	Unspiked * Blowdown	Typical Monthly Maximum (Spiked)	Worst Case (2-Year) Maximum (Spiked)
Arsenic	0.1	<0.25	0.33	1.1
Barium	4.0	0.82	3.0	0.69
Beryllium	2.0	<0.005	0.045	1.3
Cadmium	0.05	0.026	0.46	5.3
Chromium	0.2	0.079	0.43	67**
Copper	0.5	1.10	2.6	6.9
Iron	4.0	13.7	190	89
Lead	0.6	0.25	2.8	6.6
Mercury	0.05	0.19	0.29	6.1
Nickel	1.3	0.081	2.7	64
Selenium	0.1	<2.0	0.28	0.83
Zinc	0.5	0.60	5.6	14

* Laboratory Analytical Sample #78303-1
** Spiked with 97.8 mg/L CR_2O_3

B.3 Feed Stream Characterization

The WWT process will be designed to accept blowdown from the two kiln flue gas scrubbers and the auxiliary boiler (currently not in use). The process design will include a possible future feed stream from backwashing of a raw water reuse filtering system. These streams will be fed to the front end of the treatment process. An additional stream, the kiln trunnion cooling water, will be fed to the process after the clarification step in an overflow collection tank. The design average and peak volumetric flow rates are as follows;

	Average	Peak
Scrubber Blowdown (2)	17 gpm Each	30 gpm Each
*Boiler Blowdown	0.5 gpm	1.0 gpm
Trunnion Cooling	25 gpm	40 gpm
**Alternate Water Backwash	1.0 gpm	2.0 gpm

* The Boiler System is not presently in operation.
** This stream represents a potential future feed resulting from a raw water (quarry water, clinker cooler tunnel water, etc.) reuse filtering system. Reuse could be applied to the scrubber make-up supply, soda ash make-up, and the WWT system backwash and chemical dilution requirements. The flow rate presents the treatment rate required for backwash generated from this reuse filtering system.

The scrubber blowdown stream volumetric flow rates were estimated based on the current blowdown rates of 5.5 gpm from each scrubber at a total dissolved solids concentration of 10.8% wt. The optimum precipitation and settling of metal hydroxides and other suspended solids in the scrubber blowdown was found to occur at a TDS of 3.5% wt. Operation of the scrubber at this TDS would require a threefold increase in the blowdown rate or a rate of 17 gpm per scrubber. Peak scrubber blowdown flows are based on 1992 trial burn data when LGF containing higher than existing permit limits for halogen was
fired. The scrubber achieved the required acid gas removals at a blowdown of approximately 30 gpm for 9.0% halogen.

Present design objectives however, assume a future maximum halogen of 4.5% in the LGF. Trunnion cooling water flows were based on normal summer and winter flow rates of 40 and 25 gpm respectively.

Each of the feed streams contain varying concentrations of suspended and dissolved solids. The design average and peak concentrations are;

TOTAL SUSPENDED SOLIDS

	AVERAGE	PEAK
Scrubber Blowdown (2)	1,000 ppm	10,000 ppm
Boiler Blowdown	1,000 ppm	1,000 ppm
Trunnion Cooling	100 ppm	200 ppm
Alternative Water Backwash	5,000 ppm	5,000 ppm

The scrubber blowdown suspended solids concentrations were derived from a review of two years data from the existing scrubbers.

TOTAL DISSOLVED SOLIDS

		AVERAGE	PEAK
Scrubber Blowdown (2)	=	3.5% wt	5.0% wt
Boiler Blowdown	=	0.4% wt	0.5% wt
Trunnion Cooling	=	0.05% wt	0.05% wt
Alternate Water Backwash	=	0.05% wt	0.05% wt

Note that average suspended and dissolved solids conditions are those that will be present during greater than 90% of the process operation. Peak conditions denote the extreme upper limits that can occur for short durations.

B.4 Process Design

The Norlite WWT process will consist of five basic unit operations - influent equalization, dissolved metals precipitation, solids settling and removal, effluent polishing and effluent equalization/cooling.

B.4.1 Influent Equalization

The combined flows of the scrubber blowdowns, boiler blowdown and alternate water backwash will enter a 25,000 gallon agitated Equalization Tank (TK-4601). The operating level in this tank will be maintained at 12,500 gallons under normal conditions. This will provide approximately 6 hours of equalization at average flow rates and over 3 hours of equalization at peak flows.

The equalization tank will, under normal conditions, have 12,500 gallons of available surge capacity. This will provide 6 hours of additional storage in the event of downstream equipment breakdown.

B.4.2 Metals Precipitation

The metals precipitation system consists of a 3,000 gallon capacity agitated Flocculation Tank (TK-4604). This tank receives the flow from the equalization tank via the Equalization Transfer Pump (PC-4603). The flocculation tank will be equipped with a pH measurement and control system that will adjust the pH to approximately 10.0 - 10.2 via proportioned caustic addition. At this pH, the dissolved metals form a solid hydroxide precipitate. Jar tests performed resulted in the minimum residual solubilities of the various dissolved metals allowing for compliance with the discharge limitations.

Caustic will be fed as a 50% solution via a proportioning pump (Caustic Pump PM-4611). It will be fed at an average rate of 6.0 GPH from a 7,500 gallon receiving and storage tank. Maximum feed rates of 16.0 GPH can be required during high flow and TDS periods. The Caustic Storage Tank (TK-4609) is positioned inside the WWT building.

B.4.3 Solids Settling and Removal

This portion of the process consists of the flocculent feed system, solids clarifier, sludge storage tank and the filter press.

Flocculent will be added to the Flocculation Tank (TK-4604) to promote the formation of large flocs of metal precipitates and suspended solids. This provides optimum solids settling rates. Flocculent solution will be precisely fed by a chemical metering pump (Flocculent Pump PM-4608) from either of a pair of 200 gallon Flocculent Storage Tanks (TK-4606 (A&B). Jar testing indicates that a dosage of up to 10 ppm of flocculent product is required under normal conditions. A maximum addition rate of 20 ppm is assumed to be required during upset conditions. The flocculent solution is prepared by mixing 500 ml of flocculent product in 180 gallons of city water.

The process slurry of flocculated solids overflows via a still pipe in the flocculation tank into the center well of the Clarifier (CL-4612). The 150 sq. ft.

clarifier is sized for a loading of 0.23 gpm/sq. ft. under average flow conditions and 0.4 gpm/sq. ft. during peak flows. Resulting upflow rates of 0.37 and 0.64 inches/minute provide adequate settling time based on measured solids settling rates of 1.3 inches/minute.

The sloped bottom clarifier is equipped with a center feed well and a peripheral overflow weir. A mechanical rake mechanism provides continuous settled solids fluidization and prevents solids clogging of the underflow outlet.

The underflow sludge from the clarifier is periodically pumped (based on the level in the clarifier) to the Sludge Storage Tank (TK-4616). The underflow sludge solids concentration is approximately 5% to 10% wt exiting the clarifier. This 5,800 gallon agitated storage tank has a 7 day storage capacity under normal conditions and a 16 hour capacity during peak conditions. This sludge is pumped (Via Filter Press Pump PD-4618) at least once a day through the 10 cu. ft. Filter Press (FP-4619). This plate and frame filter press produces a filter cake of approximately 40 to 50 wt% solids which is discharged into a collection hopper for disposal. The filtrate from the filter press typically containing less than 200 ppm of suspended solids is discharged to the Overflow Collection Tank (TK-4613).

The overflow from the clarifier typically containing less than 200 ppm of suspended solids will gravity discharge into the Overflow Collection Tank (TK-4613).

B.4.4 Effluent Polishing

Polishing of the clarified effluent is designed to ensure that the treated water meets discharge limitations. Final pH adjustment, fine particle suspended solids removal and carbon adsorption for selected dissolved metals removal is provided to accomplish final water quality. Reserve availability of carbamate addition for dissolved metals precipitation and a sulfur impregnated carbon absorption system for additional metals removal capability provides assurance of meeting discharge limitations during worst case and also normal process upset conditions.

Both the clarified blowdown streams and trunnion cooling water are fed to the Overflow Collection Tank (TK-4613). This 7,000 gallon agitated tank provides 2 hours of retention under normal flow conditions and over an hour during peak flow conditions. The tank is equipped with a pH measurement and control system that will proportionately add 30 to 36% hydrochloric acid to the tank contents to maintain a pH of 8.5. The acid is received and stored in a 7,500 gallon tank, Acid Tank (TK-4620). Addition of the acid is provided by an Acid Feed Pump (PM-4622) at a normal rate of 22 gph and a peak rate of 36 gph.

The metal precipitating carbamate is added to the overflow collection tank when necessary to precipitate trace amounts of dissolved metals from solution. The carbamate is stored in 55 gallon shipping drums and is fed directly from the drum to the system by a Metals Precipitating Agent Pump (PM-4623). It is fed at a rate of 20 to 40 ppm (300 - 600 ml per hour under normal flow conditions).

The discharge from the overflow collection tank is pumped (Via Filter Feed Pump (PC-4624) through a parallel bank of four Polishing Filters (F-4625 A,B,C,D) for fine suspended solids removal. These sock type filters are fitted with a 250 mesh fabric to accomplish the solids removal (including the carbamate precipitated metals). The filtration system is designed for a maximum flow of 120 gpm. Loading under normal flow conditions is 60 gpm and 100 gpm during peak flow conditions. The surplus flow capability of the filters is available to allow re-treatment, if necessary, of final effluent recycled from the Effluent Storage Tanks (TK-4627 & 4628).

The sock filters are backwashed based on pressure differential typically on a once every four hours basis. Backwash consists of the diversion of the discharge flow from three of the filters through the filter to be backwashed for approximately 15 to 30 seconds. The suspended solids containing backwash stream (typically 30 gallons) is directed back to the equalization tank for full re-treatment.

The discharge from the sock filters is normally directed to a pair of Carbon Filters (F-4626 A,B) arranged in series for removal of trace metals. (Note: Significant organic materials are not normally present in these wastewater streams. However, the carbon will also remove organics if present). Piping arrangements allow the feed flow to be directed to either carbon canister first,

followed by the second. This provides assurance that the second canister in the series is always the freshest and that in-process exhaustion of the first bed does not reduce the total system removal capability. During upset periods, a parallel sulfur impregnated carbon absorber Carbon Filter (F-4627) is available to remove a higher degree of dissolved metals.

Both of the carbon adsorption trains are sized to treat a peak flow of 120 gpm. Normal throughput will be about 60 gpm. Backwashing of the carbon filters is based on pressure drop across the adsorbers and will utilize city water (or future treated raw water) for backwash. Backwashing is performed at a rate of approximately once per day under normal conditions at a 60 gpm rate for a five minute duration. Periodic analysis of the adsorption efficiency of each unit will be performed to determine when replacement with fresh carbon is required.

Discharge from the carbon filters is directed to the Effluent Storage Tanks (TK-4627 or 4628).

B.4.5 Effluent Equalization

The effluent equalization system consists of two 25,000 gallon unagitated tanks. Discharge from the effluent polishing system is directed to one of the effluent storage tanks which will be controlled at a level of 7,000 gallons. This provides 2 hours of effluent equalization during normal flow conditions. The remaining 18,000 gallons will be held as reserve storage in the event of poor quality effluent production. The second tank is also held in reserve and provides an additional 7 hours of storage capacity under normal flow conditions and over 4 hours at peak flows.

The combination of effluent equalization and reserve storage provides assurance that poor quality effluent can be captured before discharge to the Mohawk River. Stored effluent will typically require retreatment through the effluent polishing system (with carbamate addition and sulfur impregnated carbon adsorption) to attain discharge quality. Retreatment can be accomplished at a rate of 61 gpm under normal feed flow conditions (less than 7 hours to retreat a 25,000 gallon tank volume).

Providing that acceptable quality effluent is present, the effluent is pumped via the Effluent Discharge Pumps (PC-4629 A&B) through the discharge pipeline to a city stormwater sewer connection that discharges to the Mohawk River.

B.5 System Control Philosophy

B.5.1 Introduction

The main goal is to provide enough retention treatment capacity and flexibility to meet effluent discharge limitations under all anticipated influent loadings and conditions. Two related guidelines in the design of the WWTP are minimization of both cost and operator interaction. The WWT process is particularly suited to meeting these goals since it has large capability at both ends of the process and the input flows (scrubber blowdown and trunnion cooling water) are generally constant. Both of these factors will result in relatively slow changes in the process operating conditions.

Currently, the existing WWT plant operation is maintained by hourly walk-through by kiln operators. Changes in conditions are noted and appropriate actions are taken as necessary. It is intended that this degree of operator oversight of the new plant be maintained.

B.5.2 Process Description

The proposed wastewater treatment process is depicted in the attached process flow diagram. It consists of three basic unit operations, equalization, gross and fine solids removal, and effluent storage. Process input flows consist of the two scrubber blowdown streams and the trunnion cooling water. Both of these systems will provide relatively steady flow rates of 34 gpm/scrubber and 25 gpm of cooling water (plus 1-6 gpm of miscellaneous sources including boiler water, backwashes and sump and containment discharges) for an average total flow of 60 to 65 gpm. WWT operators will have radio access to the kiln operator who will have data regarding current blowdown rates from the scrubbers. This will

assist the WWT operators in determining the degree of flow adjustments necessary.

Equalization is accomplished via a 25,000 gallon tank (normally operated at 12,500 gallons) that provides a 6 hour retention of the scrubber blowdown flows. The remaining 12,500 gallons will be held available for upset flow absorption.

There will be two effluent storage tanks of 25,000 gallons each. There will be minimal retention of treated wastewater in these tanks under normal conditions. One will serve as a wet well for the effluent discharge pump, the other will be held spare for collection of non-compliant flows.

B.5.3 Instrument and Control Description

There will only be four basic parameters monitored in the process - flow, level, TDS, and pH. (Note that the sludge filter press will be purchased with its own integral I&C package). Only pH measurement will be tied in to a control loop. Level, TDS, and flow measurement will be manually controlled by the operators.

B.5.3.1 Flow Measurement

Flow will be measured and local indication will be provided at three locations - the discharge of the equalization tank, the discharge of the clarifier overflow collection tank, and the discharge from either of the two effluent storage tanks. The readout of these flow meters will be at a location that will allow the operator to make manual valve adjustments to a desired flow rate. The effluent storage tank discharge flow meter will include flow totalization.

The existing scrubber blowdown lines are equipped with flow indicating devices. Indication is made in the respective kiln control rooms.

B.5.3.2 Level Measurement

Level will be monitored via level switches that will illuminate alarm lights on the WWT annunciator panel. Level switches will be installed on the equalization tank, clarifier overflow collection tank, the two effluent storage tanks and the sludge conditioning tank. Level switches will also likely be installed in containment sumps. Each of the level switches will require an appropriate operator action. Due to the sizing of the tanks, relative steadiness of the process flow rates, and the positioning of the switches, operator intervention will normally not be required instantaneously. Generally, an operator will have a minimum of 15 minutes before his response is critically required.

B.5.3.3 Total Dissolved Solids Measurement

TDS will be measured manually (as will settled sludge levels in the clarifier) on a two to four hour basis. TDS will also be determined by specific gravity measurements on the equalization tank (TK-4601) effluent and increases or decreases in scrubber blowdown rate made to control this parameter.

B.5.3.4 Level and Flow Control

a. Equalization Tank

Equalization Tank - three requirements are necessary in the equalization tank;

1) Maintain minimum suction head for the EQ discharge pump.

2) Control the wastewater level at approximately 12,000 gallons.

3) Prevent overfilling of the tank.

Four level switches will be required to accomplish this;

A low-level switch at approximately 2,000 gallon level will alarm to indicate extreme low tank level. The operator will have approximately 40 minutes to respond before losing pump suction. Response will be decreasing the discharge rate from the EQ tank by closing down on a manual control valve.

A low level switch at approximately 11,000 gallon level to indicate that the EQ tank discharge rate is exceeding the scrubber blowdown input rate. Operator response is to slightly close the discharge valve. Rapid response is not required.

A high level switch at approximately 12,000 gallons to indicate that the EQ tank discharge rate is less than the scrubber input rate. Operator response is to slightly open the discharge valve. Rapid response is not required, but the levels that accumulate above the high alarm point is the spare tank capacity that should be available for upset conditions.

A high level switch at approximately 23,000 gallon mark to indicate that extreme high levels are present and overflow of the tank is imminent. The operator will have approximately 50 minutes to respond to this alarm. Operator response is to open the discharge valve to draw down the tank level. The discharge rate can be increased to 67 gpm for brief periods without compromising the treatment process.

b. Clarifier Overflow Collection Tank

Clarifier overflow collection tank - There are three level control requirements for this tank;

1) Maintain minimum suction head for the tank discharge pump.

2) Prevent overfilling of the tank.

3) Maintain a minimum of 1 hour of retention at average flow conditions.

Three level switches will be required to accomplish this;

A low-low level switch at approximately 1,500 gallon level will alarm to indicate extreme low tank level. The operator will have approximately 21 minutes to respond before losing pump suction. Response will be

decreasing the discharge rate from the tank by closing down on a manual control valve.

A low level switch at approximately 3,600 gallons level will alarm to indicate low tank level. This will indicate that the tank level is dropping below minimum retention requirements.

A high-high level switch at approximately 6,500 gallon mark to indicate that extreme high levels are present and overflow of the tank is imminent. The operator will have approximately 15 minutes to respond to this alarm. Operator response is to open the pump discharge valve to draw down the tank level. The discharge rate can be increased to 108 gpm for brief periods without compromising the treatment process.

c. Effluent Storage Tanks

Effluent storage tanks - There are three requirements for level control in this tank;

1) Maintain minimum suction head for the tank discharge pump.

2) Control the wastewater level at approximately 7,000 gallons. This will ensure that maximum upset storage capacity is available in this tank.

3) Prevent overfilling of the tank.

Three level switches will be required to accomplish this;

A low-low level switch at approximately 2,000 gallon level will alarm to indicate extreme low tank level. The operator will have approximately 30 minutes to respond before losing pump suction. Response will be decreasing the discharge rate from the effluent storage tank by closing down on a manual control valve.

A high level switch at approximately 7,000 gallon to indicate that the effluent storage tank discharge rate is less than the WWT system input rate. Operator response is to slightly open the discharge valve. Rapid response is not required, but the levels above the high alarm point is the spare tank capacity that should be available for upset conditions.

A high-high level switch at approximately 23,000 gallon mark to indicate that extreme high levels are present and overflow of the tank is imminent. The operator will have approximately 30 minutes to respond to this alarm. Operator response is to open the discharge valve to draw down the tank level. The discharge rate can be increased to maximum pump discharge (or more critically, max discharge rate as to be defined by the NYSDEC permit) as necessary to draw down the tank level.

d. Sludge Storage Tank

Sludge storage tank - There are only two level control requirements for this tank;

1) Maintain minimum suction head for the tank discharge pump.

2) Prevent overfilling of the tank.

This tank will be filled on an intermittent basis by manual operation of the clarifier underflow pump. Discharge will be during a filter press run cycle. Two level switches will be required to accomplish this;

A low-low level switch at approximately 1,000 gallon level will alarm to indicate extreme low tank level. The operator will have approximately 15 minutes to respond before losing pump suction. Response will be to shut the filter press feed pump off, ending the filtration cycle.

A high-high level switch at approximately 5,800 gallon mark to indicate that an extreme high level is present and overflow of the tank is imminent. The operator will already be in attendance making the sludge transfer from the clarifier. This alarm will be his signal to stop the transfer.

e. pH Measurement and Control

pH measurement and automatic control will be performed in the equalization tank and in the clarifier overflow collection tank. Current design calls for the equalization tank pH control system to add caustic to raise the pH to 10.2. Likewise, the overflow collection tank pH control system will add acid to a pH of 8.8. Local indication of the pH will be available at each of the tanks.

f. Annunciator Panels

There will be two annunciator panels that will display level alarms - one in the WWT building and one in each kiln control room. Panel graphics will provide rapid recognition of alarm locations for the operators. Any alarm conditions that occur will require the kiln operators to notify the WWT operators of the alarm so that appropriate actions are taken.

No panel indication of flow rates or pH values will be made. Operators will be required to perform thorough hourly plant inspections to log this data.

B.6 Process Flow Diagram

A process flow diagram is included in this section, Drawing No. NY029-D1003 showing the proposed wastewater treatment process influent, effluent and internal flow streams.

B.7 Simplified Piping and Instrumentation Diagram

The wastewater treatment system piping and instrumentation diagram is provided in this section as Drawing No. NY029-D1004.

APPENDIX C:

ELECTRICAL POWER, INSTRUMENTATION AND CONTROLS: KILNS, APC'S AND WASTEWATER TREATMENT

Contents

APPENDIX C:
ELECTRICAL POWER, INSTRUMENTATION AND CONTROLS: KILNS, APC'S AND WASTEWATER TREATMENT

C.1. Engineering Basis:

C.1.1 The proposed electrical power, instrumentation and controls for Kilns #1 and #2 to bring the facility into compliance with Norlite's Part 373 Part B permit have been completed as follows:

* Installed new power distribution systems at the Motor Control Centers.
* Installed new PLC based control Systems.
* Incorporated LGF Area PLC Systems with Kiln 1 PLC Systems.
* Installed New APC System for Kiln 1 and installed Dust Conveyance System for both Kilns.
* Removed obsolete equipment and instrumentation as required.

C.1.2 The Wastewater Treatment facility is under construction and is scheduled for completion in September 1995. A new Motor Control Center will be added. Primary control functions will be accomplished at the new Wastewater Treatment Facility with PLC monitoring interface to Kiln 1.

C.1.3 The Process Control objectives currently and for future expansion are:

* Provide PLC based control systems with operator interface.
* Provide necessary safety and regulatory interlocks.
* Provide necessary data acquisition for regulatory, maintenance, and engineering functions.
* Provide a sufficiently expandable control system without need for new hardware or software.

C.2. General Electrical Specifications

The following listed publications, latest edition and addendum, will be a part of any specification to the extent applicable or specified.

National Fire and Protection Association (NFPA)

NFPA 70	National Electric Code (NEC)
NFPA 78	Lighting Protection Code
NFPA 496	Purged and Pressurized Enclosures for Electrical Equipment in Hazardous Locations

National Electrical Manufacturers Association (NEMA)

NEMA MG1	Motors and Generators
NEMA MG2	Safety Standards for Construction and Guide for Selection and Use of Electric Motors and Generators
NEMA 250	Enclosures for Electrical Equipment
NEMA ICS 1	General Standards for Industrial Controls and Systems
NEMA ICS 3	Industrial Systems

NEMA ICS 6 Enclosures for Industrial Controls and Systems
NEMA FB1 Fittings and Supports for Conduit and Cable Assemblies

Instrument Society of America (ISA)

ISA RP60.8 Electrical Guide for control Centers
ISA RP12.1 Electrical Instruments in Hazardous Areas
ISA S12.4 Instrument Purging for Reduction of Hazardous Area Classifications

Joint Industrial Council (JIC)
JIC EL-1 Electronic Standard
JIC EMP-1/EGP-1 Electrical Standards

Underwriters Laboratories (UL)

UL 50 Cabinets and Boxes
UL 508 Industrial Control Equipment

American national Standards Institute (ANSI)

ANSI C80.1 Rigid Steel Conduit, Zinc Coated
ANSI C80.4 Fittings for Rigid Metal Conduit

Occupational Health and Safety Administration (OSHA)

29 CFR 1910 General industrial Standard

Any local electrical codes if applicable.

C.3. Design and Operating Description

C.3.1 WASTE FEED CUTOFF INSTRUMENTATION

Introduction

Waste feed to the kiln shall cease whenever any of the system operating conditions deviate from the permit limits. Appropriate instrumentation and controls shall be interlocked with the LGF feed pump and a LGF feed line solenoid valve to ensure positive cut off of LGF feed to the kiln.

The instrumentation and controls indicated in Process & Instrumentation Diagram Dwg. #NY-D-I-5006 shall be installed, maintained and calibrated to automatically initiate a Waste Feed Cut Off (WFCO) when the limits in Table C-1 are exceeded.

Kiln Pressure

Kiln pressure is measured by a Magnahelic Differential Pressure Transmitter with a range of -1.0 to +1.0" H_20 with an accuracy of ±2%. The kiln is operated at a kiln pressure of less than -0.05" of H_20.

The instrument is calibrated to produce an alarm signal at a kiln pressure of less than -0.05" H_20. If the Kiln pressure falls below -0.05" H_20 the waste feed cutoff circuit is activated shutting off the LGF feed pump and de-energizing the LGF feed line solenoid valve. This is a fail safe system whereby the LGF Feed System is shut down when a cutoff limit is reached or a power failure is experienced.

Kiln Exit Gas Temperature (Back End Temp)

Kiln Exit Gas Temperature is measured by a Type J Thermocouple with a temperature range of +32 F to 1382 F with an accuracy of ±5 F. During operation, kiln exit gas temperature prior to the heat exchanger is approximately 900 F.

The temperature transmitter is calibrated to alarm at 885 F and 1080 F. The automatic waste feed cutoff system is activated if the back end temperature falls below 875 F Hourly Rolling Average (HRA) or above 1091 F (HRA). The LGF Feed Pump shuts off and the LGF feed line solenoid valve is de-energized ensuring a positive cutoff of the LGF feed to the kiln burner.

Oxygen Concentration

Oxygen concentration is determined by an oxygen analyzer which works on the paramagnetic principle with automatic self calibration. The instrument is calibrated to produce an alarm signal at an oxygen concentration of less than 3%.

Carbon Monoxide Concentration in Stack

A non-dispersive infrared gas analyzer with automatic calibration is used to continuously monitor emissions of carbon monoxide (CO) that ends up in the stack. The instrument is calibrated to produce an alarm at CO concentrations of 75 PPM. The automatic waste feed cutoff system is activated if the 60 minute hourly rolling average (HRA) of Concentration in the stack is greater than 100 PPM.

Scrubber Water Recirculation Flow

Scrubber water recirculation flow rate is measured by a magnetic flowmeter with a maximum flow rate of 250 GPM and an accuracy of ±1.0% of flow. This instrument has an internal calibrator and a self test function to confirm proper operation. With a typical flow rate of 190 GPM, an alarm signal will be calibrated for 194 GPM and a cutoff signal if the flow rate falls below 175 GPM. The automatic waste feed cut off system is activated if the scrubber water recirculation flow falls below 175 GPM.

Combustion Gas Velocity

Combustion Gas Velocity is extrapolated from the induction fan motor current and the position of the induction fan damper. The damper is set at a maximum of 60 per cent open. A lower fan current signals a lower kiln gas velocity. As the gas velocity increases the motor current is increased. When the motor current reaches 400 AMPS an alarm is sounded, and at any current greater than 404 AMPS (HRA) the LGF cut off circuit is activated - shutting off the LGF feed to the kiln burner.

Low Grade Fuel Feed Rate

Low Grade Fuel (LGF) flow is measured by a Micro Motion Flowmeter or equivalent. Calibration of this flow meter is accomplished through an internal calibration system. At 9 gallons per minute (GPM) an alarm is sounded to alert the kiln operator that a waste feed cutoff limit is being approached and some action should be taken to avoid shutdown. If a feed rate greater than 10.1 GPM (HRA) is reached the LGF cutoff circuit is activated - shutting off LGF Feed to the Kiln Burner.

Scrubber pH

Scrubber pH is measured by an in-line pH probe and electronics package. The calibration of this unit is accomplished through the use of buffer solutions of known pH. The probe must be removed from service, cleaned and submersed in the buffering solutions in the proper order. While setting the output to the known pH of the buffering solution.

The scrubber pH is continuously monitored and if it falls to 8.0 an alarm will be sounded to alert the operator. If corrective actions are not taken or are not successful and the pH falls below 7.9 the LGF cutoff circuit is activated to close the LGF feed valve.

Baghouse Pressure Drop

Baghouse Pressure Drop is measured by a Differential Pressure Transmitter. This instrument is calibrated DL line by comparison to a standard reference pressure calibrator. The baghouse pressure drop is an important parameter that indicates when the filter bags require cleaning. If the differential pressure drops below 5.3 inches of H_20 an alarm is sounded for operator action. If the pressure drops below 4.8 inches of H_20 the LGF cutoff circuit is activated and closes the LGF feed valve.

Baghouse Inlet Temperature

Inlet temperature to the baghouse is measured by a Thermocouple. The calibration of the indicating instrument is done by comparison to a standard reference Thermometer. The baghouse inlet temperature is maintained below 450 F to prevent damage to the baghouse.

An alarm is sounded when this temperature reaches 435 F alerting the kiln operator to take corrective action.

The LGF cutoff circuit is activated if the temperature goes above 450 F closing the LGF feed valve.

Scrubber Blowdown Rate

Scrubber blowdown rate is measured by a Magnetic Flow Meter with an internal calibrator and a self test function to confirm proper operation.

If the scrubber blowdown rate falls below 5.0 gallons per minute (GPM) an alarm is sounded for operator action. If this rate continues to fall and reaches 4.4 GPM the LGF cutoff circuit is activated closing the LGF feed valve.

Scrubber Venturi Pressure Drop

The Scrubber Venturi Pressure Drop is measured by a Differential Pressure Transmitter with an operating range of 0-15" H_20. This instrument is calibrated on line by comparison to a standard reference calibrator. A higher pressure drop across the Scrubber Venturi produces better cleaning action. To calibrate this instrument it must be compared against a known accurate calibration instrument. The higher the Venturi pressure drop in the scrubber, the better the cleaning action. If the Venturi Pressure drop decreases to 2.5 inches of H_20 an alarm is sounded for operator intervention. If the pressure drop decreases to below 2 inches of H_20 the LGF cutoff circuit is activated closing the LGF feed valve.

TABLE C-1
WFCO AUTOMATIC AND OPERATOR ALARMS

SYSTEM	ALARM SET POINT	LGF CUT OFF LIMITS WFCO	CALIBRATION FREQUENCY	OPERATIONAL TEST FREQUENCY
Kiln Pressure	-0.05" H_2O	> -0.05" H_2O for 15 Sec	Monthly	Weekly
Kiln Exit Gas Temp (Back End Temp.)	885 F (HRA) 876 F (OMA) 1080 F (HRA)	< 875 F (HRA) <866 F (OMA) > 1091 F (HRA)	Monthly	Weekly
Oxygen concentration			(NBS traceable audit gases) Quarterly internal standard daily	Weekly
Carbon Monoxide concentration	75 PPM	> 100 PPM (HRA at 7% 02 DRY)	(NBS traceable audit gases) Quarterly internal standard daily	Weekly
Scrubber Water Recirculation Flow	194GPM	< 175 GPM	Monthly	Weekly
Scrubber Venturi Pressure Drop	2.0" H_2O		Quarterly	Weekly
Baghouse Pressure Drop 3 Modules On-Line 2 Modules On-Line	 5.3" H_2O 10.0" H_2O	 < 4.8" H_2O (OMA) < 9.2" H_2O (OMA)	Monthly	Weekly
Inlet Temp. to Baghouse	435 F	> 450 F (OMA)	Monthly	Weekly
Scrubber Blowdown Rate	5.0 GPM		Quarterly	Weekly
Combustion Gas Velocity (as measured by I.D. fan amp draw)	400 amps	> 404 amps (@ a max. damper setting of 60% (OMA)	Quarterly	Weekly
LGF Feed Rate	9 GPM	10.1 GPM (HRA)	Monthly	Weekly
Scrubber PH	8.0	< 7.9 (HRA)	Daily	Weekly
Sludge Feed Rate	TBD		Monthly	Weekly
LGF Burner Atomization Air Pressure	45 PSIG		Monthly	Weekly
Shale Feed Rate	21.5 TPH	> 22 TPH (HRA)	Monthly	Weekly

Lime Feed Rate	2.9 lbs/hr/ lb/hr chlorine	2.7 lb/hr per lb/hr Cl feed	Quarterly	Weekly
Ducon Scrubber Pressure Drop	1.5" H_20		Quarterly	Weekly
Sludge Burner Atomizing Air Pressure	TBD		Monthly	Weekly
SLGF Burner Atomizing Steam Pressure	TBD		Monthly	Weekly

C.4 Kiln Procedures/Operational Parameters, Monitoring and Control

This section is presented as follows:

C.4.1 Kiln Start-Up Procedure
C.4.2 Kiln Shutdown Procedure
C.4.3 Operational Parameters, Monitoring and Control
C.4.4 Cooler Control
C.4.5 Kiln Control-Essential Compliance Parameters Associated With WFCO

C.4.1 System Start-Up Procedure

1. Turn on pilot combustion air (2 position selector switch (on-off) on kiln main control panel. Pilot combustion air runs continuously and is controlled by a hand ball valve mounted outside the control room. A pressure gauge (D-20 psi) monitors the pressure. A setting for 4 psi is usually employed.

2. Turn pilot light switch to on position.

3. On the kiln main control panel, start/depress button until flame lights, then release: this push button energizes solenoid valve for gas flow (pre-set flow) and enables the spark to ignite the flame. Normally the pilot will be allowed to run until the kiln back end temperature is 200 - 400 °F. Once this temperature range is obtained the main gas may be started.

4. Initiate scrubber water flow. Verify with the trunnion man that the quench water flows are set at 2 gpm per header (4) for a total of 8 gpm. The scrubber recirculation pump should be started and a minimum flow of 194 gpm established.

5. The pyrometer reads the flame temperature and then opens the auto Maxon valve and sets up the semi-auto Maxon valve.

6. The gas flow regulator valve (actuator) must be closed; this valve is operated by a spring return to off selector switch on the kiln main control panel.

7. Now the semi-auto Maxon valve can be opened. This is done by engaging a lever on the valve body. A red bar on these Maxon valves indicate open or closed position.

8. The gas flow regulator (actuator) is then opened slowly. Note valve limit switches. Main gas is now flowing. Enough gas should be turned on so that the end of the flame drifts upward and slight impingement occurs on the top brick of the kiln. The flame should appear slightly rich (yellow to orange).

9. Once the kiln back end is 200-300°F prepare to start the scrubber ID fan. Two ball valves on the underside of the fan housing must first be opened. This is done to release any water that has accumulated in the fan. This is principally done following a prolonged shut-down. Now start the scrubber ID fan and adjust the variable speed control to 25 % of speed. The fan speed can be used in increase the kiln draft.

Note: (1) Based on operating conditions, the ID fan, kiln drive and shale conveyors may be started before the main gas flow.

10. Turn on the primary combustion air fan flow. This is done by a start-stop lever located outside the kiln control room. The damper on the outlet of the fan should be set to 1/4 open. The addition of to much primary air will result in the main burner flame blowing out. Now the primary air and the main gas should be adjusted upward in a step wise fashion until the primary air damper is 3/4 to full open. The main gas flow should be adjusted so that the kiln back end temperature increases at a steady rate while not overheating the brick in the front end of the kiln.

11. The kiln may now be started via the pony motor or turned ½ revolution every 15 minutes on the main kiln drive. Again, this is determined by the operator based upon present conditions. The shale feed conveyors may now be started (or any time up to time of shale feed). The kiln and conveyors are started and stopped by push buttons on the kiln main control panel.

12. Turn on the heat exchanger cooling fan (based on operating conditions). Normally this is turned on when the kiln back-end temperature reaches 600 °F.

13. Start the nose ring (seal) cooling fan and the tire cooling fan (note all dampers to be open). Also insure that cooling water is being circulated for Trunnion cooling.

14. At this time the cooler and support systems are to be activated. This includes the grate and screw conveyors, east and west fans, clinker product conveyor (with water sprays), cooler vent fan, cooler multiclone(s), hopper discharge devices and hopper dust collector. These components are started and stopped by push buttons on the MCC in the motor control room.

Note: (1) Start clinker conveyor first, then 5 seconds later the cooler conveyor.

(2) Start the north cooler fan first, 20 seconds later the south fan, and then adjust the dampers accordingly. The clinker cooler vent fan and cooling fans are useful in balancing heat distribution during warm up.

15. At this point, the kiln back-end temperature should be adjusted to approximately 600-700 °F controlling gas flow and draft.

16. Conversion to fossil fuel oil now commences. If used oil will be fired verify the CEM system is operational, and all compliance parameters are in specification with the used oil. Atomization air (or steam) should be activated with pressures checked to assure meeting compliance requirements.

To control the flow, the Worcester flow control valve (auto) and/or a flow control manual ball valve will be utilized. As the fuel oil flow is increased, the natural gas flow via the actuator is reduced until complete changeover has taken place.

17. The heat up process should continue until the back end temperature is 1050 °F. Now shale feed may be started.

18. Initiate shale feed by engaging the push button located on the Accurate control panel in the main control room. Once the shale feed is introduced into the kiln the temperature in the kiln will begin to drop. The operator will monitor the back-end temperature (note a WFCO parameter) and adjust fuel flow rates (noting WFCO limits) and other parameters (e.g., kiln speed) to make sure the temperature is stable and within regulatory requirements.

Note: Shale feed retention time in the kiln is approximately 45 minutes.

19. When the system is at steady-state (e.g., kiln back-end temperature, kiln pressure), and all process parameters are in compliance with the operating permit conversion to LGF may commence. Note the continuance of atomizing air (or steam) which along with the primary air flow may have to be adjusted to provide for a stable flame.

Note: At this point the LGF flow rate and pressure should be monitored to assure compliance (see WFCO table for appropriate set points).

20. The LGF flow is monitored by a Micromotion mass flowmeter and displayed by a digital display mounted on the control room wall and by the genesis data acquisition system. The flow rate is adjusted manually by the hand/ball control valve or automatically by the Worcester flow control valve.

21. Once the LGF flow is established, if still on, the main gas flow via the actuator can be adjusted down and shut off. This will be done by the open/close spring return selector switch on the kiln control panel. Once this valve is fully closed, the gas supply is cut off.

Note: The Maxons remain open. They only close at loss of flame, high pressure, or low pressure (natural gas).

22. The cooler system control is addressed to support kiln combustion (pre-heated air yield), pressure and temperature profiles, the latter two of which are WFCO related. This is achieved by the east and west fan and cooler vent fan dampers. The east and west fan dampers are cooler pressure controlled with a manual override. The cooler vent fan damper is fully manual controlled and as discussed must be closely monitored.

Note: (1) This process has a strong impact on the kiln achieving LGF/sludge and aggregate capacity.

(2) The cooler dampers are controlled by a feedback signal from a pressure switch located in the cooler bed. If pressure in the bed is high, open damper and speed up the grate. If pressure in the bed is low, close damper and slow down the grate.

23. For temperature control, the LGF are adjusted accordingly. Should auxiliary heat input be required, co-firing with natural gas may be pursued.

24. Flame on/off is monitored by the flame temperature pyrometer. If off, convert to fuel oil. Ignition will be achieved via the residual heat, pilot that is on or pilot that must be activated.

C.4.2 System Shut Down

C.4.2.1 Prepared/Routine Shutdown

A. Shut down the Shale feed system. Allow 45 minutes for all product to exit the kiln. LGF flow must cease within 30 minutes of when shale feed is stopped.

B. Shut down the LGF/#4 fuel oil/main gas/pilot gas pumps and valves accordingly.

C. Position the kiln shale feed chute drop plate to protect equipment (e.g., residual heat burning belt feeder).

D. Turn down the kiln speed by converting to the pony motor and run for 6 hours to empty the kiln and cool down. If entry into the kiln is required within 12 hours the ID fan will be left at full speed to remove maximum heat from the kiln. When entry is not required within 24 hours the ID fan should be shutdown after all shale is out of the kiln and the flame is out. This will reduce the thermal shock to the refractory.

E. The cooler system will run until all material is discharged from the kiln and the cooler grate and screw conveyors—a period of approximately 1 hour and 15 minutes.

F. Then shut down the cooler drive and conveying screws. The cooler fans remain on to cool off the kiln. The front bearing motor should be shut off with the damper opened.

G. Shut down the lime feed system. Maintain the Baghouse operation. The scrubbers continue to run.

H. After approximately 12 hours of the kiln cooling, it should be cool enough to enter the kiln (e.g., for repairs).

I. At this time the remaining equipment may be shut down.

J. Close and tagout LGF vent line from the tank farm.

C.4.2.2 WFCO Shut Down

This is achieved by stopping LGF and converting to fuel oil or natural gas and maintaining the operation otherwise. If the out-of-compliant parameter(s) continues to be at undesirable levels, the overall system will shut down following the Prepared/Routine Shut Down Procedure.

C.4.2.3 Emergency/Power Failure

All systems (motors) will cease or react accordingly (fail-close).

1. Shale belt feed system will stop
2. Fuel oil and LGF pumps will stop and solenoids fail to close
3. For natural gas, de-energize the fire-eye selector switch; this shuts off power, closes the gas flow line, de-energizes the Maxons, etc.

The only active feature (on back-up power) will be the kiln drive, which will be rotated until all shale/clinker has been discharged, collecting on the cooler grate.

Other matters to note include:

1. Kiln speed should be set to zero. The kiln could rock back if power comes on and could strip gears.

2. City water by-pass valve should be opened (Trunnion cooling).

3. The auto ASCO valve in the main natural gas line will open upon shut-down to vent any line gas accumulation to the atmosphere.

4. Kiln shale feed chute plate should be closed off.

C.4.3 Operational Parameters

1.LGF fuel pressure	15.Cooler grate speed
2.Secondary air temperature	16.ID fan speed
3.Shale feed rate	17.Fuel oil use/flow
4.Flame temperature	18.Natural gas use/flow
5.Kiln back-end temperature	19. CO concentration (in flue gas)
6.Stone temperature	20.O_2 concentration (in flue gas)
7.Primary air flow/pressure	21. ID fan current
8.Atomization steam pressure	22. Baghouse pressure drop
9.Atomization air pressure	23.Baghouse inlet temperature
10.Kiln hood pressure	24.Scrubber venturi pressure drop
11.Heat exchanger inlet & outlet temperature	25.Scrubber recirculation tank pH
12.Flame stability	26.Lime feed rate
13.Cooler vent fan damper	27. Scrubber blowdown rate
14.Cooler pressure/fan dampers (n/s)	28.Ducon scrubber pressure drop

Parameters 1-20 are associated with the kiln operations and the balance are compliance/operational parameters which are associated with APC and peripheral system operations.

C.4.4 Clinker Cooler Control

The primary function of the clinker cooler is to reduce the temperature of the expanded clinker as it exits the kiln. The secondary benefit of the cooler is that it operates as a recuperative heat exchanger in that hot air generated from the cooling process can be used for secondary combustion air in the burning zone of the kiln. The primary components to the cooler are the: (see figure 2.1)

1) cooler enclosure
2) cooler grates
3) FD fans
4) waste heat fan.
5) oversize discharge.
6) discharge grate/conveyor
7) cooler screws.

Keys to cooler optimization are:

1) Quick cooling of clinker using cooler fans.
2) Maximum secondary air temperature.
3) Maximum cooling of clinker.
4) Minimum waste gas volume.
5) Optimum kiln draft.

The front cooler fan should be used as the primary cooling source. The back fan should be used secondarily. The kiln hood draft should be controlled with the cooler fans and ID fan. Do not use the waste heat fan to control hood draft.

Weather conditions will affect cooler performance. Temperature of cooling air will affect gas density. The fan gas volume is a function of the gas density. The mass delivered by the fans is affected by the gas temperature.

The automatic loop control will call for setting the under-grate pressure via auto modulation of the respective east and west fan or fan dampers. This control may be manually overridden by adjusting the damper setting.

Manual control of the cooler envolves the following:

1. Adjust grate speed
2. Screw conveyors on/off to remove fines from bottom of cooler.
3. Cooler waste heat speed.
4. Clinker belt water application

C.4.5 Kiln Control-Essential Compliance Parameters Associated with Waste Feed Cutoff (WFCO)

Norlite's NYS Part 373 Permit defines nine process parameters which automatically initiate a waste feed cutoff if one (or more) parameters deviate from predetermined limits. Additionally there are eight other parameters which are required to be monitored in order to burn hazardous waste.

The WFCO control system consists of Programmable Logic Controller (PLC), and an electronically actuated WFCO valve in the LGF line. The PLC receives a 4-20 milliamp signal from local transmitters that monitor the compliance parameters. These signals are used by the PLC to determine if the various parameters are within preset limits that are defined by the Part 373 permit. When the PLC receives a signal identifying that a parameter is outside of the permit limit, it sends a signal to the WFCO valve to close, terminating LGF flow. This system is tested once per week for each WFCO parameter by sending a false high or low signal from the transmitter to the PLC, thus causing the WFCO valve to close.

LGF Flow Control System

The LGF flow control system consists of the LGF flow control valve (manual ball valve), LGF pressure transmitter, Micromotion flow meter, PLC and Genesis software interface, and local flow meter display. The WFCO permit limit for LGF flow is 10.1 gpm (hourly rolling average-HRA). The PLC continuously monitors the flow rate and reports a one minute average to the Genesis system and DEC printer. The one minute average is used to calculate the HRA. At 9.0 gpm HRA an alarm will be activated on the Genesis control monitor to notify the operator that the HRA is approaching the WFCO limit.

Kiln Exit Temperature

Kiln exit (back end) temperature is monitored by a thermocouple in the transition duct work between the kiln and the multiclone. The output from the thermocouple is sent to a transmitter that converts the output to a signal that can be sent to the PLC. The WFCO permit limit for kiln exit temperature is a temperature range that must be at least 875°F HRA and less than 1091°F HRA. Alarms on the Genesis control monitor will warn the operator that the parameter is approaching a WFCO when the temperature is 885 °F or less and 1080 °F or higher.

Back end temperature is influenced by a variety of variables; however thermal input to the kiln via LGF, # 4 oil, waste oil or gas is the dominant variable. The combustion process creates thermal energy. The thermal energy that is not absorbed by the shale in the expansion process or radiated from the kiln will exit through the back end of the kiln in the form of flue gas energy, i.e., temperature. The exit temperature thermocouple measures the temperature of these gases.

Back end temperature will also fluctuate based on the amount of shale input. The shale acts as a heat sink, as more shale is introduced to the kiln more fuel is required to increase the kiln exit temperature.

ID fan speed determines the volume and rate at which heated flue gas will be removed from the kiln. As the fan speed setting is increased more gas volume will be removed from the primary combustion zone, thus raising the back end temperature.

A secondary control of the exit temperature is the clinker cooler vent fan speed. The cooler vent fan removes waste heat from the clinker cooler in the form of heated gases. Gases that do not exit the cooler vent stack are introduced into the burning zone as secondary combustion air. Fluctuation of the cooler vent fan speed will affect the exit temperature based on the temperature and volume of the gases.

Carbon Monoxide

The CEM continuously monitors CO in the kiln's exhaust gases. The CEM system consists of carbon monoxide monitors, oxygen monitors, sample conditioners, and data acquisition and control systems.

The system continuously monitors CO and O_2 and uses the monitored O_2 concentration to normalize CO to 7 % O_2. The corrected CO measurements are averaged to form a one minute average. The one minute CO averages are, in turn, averaged each minute to calculate a one hour rolling average.

CO and O_2 one minute averages and CO one hour rolling averages are then transmitted to the kiln's PLC for computerized storage in the Genesis data acquisition and data base management system. The WFCO for this parameter is 100 ppm HRA. Alarms on the Genesis control monitor will warn the operator that the parameter is approaching a WFCO when the CO HRA is 75 ppm or higher.

The primary factors that influence CO are kiln temperature, proper fuel atomization, air to fuel ratio, fuel quality (i.e. Higher Heating Value(HHV), water

content, solids content), and uniformity of fuel flow. The kiln temperature is determined by the flow rate and HHV of the fuel processed. In order for the combustion reaction to occur there must be an adequate supply of oxygen to oxidize the carbon atoms of the fuel. The by product of complete combustion is carbon dioxide (CO_2). CO is a product of incomplete combustion. Primary air is injected to ensure there is enough excess O_2 present to complete the combustion reaction and minimize the amount of CO produced. Atomization air is injected to the burner nozzle to enrich the fuel with O_2 and mechanically atomize the fuel to help facilitate the combustion reaction.

Interruptions in fuel flow delivery to the kiln cause a shift away from the equilibrium of the combustion reaction occurring in the kiln. Thus resulting in the production of CO.

Induced Draft Fan Current

The components of the induced draft fan are the I.D. fan, 400 HP motor, variable speed drive, PLC and Genesis software interface. The fan current(amps) is sent to the PLC by a local transmitter. The fan motor amperage is recorded in the Genesis data base and printed out each minute on the DEC printer. The WFCO is 404 amperes. Alarms on the Genesis control monitor will warn the operator that the parameter is approaching a WFCO when the motor amperage is 400 or more.

The primary factors affecting fan amperage are the rotation speed of the fan, static differential pressure across the fan, flue gas temperature, and damper setting. With the damper locked at a fixed position (60 % open), the motor amps and gas volume flow increase as the fan speed is increased due to the work requirement to turn the fan. The temperature of the flue gas is in direct relationship to the gas density, if the volume flow remains constant and the gas density increases the mass of the gas pumped by the fan will increase, thus requiring more motor horsepower to perform the work.

Kiln Pressure

The kiln pressure monitoring loop consists of a are the pressure sensor, pressure transmitter, PLC and Genesis software interface. The kiln pressure is measured by a diaphragm pressure sensor that sends a voltage signal to a local transmitter at the kiln firing hood. The transmitter sends a signal to the PLC that is translated to pressure data on the Genesis control monitor. The WFCO limit is a continuous reading of -0.05" H_2O column or greater for 15 seconds. Alarms on the Genesis control monitor will warn the operator that the parameter is approaching a WFCO when the pressure is -0.05" H_2O column or greater.

The primary control for the kiln pressure is the ID fan. Increased speed of the ID fan increases draft. The clinker cooler vent fan influences hood draft, however it should be used for a secondary control. Over use of the cooler vent fan will result in a lower hood pressure, but secondary combustion air necessary for proper combustion will be vented from the cooler vent stack. The cooler grate fans also affect kiln draft. The east cooler grate fan should used as a primary cooling source, the west fan should be used for secondary cooling.

Scrubber Water Recirculation Rate

The scrubber water recirculation system consists of the recirculation pumps and motors, magnetic coil flow meters, local transmitter, recirculation piping and valves, scrubber headers and nozzles, and PLC and Genesis software interface. The scrubber water flow rate is monitored by the magnetic coil flow meters. Scrubber water flowing through the meter generates a voltage that is measured by the magnetic coil, this coil amplifies the voltage signal and sends the signal to the local transmitter. The transmitter converts the voltage a 4-20 milliamp signal that is routed to the PLC. This signal is translated to data in gallons per minute on the Genesis control monitor.

The WFCO for scrubber water recirculation is a flow rate of 175 gpm or less (one minute average). Alarms on the Genesis control monitor will warn the operator that the parameter is approaching a WFCO when the flow rate is 194 gpm. The recirculation rate may be directly controlled by manual valves in the system, however the valves are normally operated at full open position. Reduced flow rate is normally a sign of solids plugging of header nozzles due to of solids accumulation in the recycle tank. Excursion of pH may affect flow meter performance because the conductance of the water changes when acidity is high.

Baghouse Inlet Temperature

The baghouse inlet temperature is monitored by a thermocouple at the duct entering the baghouse. The output from the thermocouple is sent to a transmitter that converts the output to a signal that can be sent to the PLC. The WFCO permit limit for baghouse inlet temperature is 450°F or greater. Alarms on the Genesis control monitor will warn the operator that the parameter is approaching a WFCO when the temperature is 435°F or higher.

The baghouse inlet temperature is controlled by the flue gas temperature exiting the heat exchanger and a modulating tempering air damper located in the duct upstream of the baghouse inlet. Normally the temperature of the flue gas exiting the heat exchanger is 500-600°F. The exit temperature of the heat exchanger may be varied by adjusting the speed of the heat exchanger cooling fan.

The modulating tempering air damper controls the temperature to a set point predetermined by the operator (normally 430°F). The damper allows cooling air to enter the flue gas stream. The damper may be controlled manually or automatically at the Genesis control monitor.

Baghouse Pressure Drop

The components that monitor baghouse pressure are the pressure differential sensor, local transmitter, PLC and Genesis software interface. The pressure differential sensor detects the difference in pressure between baghouse inlet and outlet static pressures. This pressure difference is converted to a voltage by the sensor and a signal is sent to the local transmitter. The transmitter routes a signal to the PLC that is translated to pressure data on the Genesis control monitor. The WFCO limit is a continuous reading of -4.8" H_2O column. Alarms on the Genesis control monitor will warn the operator that the

parameter is approaching a WFCO when the pressure is <5.3" H_2O column or greater. When operating on two baghouse modules, the alarm point and WFCO point is < 9.2" H_2O and 10.0" H_2O, respectively. In addition, if the baghouse pressure exceeds 9.4" H_2O, an alarm is sounded. Within 10 minutes of this alarm, and every 30 minutes thereafter, the operator must inspect the kiln seals and APC ducting for fugitive emissions until the differential pressure drops below 9.4" H_2O. This is per condition III D(3) (footnote 6) of the Part 373 Permit.

The primary control of the baghouse pressure drop is the dust cake on the filter media. As dust cake builds on the filters in the baghouse the pressure differential increases. When the differential reaches a predetermined set point (usually 5.5" H_2O column) the filter is cleaned by high pressure air injected into the throat of the bag. This causes a shock wave along the length of the bag and the dust cake is removed. The filter media is continuously pulsed one row at a time. Control is by a 10 position timer.

Baghouse differential pressure is also affected by the position of the tempering air damper used to cool the flue gas exiting the heat exchanger. Cooling air creates a higher pressure in the baghouse , thus creating a higher differential in pressure across the baghouse.

Lime Feed Failure

Lime is gravity fed into three feed hoppers from the lime silo. Each hopper feeds into its own lime feed system. This system is designed to have one primary feeder for each baghouse and one feeder as a back up. Each lime feeder may be isolated from the silo by way of a slide gate at the top of each hopper. Each lime feed system is composed of a bladder, paddle, and screw auger. The paddle speed control determines the rate at which lime is introduced from the bladder to the screw auger. The screw auger injects the lime into a pneumatically driven line that feeds the lime into the baghouse system. The pneumatic system is composed of four blowers and three lines. The piping and blower system is designed so that any combination of blower and line maybe used to inject lime into either baghouse.

Lime feed is an WFCO parameter to the kilns and is required to be fed at the rate of 2.7 lbs/lb of halogen introduced to the kilns while burning LGF or waste oil. Lime is also fed at 50 lbs/hour during times at which # 4 oil is being processed in order to neutralize small amounts of SO_2 and SO_3 produced during the combustion of this fuel. The lime feed WFCO will occur if the feeder paddle or screw stops for any reason. Before an LGF tank can be fired to the kilns the lime feed rate must be set. The set point for the tank is documented on the WAP-2 fuel certification sheet. The feed rate control is housed in the kiln 2 motor control center. Generally the Trunnion operator is notified by the burner operator anytime there is a required change in feed rate of lime.

Appendix D

LGF Storage & Feed Systems
Description of Modifications

Contents

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LGF Storage & Feed Systems
Description of Modifications

D.1 Summary

Existing facilities for receiving, storing, mixing and feeding waste fuels to two (2) light weight aggregate kilns are approved with certain exceptions for handling Low Grade (Waste) Fuels, hereafter referred to as "LGF." The exceptions are:

- Tanks 100 and 200 were replaced with six (6) 7,300 gallon agitated tanks with secondary containment as required.
- New fuel feed piping with required secondary containment was installed.
- The fuel feed Booster Pump House located approximately 100' North of Kiln #2 no longer is in the LGF feed system, therefore, eliminating the need for secondary containment.

The additions and other modifications described herein were completed for the purpose of receiving, storing, mixing and feeding waste fuels in compliance with NYSDEC standards. In order to satisfy these needs and also to provide for the improved handling and storage of fuels, a unified approach was taken in order to achieve both objectives in a technically correct and environmentally protective manner.

In summary, the overall modifications consisted of the following tasks:

(1) Removing Tanks 100 and 200 (permit capacity 24,000 gallons each) to an adjacent area for inspection, cleaning and close out. Work included steps to protect existing tanks, testing of the installation area and remediation as necessary.

(2) Removed the shed structure and containment/foundation for the pumps previously used to service Tanks 100 and 200.

(3) Constructing a new LGF Building to house six (6) 7,300 gallon tanks partially replacing the two (2) removed tanks of 24,000 gallon capacity (ea.). These tanks are equipped with mixers, new pumps and controls. Associated piping systems are designed to satisfy the requirements of better fuel handling and delivery with improved environmental protection. This building is fully enclosed to exclude rainwater, to facilitate heating of the tanks and to protect equipment. The building is sized, constructed and lined with an approved coating so as to act as the primary secondary containment volume for the tanks within it as well as other tanks and facilities in the fuels area. Required volatile organic (VOC) monitoring, fire protection, grounding, lighting, ventilation and two means of egress are provided.

(4) Upgraded and modified the existing truck tanker Unloading Dock to:

- Provide new containment liner coating of NYSDEC approved type.
- Installed two (2) new LGF unloading pumps with strainers.
- Installed one (1) waste oil unloading pump.
- Constructed secondary containment for all unloading piping.

(5) Modified the existing LGF pumping facilities and piping to interconnect with new storage and pumping facilities, including the addition or improvement of secondary containments where needed.

(6) Installed a new above-ground 25,000 gallon double wall Waste Oil Tank in the Fuel Farm, including required foundation and secondary containment for pumps and associated piping. Piping is provided to rapidly gravity drain to the new LGF Building in the event of failure of both the tank primary shell and containment shell.

(7) Installed new above-ground fuel feed and fugitive emissions control piping extending from the new LGF Building to the kiln burner front. This piping is contained inside a new overhead 90" diameter walk-through tunnel supported on a structural steel system of beams, trusses, bents and concrete foundations. The tunnel drains to the LGF Building for containment of spills and wash down fluids. The tunnel is equipped with required VOC monitoring, fire protection, grounding, lighting, ventilation and emergency exit locations.

(8) Constructed a new Solids Processing Building adjacent to the North side of the existing Unloading Dock to provide storage of drummed solids generated on site from clean out of strainers, tanks and other equipment, and to house process equipment needed to reintroduce this material into the LGF stream to the kiln burners.

(9) Remove existing fuel Booster Pump House and equipment, test soils in the area, and remediate as may be required after changeover to the new feed piping systems.

(10) Constructed a new Feed Pump Room in the area previously occupied by pulverized coal feed equipment. This facility houses three (3) 1,000 gallon Fuel Equalization Tanks able to receive material from the LGF transfer piping and one (1) 1,000 gallon vent knockout tank. The fuel piping secondary containment tunnel extends to this room which is constructed to provide containment for the Equalization Tanks, Feed Pumps and associated piping. Required VOC monitoring, fire protection, lighting, grounding, ventilation and emergency exit locations are provided.

(11) Constructed a new Solid LGF Feed room adjacent to the Feed Pump Room in the Kiln Building to house two (2) extrusion pump systems to feed this material to separate burners in each kiln.

(12) Modified Kiln Control Room fuel piping and/or the room structure to provide suitable secondary containment and add required fuel cut-off valves.

(13) Designed and installed an overall control system for managing fuel storage and feed to the kiln burners.

(14) Remove existing fuel feed and fugitive piping after it is disconnected, including soils testing and remediation as necessary.

The modified Fuel Farm described in this construction plan is environmentally superior for the following reasons:

Secondary containment is provided for both the existing four (4) permitted tanks (Nos. 300, 400, 500 and 600), as well as for the pumping and piping system, the unloading operations and LGF feed to the kiln. Under the previous engineering plans, if a line or pump failed outside the Tank 300-600 containment system, the capacity of the tertiary containment bunkers was only 3000 gallons. The containment for the six new 7,300 gallon tanks is sufficient in volume to provide containment for the largest Fuel Farm Tank and all LGF lines and pumps.

Having 6 smaller vertical 7,300 gallon tanks, as opposed to two 24,000 gallon tanks provides for better mixing and control of LGF prior to feed to the kiln. This is beneficial in ensuring that the LGF is homogenous, providing more stable operations and greater uniformity in achieving metal limits.

The six smaller 7,300 gallon tanks provide for more effective testing of metals on a tank-by-tank basis, providing greater assurance of uniform LGF feed. Each tank provides approximately six (6) hours of fuel, allowing one to be filled and tested, while the other is supplying the kilns.

The smaller volume of 7,300 gallons allows for quarantining of a given shipment prior to mixing. In this way materials can be isolated and tested on an individual shipment basis prior to use. Any problems identified can be easily resolved, since the shipment will still be isolated and can be returned to the generator.

The smaller volume tanks combined with the vertical design allow for better mixing and less potential for buildup of solids, reducing the frequency of tank cleaning, and allowing for easier compliance with 40 CFR 268.50.

D.2 Tank Removal and Other Demolition

D.2.1 Removal of Tanks 100 and 200

The removal and replacement of the existing underground tanks 100 and 200 was conducted in accordance with Norlite's current closure plan. The tanks were decontaminated as described in the closure plan. Soil adjacent to and below the tank were sampled and tested. The tanks are stored on-site for possible future use in non-hazardous service.

Norlite has included in the attachments revised pages for the closure plan. Note that these revised pages are associated with the new replacement tanks, and should be incorporated into the Part 373 permit.

The excavated area necessary to remove the tanks was shored as necessary and remained open for further excavation to construct the new LGF Building. All excavation, backfill and compaction was performed in accordance with applicable ASTM standards and Section D, Subsection 02222 of the Part 373 Permit Application.

Tank removal was the first activity due to their location in the construction area of the new building.

D.2.2 Tanks 100/200 Pump Shed Demolition

This facility and the pumps have been removed in connection with removal of Tanks 100 and 200. Soils testing was performed and remediation undertaken, as required.

D.2.3 Fuel Booster Pump Building Demolition

This facility remained in service for operation of Kiln #2 until the new fuel feed piping and containment was installed and the burner connections changed over to the new lines.

After being taken out of service, the equipment will be removed, cleaned and stored for potential use in other locations/systems. The building will be dismantled and materials disposed of in an approved facility. Testing will be performed to determine the need for remediation.

D.2.4 Buried Feed and Fugitive Piping Removal

After being taken out of service the existing underground fuel feed and tank fugitive piping was drained, flushed, capped. They are to be removed for disposal in an approved facility. Testing will be performed to determine the need for remediation.

D.3 Tanks, Mixers, Pumps and Miscellaneous Equipment

All metal equipment was provided with attachment points for grounding, and where appropriate, bonding is provided between sections of equipment separated by non-conductive materials.

D.3.1 New LGF Tanks

The new LGF Tanks, six (6) total, are identical 7,300 gallon (operating capacity) vertical tanks supported on concrete piers to allow bottom drainage, and are designed and fabricated in accordance with ASME Boiler and Pressure Vessel Code, Section VIII, Division 1. See Drawing NY-D-M-6002 for configuration and connections.

All tanks are fabricated to allow future installation of external heating jackets to maintain 75 - 80 F (maximum), and are provided with agitator mounting flanges and floor access manholes. Fluid inlet and outlet connections are extended to a level near the bottom of the tank. Additional nozzles for pressure relief, sampling, bottom drain, nitrogen blanketing and fugitive venting are provided.

Two of these tanks are typically used to mix and prepare the various LGF materials for transfer to the kilns. The other four tanks are normally be used for storage of as-received material.

D.3.2 New LGF Tank Agitators

Agitators are of a standard vertical tank flange mounted type with fully enclosed gearing, totally enclosed fan cooled (TEFC) motors and control components complying with requirements for the area classification. Mounting flange and shaft seals are designed to contain LGF vapor.

D.3.3 New LGF Pumps

The new pumps installed at the Unloading Station, new LGF Building and new Feed Pump Room are types well adapted to efficient handling of a wide range of fuel materials. Two (2) pumps are located at the Unloading Station, six (6) in the LGF Building and four (4) in the Feed Pump Room. Two (2) of the LGF Building pumps are designed for fuel transfer to the kilns and arranged such that either pump can maintain fuel delivery in the event of failure or problems with the pump in use.

These pumps have TEFC motors and have other features necessary to comply with area classification requirements.

D.3.4 Existing LGF Tanks and Pumps

Four (4) existing 24,000 gallon tanks and associated pumps continue in service as previously used.

Pumps located in a small building North of Kiln #2 remained in service without modification until their function was replaced by the new above-ground LGF transfer piping and new burner feed pump systems. The deficiency at this booster pump facility related to inadequate secondary containment will be corrected by removal of the pumps and building structure followed by remediation as determined necessary by testing of soils in the area.

D.3.5 Activated Carbon Adsorbers

Fugitive vapor and nitrogen from all LGF Tanks is normally directed to the kilns where hydrocarbon content is burned.

At times when both kilns are shut down, there is still the need to vent fugitives from the storage tank systems. Under these shutdown conditions fugitives are redirected to an activated carbon (or other applicable packing material) adsorption unit located in the Fuel Farm area. The adsorber is sized to satisfy the maximum flow resulting from the simultaneous filling of two (2) of the largest LGF storage tanks.

D.3.6 Ventilation Equipment

The new LGF Building, new LGF Pipe Tunnel, new Solids Processing Building, new Feed Pump Room, and new Solid LGF Feed Room are fully enclosed structures. Ventilation of the LGF Building, LGF Pipe Tunnel and Feed Pump Room, which are open to each other, is achieved by redundant exhaust fans at the kiln end of the pipe tunnel and an additional fan at each of the LGF buildings and rooms to provide required floor level exhaust of VOC. Outside air is drawn into the LGF Building and Feed Pump Room through suitably located louvers, through the buildings, through the tunnel and exhausted above the kiln structures. Exhaust fans are designed to provide ventilation necessary to prevent accumulation of excessive levels of VOC and as required for fire protection purposes.

Ventilation air from the Solids Processing Building will be exhausted by a separate fan through the Fuel Farm adsorber unit when solids reprocessing is to be done in this area.

Ventilation air from the Solid LGF Feed Room will be exhausted by a separate fan into the normal Fugitive Emissions System to the kilns when this processing is started. When both kilns are shut down, manual valves are provided to redirect this flow to the Fuel Farm adsorber unit.

D.4 Piping and Valves

D.4.1 Piping

All piping systems to contain LGF, waste oil and fugitive vapor from the storage tanks were designed, fabricated and installed in accordance with NFPA 30 and ANSI/ASME B31.3, Chemical Plant and Refinery Piping. All other pressure piping was designed, fabricated and installed in accordance with ANSI/ASME B31.1, Power Piping. Vent and pressure relief piping from LGF and waste oil tanks comply with the requirements of NFPA 30 and/or UL 142 and 6 NYCRR Part 614 as applicable.

Additional requirements of the NYS Fire Prevention and Building Code are incorporated. All piping systems within NEC classified areas are grounded and bonded across gasketed joints.

D.4.2 Valves

All valves were selected on the basis of pressure-temperature rating for the pipe line service in which used. LGF valves are typically full-flow ball valves having seat and stem packing material compatible with the chemical properties of LGF.

Where specific types of valves are required by applicable codes and regulations, these requirements were implemented.

D.4.3 Power Actuated and Control Valves

Valves requiring power actuation and control valves with external operators were selected for the required pipe line rating, process function, and have pneumatic actuation. All electrical control or instrumentation devices satisfy the area classification requirements for the installed location.

D.5 Foundations, Containments and Superstructures

All new structures and modifications to existing structures were designed and constructed in accordance with NYS Fire Protection and Building Code requirements and the following as applicable:

- American Concrete Institute (ACI), 318.
- American Institute for Steel Construction (AISC), Manual of Steel Construction, Allowable Stress Design, 9th edition.
- American Society for Testing and Materials (ASTM) standards.
- American Welding Society (AWS), D1.1, Structural Welding Code.
- Metal Building Manufacturers Association standards.
- Steel Joist Institute standards.

Basic design parameters were Seismic Zone 2A, 100 mph wind speed, a snow load of 45 pounds/square foot and a 50" frost depth.

D.5.1 Foundations

Based on existing soil boring information, some foundations were supported by piles to bedrock. Specific pile depth and soil bearing information were developed from new borings taken at locations determined from the new building and structure layout. Pile caps were reinforced concrete and designed in accordance with the structure supported.

D.5.2 Secondary Containment System

Secondary containment required for unloading, storing, pumping and pipe transfer of fuels is of reinforced concrete, with the exception of the LGF Pipe Tunnel for fuel transfer to the kiln Feed Pump Room (see below), the containment areas in the Control Rooms and the Waste Oil Tank. Curb and wall heights allow for sufficient freeboard above the maximum expected spill depth. Containment volume calculations are in the permit application.

All secondary containments were shielded from rainwater entry at or above a slant angle of 45 by a roof with eaves extending beyond the containment working in conjunction with partial metal siding walls where necessary, or were fully enclosed.

Each containment has a lined blind sump at the low point to facilitate pump removal of spills to a suitable container for disposal.

D.5.3 Containment Liner Coatings

Concrete containments are lined with an impervious and chemical resistant coating (Dudick Reinforced Protecto-Line 900), similar to that previously used at this facility and approved by NYSDEC.

Steel containments have a chemical resistant epoxy type coating with compatible primer applied either during fabrication or at the time of construction on site. Coating systems data was presented to NYSDEC for approval.

D.5.4 Fuel Feed Piping Containment

Containment Tunnel:

Fuel transfer and fugitive emission piping secondary containment is provided by a walk-through tunnel 90 inches in inside diameter extending from the new LGF Building enclosure to and across the roof of the kiln building to the Feed Pump Room. The tunnel was constructed of sections of double wall steel pipe. The inner wall is smooth to facilitate

sealing by application of a liner coating, and wash down or other cleaning which may be required in the event of a spill. The outer wall is corrugated for strength. The wall layers were integrally joined during fabrication.

Containment tunnel sections were joined with a sealing type connector band externally applied and further sealed with a chemical resistant caulk on the interior. Expansion provisions were included at intervals as required.

Maintenance and compliance inspection access is provided by normal entry points at the ends of the tunnel and man ways in the roof of the tunnel. The latter is located at intervals as required by the NYS Fire Prevention and Building Code for egress. External platforms and ladders with cages are attached to the tunnel support structure.

Containment Tunnel Support Structure:

The tunnel is continuously supported by a system of steel trusses and bents as shown on attached drawings. Each section of tunnel pipe is attached to the support structure by a minimum of two stainless steel bands. Adequate truck and heavy equipment clearance is provided at all intersecting roads.

Containment Tunnel Internal Features:

A steel grating walkway was constructed at the bottom center of the tunnel pipe allowing a 6'-9" clearance at the center. The walkway was supported on steel structural members within the tunnel. The bottom of the tunnel pipe beneath the walkway provides the drain path for spills and wash down fluids. The overall slope of the tunnel is toward the new LGF Building which serves as the containment volume for the horizontal portion of the tunnel.

Vertical steel channel supports for piping, conduit, lighting and instrumentation were provided on both sides of the tunnel at approximately 10 foot intervals.

Ladders are provided for internal access to overhead man ways.

D.5.5 Burner Feed Pump Room

Three (3) 1,000 gallon Equalization Tanks and three (3) Feed Pumps are included as an integral part of the LGF transfer and feed system. These tanks were installed to provide more uniform fuel feed and to meet the specific pumping requirements of the burners when we start reprocessing solids. The equalization tanks provide a point for mixing LGF feed prior to introduction to the kiln, to ensure that any solids remain suspended during feed. This equipment is housed in a new room located between the kilns and within the Kiln Building in an area previously occupied by pulverized coal fuel equipment which was removed.

A previously existing concrete pit was partially utilized and expanded with a new concrete floor at a higher elevation. The walls to grade provide a containment volume substantially larger than required. Existing concrete surfaces were cleaned by sand blasting and the containment volume lined with Dudick Reinforced Protecto-Line 900.

Because this room is contiguous to the Kiln Building structure, the room above the concrete containment was constructed with 3-hour fire rated walls to comply with NFPA 30. Two means of egress, VOC monitoring, fire protection, equipment grounding, lighting, emergency and exit lighting and ventilation were provided in accordance with NYS Fire Prevention and Building Code. All electrical equipment was selected to comply with the area classification.

D.5.6 Solids Processing Building

A new building was constructed to stage drums of solids generated on site and to house processing equipment required to reintroduce these solids into the LGF materials in LGF Tanks. This building is located adjacent to the existing Unloading Dock and to the LGF Building. The concrete floor and curbs are matched to the elevation of the Unloading Dock to permit a ramp to be constructed from the Unloading Dock for forklift movement of drums into and within the Solids Processing Building. The concrete spill containment of the new building was lined in the same manner as the Unloading Dock.

The building was enclosed by a steel frame and metal siding enclosure with an eave extending over the Unloading Dock roof to exclude rainwater entry to the ramp area.

Two means of egress, VOC monitoring, fire protection, equipment grounding, lighting, emergency and exit lighting and ventilation were provided in accordance with NYS Fire Prevention and Building code. All electrical equipment was selected to comply with the area classification.

D.5.7 Solid LGF Feed Room

A portion of the expanded area between the kilns (previously occupied by coal pulverizing equipment) was separated from the Feed Pump room to provide an area for the Solid LGF Feed equipment. The walls of this room are fire rated and constructed similarly to those of the Feed Pump Room. Two means of egress, VOC monitoring, fire protection, equipment grounding, lighting, emergency and exit lighting and ventilation was provided in accordance with NYS Fire Prevention and Building Code. All electrical equipment was selected to comply with the area classification.

D.5.8 Kiln Control Room Modifications

Kiln Control Room modifications associated with fuel systems improvement consisted of providing physical isolation from the control and operational area and secondary containment of new and/or modified fuel supply piping.

All instrumentation and control readouts, indicators, annunciators and other control components whether existing or new are located within the Control Rooms external to the fuel piping containment.

D.6 Electrical Power System

D.6.1 Area Classifications

All of the below listed areas related to fuel systems will be classified as Class I, Division 2 in accordance with NFPA 70 National Electrical Code (NEC) 500-5(b).

Fuel Farm including new LGF Building, new Solids Reprocessing Building and existing facilities.

LGF Pipe Tunnel.

Feed Pump Room, and Solid LGF Feed Room.

The interior of the Fuel Farm Motor Control Center (MCC) Building will be unclassified on the basis of providing positive pressure forced ventilation. All other plant areas will remain unclassified.

D.6.2 Electric Power and Lighting

Electric power supplied to the existing and new main service disconnects will be 460 volts, 3-phase, 60 Hertz. Lower voltages, where required, will be obtained from properly rated transformers located in the MCC Building or other unclassified area.

Power distribution throughout the fuel systems will be in rigid conduit or other raceway complying with area classification requirements.

Lighting will be provided in all areas for 24 hour operation at illumination levels required to meet OSHA standards (per 29CFR191(c), 25 foot-candles in the absence of daylight). All lighting fixtures will be selected to satisfy the area classification where installed.

Emergency and exit lighting as required by OSHA and NYS Fire Prevention and Building Code will be provided and will be selected to satisfy the area classification.

D.6.3 Grounding and Lightning Protection

All steel building structures, tanks, equipment and electrical enclosures will be grounded in accordance with NFPA 70 (NEC), Article 250.

Fuel systems structures will be provided with full lightning protection in accordance with NFPA 78.

D.7 Controls and Instrumentation

D.7.1 Control System

A control system for fuel unloading, storage, transfer and feed to burners will be provided using a programmable logic controller (PLC) selected to provide I/O capacity and other features for presently planned additions/improvements and potential future additions. All motor control and instrumentation signals for normal start/stop, operation and alarms will be controlled by the PLC. Pumps, agitators, and any other motor driven equipment will have local start/stop stations which can be activated for maintenance purposes.

Necessary equipment emergency stop push-button stations, manual fire alarm stations and any other critical emergency condition circuits will be hard wired in conduit point to point and will not be processed by the PLC.

D.7.2 Tank Level Control

All tanks will have level instrumentation for control of contained fluids. Typically tank level controls will have both high/low and high-high/low-low set points. The high/low set points will normally cause an alarm condition to alert operators of the approach of a limiting condition so that appropriate action can be taken. The more extreme set points of high-high/low-low will establish the limits required to prevent overflow or damage to equipment. These set points will be interlocked with pump and agitator motor controls to shut down the affected equipment.

Level instrumentation on the tanks used as fuel feed sources for the burners will have their level and alarm signals displayed in the kiln Control Rooms for kiln control purposes.

D.7.3 Tank Nitrogen Blanket and Fugitive Emissions Control

All LGF tanks are nitrogen blanketed.

Tanks are outfitted with pressure instrumentation having high and low set points. At the high pressure set point (less than the tank code pressure relief setting) a valve to the vent system leading to the kilns will be opened and remain open until the pressure has fallen to within the normal pressure range at which time the valve will be closed. Vapor and nitrogen in the tank will be forced through the vent system piping by tank pressure. At the low pressure set point (above atmospheric pressure) a valve from the nitrogen supply system will be opened and remain open until the tank pressure has increased to the normal operating range at which time the valve will be closed.

Manual valves will be provided to divert fugitive emission flow to the activated carbon adsorber unit when both kilns are shut down. The automatic control system as described above will remain in operation.

Additionally, nitrogen purging takes place if high oxygen levels are developed in the tanks and vent system. This system is all PLC controlled and was brought on line in August 1995.

D.7.4 Motor Controls

All motors will be controlled by magnetic starters with individual lockout capability at the starter. In addition, emergency stop signals from each power driven item of equipment will trip its motor starter to a condition requiring reset only after appropriate interlocks have been satisfied, i.e., no remote manual or automatic restart will be possible prior to meeting established control logic criteria.

All new equipment starters for the Fuel Farm will be located in a common panel in an enclosed MCC Building as described above. New equipment starters for the Kiln Building will be located in an MCC Panel in that area.

Start/stop controls for power driven equipment will be located on panels in the vicinity of the equipment, but control signals will be processed by the PLC to coordinate valve operation and prevent actual starting of the equipment under improper system conditions.

D.7.5 VOC Monitoring Systems

Continuous Monitors:

VOC monitoring detectors will be located at various points within the new facilities as shown on attached drawings. Equipment will be UL, Factory Mutual or CSA approved or rated. Detector set points will be lower than the lowest explosive limit expected for any LGF material.

Monitoring signals will be processed by the PLC system for alarm and control response purposes.

Leak Detection and Repair Program (LDAR)

In addition to the above continuous monitoring, tanks and equipment will be tested and inspected routinely in accordance with 40 CFR Subpart AA and BB. These sub-parts relate to organic air emissions standards for process vents and equipment leaks. In accordance with this sub-part all regulated units will be marked. With a unique equipment identification number permanently affixed to each unit. A list indicating the location of each unit will be used for comparison with the plot plan. This master list with the location and type of equipment, i.e. pump, valve, flange, etc. will be established and kept. All such equipment will be kept in compliance by using the weekly or monthly leak detection and repair methods outlined in this section.

Closed-Vent Inspection and Monitoring

Each tank is connected to a closed-vent system leading to the kilns. The system includes a non-regenerative carbon (or other applicable packing material) adsorption canister system as a backup to the closed vent

system to the kiln and for the Solids Reprocessing Building ventilation air.

Monitoring of the concentration of organic compounds in the vent of the canister will be conducted on a weekly basis when these canisters are in use. Monitoring will be with an organic vapor analyzer (OVA) or equivalent test unit described below. A canister will be operated with no detectable emissions. No detection is indicated by an instrument reading of less than 500 ppm above background as defined by the regulation. Monitoring will comply with Method 21 in 40 CFR Part 60, App A, as described below.

Replacement of an existing carbon canister with a fresh one will be required when a reading above no detectable emissions is recorded.

Equipment Inspection

All equipment in contact with hazardous organic waste will be inspected for leaks on a daily basis and monitored for leaks on a regular basis in accordance with 40 CFR Part 264/265, Sub-parts AA and BB as described above. Units that will be monitored include all equipment in organic service that are not controlled by a closed-vent system. These units include all pumps in light liquid service, pressure relief devices in gas/vapor service, open-ended valves or lines, valves in gas/vapor service or light liquid or heavy liquid service, or flanges and other connectors, and closed-vent systems as outlined above.

The regulated equipment will be identified and listed on a master inspection sheet and in a plant block piping diagrams. Leak detection monitoring of all regulated equipment will be conducted on a periodic basis (generally quarterly unless a leak is detected. Daily inspection of each device will be conducted. The inspection will be for indications of free liquid or leaks. The following schedule will be used to determine the no leak detection limit for a given type of equipment.

Non-Detect Limit, PPM

Type of Equipment	(55 Federal Register 25454)
All pumps, valves and fittings in organic service	10,000
Pressure relief units	500

If a leak is detected at the non-detection limit, a first attempt at repair will be made. If on retesting, a level above detection limit is obtained, a weather-proof identification tag will be affixed to the leaking component. The tag will be marked with the equipment identification number. The component will be repaired within 15 days or at the next equipment shutdown if required, as defined by the Volatile Organic Air Emission Standards regulation (Subpart AA / BB) for TSDFs.

All records will be maintained per 40CFR264.1035 and 40CRF264.1064. The records will include the discrete identifying number, equipment location, type of equipment, percent-by-weight total organic in the equipment. All records of equipment monitoring, monitoring instrument calibration and repair will be maintained for three years.

VOC Sampling Methods

Volatile Organic Compound (VOC) Fugitive Emissions Sampling:

Sources monitored include closed vent system exhaust, valve stems, packing glands, seals, fittings, open ended valves, and any other potential leak points. Equipment screened includes those which contain or contact hazardous waste. The leak detection and repair program is performed in accordance with 40CFR264.1034, and 40CRF264.1063 (d). The sampling procedure used is as outlined in EPA Reference 40 CFR Part 60, App. A - Method 21. All required quality assurance and O&M procedures are followed.

The general LDAR procedure is as follows.

1. All potential sources of fugitive VOC emissions are screened using a flame ionization hydrocarbon detector, Foxboro Model 108 OVA (Organic Vapor Analyzer), or equivalent unit or a photo-ionization hydrocarbon detector, Hnu Model "Microtip", or equivalent. The Foxboro OVA-108 has a logarithmic readout to 10,000 ppm. The Hnu Microtip operates over a range of 0 -2000 ppm.

2. Prior to testing, the analyzer is calibrated over the entire operating range using appropriate gases and concentrations specified by Method 21 and the instrument manufacturer's operation manual. Calibration results are logged on an Calibration Data Sheet.

3. Leak detection testing is performed by placing the instrument probe as close as possible to the device being monitored. The probe is then slowly moved around the surface of the device. If any upscale reading is observed, the probe is then moved such that the maximum reading can be obtained. The maximum reading for each device is recorded on the LDAR Monitoring Data Sheet.

4. If a reading greater than 10,000 ppm is detected with the OVA-128 or >2,000 ppm with the Hnu Microtip, the device is considered to be leaking. If a device is determined to be leaking above the appropriate threshold, the device is then tagged with a weatherproof, chemical resistant tag. The date, time, device number and instrument reading are written on the label using an indelible marker.

5. A Leak Notification form is then completed and given to the appropriate individual responsible for ensuring corrective action is taken.

6. The leak must be repaired within the time frames stated in 40 CFR Part 60 Sub-parts AA/BB.

The frequency of analysis for VOC fugitive emissions from closed vent systems will be in accordance with 40CFR264.1033 and 40CRF264.1060. Weekly emissions checks of the Carbon Adsorption Systems will be taken until a more practical sampling frequency can be determined based on demonstrated experience. A more realistic frequency will be 20% of the typical elapsed time to exceed a no detectable leak maximum of 500 ppm above background is detected. All other devices will be monitored on a quarterly basis. However, for equipment sampled on a quarterly basis, if a leak is detected, a monthly sampling schedule will be implemented for the next two periods, before going back to a quarterly basis.

D.7.6 Alarms and Trip Conditions

For the automatic organic vapor monitors alarms and equipment trip conditions are annunciated in the Kiln Control Room and at a central location in the Fuel Depot. In addition, audible/visible alarm devices and indicators will be located at points within the systems appropriate to the particular alarm.

D.8 Fire Detection and Suppression

Fire detection and suppression systems complying with the NYS Fire Prevention and Building Code, local Fire Department requirements and applicable NFPA standards will be provided at all appropriate locations. Specific details of systems to be used will be determined during design stages.

As a minimum, appropriate types of hand held extinguishers will be provided throughout the fuel systems facilities and the structures listed below will be equipped with fusible element activated Aqueous Film Forming Foam (AFFF) sprinkler systems:

- LGF Building and truck unloading area.
- Solids Reprocessing Building.

- LGF Pipe Tunnel.
- Solid Feed Room.
- Equilization Building.

D.9 Testing Plans and Procedures

All new construction and modifications to existing structures and new equipment will be tested and inspected in accordance with governing code requirements. Testing and inspections will be required to be satisfactorily completed prior to placing any tanks, equipment or piping in service.

Specific test procedures and standards for acceptable results will be included in specifications for equipment and field construction. Where contractors are required to provide test procedures, these will be reviewed by ENSR for compliance with codes and specifications.

ENSR Consulting and Engineering will provide a written assessment (as required by 40CRF264.192) of storage tanks, tank foundations, tank supports and secondary containment systems reviewed and certified by a qualified engineer registered in the State of New York. Such assessment will be provided before start-up and will verify that the tank storage systems are properly designed and constructed to be of sufficient strength and compatibility with the wastes to be stored and mixed. The structural integrity of tanks fabricated in accordance with the ASME Unfired Pressure Vessel Code will be considered to be validated by the presence of the authorized ASME stamp on the vessel.

Test procedures for UST and other equipment removal are described in Section 2.1, above.

D.10 Materials of Construction

All materials of construction will conform to the standards of ASME, ASTM or other nationally recognized publications. Where required by applicable codes, NYS or federal regulations, mill test reports of material will be obtained. As a minimum, suppliers will be required to certify in writing that structural or pressure containing material complies with specification requirements.

Concrete mix designs will be required to be pretested in accordance with ACI and ASTM standards.

Tank and piping material will be carbon steel with suitable corrosion allowance.

Detailed bills of material will be developed during design stages and required of all equipment manufacturers.

D.11 General Description of LGF System Processes

All LGF process systems are limited to the straightforward functions of transporting fluid and slurry fuel materials to the kilns via piping systems and pumps designed for this type service, and storing LGF in tanks with agitators to maintain suspension of particulate solids and uniform liquid properties. There are no functional processes which alter the as-received material other than the mixing of batches which is both necessary and normal to maintain a steady supply of fuel having properties within regulatory limits to the kilns. Ancillary systems such as Fugitive Emissions Nitrogen, Fuel Oil and various other utilities support the primary LGF systems operation.

Safety and fire protection systems are essentially independent and are provided according to the requirements of applicable regulations, standards and codes.

D.11.1 LGF and Fuel Unloading Systems

Pumps located in the Unloading station take suction from truck tanks via strainers which exclude oversize debris. The Unloading Pumps transfer LGF into the tank systems in two different ways:

(1) Two (2) LGF Pumps deliver to the recirculation pump loop of each of the four (4) existing Tanks 300, 400, 500 and 600. Piping and valving is arranged such that either of these two unloading pumps can deliver to any of the four storage tanks. Provision is made for flushing the unloading piping with Waste Oil when needed.

(2) Each of the two (2) LGF Pumps deliver directly to any of either the three (3) agitated 100 LGF Tanks or the three (3) 200 LGF Tanks. There is a crossover system that allows the either pump to go to the other tank system. Provision is made for flushing this unloading piping with Waste Oil when needed.

Sampling points at each of these tanks and on the recirculation loops of the existing tanks provide for convenient sampling and testing of LGF properties to assure that feed to the burners is maintained within regulated limits.

An unloading pump is also provided for Waste Oil and transfers only to the aboveground Waste Oil Storage Tank.

All unloading pump controls and associated alarms are interlocked with the level sensors of the tank to which material is being transferred. Interlocking is automatically accomplished by PLC programming initiated when the operator selects the particular tank to which a pump will discharge. The PLC actuates valves required to enable the desired transfer, registers position switch condition on the receiving tank and transfer pump to establish a permissive which allows the unloading pump to start, and connects the proper level sensor into the pump motor control. If the high level set point is reached prior to completing the unloading operation, an audible and visual alarm is initiated to alert the

operators to take appropriate action. In the event the maximum level set point is reached, the pump is automatically tripped off accompanied by another alarm. Once tripped off in this manner unloading pump motor starters can only be reset by specific separate PLC control functions. The tank volume available between the high level and maximum level set points is sufficient to allow flushing of the unloading piping with Waste Oil.

Refer to P&ID Drawing NY-E-D-5003 for further details.

D.11.2 LGF Storage, Mixing and Burner Feed Transfer

Each LGF tank has an associated pump. In the case of existing Tanks 300, 400, 500 and 600, the pumps are used for recirculation of the tank as well as for transfer operations. The LGF Tank pumps inside are primarily for transfer operations, but may be used for tank recirculation in the event of agitator failure, thereby assuring that reasonable suspension of solids can be maintained.

Piping and valving systems for the four existing tanks are arranged such that a portion of the recirculation flow may be diverted for transfer to any of the other three existing tanks or to any of the six inside tanks.

Piping and valving systems for the six inside tanks are arranged such that LGF may be transferred from any one tank to any of the five other tanks. Piping systems for the inside tanks are also arranged such that more than one pump can take suction from any particular tank so as to prevent pump breakdown from disrupting normal operations.

Pumps associated with two of the inside tanks have characteristics required to deliver LGF through the feed transfer piping to the Kilns. Piping and valving systems for these tanks and pumps is arranged such that pumps may take a suction from either of two tanks normally used for preparation of LGF.

As with unloading operations, valve lineups and interlocking of tank level sensors with pump controls is accomplished by PLC programming. Automatic valve positioning and permissives from valve position switches related to the source and target tanks enable pump start. This prevents incorrect transfers. High level and overfilling is controlled in the same manner as for unloading pumps. Low and minimum tank level controls function in a similar manner to assure that agitator blades are not uncovered and solids suspension is maintained.

All LGF Tanks are nitrogen blanketed under low pressure. Tank pressure is maintained within a preset range by admission of nitrogen when pressure falls below the range and by exhausting fugitives when the pressure rises above the range. Nitrogen is delivered from the supply at regulated pressure slightly above the normal tank pressure

range. When pressure falls to the low set point, a valve is opened admitting nitrogen until pressure rises to normal at which time the valve is closed. When tank pressure rises to the high set point, as when the tank is being filled, a valve to the Fugitive Emissions Vent line is opened until tank pressure falls to normal at which time the valve is closed. All tanks are connected to a common vent line which delivers fugitive emissions to the kilns in the vicinity of the burners. Tank pressure provides the motive force needed to produce flow of fugitive emissions to the kilns. A manual valve is provided to divert fugitive emissions flow through an activated carbon adsorber when both kilns are shut down.

All LGF Tanks have safety pressure/vacuum relief provided by rupture discs. Discharge is direct to atmosphere, external to the LGF Building in the case of the inside tanks. Safety relief connection sizes, set pressures and vent stack sizing are in accordance with ASME Section VIII rules.

LGF for feed stock to the kiln burners is transferred via redundant piping systems within the LGF Pipe Tunnel which provides secondary containment. Duplication is primarily to permit continued operation in the event one line is disabled by plugging or other problems. Low viscosity LGF transfer piping is arranged in duplicate recirculation loops (returned to the source tank) to provide for the high velocity flow required to maintain particulate solids in suspension. As with high viscosity feed transfer lines, duplication is provided primarily for continued operation in the event one of the loops becomes disabled. All LGF transfer pipe lines are provided with cleanout ports placed at frequent intervals to facilitate cleanout.

Refer to P&ID Drawing NY-E-D-5004 for further details.

D.11.3 LGF Equalization and Feed

Four (4) 1,000 gallon agitated Equalization Tanks in the Feed Pump Room receive LGF from the transfer lines. Four (4) progressing cavity pumps with variable speed drives are located adjacent to the Equalization Tanks with piping and valving arranged to allow two pumps to take suction from either of two tanks and pump to the burner of Kiln #1. The other two tanks and pumps are similarly arranged to feed Kiln #2. The variable speed drives and positive displacement characteristic of these pumps provide the required controlled fuel feed rate. Normally two of the pumps are in use, one feeding each kiln burner. The other two pumps are in ready standby to assure uninterrupted fuel feed in the event of pump breakdown or outage for maintenance. Pump controls and associated alarms, power actuated valve controls and tank level indicators are located in the Kiln Control Rooms.

Equalization Tanks are nitrogen blanketed at low pressure and have fugitive emissions vents. Tank pressure and venting of fugitive emissions is accomplished in the same manner as other LGF Tanks.

Level controls and alarms are also similar except that necessary alarm annunciation is repeated at the LGF Building to assist in operation of the LGF Transfer Pumps.

Equalization Tank level is maintained within a preset adjustable range by on/off cycling of transfer pumps in the LGF Building, or by opening and closing a valve from one of the recirculation loops. This operation is automatic under PLC control and allows considerable flexibility in handling LGF of varying viscosity and particulate solids content while assuring a reliable continuous fuel feed to the kiln burners.

Sampling points are provided on each Equalization Tank for verification of the properties of LGF being fed to the burners.

Refer to P&ID Drawings NY-E-D-5008 and NY-E-D-5013 for further details.

D.11.4 Solid LGF Feed System

Drum (55 gallon) quantities of solid (extrudable) LGF (SLGF) are processed for direct feed to separate kiln burners by direct pumping from the drum. Solid LGF can be fed to each kiln at the rate of 800 pounds per hour. Closed drums of material are introduced onto a powered roller conveyor through a roll-up door at grade level in the rear wall of the SLGF Room. A drum is moved to a turning mechanism where an air-powered cutter is used to remove the top. The drum may then be moved to either of two (2) pump stations, one serving each kiln.

Pumps are of a special type in which a follower plate fitting the inside diameter of the drum is compressed against the drum contents by two rams forcing the material into the suction of an air driven extrusion pump which forces the material at high pressure through a steel tubing line to the kiln burner. After being emptied, drums are capped with a suitable plastic cover and removed through the roll-up door to an empty drum storage area awaiting disposal in an approved facility.

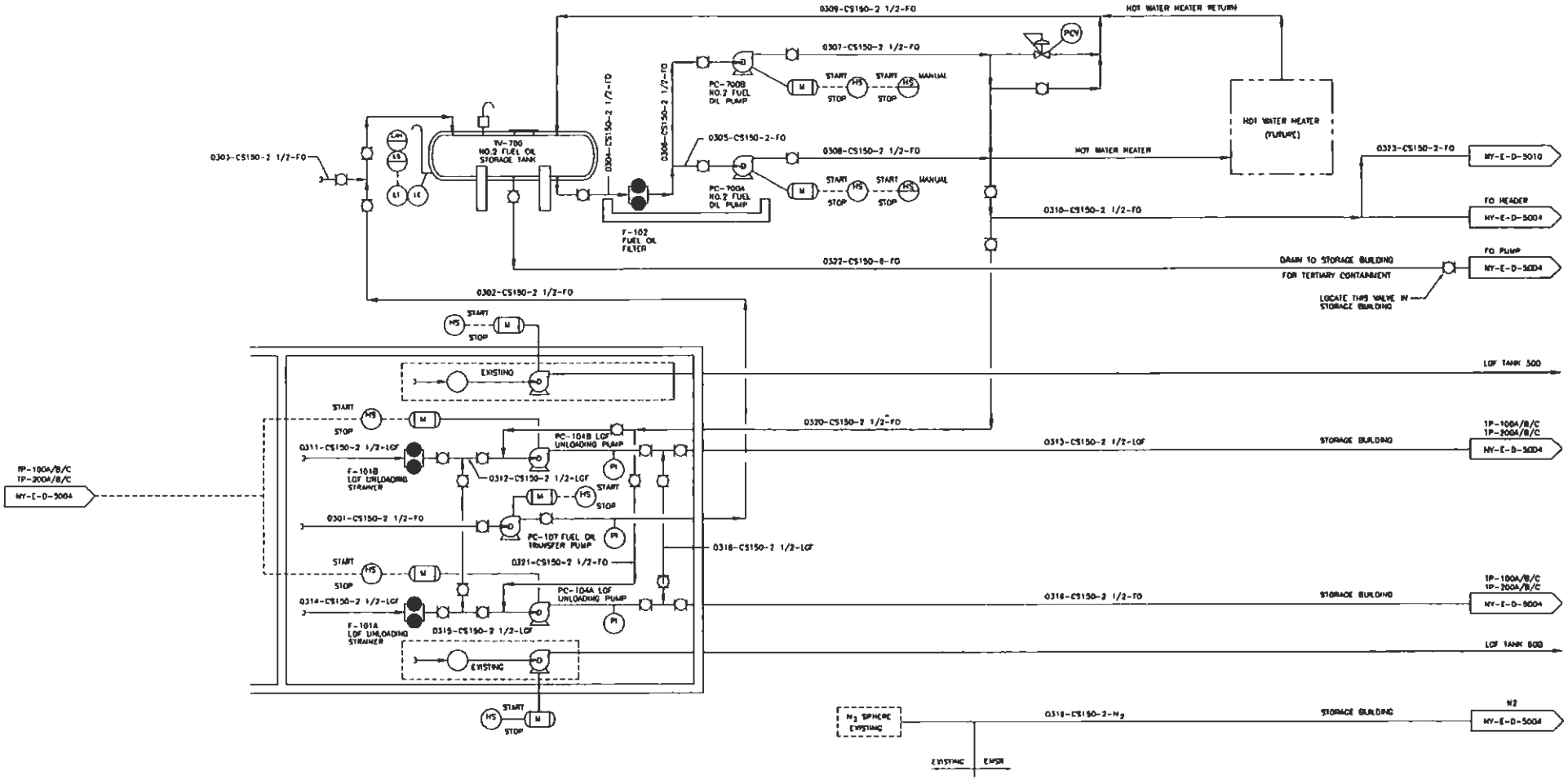
Refer to P&ID Drawing NY-E-D-5011 for further details.

D.11.5 Solids Reprocessing System

Drummed debris and sludges produced on site by clean out of strainers and tanks is reintroduced into the LGF stream by a small system designed to assure that solids are reduced to an acceptable particle size and thoroughly mixed with an appropriate liquid carrier, normally one of the LGF materials on hand.

The system consists of a single drum tipper which is used to empty a drum into the hopper of a shredder. Low solids LGF, or if necessary, No. 2 Fuel Oil, is also introduced both to flush material through the shredder and to provide sufficient fluidity for processing. Material is drawn from the output hopper of the shredder by a macerating pump where solids are further reduced in size and transferred into a dispersion mixer tank. material in the dispersion mixer is essentially identical to other LGF materials and is pumped into one of the LGF Tanks for later delivery to the kiln burners. Provision is made for recycling material through the dispersion mixer tank, if necessary, prior to transfer to an LGF Tank. Empty drums are capped with a suitable lid and returned to an empty drum storage area for reuse or disposal in an approved facility.

Refer to P&ID Drawing NY-E-D-5010 for further details.



ITEM NUMBER	TV-700	F-101 A/B	F-102	PC-104 A/B	PC-700 A/B
ITEM	TANK FO	STRAINER	FILTER	PUMP	PUMP
CAPACITY	25,000 GAL	——	——	——	——
FLOW GPM	——	150 GPM	50 GPM	80 GPM	50 GPM
SIZE	11'8 X 38'	——	——	——	——
MAT'L CONST	CS	CS	CS	CS	CS
TYPE	DOUBLE WALL	DUPLEX 1/8	DUPLEX 10m	CENTRIFUGAL	CENTRIFUGAL
HP	——	——	——	20	——

CLIENT APPROVAL: DATE:

0	RELEASE FOR NYSDEC SUBMITTAL	M.L.			1/15/92

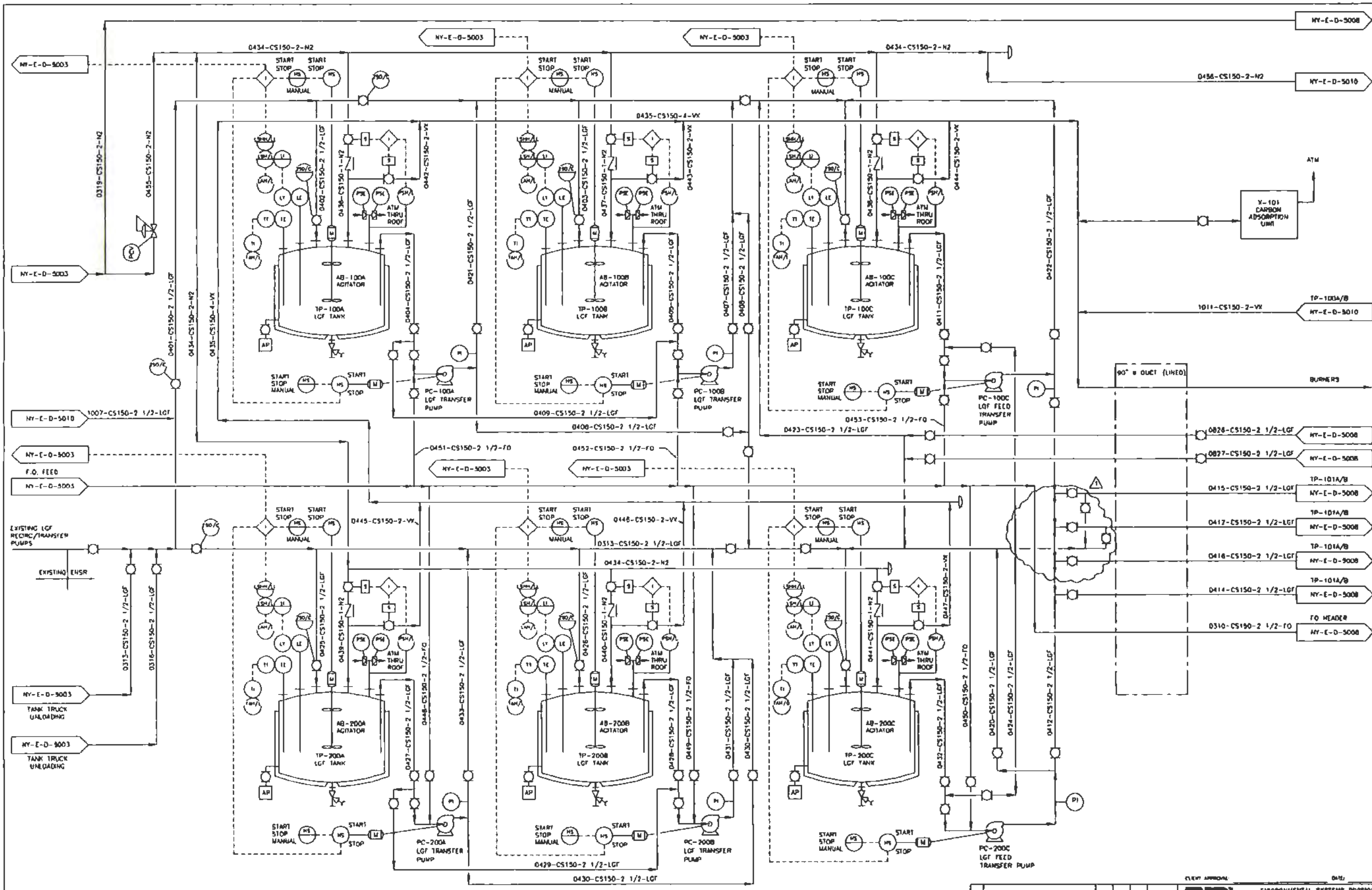
ENSR Consulting and Engineering

ENVIRONMENTAL SYSTEMS DIVISION

HOOKLITE CORPORATION Cohoes, N.Y.
PLANT PERMIT SUPPLEMENTATION
PIPING AND INSTRUMENTATION DIAGRAM
UNLOADING AND F.O. STORAGE

DRAWN BY: M. LYNCH	1/1/92	SCALE: 1 = 1	PROJECT NO: 0511-003
APPROVED BY: J. ELLYSON		FILE NAME: 007-LYNCH-1/20/92	FILE NO: NY5003PID

NY-E-D-5003 | 0



ITEM NUMBER	TP-100 A/B/C	TP-200 A/B/C	AB-100 A/B/C	AB-200 A/B/C	PC-100 A/B/C	PC-200 A/B/C	X-101
ITEM	TANK	TANK	MIXER	MIXER	PUMP	PUMP	CARBON ADSORPTION
CAPACITY	7800	7800	—	—	—	—	—
FLOW GPM	—	—	—	—	150	150	—
SIZE	11x11 T/T	11x11 T/T	—	—	—	—	—
MAT'L CONST.	CS	CS	CS	CS	CS	CS	CS
TYPE	VERT	VERT	TURBINE	TURBINE	CENTRIFUGAL	CENTRIFUGAL	—
HP	—	—	10	10	20	20	—

CLIENT APPROVAL: DATE:

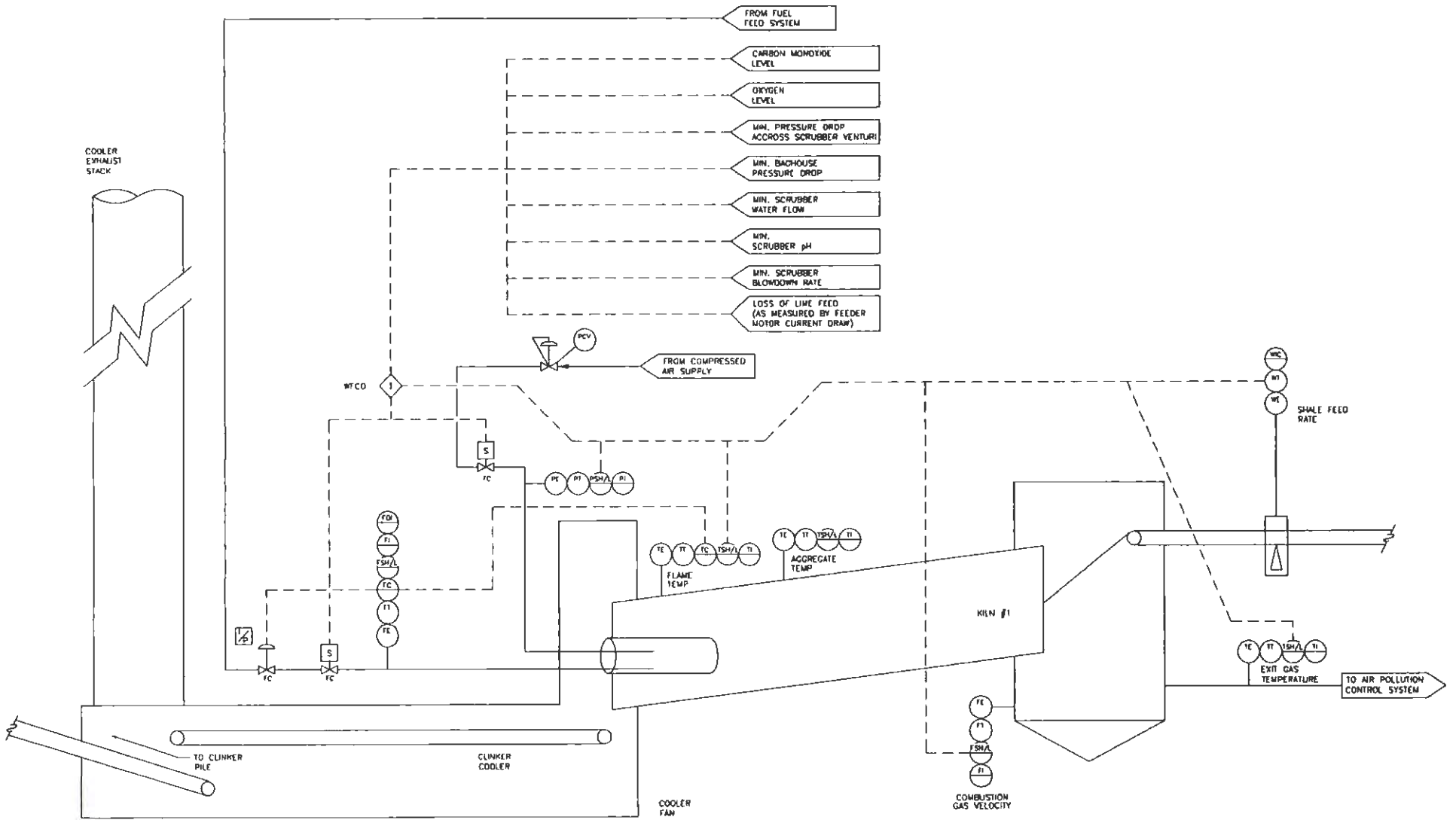
1	ADD BYPASS LINES	S.L.	J.E.		11/3/93
0	RELEASE FOR NYSDEC SUBMITTAL	M.L.			1/15/93

ENSR
ENVIRONMENTAL SYSTEMS DIVISION

NORLITE CORPORATION Cohoes, N.Y.
PLANT PERMIT IMPLEMENTATION
PIPING AND INSTRUMENTATION DIAGRAM
LGF STORAGE AND FEED TRANSFER

M. LYNCH 1/8/93 1 = 1 9511-003
J. ELLYSON 005-BATTAL00-11/3/93 NY5004R1

NY-E-D-5004 1



LEGEND:

- PRESSURE REDUCING REGULATOR
- SOLENOID OPERATED ON/OFF VALVE
- DIAPHRAM CONTROL VALVE
- HAND OPERATED VALVE
- SIGNAL CONVERTER CURRENT TO PRESSURE
- FAIL CLOSED VALVE FC
- FC FLOW CONTROLLER
- FE FLOW ELEMENT
- FQI FLOW TOTALIZER WITH INDICATOR
- FSH/L FLOW SWITCHES HIGH AND LOW
- FT FLOW TRANSMITTER
- PE PRESSURE ELEMENT
- PI PRESSURE INDICATOR
- PSH/L PRESSURE SWITCHES HIGH AND LOW
- PT PRESSURE TRANSMITTER
- TC TEMP. CONTROLLER
- TE TEMP. ELEMENT
- TI TEMP. INDICATOR
- TSH/L TEMP. SWITCHES HIGH AND LOW
- TT TEMP. TRANSMITTER
- WE WEIGHT ELEMENT
- WIC WEIGHT INDICATING CONTROLLER
- WT WEIGHT TRANSMITTER
- ZSO/C POSITION SWITCHES OPEN & CLOSED

CLIENT APPROVAL: _____ DATE: _____

REV	DESCRIPTION	DRN	DES	CHK	DATE
B	ADDED LOSS OF LIME FEED WFCO	SB			9/20/93
A	ISSUED FOR COMMENTS	JEG			12/11/91

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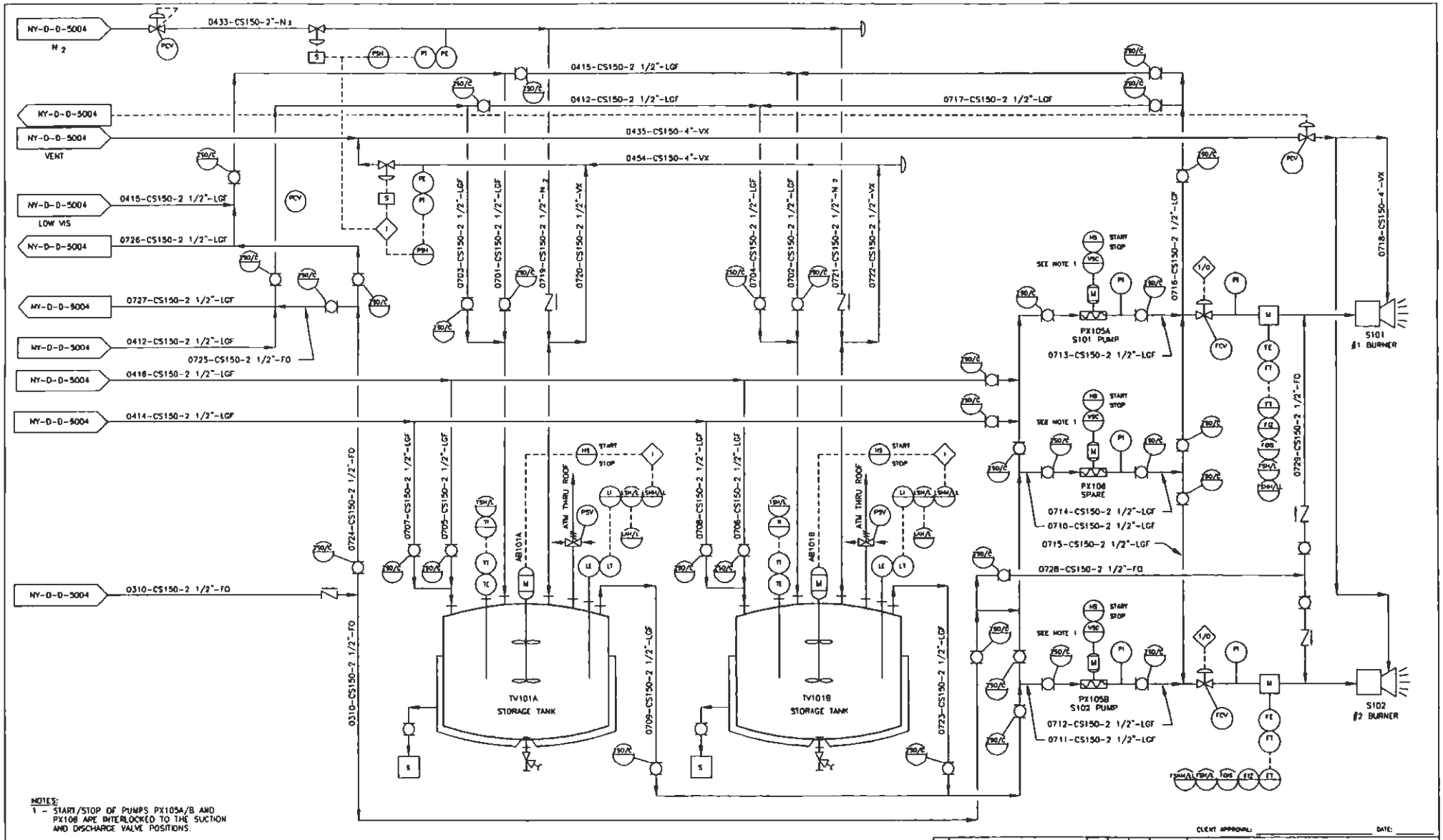
1220 Macarthur Blvd. Mahwah, N.J. 07430
Telephone (201) 818-0900 Fax (201) 818-0030

NORLITE CORPORATION Cohoes, N.Y.
PLANT PERMIT IMPLEMENTATION
KILN #1 – PIPING & INSTRUMENTATION DIAGRAM
WASTE FEED CUT OFFS

DRAWN BY: GREGORY	DATE: 12/11/91	PLOT SCALE: 1 = 1	PROJECT NO.: 5511-003
ENGINEER: HARVEY	CHECKED: DOBBES	PLOT DATE: 005-BATTALINI-9/20/93	FILE NAME: NY5006RB
APPROVED:	DATE:	DWG NO.: NY-D-D-5006	REV: B



NOTES:
1 - START/STOP OF PUMPS PX105A/B AND PX106 ARE INTERLOCKED TO THE SUCTION AND DISCHARGE VALVE POSITIONS.

ITEM NO.	T101A/B	AB101A/B	PX105A/B	PX106	S101	S102
ITEM	TANK	AGITATOR	PUMP	PUMP	BURNER	BURNER
CAPACITY	1000 GAL	-	-	-	-	-
FLOW GPM	-	-	20	20	10	10
SIZE	54 X 7	-	2 1/2X2 1/2	2 1/2X2 1/2	-	-
MAT'L CONST	CS	CS	CS	CS	-	-
TYPE	CODE	TURBINE	PROG CAV	PROG CAV	-	-
HP	-	10	10	10	-	-

CLIENT APPROVAL: _____ DATE: _____

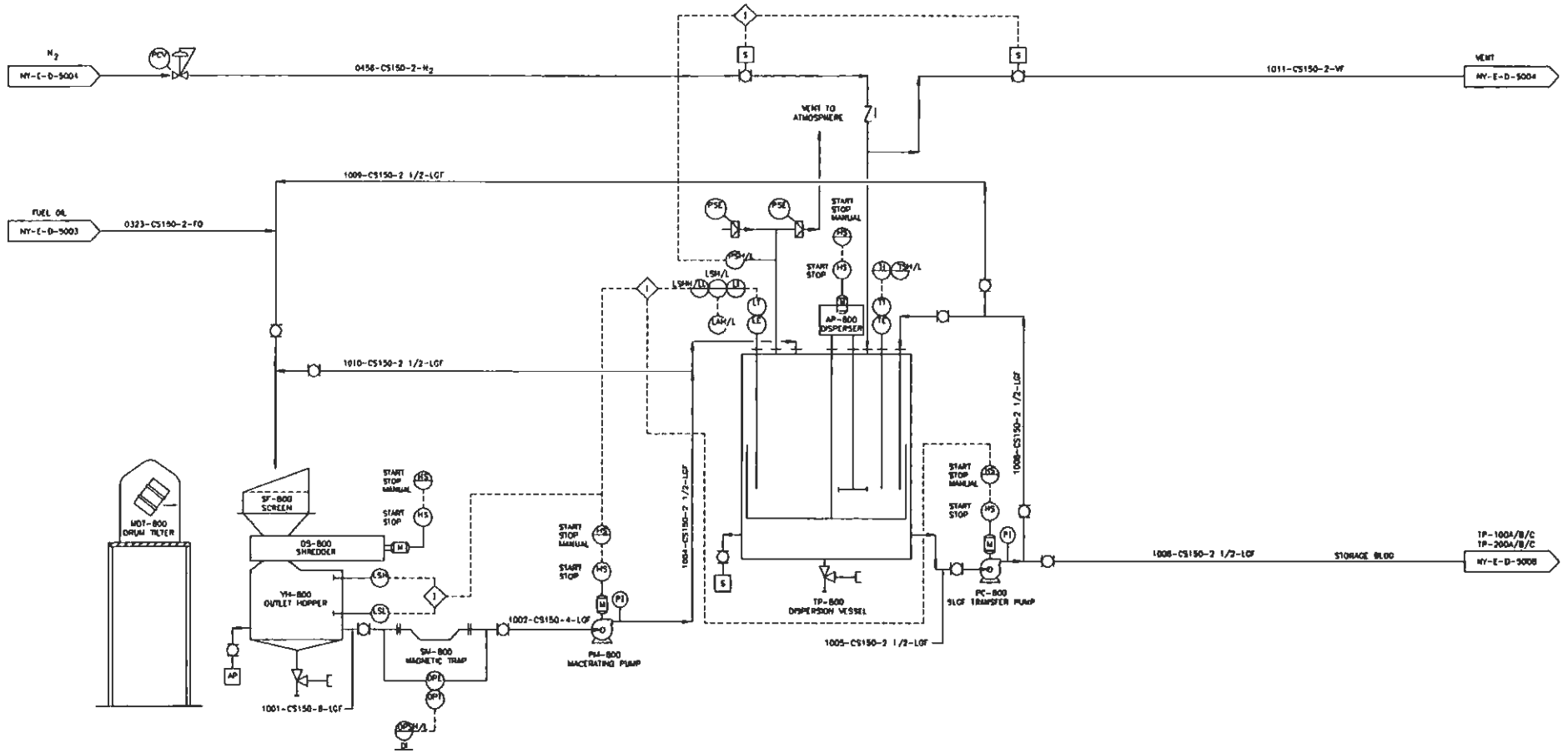
ENSR Consulting and Engineering
ENVIRONMENTAL SYSTEMS DIVISION
1220 Washington Street, Hoboken, N.J. 07030
Telephone (201) 918-0800 Fax (201) 918-0838

NORLITE CORPORATION COHOES, N.Y.
FACILITY UPGRADE
PIPING AND INSTRUMENTATION DIAGRAM
BURNER AREA

NO.	DESCRIPTION	BY	CHK	APP	DATE
A	ISSUED FOR COMMENTS	ML			12/19/91

DRAWN BY: M. LYNCH — DATE: 12/19/91 — SCALE: 1 = 1 (FULL) — PROJECT NO: 9511-003
CHECKED: ELLYSON — DATE: — FILE DATA: 003-LYNCH-12/20/91 — TAG DWG: NY500BRA
APPROVED: — DATE: — DWG NO: NY-D-D-5008 — REV: A

This drawing is property of ENSR Corp., including all patented and applicable features, and / or confidential information and was loaned to user/client upon the user's agreement not to reproduce this drawing in whole or part, nor the material displayed herein, nor to use it for the building for any purpose other than specifically permitted in writing by ENSR Corporation.



TAG NUMBER	X-300	SF-300	CS-300	YH-300	TM-300	PM-301	PC-303	AP-301	TY-301
ITEM	DRUM TILTER	SCREEN	SHREDDER	OUTLET HOPPER	MAGNETIC TRAP	PUMP	PUMP	AGITATOR	TANK
CAPACITY	1 DRUM	–	–	100 GAL	–	–	–	–	300 GAL
FLOW GPM	–	–	100 GPM	–	100 GPM	50 GPM	50 GPM	–	–
SIZE	–	4" x 4"	3" x 13"		8"	10 x 8 x 4	4 x 2	–	
MAT'L CONST	CS	CS	CS	CS	CS	CS	CS	CS	CS
TYPE	MANUAL	–	BLADE	–	MAGNETIC	MACERATING	CENT.	DISPERSER	PRESSURE
HP	2	–	50	–	–	20	10	20	–

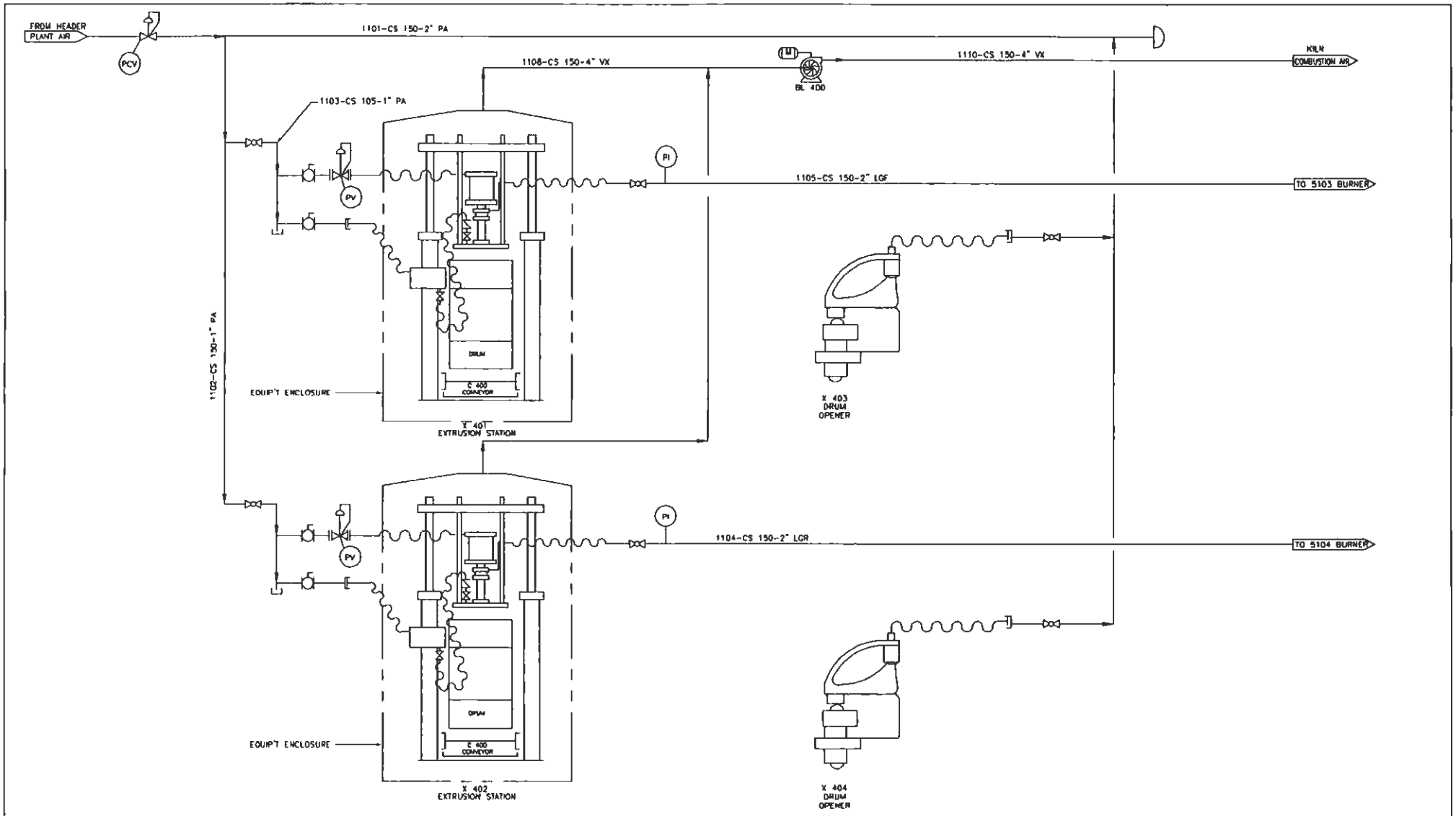
CLIENT APPROVAL: DATE:

ENSR — ENVIRONMENTAL SYSTEMS DIVISION

NORLITE CORPORATION Cohoes, N.Y
PLANT PERMIT IMPLEMENTATION
PROCESS AND INSTRUMENTATION DIAGRAM
SOLIDS REPROCESSING

NO.	REVISION	BY	CHK	APP	DATE
0	RELEASED FOR HYDROC SUBMITTAL	RJS			1/15/92

DRAWN BY: RE — DATE: 1-16-92 — FILE NAME: 5011-003
CHECKED BY: J. SULLIVAN — DATE: — FILE NAME: 003-LYNCH-1/20/92 — PROJECT NO.: NY501096
APPROVED: — DATE: — DWG. NO.: NY-D-D-5010 — REV. NO.: 0



ITEM NO.	X401 / X402	C 400 / C 401	X 403 / X 404	S 103 / S 104	BL 400	
ITEM	EXTRUSION STA.	CONVEYOR	DRUM OPENER	BURNER	BLOWER	
CAPACITY						
FLOW GPM						
SIZE						
MATL CONST.	CS	CS	CS	CS	CS	
TYPE						
HP						

CLIENT APPROVAL: DATE:

A	ISSUE FOR COMMENTS	JO	JE		1/14/92

ENSR (2000 Consulting and Engineering)
ENVIRONMENTAL SYSTEMS DIVISION
1300 Washington Blvd. Hoboken, N.J. 07030
Telephone (201) 610-0880 Fax (201) 610-0330

MOBILITE CORPORATION Cohoes, N.Y.
PROCESS AND INSTRUMENTATION DIAGRAM
EXTRUSION FEED STATIONS

DRAWN BY: JO	DATE: 1/14/92	SCALE: -------	PROJECT NO.: 9511-003
CHECKED: ELLYSON	APPROVED:	FILE NAME: 001-OLMER-1/14/92	DRG. NUMBER: MC5011BA
APPROVED:	DATE:	SIZE: D	NY-D-D-5011 REV: A

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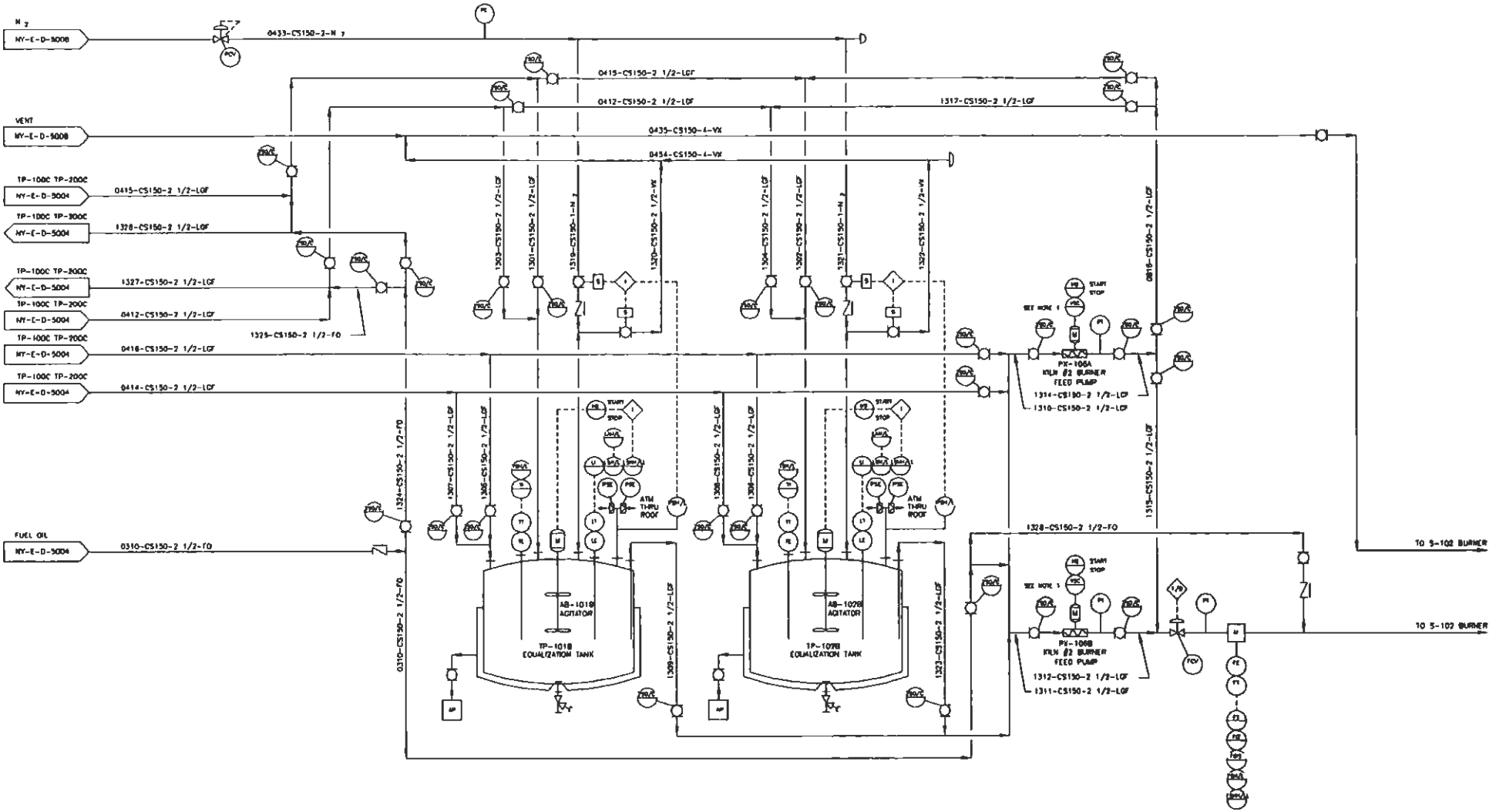


NOTE:
1 - START / STOP OF PUMPS PX-105A/B ARE INTERLOCKED TO THE SUCTION AND DISCHARGE VALVE POSITIONS.

ITEM NO.	TP-101B	AB-101B	PX-105A/B	TP-102B	AB-102B
ITEM	TANK	AGITATOR	PUMP	TANK	AGITATOR
CAPACITY	1000 GAL			1000 GAL	
FLOW GPM			20		
SIZE	56 X 7		2 1/2x2 1/2	56 X 7	
MATL CONST	CS	CS	CS	CS	CS
TYPE	CODE	TURBINE	PROC CAV	CODE	TURBINE
HP		10	10		10

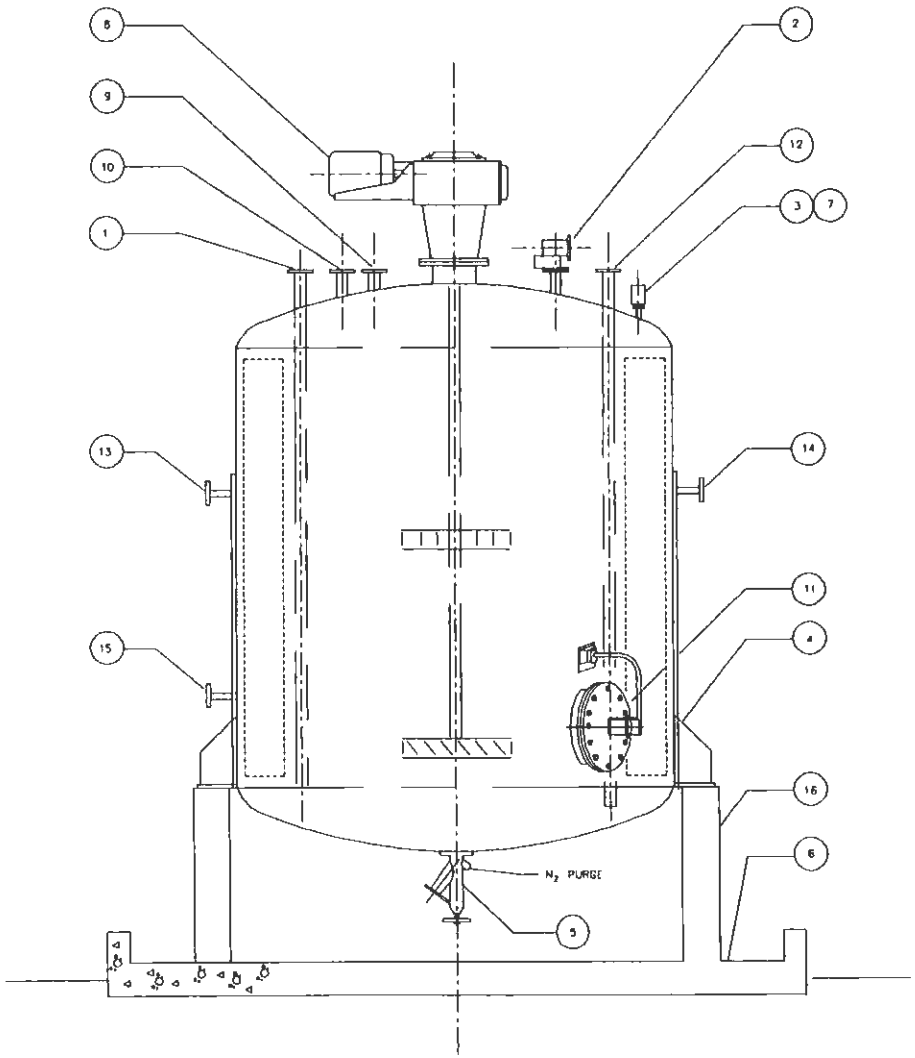
CLIENT APPROVAL: DATE:

0	RELEASE FOR HYDROC SUBMITTAL	M.L.			1/18/92

ENVIRONMENTAL SYSTEMS DIVISION
1200 Wehrle Drive, Williamsville, N.Y. 14221
Telephone (716) 626-8000 Fax (716) 626-8000

NORLITE CORPORATION Cohoes N.Y.
PLANT PERMIT IMPLEMENTATION
PIPING AND INSTRUMENTATION DIAGRAM
LCF EQUALIZATION AND FEED - KILN #2

DRAWN BY	DATE	SCALE	PROJECT NO.
M. LYNCH	12/19/91	1 = 1	9311-003
DESIGNED BY	CHECKED	FILE NAME	FILE NO.
A. DUTTON		002-LYNCH-1/22/92	NY9311.DWG
APPROVED	DATE	DRAWING NO.	REV.
		NY-E-D-5013	0



LEGEND	
ITEM	DESCRIPTION
1	FILL LINE
2	PRESSURE RELIEF
3	HIGH LEVEL SWITCH
4	TANK BRACKETS (4 REQ'D)
5	DRAIN VALVE
6	SEALED CONCRETE PAD
7	LOW LEVEL SWITCH
8	MIXER
9	NITROGEN (BLANKET)
10	FUGITIVES OUTLET
11	MANHOLE W/DAVIT
12	SUCTION LINE
13	HOT WATER FEED (HOLDING TANK ONLY)
14	HOT WATER RETURN (HOLDING TANK ONLY)
15	SAMPLE CONNECTION
16	CONCRETE PEDESTAL (4 REQ'D)

HOLDING TANK DESIGN DATA			
DESIGN PRESSURE	20 PSIG	CODE CERTIF REQ'D	YES
VACUUM DESIGN	- - -	STATE REQ'MTS	- - -
TEST PRESSURE	30 PSIG	WELD EFF SHELL	- - -
DESIGN TEMPERATURE	100 °F	WELD EFF HEADS	- - -
SHELL THICKNESS	- - -	STRESS RELIEVED	- - -
SHELL MATERIAL	SA516 OR EQUAL	RADIOGRAPHED	SPOT
HEAD THICKNESS	- - -	CORROSION ALLOW	.0625 INCH
HEAD MATERIAL	SA516 OR EQUAL	SHIPPING WEIGHT	- - -
TYPE HEADS	FLANGED & DISHED	OPERATING WEIGHT	- - -
NOZZLE NECK MAT'L	- - -	FLOODED WEIGHT	- - -
FLG & FTG MAT'L	- - -	NET OPERATING CAP.	7,300 GALS.
A.S.M.E. CODE	SECT. VIII, DIV. 1	FLUID	LGF
		SPECIFIC GRAVITY	0.7 - 1.3

COMMON TO BOTH TANKS

INTERNAL PROTECTION: NONE
EXTERNAL PAINT: ZINC RICH PRIMER W/ EPOXY FINISH COAT (5 MILS)

NOTE: FOR CONTAINMENT DIMENSIONS & VOLUME SEE DWG. NY-D-C-3014
TYPICAL STORAGE TANK 6 REQUIRED

EQUALIZATION TANK DESIGN DATA			
DESIGN PRESSURE	20 PSIG	CODE CERTIF' REQ'D.	YES
VACUUM DESIGN	------	STATE REQ'MNTS	------
TEST PRESSURE	30 PSIG	WELD EFF SHELL	------
DESIGN TEMPERATURE	100'F	WELD EFF SHELL	------
SHELL THICKNESS		STRESS RELIEVED	------
SHELL MATERIAL	SA 516 OR EQUAL	RADIOGRAPHED	SPOT
HEAD MATERIAL	SA 516 OR EQUAL	SHIPPING WEIGHT	------
HEAD THICKNESS	------	CORROSION ALLOW	.0625
TYPE HEADS	FLANGED & DISHED	OPERATING WEIGHT	------
NOZZLE NECK MAT'L	------	FLOODED WEIGHT	
FLG & FITTING MAT'L	------	NET OPERATING CAP	1000 GALS.
ASME CODE	SECT XXIII DIV.1	FLUID	LGF
		SPECIFIC GRAVITY	0.7-1.3

CLIENT APPROVAL: _____ DATE: _____

B	GENERAL REVISIONS	RJS		12-17-91
A	ISSUED FOR PERMIT	RPF		11/29/91
NO.	DESCRIPTION	DRN	CHK	DATE

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NORLITE CORPORATION Cohoes, N.Y.
FACILITY UPGRADE
LAYOUT
LGF STORAGE TANK

DRAWN BY: RPF	DATE: 11/12/91	SCALE: 3/8"=1'-0"	PROJECT NO.: 9511-003
DESIGNED BY: J. ELLYSON	CHECKED:	FILE NO.: DGS-OLVER-12/20/91	FILE NAME: NY6002RB
APPROVED:	DATE:	DWG. NO.: NY-D-M-6002	REV. NO.: 0

APPENDIX E

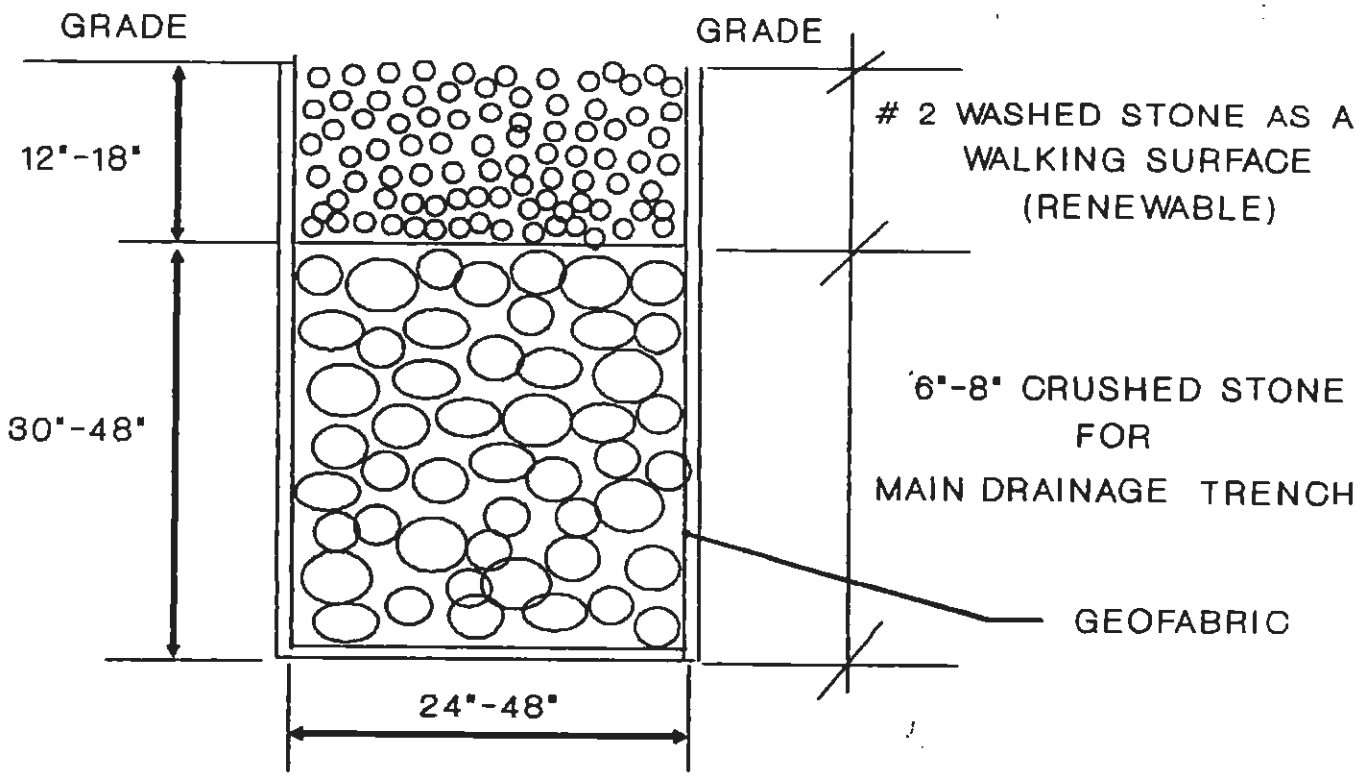
STORMWATER CONTROL DETAILS

NORLITE SITE IMPROVEMENT - SURFACE RUNOFF CONTROL

BY: AARON WESTFALL (7/7/95)

DRAINAGE AREA N0.2 SEDIMENT TRAP TRENCH SYSTEM ALONG EAST SIDE OF SITE (SEE SITE PLAN)

LENGTH OF TRENCH FROM SALT KILL TO FAR SIDE OF MAINTENANCE GARAGE = 300 + FEET



TRENCH SECTION

FIGURE: E-1 BMP PLAN APPENDIX E

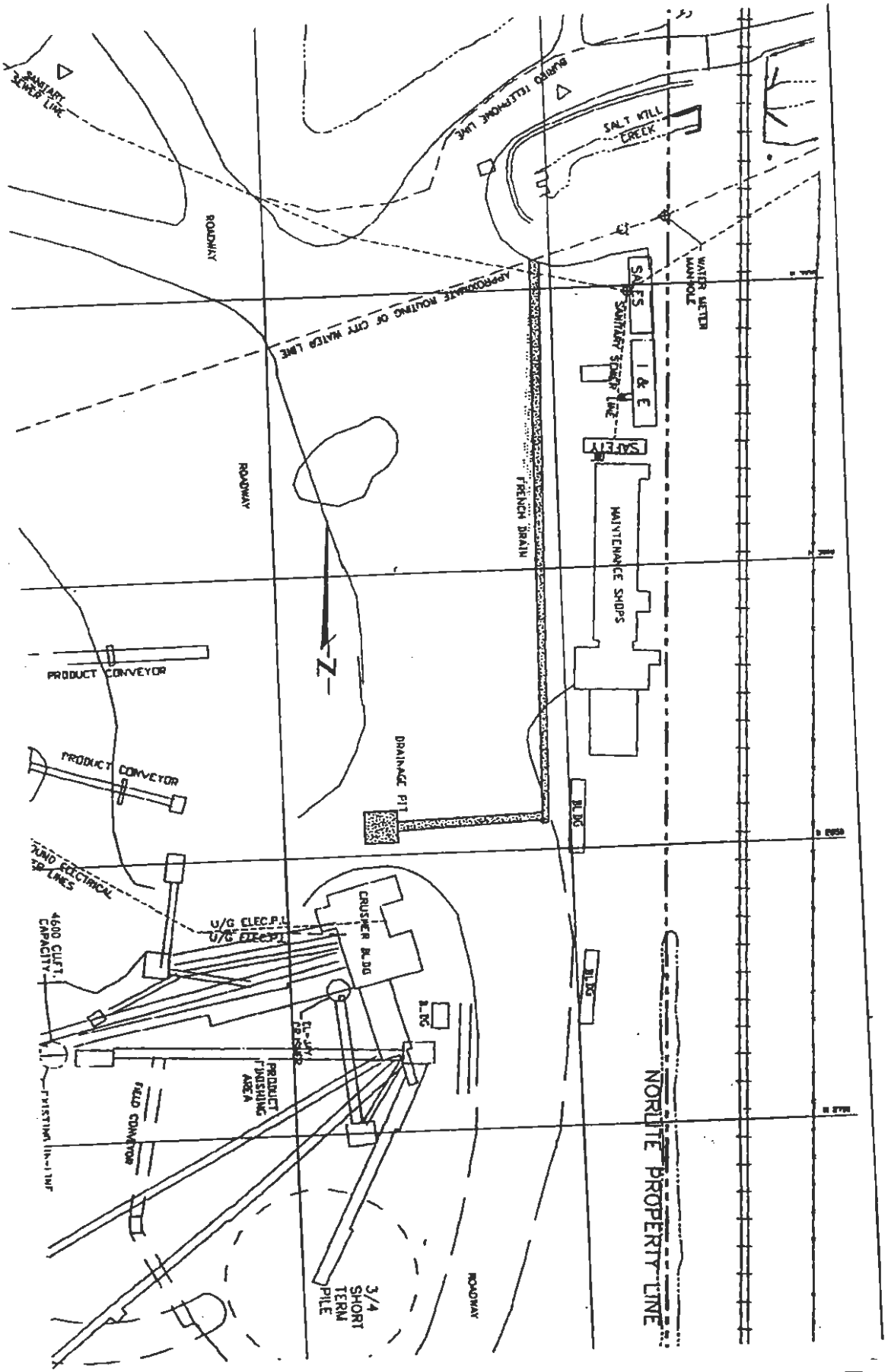


FIGURE: E-2 BMP PLAN APPENDIX E

NORLITE SITE PLAN DRAINAGE TRENCH LOCATION

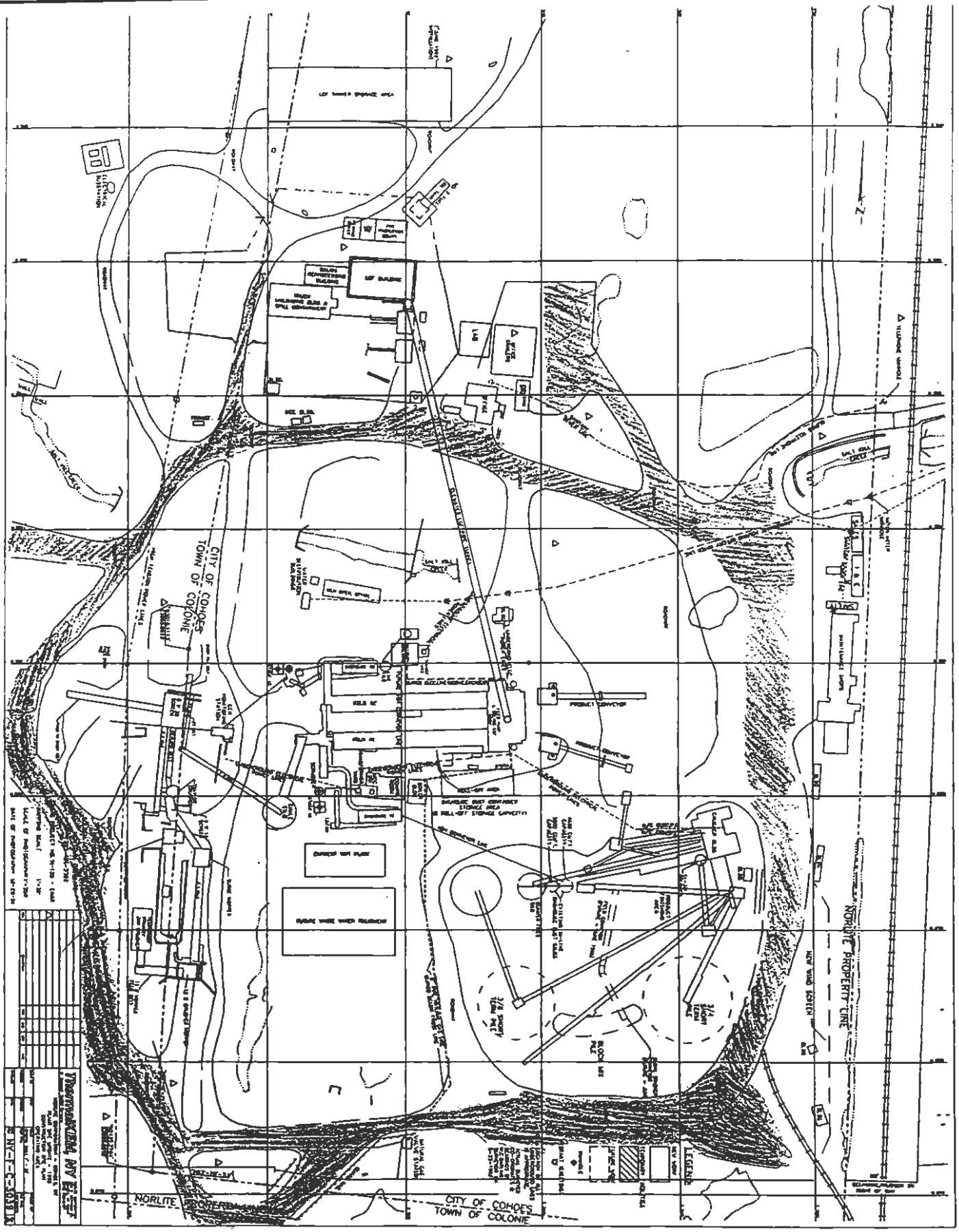


FIGURE: E-3 BMP PLAN APPENDIX E

NORLITE SITE IMPROVEMENT
OPERATING PROCESS AREA

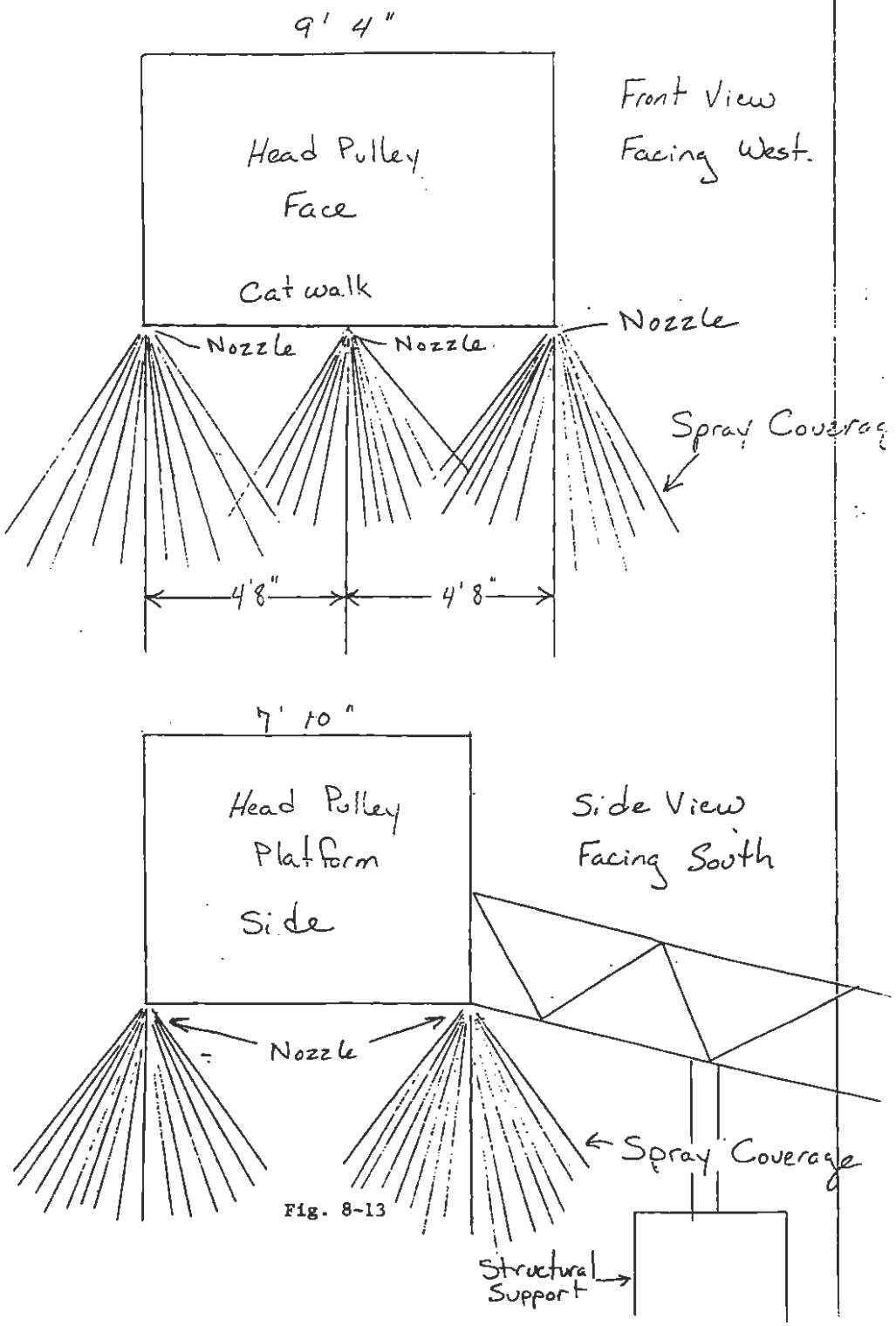


Fig. 8-13

FIGURE: E-4 BMP PLAN APPENDIX E

NORLITE SITE IMPROVEMENT

MODIFIED WET DUST SUPPRESSION SYSTEM SPRAY PATTERN

Norlite Part Specification Sheet

N	100009-Size

Name:	Nozzle, Hollow Cone

		DATE
Written By	A. Popp	4/24/95
Revised By		

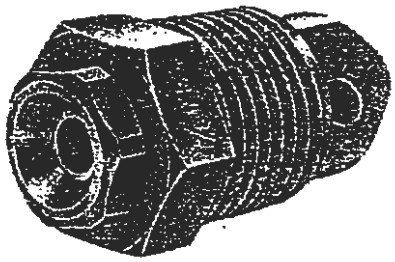
Body Material: Fiberglass Reinforced Nylon

Cap Material: Brass

Pipe Size: 3/8" Male NPT

Maximum Operating Pressure: 500 psi

Vendor: Spraying Systems or equivalent



Size	Orifice Diameter	GPM @ 100 psi	Spray Angle @ 100 psi	Spraying Systems Part Number
1	3/64"	0.25	52	3/8 BDM-2-0.5
2	1/16"	0.36	65	3/8 BDM-2-1
3	5/64"	0.63	69	3/8 BDM-2
4	5/64"	0.69	68	3/8 BDM-3-2
5	3/32"	0.94	75	3/8 BDM-3
6	1/8"	1.6	78	3/8 BDM-5
7	5/64"	1.1	46	3/8 BDM-10-2
8	11/64"	4.3	60	3/8 BDM-20-10

FIGURE: E-5 BMP PLAN APPENDIX E

NORLITE SITE IMPROVEMENT

MODIFIED WET DUST SUPPRESSION SYSTEM SPRAY NOZZLE

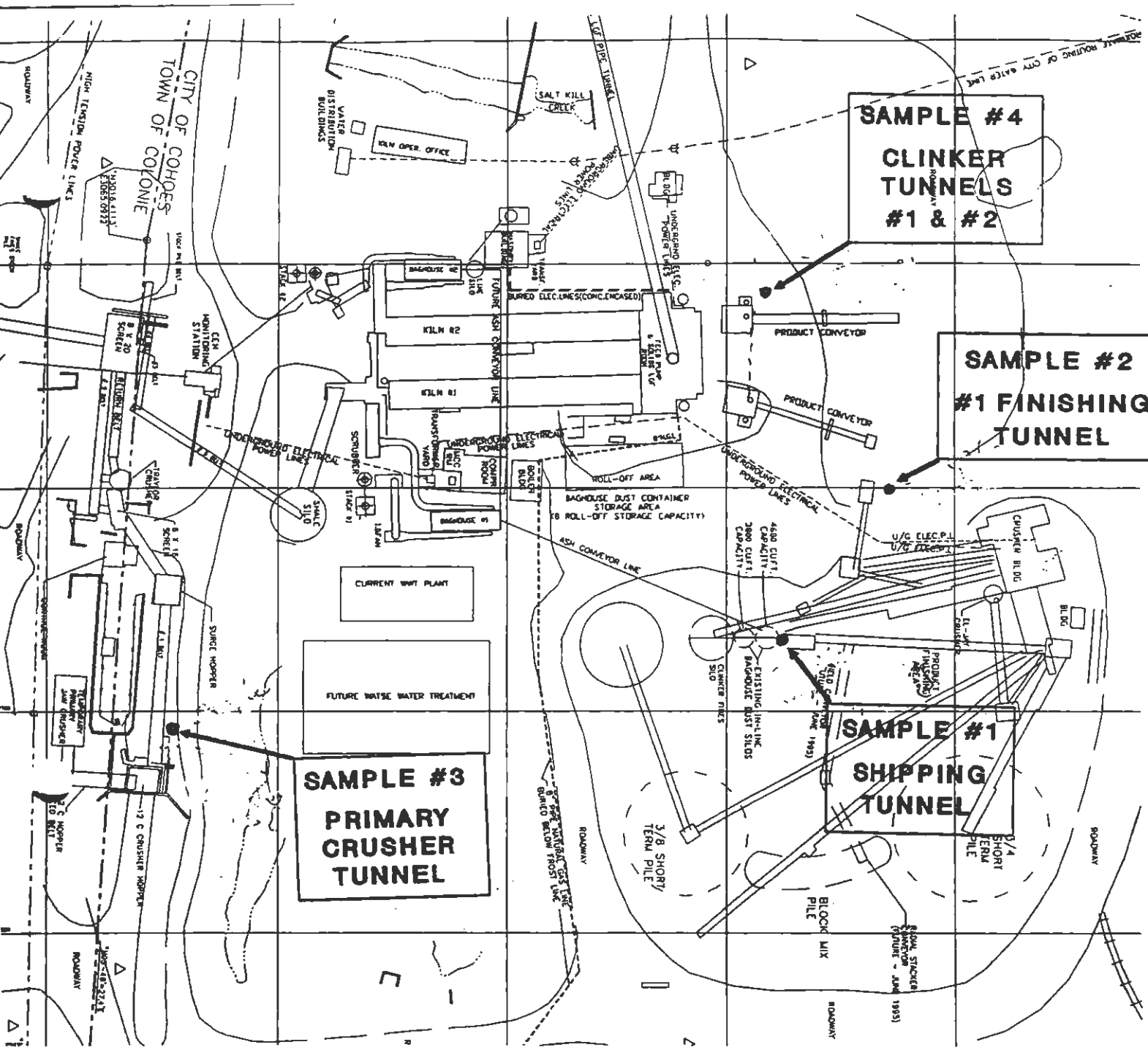


FIGURE: E-6 NORLITE BMP PLAN APPENDIX E

FACILITY CONVEYOR SYSTEM TUNNEL WATER SAMPLING LOCATIONS

APPENDIX F

Air Pollution Control System Maintenance Manual

Purpose of Air Pollution Control System Maintenance Manual

The goal of the Air Pollution Control System (APCS) Maintenance Manual is to provide minimum operation and maintenance standards and requirements to keep the APCS operating in an environmentally compliant manner. By following these guidelines the operation of the APCS will clean emissions from the kiln to within the requirements and regulatory limits set forth in the Air Pollution Control Permit. This manual presents an overview of the APCS at Norlite and a review of process monitors.

Air Pollution Control System Overview

Both kilns have identical emission control systems that include both wet and dry emission control devices for the collection and removal of particulate matter, hydrogen chloride (HCl), and other gaseous species. The principal collection mechanisms affected are sedimentation, condensation, impaction, filtration and interception for particulate and absorption of HCl and other gaseous species.

The APCS consists of six key components: a Multi-clone, a heat exchanger, a baghouse, an induced draft fan, a scrubber and a demister.

After leaving the kiln, emissions first pass through a mechanical collector (knockout box) and a Barron multiple cyclone unit (multiclone) to remove coarse particulate. This process utilizes relatively small diameter cyclones operating in parallel with a common inlet and outlet. The multiclone captures course dust and is rated for 2-3 in. w.c. pressure drop. Dust and clinker fines collected in the multiclone accumulates in a hopper. A blower and rotary airlock aid in pneumatically conveying the collected material to the baghouse dust storage silos to be recycled as a useful product. The gases then pass to an air-to-air, shell and tube heat exchanger which is rated at 65,000 ACFM. This unit uses forced draft ambient air as the cooling medium. Gases enter the heat exchanger at approximately 900^0F and exit at approximately 450^0 F with a 2-3 inch w.c. pressure drop across the unit.

Following the heat exchanger is a Aeropulse, Inc. Power Pulse Collector (fabric filter) with three modules. Each unit is rated for 53,000 ACFM at 450^0F. Kiln 1 has 1200 filter bags that are 12 feet in length and 4 5/8 inches in diameter. Kiln 2 has 810 filter bags that are 17 feet, 3 inches in length and 4 5/8 inches in diameter. Kiln 1 has an air to cloth ratio of 3.02:1 with all three modules on line and 4.53:1 with one module down for maintenance. Kiln 2 has an air to cloth ratio of 3.11:1 with all three modules on line and 4.67:1 with one module down for maintenance.

Each module is cleaned independently to maintain a differential pressure range. The differential pressure range is set on the photohelic gauges in the motor control center.

When the differential pressure exceeds the photohelic high set point, compressed air pulse cleaning will commence. The filter media is pulsed on row at a time until the differential pressure drops to the photohelic low set point. Pressure drop across the unit is rated between 3-6 in. W. C. with all three modules on-line. If required, a modulating air damper automatically adjusts inlet gas temperature to a set point between 400^{0}F and 450^{0}F by bleeding in ambient air.

The baghouse is followed by a 400 HP system fan which induces draft through the kiln, knock-out box, multiclone, heat exchanger and baghouse. The induced draft fan carries exhaust gases to a BECO Venturi (MMV) scrubber for acid gas removal. This unit is rated for 53,000 ACFM at 450^{0}F at the inlet and 38,600 ACFM at 138^{0}F at the outlet, with 2 to 5 inches of water pressure differential. The scrubber is a rod design that has tubular stainless steel rods installed in rows across the throat to provide a series of smaller throats. The intent is to provide the effect of a small venturi throat without incurring the high pressure drop typically associated with conventional high efficiency venturi scrubbers. Additionally, the tubes provide additional impaction surfaces for enhanced particulate and HCl collection. The scrubber is designed for 99% HCl and 68% SO_2 removal efficiencies.

Clean (city) water headers are located directly above the venturi to provide sensible cooling to the exhaust gases. Caustic sodium carbonate (soda ash) solution is recycled through the unit at approximately 200 gpm. The scrubbing fluid is introduced through tangentially positioned nozzles located directly above the MMV module. Scrubbing solution is also injected into the transition segment located between the venturi MMV and Ducon Units.

Excess water drains from the venturi exit elbow to the 1000 gallon recycle tank. The pH of the solution in the recycle tank is automatically maintained to 8.0 or greater by the introduction of a 5-10% sodium carbonate solution. Blowdown is taken from the recycle pump discharge to maintain a constant solids concentration in the solution. Blowdown is maintained in excess of 4.4 gpm, depending on the quantity of fuel burned as well as the chloride and sulfur content of the fuel.

Following the BECO Venturi unit is a BECO MMV mist eliminator installed in the bottom of the Ducon mist eliminator shell. This unit, manufactured of PVC, is designed to capture entrained droplets of caustic solution exiting the BECO venturi scrubber and is rated for a differential pressure drop of 1.5 to 4 inches of water. This mist eliminator drains into the recycle tank.

A further modification of the Ducon unit consists of the insertion of a Mist Master plastic mesh-type mist eliminator at the top of the unit immediately preceding the exhaust stack. This unit has a rated capacity of 48,000 ACFM at 140°F with minimal pressure drop. The Ducon unit functions as an entrainment separator for the venturi scrubber. The final APCS exhaust passes to the atmosphere at approximately 42,000 ACFM at 140^{0}F and 10% moisture (v/v).

Process Monitors

Process monitors consist of sensors for temperature, pressure, scrubber and blow down flow, pH, and gas composition that allow for proper system control and documentation to meet compliance requirements.

Process Performance

The performance of the APCS depends on a number of kiln design and operating parameters, on the compatibility of the APCS to the process and the pollutants to be controlled, and on the specific requirements demanded by the process and applicable air pollution control regulations. The process variables that must be considered in evaluating the operation of the facility APCS include:

1. Gas flow
2. Inlet and outlet gas temperature
3. Liquid flow (in the wet system)
4. Pressure drop across the APCS components
5. Physical and chemical properties of the gas
6. Particulate concentration
7. Particulate size distribution
8. Physical and chemical properties of particulate, and
9. Emission levels of regulated pollutants.
10. Shale mass feed rate and size distribution

These performance parameters have been measured and evaluated by previous trial burn tests overseen by DEC officials and incorporated into an operating permit as regulatory limits.

The APCS will be inspected on a regular basis to verify acceptable operational status. The list below shows the inspection and maintenance schedule for the APCS equipment. Compliance and operational inspections are more frequent than those recommended by the manufacturers of the equipment. These inspections are designed to detect and prevent equipment problems before performance is affected or components fail.

Inspection and Maintenance Frequency

Equipment Parameters	Calibration	Inspection	Alarms	WFCO
Backend Temperature	Monthly	Daily	Weekly	Weekly
Baghouse Inlet Temperature	Monthly	Daily	Weekly	Weekly
Carbon Monoxide	Daily	Daily	Weekly	Weekly
Oxygen	Daily	Daily		
ID Fan Current	Quarterly	Daily	Weekly	Weekly
Kiln Hood Pressure	Monthly	Daily	Weekly	Weekly
Baghouse Pressure Drop	Quarterly	Daily	Weekly	Weekly
Scrubber Water Recycle Rate	Monthly	Daily	Weekly	Weekly
Venturi Pressure Drop	Quarterly	Daily		
Recycle Tank pH	Daily	Daily		
Lime Feed Rate	Quarterly	Daily	Weekly	Weekly
Scrubber Water Blowdown Rate	Quarterly	Daily		
ID Fan Damper Setting	Quarterly	Daily		
Ducon Scrubber Pressure Drop	Quarterly	Daily		

Methods for Detection and Correction of Baghouse Leaks

Two parameters are used to ascertain if the baghouse bags or seals are leaking. A third is under development.

I. The Ducon Scrubber mist eliminator pressure drop normally runs between 1.5 and 2.5 inches of water. If a bag or seal begins to leak, the combination of particulate, lime, and soda ash builds up on the scrubber MMV quadrants and the pressure drop will begin to climb. The maximum recommended pressure drop on the quadrants for good removal efficiency and structural integrity is approximately 4 to 5 inches of water. Once a bag or seal begins to leak the increase usually occurs over a period of 24 hours.

The Ducon pressure drop will be checked and at least once per shift. If the pressure drop reaches 5 inches of water the baghouse will be checked and leaking bags and/or seals replaced. The scrubber will be checked and cleaned as needed.

II. A second indicator of a baghouse bag or seal leak is the turbidity and size of solids in the scrubber blowdown water. When the baghouse is functioning normally the turbidity consists of a fine whitish to slightly brownish cloud that readily settles to the bottom of a sample jar. When a bag or seal leak begins to occur, the turbidity increases, the particles become more coarse, and the color becomes a darker brown. Specific measures on turbidity and color have not been developed, however, standard sample jars will be provided to operators to use as indicators. The scrubber blowdown water sample will be checked and sample taken for comparison at least once per day.

III. A third method under development is the use of a quantitative measuring device that will detect relative particulate removal of the baghouse. A static discharge device known as a Triboflo unit has been under evaluation. The concept of a higher particulate loading removing a static charge from a sensor at a greater rate is being tested. Results are presently limited and will need further evaluation before this type of measure can be validated.

Baghouse bag and/or seal replacement:

Once the Ducon scrubber pressure drop increases to 4 inches of water or the scrubber blowdown water reaches the turbidity standard, the baghouse, or individual chamber (if it can be isolated as the source), is taken out of service. When the top access to each chamber is opened, leaking bags and/or seals are readily detected by observing a deposited dust trail on top of the bag support platform. The trail(s) emanates from and points to the leaking bag(s). The leaking bag(s) are removed and replaced.

In the future improvements will be sought in the bag and seal materials of construction. The goal will be to effect improvements in the static discharge device (Triboflo) or replace it with another technology. Another potential technology consists of opacity measurements in the baghouse exit duct using light transmissivity.

2.3.4 Air Pollution Control System

Preparation for and Performance of Routine Scrubber Maintenance¾Draining and Cleaning Scrubber Internals

Overview/Purpose:

Preparation of the scrubber for internal maintenance involves performance of several routine tasks which, if not accomplished properly, could result in injury or the improper handling and disposal of caustic scrubber liquids and solids. Performance of these tasks is hereby standardized via this operating procedure.

Equipment:

1. Personal protective equipment consisting of Tyvek coveralls, chemical resistant gloves and boots, respirator, hard hat and hearing protection;
2. Lockout devices and locks;
3. Water hose(s) and nozzle(s);
4. Shovel(s);
5. 5 gallon bucket(s);
6. Appropriate tools (to remove inspection/access doors); and
7. Steam cleaner.

Precaution:

Physical entry into any of the scrubber vessels constitutes a confined space entry which is controlled by Norlite Policy # F-3, Confined Space Entry Procedure. The provisions of Policy # F-3 shall supplement those contained herein.

Procedures:

1. Shutdown the kiln and Air Pollution Control Systems in accordance with established practices.

2. Tag out the following valves to prevent accidental introduction of liquids into the scrubber:
   - soda ash supply,
   - quench water supply,
   - emergency water makeup
   - mist pad spray bar water supply.
   - close and tag out LGF vent line on burner room floor.

3. Lockout the following equipment at the motor control center from which they receive power:
   - recirculation pumps, and
   - induced draft fan.

4. Drain the scrubber recirculation tank by running the blowdown pump until the tank is empty. When the tank is empty, shutdown the blowdown pump and lock it out at the motor control center.

5. Remove the inspection/access hatches from the recirculation tank, Ducon vessel (2), and venturi vessel.

   Precaution: When removing the inspection/access hatch from the recirculation tank, a small amount of water may still be in the tank.

6. Remove scrubber and transition headers and inspect for plugging and nozzle wear. Nozzles should be replaced as needed. Header hoses should be inspected for wear and plugging.

7. Remove and inspect quench water sprays (4), and rotometers (4). Replace nozzles and Pipe nipples as needed.

8. Multiple Miniature Venturi (MMV) inspection:

   a. Verify that there is no plugging of the vertical tubes of the MMV. If plugging is present, remove build up and rinse with the steam cleaner.

   b. Inspect the fiberglass hold down bolts and MMV support ring. Repair/replace as necessary.

9. Mist Pad Inspection:

   a. Inspect the mist pad for excessive solids build up. Remove build up and rinse with steam cleaner as needed.

   b. Inspect spray bar and spray bar nozzle condition. Replace spray bar nozzles as needed.

c. Inspect mist pad for gaps. Secure mist pad, as needed, using appropriate fasteners.

10. Recirculation Tank Inspection:

a. Wash sediment from the inside of the tank to the scrubber secondary containment. Exercise caution to ensure that all water and sediment is captured within the containment.

b. Inspect inlet, outlet, and level probe ports for plugging.

Precaution: The contents of the sump in this containment must be pumped to the WWT Plant influent tank (T-1) for treatment, using the containment sump pump. Solids and sediment which cannot be pumped must be manually removed by shoveling into 5 gallon buckets. The contents of these buckets must be dumped into the WWT Plant clarifier (T-2 or T-4) for treatment.

11. Reinstall headers and replace inspection ports.

12. Remove all lock outs and tag outs.

13. Fill recirculation tank with water and run recirculation pumps. Inspect for leaks and verify that there is adequate recirculation water flow.

14. Perform a final inspection of the area to ensure that all debris and waste materials are removed and disposed properly, and all standing water has been swept into the sump and the sump emptied in accordance with the precaution identified in Step 10.

APPENDIX G

NORLITE CONTINGENCY PLAN

The information contained herein is submitted in accordance with the requirements of Sections 373-1.5(a)(2)(vii) and 373-2.4. Norlite's Contingency Plan, a copy of which is attached here, meets the requirements of Section 373-2.4.

The intent of Section 373-2.4 (Contingency Plan and Emergency Procedures), is to ensure that facilities that treat, store or dispose of hazardous wastes have established the necessary emergency procedures in the event an emergency situation should arise. In contrast, the intent of the requirements under Section 373-2.3 (Preparedness and Prevention), which was described in Section F, is to ensure that the facility is properly designed and equipped to minimize the possibility of accidents and prevent the occurrence of emergency situations. The requirements of Section 373-2.4 address the actions that are to be taken if an accident should occur.

G.1 General Information

Chuck Vannoy, Director of Operations, is the facility Director of Operations and may be reached at (518) 235-0401 from 8:00 a.m. to 5:00 p.m. on weekdays. Stephen Jabour, Safety Manager, is the primary emergency coordinator at the facility may also be reached at the above number on weekdays.

A copy of the Contingency Plan is maintained in the main office of Norlite's facility.

Norlite stores LGF, LGF filter sludge and other waste materials at the LGF storage area. The storage area consists of four 24,000 gallon and six 7,300 gallon storage tanks, and drum storage for 214 55-gallon drums of LGF filter sludge and other waste materials in the drum storage and truck unloading/containment area. The drum processing area also contains a mixing tank for facilitating suspension of solids filtered during the truck unloading operations. Four 1,000 gallon equalization tanks, located in the feed pump room along with associated pumps and piping within the kiln building also contain LGF. The overhead pipe tunnel transfers fuel from the tanks to the equalization/kiln area. A general site plan and a full description of the facility is contained in Sections B and D. A description of the wastes is contained in Section C.

G.2 Emergency Coordinators {Sections 373-2.4(c)(4) & 373-3.4(f)}

The Primary Emergency Coordinator is Stephen Jabour, Safety Manager. His name and address along with those of alternate Emergency Coordinators and other emergency contacts are found on Attachment 1 of the Contingency Plan. These individuals are thoroughly familiar with all aspects of Norlite's Contingency Plan and the plant's operation and hazardous waste handling activity. In addition, they have the authority to commit resources needed to carry out the plan.

G.3 Implementation of the Contingency Plan {Section 373-2.4(b)(2)

The decision to implement the Contingency Plan depends on whether or not an imminent, or actual, incident threatens human health or the environment. This section offers the Emergency Coordinator guidelines for decisions regarding implementation.

The Contingency Plan will be implemented in the following situations:

G.3.1 Fire and/or Explosion

1. A fire causes the release of toxic fumes.
2. The fire spreads and could possibly ignite materials at other locations on-site or could cause heat-induced explosions.
3. The fire could possibly spread to off-site areas.
4. Contamination could spread from the use of water, or water and chemical fire suppressants.
5. An imminent danger exists such that an explosion could occur.
6. An imminent danger exists such that an explosion could ignite other hazardous waste at the facility.
7. An imminent danger exists such that an explosion could result in the release of hazardous material.
8. An explosion has occurred.

G.3.2 Spills or Materials Release

1. The spill could result in release of significant quantities of flammable liquids or vapors, thus causing fire or gas explosion hazard.
2. The spill could cause the release of significant quantities of hazardous liquids or toxic fumes.
3. The spill is contained on-site, but the potential exists for groundwater contamination.
4. The spill cannot be contained on-site, resulting in off-site soil contamination and/or ground or surface water contamination.
5. If flooding, wind, electrical discharge or other damage occurs due to natural causes which causes an event listed above.

G.4 Emergency Response Procedures {Sections 373-2.4(c)(1) and (g)}

Details of Norlite's Contingency Plan are summarized in Appendix G-5.

G.4.1 Notification {Section 373-2.4(g)(1)}

In the event of a non-medical or medical emergency situation, the employee's supervisor, if available, will be notified and he will contact the Emergency Coordinator. Subsequently, the Emergency Coordinator will follow the procedure outlined in Appendix G-1 to make appropriate external contacts if required.

G.4.2 Identification of Hazardous Wastes {Section 373-2.4(g)(2)}

The Emergency Coordinator will immediately identify the character, exact source, amount and extent of release. Reference documents (e.g., waste manifests), which characterize the physical and chemical properties of each hazardous waste stored on-site, are readily available at the site. In the event that the released material cannot be identified, samples will be obtained for chemical analysis. Reporting of analytical results of these samples will be based on an objective turn-around time of two (2) working days.

G.4.3 Assessment {Section 373-2.4(g)(3)}

The Emergency Coordinator will assess possible hazards, both direct and indirect, to human health or the environment in accordance with Section 373-2.4(g)(3).

G.4.4 Control Procedures {Sections 373-2.4(c)(1) & (g)(4)}

G.4.4.1 Overview

Potential accidents will be classified into two general categories:

1. fire and/or explosion
2. spills or material release

Notification in all cases will follow the system outlined in Appendix G-1 and will be documented using the Emergency Incident Reporting Form (Figure G-1).

G.4.4.2 Fire and/or Explosion {Section 373-2.4(g)(5)}

The hazardous waste storage areas are all easily accessible by fire-fighting and other emergency vehicles and equipment. If a fire should occur, efforts will be concentrated to prevent the fire from spreading to nearby areas by company personnel. The company's fire fighting effort will be sustained until outside assistance has arrived.

The following actions will be taken in the areas affected by a fire and/or explosion:

a. The Emergency Coordinator will be contacted.

b. The immediate supervisor will be contacted.

c. Work in all affected areas will cease and equipment shut down. Kiln burner operators will immediately cease LGF supply to the kilns. If possible, containers, if any, containing ignitable materials, which are in the vicinity of the fire, will be removed to prevent spreading of the fire.

Any tank unloading operations will be stopped and all trucks within the unloading area moved to a safe and unaffected area.

d. Company personnel will utilize fire extinguishers located in the area in addition to the company water truck equipped with a pump and spray nozzle to prevent the fire from spreading and/or to keep containers cool.

e. When a fire could endanger personnel and/or property in a given process area, or throughout the surrounding operations, the local fire department will be contacted to assist in controlling the fire.

f. The area will be cleared of all personnel not actively involved in fighting the fire.

g. All injured persons will be removed to local hospitals and minor first aid medical treatment will be administered by qualified personnel.

h. Since fire is a potential hazard in spills of flammable materials, potential ignition sources will be eliminated until the spill is contained and safety is restored. If spilled materials are flammable, suitable extinguishing/controlling media will be utilized by appropriate fire-fighting personnel.

Until evacuation is signaled, personnel who are not in an affected area will stay in their respective work areas. The evacuation signal will be a continuous three (3) minute blast from an air horn readily available on the company's major earthmoving equipment. Contract personnel and visitors are to be instructed to report to the main entrance until safety is restored. The decision to invoke partial or total evacuation will be made by the Emergency Coordinator and will depend ont he effect of the following conditions:

a. A fire and/or explosion has occurred.
b. Location of the incident and extend of involvement of adjacent areas.
c. Release to the environment of hazardous materials including toxic fumes.
d. Potential for involvement of off-site areas due to spreading of the fire.
e. Actual or potential threat to human health and/or extend of injuries sustained.

An "all clear" signal will sound when the fire has been extinguished and the personnel's safety is no longer endangered. The all-clear signal will be a continuous one (1) minute blast repeated after a 30 second interval. The blast will be from an air horn readily available on the company's major equipment. All emergency equipment used in the emergency must be cleaned and fit for use prior to resumption of normal plant operations in the affected areas.

G.4.4.3 Spills or Material Release {Sections 373-2.4(g)(2-4) and Section 373-2.10(d)(3)}

A. In the event of a major emergency involving a chemical spill, the following procedures will be used for rapid, safe response and control.

1. Contact Emergency Coordinator.
2. Contact immediate supervisor.
3. Make assessment of degree of hazard.
4. Implement plans to move personnel and contact external resources if required.
5. Implement plans to contain and treat the spill/release.

B. The Emergency Coordinator must obtain information enabling him to assess the magnitude and potential seriousness of the release. His initial response is to protect human health, safety, and the environment.

Additionally, he must determine if the accident can be handled by the company's capabilities or if appropriate external resources must be contacted.

Required information includes:

1. The material and amount spilled or released.
2. The location and extend involved.
3. The direction in which the release is heading.
4. Any injuries.
5. Fire and/or explosions and possibility of same.

C. Internal resources will be utilized to handle accidents of a nature where the amount of material released does not pose an actual or potential hazard to life or property and will not extend outside the facility property. The following are considered typically to be within this category: leaks from containers in the storage area; spills during container transfer or loading; spills during tank truck unloading; spills or leakage from piping systems; and/or spills or leakage from pump seals, valves or other equipment.

In these cases, the Emergency Coordinator will dispatch appropriate emergency personnel who will:

1. Ascertain that all unnecessary individuals are removed from the hazard area.
2. Utilize suitable protective clothing and equipment.
3. Remove all ignition sources and utilize spark/explosion-proof equipment if flammable waste is involved.
4. Attempt to stop the source from continuing to emit wastes and contain the area. By way of example, if a leaking drum is observed the adjacent drums will be removed by manual hand truck to provide additional access to the drum. The drum contents will then be transferred to a new or over-packed drum as soon as possible. If a slow leak from a truck is observed, efforts will be made to stop the leak. The truck will be directed to the contained truck unloading area and the truck will be unloaded as soon as possible.
5. Identify the waste and remove all surrounding materials which could potentially react.

6. Utilize appropriate absorbent materials or pump liquid into proper storage containers.
7. Place all contaminated materials in drums for proper disposal.
8. Place all recovered liquid wastes and contaminated soil in drums for proper disposal.
9. Clean and fit for reuse all emergency equipment utilized prior to resumption of plant operations in affected areas.
10. The containment area(s) will be cleaned upon completion of containment activities.

For material releases potentially posing an actual or potential hazard to life or property, such as spills/leaks from storage tanks; tank ruptures and/or spills from overflow of tank containment system, the Emergency Coordinator will dispatch appropriate emergency personnel who will:

1. Ascertain all unnecessary individuals are removed from the hazard area.
2. Utilize suitable protective clothing and equipment.
3. Remove all ignition sources and utilize spark/explosion-proof equipment if flammable waste is involved.
4. Attempt to stop the source from continuing to emit wastes and contain the area.
5. Identify the waste and remove all surrounding materials which could potentially react.
6. Determine the extend of the release and if required, implement the Contingency Plan with emergency response contractor. If the release can still be supported by internal resources continue with the containment/clean-up effort.
7. Utilize appropriate absorbent materials or pump liquid into proper storage containers.
8. Place all contaminated materials, recovered liquid wasted and/or contaminated soils in proper storage containers for proper disposal.
9. Clean and fit for reuse all emergency equipment utilized prior to resumption of plant operations in affected areas.
10. The containment area will be cleaned upon completion of containment activities.

d. The minimum volumes spilled/released which will be considered as emergencies are:

1. Any release involving hazardous materials posing an actual or potential hazard to life or property.
2. A spill equal to or greater than a quantity specified for chemicals listed under 40 C.F.R Part 302 (Appendix G-2).
3. A quantity of one thousand pounds or greater of hazardous waste LGF.
4. One thousand pounds or more of substances not included n the Solid Waste Disposal Act, Clean Air Act, Clean Water Act, or TSCA but which could be classified as a hazardous waste RCRA or "Superfund" regulations.

Appropriate external agencies/officials will be contacted depending upon the emergency.

G.4.4.4 Prevention of Recurrence or Spread of Fires, Explosions or Releases {Sections 373-2.4(g)(5) & (6)}

Actions to prevent the recurrence or spread of fires explosions or releases include:

a. Halting processes and operations.
b. Collecting and containing released wastes.
c. Recovering and/or isolating all storage vessels.
d. Monitoring all valves, pipes or equipment for leaks or ruptures after system shutdown.

All reasonable safety procedures will be followed prior to resuming operations.

G.4.4.5 Storage and Treatment of Released Material {Section 373-2.4 (g)(7)}

Immediately after an emergency, the Emergency Coordinator will make arrangements for proper treatment, storage and/or disposal of all water and contaminated materials according to New York State and federal regulations, Temporary storage of collected material will be in drums being stored in the LGF storage area previously described. Larger quantities of materials contained and collected by the emergency response contractor would be stored inn tank trucks and/or run-off box containers pending completion of disposal arrangements in accordance with New York State and federal regulations. Attempts will be made to treat these materials on-site within the normal process parameters of the waste treatment operations, i.e., released material that has been contained and collected will be incinerated and used for energy recovery purposes if said material is in accordance with Norlite's permit limits. Under no circumstances will any collected contaminated materials be added to the settling pond.

G.4.4.6 Incompatible Wastes {Section 373-2.4(g)(8)(i)}

The Emergency Coordinator will insure that wastes which may be incompatible with the released material are not treated, stored or disposed until clean-up procedures are completed.

G.4.4.7 Post-Emergency Equipment Maintenance {Sections 373-2.4(g)(8) (ii) and (9)}

After an emergency event all emergency equipment utilized in the affected area will be cleaned, or replaced, so that they are suitable for use. Prior to resuming operations in the affected area, an inspection of all utilized safety equipment will be conducted. All proper necessary authorities will be notified that the post-emergency equipment maintenance has been performed and operations will resume.

G.4.4.8 Container Spills and Leakage {Section 373-2.9(b)}

Paragraph 3 of this section presents emergency response procedures for container spills and leakage is presented in section 3 of section G entitled Emergency Response Procedures.

G.5 Emergency Equipment {Section 373-2-4(c)(5)}

Norlite's emergency equipment, its location and a description of its use is described on Figure G-3.

G.6 Coordination Agreements and Copies of Contingency Plan {Sections 373-2.4(c)(3),(d)(2) and 373-2.3(g)

Norlite has made arrangements with the Cohoes Fire Department and Environmental Products and Services for response in case of an emergency. The Cohoes Fire Department is staffed by a full-time paid fire chief and full time paid personnel. The Cohoes Fire Department Chief and members of his staff have visited the facility on several occasions to review emergency procedures and physical layout. The Cohoes Fire Department, through their disaster preparedness agreements, mutual aid agreements and civil defense responsibilities, will coordinate emergency services as required in case of an incident. Their coordination of emergency services will include police, ambulance service, hospitals and mutual aide fire department participation as circumstances warrant.

Copies of the Contingency Plan, section B(facility descriptions) and Section C (waste characterization) have been provided to the Mayor of the City of Cohoes and to the Fire Chief for distribution to the appropriate local authorities. In addition, copies are maintained at the facility in the main office, the environmental control laboratory, production office and the environmental officer's files.

With respect to the coordination agreements and arrangements with the City of Cohoes Fire Department, Norlite has agreed to provide a mechanism during each year of this permit to enable hazardous materials training for members of the Cohoes Fire Department. Norlite will acquire and maintain an inventory of 3% AFFF (aqueous film forming foam) agent and three (3) foam eductors to enable the Cohoes Fire Department to apply the foam in the event of a fire. To assist in a response to an emergency at the facility, Norlite will maintain a separate access route form the Northwest and will coordinate portable radio frequencies. To further aid the Cohoes Fire Department, Norlite will ensure that all fire hydrants are readily accessible and capable of supporting all required fire apparatus.

G.7 Evacuation Plan {Section 373-2.4(c)(6)}

The emergency coordinator will, as circumstances may require, evacuate personnel from the specific plant areas. The emergency coordinator will account for all personnel on the premises during an emergency. The following chart generally show the personnel location and the number of personnel typically at each location:

Quarry	3-6
Primary	3
Burner Room (each)	1
Kiln area	4
LGF area	2
Main Office area	20
Security gate	1
I & E	5
Safety	3
Garage	4
Finish Plant	3

At any given moment, however, the actual personnel location may vary from the locations shown on the chart. These numbers reflect weekday operations and designate assigned work areas.

In the event of an uncontrolled fire or explosion, the Emergency Coordinator will determine whether the fire can be contained and if there is a threat to human health. If the Emergency Coordinator determines that the fire cannot be contained, evacuation of the facility will be necessary. The Emergency Coordinator will assess the type of hazard, wind direction and probability of further deterioration of conditions. Based on the Emergency Coordinator's assessment, he may deviate from established procedures inn order to effectively and safely respond to emergency situations.

The facility has a warning system with a specific alarm signal consisting of a loud horn to initiate evacuation of all plant areas. he evacuation signal will be a continuous three(3) minute blast from an air horn readily available on the company's major earthmoving equipment. In addition to the alarm, the internal telephone system can be used to notify plant personnel as to the emergency's nature and recommended action plan.

Total pant evacuation is initiated only by the Emergency Coordinator. Primary and alternate evacuation routes are identified on Figure G-2.

G.8 Required Reports {Section 373-2.4 (g) (10)}

As required by section 373-2.4(g) (10), any emergency event (e.g., fire, explosion, etc.) that required implementing the Contingency plan will be reported in writing within 15 days to the Commissioner, New York State Department of Environmental Conservation. In addition, any spill greater than 10 gallons whether occurring inside or outside of the secondary containment will be reported to the Department. A copy of the reporting form for emergency events is shown in Figure G-1.

G.9 Amendments to the Contingency Plan {Section 373-2.4(e)}

The Contingency Plan will be revised and immediately amended, if necessary, whenever:

a. The facility permit is revised.
b. The plan fails in an emergency.

c. The facility changes in its design, construction operation, maintenance, or other circumstances in a way that materially increases the potential for fires, explosions, or releases of hazardous waste or hazardous waste constituents, or changes in the response necessary in an emergency.
d. The list of emergency coordinators changes.
e. The list of emergency equipment materials changes.

FIGURE G-3 (Page 1 of 2)

EMERGENCY EQUIPMENT

No.	ITEM	LOCATION	DESCRIPTION AND USE
1	SCBA'S (60 min)	Safety truck 2	Rescue purposes in IDLH environments
2	SCBA's (30 min)	Throughout fuel system (figure G-2)	To protect personnel from breathing solvent fumes
3	100 Fire Extinguishers	Throughout Facility (figure G-2)	Type ABC (dry) combustible material, flammable liquid, electrical
4	Fire Hydrant #1	South of Salt kill 100' North of R/R track	For use by fire department for foam application, etc.
	Fire Hydrant #2	South of Salt Kill 400' North of R/R track	For use by fire department for foam application, etc.
	Fire Hydrant #3	South of Salt Kill 600' North of R/R track	For use by fire department for foam application, etc.
5	Absorbent booms	Spill stations (2) by Gate #2 and unloading area	Place across stream to contain and absorb spilled materials
6	Absorbents	Spill stations and LGF unloading area	Absorb spilled materials
7	Lightweight clinker	Clinker storage pile	Place across stream to contain and absorb spilled materials
8	Portable Pump	LGF unloading area	Transfer spill material into tanks
9	Clay Soil	Over burden storage area	Construct dikes to contain spilled material
10	Front Loaders 3	Quarry, loading area	Construct dams and dikes to contain spills
12	Shovels (non-spark producing)	Spill stations	To build dikes to contain spilled materials, remove contaminated soil
13	First Aid supplies	Safety Trailer, Safety Truck	Bandages, compresses, etc

Figure G-3
Page 2 of 2

No.	ITEM	LOCATION	DESCRIPTION & USE
14	Emergency Communication system including horn and internal horn system	Office phones, Security gate #1	Used for external and internal plant communication
15	Wind socks or stack plumes		Used to identify wind direction in order to determine best evacuation route
16	Automatic AFFF extinguishing system	LGF unloading area and buildings, overhead tunnel, equalization area	Used as a fire extinguishing agent
17	Automated AFFF alarm system	Facility Control Room and outside LGF Pipe Tunnel	Used to inform facility personnel of AFFF fire suppression system activation
18	Standpipe system (fire hose	Outside LGF pipe tunnel Escape hatches	Used for additional fire fighting capability in Pipe Tunnel
19	Fire Dept. connection system	Ground Level, LGF Pipe tunnel escape hatch ladders	Used to allow fire department to hook into pipe tunnel fire suppression system and supply additional water for fire suppression.
20	Oxygen,LEL, rapid heat rise and flame detectors	LGF unloading area and buildings, overhead tunnel, equalization area	Used for detection within the LGF system

APPENDIX H

NORLITE SPDES PERMIT

New York State Department of Environmental Conservation

2176 Guilderland Ave.
Schenectady, N.Y. 12306
(518)382-0680
(518)382-1065-FAX

Thomas C. Jorling
Commissioner

January 27, 1992

William Vosshell
Director of Compliance
Norlite Corp.
PO Box 694
628 So. Saratoga St.
Cohoes, N.Y. 12047

RE: DEC #4-0103-16/16-0
Norlite Facility
SPDES REN/MOD
Cohoes-C, Albany Co.

Dear Mr. Vosshell,

Please find enclosed the renewed SPDES permit for the Norlite Facility. No comments were received from the public, however, we have made several minor changes which we recently discussed with you and other representatives of the company. Specifically:

- You are named as the contact for Discharge Monitoring Reports on page 1.

- Temperature and pH limits are being added for Outfall 005 on page 3.

- On page 5 the current hazardous fuel (LGF) concentration limit for Copper was corrected and the corrected Arsenic and Chromium limits were added. Language was clarified on the restriction applying to implementation of the proposed increased limits and a corrected date put in for the Fugitive Dust Control Plan.

As a follow-up to our meeting of 1/8/92 we offer the following responses:

- Plans, specifications and an engineering report along with a Beneficial Use Determination request on the sludge filter cake will be submitted as per the schedule provided on 1/23/92 in compliance with the SPDES permit deadlines. The Department's review and approval is anticipated to be handled as a compliance matter under the permit with the final approved design incorporated into the permit by reference unless the final design could cause some unanticipated impact. I would appreciate it if you could provide us with a copy of the schematic drawings shown us and the proposed location of the WWTP so it can be evaluated now for any potentials in this regard. Information on the

potential for odors, noise or other impacts and its proximity to residences and any other pertinent site factors are also needed.

- New York State Wastewater treatment system operator certification is not required for industrial facilities.

- Norlite will be seeking a Beneficial Use Determination on the filter cake sludge from the treatment process which will be submitted at the same time as the plans. Unless and until the Department approves the BUD request the sludge will be managed as a hazardous waste.

- Norlite will also be seeking a modification of its SPDES permit related to the limits on Outfall 1 after installation of the WWTP and PCB testing requirements on Outfall 4. Your application to modify the PCB testing requirement (which could be incorporated into your required engineering report would need to include a proposal for testing the underlying shale through the taking of boring samples. It would have to be demonstrated that the samples taken are representative of the landfill and that the leachability testing of the shale is capable of detecting (if they are present) the low PCB levels required by the permit.

- The BMP plan will be revised as per Department requirements.

- Additional information will be submitted to support your contention that interim wastewater treatment is not needed prior to the installation of the permanent WWTP even if the higher metals concentrations in the hazardous waste fuel are implemented. Added information regarding a mass balance of metals as well as your proposed and possible interim treatment and removal of increased precipitated metals is needed before the Department can perform an in depth review. We will be having our central office Bureau of Wastewater Facilities Design involved as well which may result in additional information needed to resolve this issue. As discussed, the permit condition #2 provides enough flexibility for resolution and therefore is being retained.

- Stormwater is already covered in your SPDES permit and the need for a letter of intent from Albany County Sewer District is not critical at this juncture as the WWTP will be designed to meet the SPDES permit discharge limits.

As we discussed briefly on 1/23/92 the WWTP and disposal of its sludge will also have to be added to the new Hazardous Waste permit as a regulated hazardous waste facility/activity. We are now determining how best to handle this administratively in order to not add delay to its construction and start-up.

If you have any further questions please feel free to contact either Carol Lamb-LaFay of our Division of Water or Myself.

Sincerely Yours,

William J. Clarke

William J. Clarke
Regional Permit Administrator
Region 4

NORLI16.D01
cc:C.Lamb-LaFay
S.Saraiya

2 (1/89)

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

State Pollutant Discharge Elimination System (SPDES)

DISCHARGE PERMIT

Special Conditions (Part I)

Industrial Code: 1422
Discharge Class (CL): 01
Toxic Class (TX): T
Major Drainage Basin: 13
Sub Drainage Basin: 01
Water Index Number: H-239
Compact Area:

SPDES Number: NY- 0004880
DEC Number: 4-0103-16/20-0
Effective Date (EDP): 2/1/92
Expiration Date (ExPD): 2/1/97
Modification Date(s):
Attachment(s): General Conditions (Part II) Date: 11/90

This SPDES permit is issued in compliance with Title 8 of Article 17 of the Environmental Conservation Law of New York State and in compliance with the Clean Water Act, as amended, (33 U.S.C. §1251 et.seq.)(hereinafter referred to as "the Act").

PERMITTEE NAME AND ADDRESS:

Attention: Jay Derman, Executive VP

Name: Norlite Corporation
Street: 628 South Saratoga Street
City: Cohoes State: NY Zip Code: 12047

is authorized to discharge from the facility described below:

FACILITY NAME AND ADDRESS:

Name: Norlite Corporation
Location (C,T,V): Cohoes (C) County: Albany
Facility Address: 628 South Saratoga Street
City: Cohoes State: NY Zip Code: 12047
NYTM-E: . NYTM-N: 4 .
From Outfall No. 001 at Latitude: 42° 45' 14" & Longitude: 73° 40' 20"
into receiving waters known as: Salt Kill Creek ,Class:

and: (list other Outfalls, Receiving Waters & Water Classifications)

003	Salt Kill Creek	D
004	Salt Kill Creek	D
005	Salt Kill Creek	D

in accordance with the effluent limitations, monitoring requirements and other conditions set forth in Special Conditions (Part I) and General Conditions (Part II) of this permit.

DISCHARGE MONITORING REPORT (DMR) MAILING ADDRESS

Mailing Name: Norlite Corporation
Street: 628 South Saratoga Street
City: Cohoes State: NY Zip Code: 12047
Responsible Official or Agent: William Vosshell Phone: (518) 235-0401

This permit and the authorization to discharge shall expire on midnight of the expiration date shown above and the permittee shall not discharge after the expiration date unless this permit has been renewed, or extended pursuant to law. To be authorized to discharge beyond the expiration date, the permittee shall apply for permit renewal not less than 180 days prior to the expiration date shown above.

DISTRIBUTION: Carol Lamb - Region 4
R. Hannaford - Room 318
Mark Wykes - ACHD
DRA

Permit Administrator: William Clarke
Address: 2176 Guilderland Avenue
Schenectady, NY 12306
Signature: William J Clarke Date: 1/27/92

EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

MODIFICATION DATE: _____

ing the period beginning EDP

and lasting until EDP + 5 YEARS

the discharges from the permitted facility shall be limited and monitored by the permittee as specified below:

Outfall Number & Effluent Parameter	Discharge Limitations Daily Avg.	Daily Max.	Units	Minimum Monitoring Requirements Measurement Frequency	Sample Type
Outfall 001 - Non-Contact Cooling Water, Boiler Blowdown, Scrubber water from Kiln #1 and Storm Water Lagoon Overflow					
Flow	Monitor	Monitor	GPD	Daily[1]	Measured
Solids, Total Suspended	25	45	MG/L	Daily[1]	Composite[3]
pH (Range)	(6.0 to 9.0)		SU	Daily[1]	Grab
Temperature	NA	90	degF	Daily[1]	Grab
Arsenic, Total	0.05	0.1	MG/L	Daily[1]	Grab
Barium, Total	2.0	4.0	MG/L	Daily[1]	Grab
Beryllium, Total	1.0	2.0	MG/L	Daily[1]	Grab
Cadmium, Total	NA	0.004	MG/L	Daily[1]	Grab
hromium, Total	0.5	1.0	MG/L	Daily[1]	Grab
Chromium, Hexavalent	NA	0.016	MG/L	Daily[1]	Grab
Copper, Total	NA	0.018	MG/L	Daily[1]	Grab
Lead, Total	NA	0.08	MG/L	Daily[1]	Grab
Mercury, Total	NA	0.0002	MG/L	Daily[1]	Grab
Nickel, Total	NA	1.8	MG/L	Daily[1]	Grab
Selenium, Total	0.05	0.1	MG/L	Daily[1]	Grab
Zinc, Total	NA	0.3	MG/L	Daily[1]	Grab
PCB Aroclor 1016	ND	ND[2]		5/Month	Grab
PCB Aroclor 1221	ND	ND[2]		5/Month	Grab
PCB Aroclor 1232	ND	ND[2]		5/Month	Grab
PCB Aroclor 1242	ND	ND[2]		5/Month	Grab
PCB Aroclor 1248	ND	ND[2]		5/Month	Grab
PCB Aroclor 1254	ND	ND[2]		5/Month	Grab
PCB Aroclor 1260	ND	ND[2]		5/Month	Grab
Outfall 003 - Quarry Water					
Flow	Monitor	Monitor	GPD	Daily[1]	Instantaneous
Solids, Total Suspended	25	45	MG/L	Daily[1]	Composite[3]
pH (Range)	(6.0 to 9.0)		SU	Daily[1]	Grab

Outfall Number & Effluent Parameter	Discharge Limitations Daily Ave.	Daily Max.	Units	Meaurement Frequency	Sample Type
Outfall 004 - Shale Fines Leachate					
Flow	Monitor	Monitor	GPD	Daily[1]	Measured
Solids, Total Suspended	25	45	MG/L	Daily[1]	Composite[3]
pH (Range)	(6.0 to 9.0)		SU	Daily[1]	Grab
Temperature	NA	90	degF	Daily[1]	Grab
Arsenic, Total	Monitor	Monitor	MG/L	Daily[1]	Grab
Barium, Total	Monitor	Monitor	MG/L	Daily[1]	Grab
Beryllium, Total	Monitor	Monitor	MG/L	Daily[1]	Grab
Cadmium, Total	NA	0.004	MG/L	Daily[1]	Grab
Chromium, Total	NA	1.7	MG/L	Daily[1]	Grab
Chromium, Hexavalent	NA	0.016	MG/L	Daily[1]	Grab
Copper, Total	NA	0.018	MG/L	Daily[1]	Grab
Lead, Total	NA	0.08	MG/L	Daily[1]	Grab
Mercury, Total	NA	0.0002	MG/L	Daily[1]	Grab
Nickel, Total	NA	1.8	MG/L	Daily[1]	Grab
Selenium, Total	Monitor	Monitor	MG/L	Daily[1]	Grab
Zinc, Total	NA	0.3	MG/L	Daily[1]	Grab
PCB Aroclor 1016	ND	ND[2]		5/Month	Grab
PCB Aroclor 1221	ND	ND[2]		5/Month	Grab
PCB Aroclor 1232	ND	ND[2]		5/Month	Grab
PCB Aroclor 1242	ND	ND[2]		5/Month	Grab
PCB Aroclor 1248	ND	ND[2]		5/Month	Grab
PCB Aroclor 1254	ND	ND[2]		5/Month	Grab
PCB Aroclor 1260	ND	ND[2]		5/Month	Grab
Outfall 005 - Air Pollution Control Saline Water					
Flow	Monitor	Monitor	GPD	Daily[1]	Grab
Temperature		90	deg. F	Daily[1]	Grab
pH	(6.0 to 9.0)		SU	Daily[1]	Grab
Solids, Total Suspended	25	45	mg/l	Daily[1]	Grab
Solids, Settleable	NA	0.3	ml/l	Daily[1]	Grab
Arsenic, Total	Monitor	Monitor	mg/l	Daily[1]	Grab
Cadmium, Total	NA	0.004	mg/l	Daily[1]	Grab
Chromium, Total	NA	1.7	mg/l	Daily[1]	Grab
Chromium, Hexavalent	NA	0.016	mg/l	Daily[1]	Grab
Copper, Total	NA	0.018	mg/l	Daily[1]	Grab
Lead, Total	NA	0.08	mg/l	Daily[1]	Grab
Mercury, Total	NA	0.0002	mg/l	Daily[1]	Grab
Nickel, Total	NA	1.8	mg/l	Daily[1]	Grab
Zinc, Total	NA	0.3	mg/l	Daily[1]	Grab

FOOTNOTES

1 = Samples shall be taken each day a discharge occurs.
2 = Each individual Aroclor shall be non-detectable by USEPA Method 608 with a MDL of 0.065ppb. See the Compliance Criteria for PCB's below.
3 = Representative composite consisting of a minimum of three samples (one at the beginning, middle, and end of the discharge period.
4= The permittee must make application prior to any increase in allowable metals concentration of the Waste Fuel Oil (LGF) which would ensure compliance with the effluent limits set forth in this permit.

Compliance Criteria for PCB's in SPDES permits

1. If one or more of the five samples are found to have a PCB concentration at or above the MDL, the permittee will be in non-compliance with the permit for the one month when the samples were taken.

2. If only one sample out of the five has a concentration greater than or equal to the MDL and less than the Practical Quantitation Limit (PQL = 4 x Approved MDL) the permittee may elect to analyze three additional samples collected and extracted earlier during the same one month period.

3. If all of the additonal three samples are found to be less than the MDL, the permittee will be in compliance with the permit for the month.

4. If one or more of the additional three samples are found to exceed the MDL, the permittee shall be in non-compliance with the permit for the month.

Additional Special Conditions

1. The Permittee shall comply with DEC Consent Order (R4-0768-90-01), dated June 12, 1990 and approved plans dated August, 1990 to comply with dust control requirements.

2. The metals feed rate concentrations in the hazardous waste fuel (LGF) for Arsenic, Chromium, Copper, Mercury, Nickel, Selenium, and Zinc shall not increase above the previously permitted levels described below until such time as all applicable pre-increase requirements contained in the hazardous waste/air control permits and Consent Order (R4-0768-89-08) have been complied with and;

   A Department approved wastewater treatment system has been installed and operating to the satisfactin of the Department; or,

   The Department determines, based upon additional information submitted by the permittee, the acceptability of alternate control measures on an interim basis; or,

   The Department determines, based on additional information submitted by the permittee the acceptability of a demonstration that effluent limitatins set forth in this permit will not be exceeded by implementation of the proposed higher feed rate concentrations prior to the completion of construction and operation of the new wastewater treatment system required by this SPDES permit.

Feed Rate Concentrations (LGF)

PPM

PARAMETER	CURRENT CONCENTRATIONS	PROPOSED CONCENTRATIONS
Arsenic	1.7	25
Chromium	200	500
Copper	490	1000
Mercury	4.5	45
Nickel	440	600
Selenium	0.36	25
Zinc	100	1000

ition of Daily Average and Daily Maximum

The daily average discharge is the total discharge by weight or in other appropriate units as specified herein, during a calendar month divided by the number of days in the month that the production or commercial facility was operating. Where less than daily sampling is required by this permit, the daily average discharge shall be determined by the summation of all the measured daily discharges in appropriate units as specified herein divided by the number of days during the calendar month when the measurements were made.

The daily maximum discharge means the total discharge by weight or in other appropriate units as specified herein, during any calendar day.

Monitoring Locations

Permittee shall take samples and measurements to meet the monitoring requirements at the location(s) indicated below: (Show locations of outfalls with sketch or flow diagram as appropriate).

utfall 005 - Air Pollution Control Saline Water

ium, Total	0.40	MG/L	Weekly	Grab
Beryllium, Total	0.010	MG/L	Weekly	Grab
Selenium, Total	0.30	MG/L	Weekly	Grab

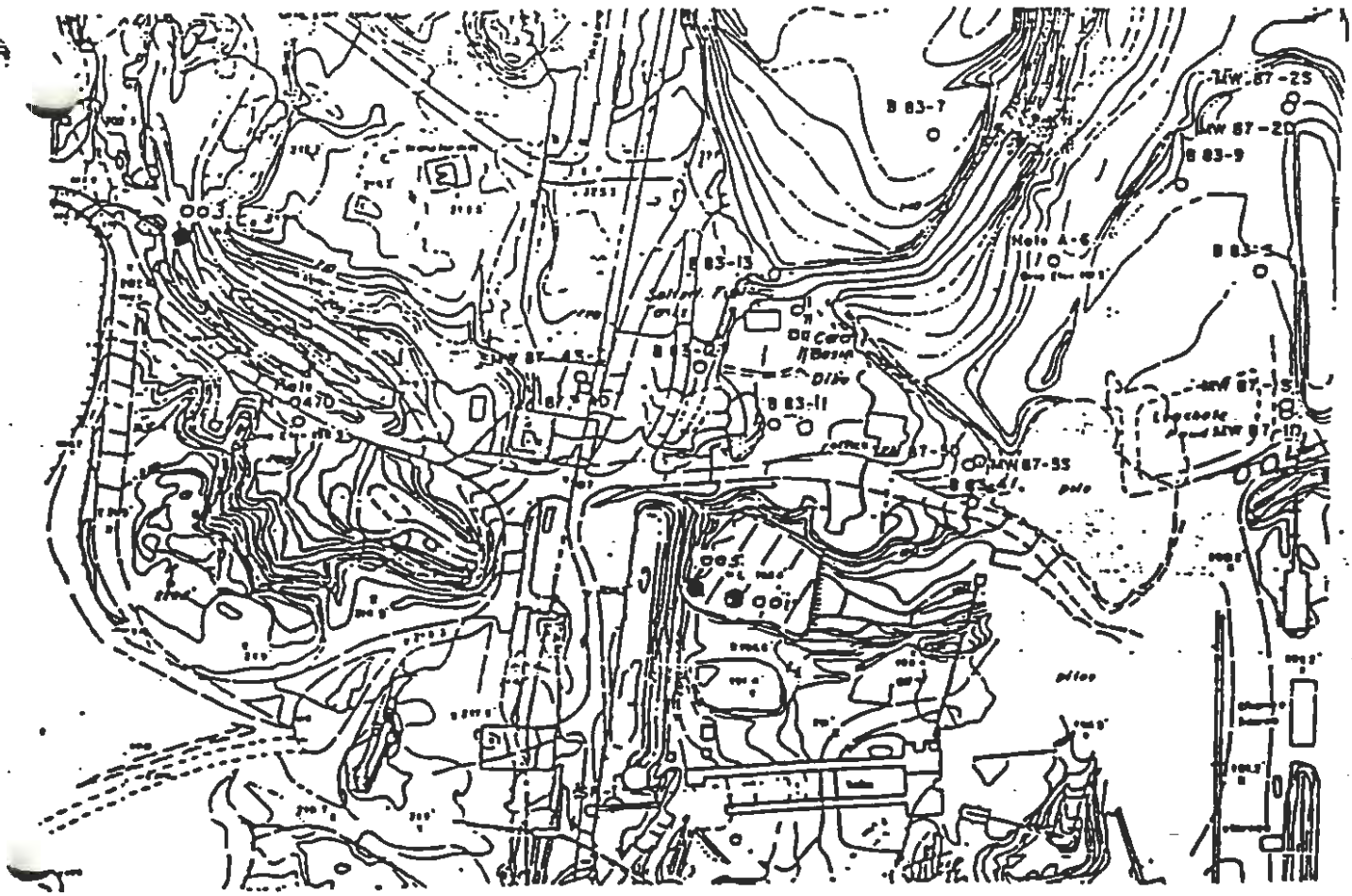
tion of Daily Average and Daily Maximum

: da average discharge is the total discharge by weight or in other appropriate units as specified herein, during a endar month divided by the number of days in the month that the production or commercial facility was operating. ere less than daily sampling is required by this permit, the daily average discharge shall be determined by the summa- n of all the measured daily discharges in appropriate units as specified herein divided by the number of days during calendar month when the measurements were made.

: daily maximum discharge means the total discharge by weight or in other appropriate units as specified herein, during calendar day.

nitoring Locations

mittee shall take samples and measurements to meet the monitoring requirements at the location(s) indicated below: ow locations of outfalls with sketch or flow diagram as appropriate).



SCHEDULE OF COMPLIANCE

a) The permittee shall comply with the following schedule.

Action Code	Outfall Number(s)	Compliance Action	Due Date
	001 004 005	The permittee shall submit an approvable Engineering Report which provides a final and comprehensive description of the wastewater problem(s) and proposed solution(s) including applicable design criteria. The Engineering Report shall contain the basic elements as described in the Bureau of Wastewater Facilities Design's Industrial Wastewater Treatment Facilities (see attached). The wastewater shall be characterized for Dioxins using USEPA Method 613, in addition to permit parameters (metals, PCB Individual Aroclors). The wastewater characterization shall adequately reflect the spectrum of operating conditions. Consideration should be given to account for contribution from both kilns once the additional air pollution control system is installed and low grade fuels are allowed. If the proposed solution is other than direct discharge to waters of the state, a letter of intent for approval from the appropriate authority must be included in the report for it to be considered approvable.	EDP + 3 mos
		The permittee shall submit revised Best Management Plan (BMP) which incorporates comments as attached.	EDP + 3 mos.

b) The permittee shall submit a written notice of compliance or non-compliance with each of the above schedule dates no later than 14 days following each elapsed date, unless conditions require more immediate notice under terms of the General Conditions (Part II), Section 5. All such compliance or non-compliance notification shall be sent to the locations listed under the section of this permit entitled RECORDING, REPORTING AND ADDITIONAL MONITORING REQUIREMENTS. Each notice of non-compliance shall include the following information:

1. A short description of the non-compliance;
2. A description of any actions taken or proposed by the permittee to comply with the elapsed schedule requirements without further delay and to limit environmental impact associated with the non-compliance;
3. A description or any factors which tend to explain or mitigate the non-compliance; and
4. An estimate of the date the permittee will comply with the elapsed schedule requirement and an assessment of the probability that the permittee will meet the next scheduled requirement on time.

c) The permittee shall submit copies of any document required by the above schedule of compliance to NYSDEC Regional Water Engineer at the location listed under the section of this permit entitled RECORDING, REPORTING AND ADDITIONAL MONITORING REQUIREMENTS, unless otherwise specified in this permit or in writing by the Department.

SCHEDULE OF COMPLIANCE

a) The permittee shall comply with the following schedule.

tion Code	Outfall Number(s)	Compliance Action	Due Date
	001 004 005	Submit an approveable Work Plan to conduct a Method Detection Limit (MDL) Study in accordance with 40 CFR 136, Appendix B utilizing the following analytical methods: Parameter — USEPA Method Cadmium, Total — 213.2 Chromium, Hexavalent — 220.2 Mercury, Total — 245.1 or 245.2 PCB Aroclor 1026 — 608 " 1221 — 608 " 1232 — " " 1242 — " " 1248 — " " 1254 — "	EDP + 1 mo.
		The permittee shall submit approvable plans and specificatons for construction of the wastewater treatment plant as approved in the Engineering Report	EDP + 6mos.
		Begin Construction of the wastewater treatment plant	EDP + 8 mos.
		Complete Construction of the wastewater treatment plant	EDP + 20 mos.
		Achieve Operational level of the wastewater treatment	EDP + 21 mos.
		Submit an approvable final report outlining the results of the MDL study.	EDP + 24 mos.

b) The permittee shall submit a written notice of compliance or non-compliance with each of the above schedule dates no later than 14 days following each elapsed date, unless conditions require more immediate notice under terms of the General Conditions (Part II), Section 5. All such compliance or non-compliance notification shall be sent to the locations listed under the section of this permit entitled RECORDING, REPORTING AND ADDITIONAL MONITORING REQUIREMENTS. Each notice of non-compliance shall include the following information:

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RECORDING, REPORTING AND ADDITIONAL MONITORING REQUIREMENTS

a) The permittee shall also refer to the General Conditions (Part II) of this permit for additional information concerning monitoring and reporting requirements and conditions.

b) The monitoring information required by this permit shall be summarized, signed and retained for a period of three years from the date of the sampling for subsequent inspection by the Department or its designated agent. Also;

[X] (if box is checked) monitoring information required by this permit shall be summarized and reported by submitting completed and signed Discharge Monitoring Report (DMR) forms for each 1 month reporting period to the locations specified below. Blank forms are available at the Department's Albany office listed below. The first reporting period begins on the effective date of this permit and the reports will be due no later than the 28th day of the month following the end of each reporting period.

Send the original (top sheet) of each DMR page to:

Department of Environmental Conservation
Division of Water
Bureau of Wastewater Facilities Operations
50 Wolf Road
Albany, New York 12233-3506

Phone: (518) 457-3790

Albany County Health Department
Division of Environmental Health
South Ferry & Green Streets
Albany, NY 12201

Send the first copy (second sheet) of each DMR page to:

Department of Environmental Conservation
Regional Water Engineer
2176 Guilderland Avenue
Schenectady, NY 12306

c) A monthly "Wastewater Facility Operation Report..." (form 92-15-7) shall be submitted (if box is checked) to the [ ] Regional Water Engineer and/or [ ] County Health Department or Environmental Control Agency listed above.

d) Noncompliance with the provisions of this permit shall be reported to the Department as prescribed in the attached General Conditions (Part II).

e) Monitoring must be conducted according to test procedures approved under 40 CFR Part 136, unless other test procedures have been specified in this permit.

f) If the permittee monitors any pollutant more frequently than required by this permit, using test procedures approved under 40 CFR Part 136 or as specified in this permit, the results of this monitoring shall be included in the calculations and recording on the Discharge Monitoring Reports.

g) Calculations for all limitations which require averaging of measurements shall utilize an arithmetic mean unless otherwise specified in this permit

h) Unless otherwise specified, all information recorded on the Discharge Monitoring Report shall be based upon measurements and sampling carried out during the most recently completed reporting period.

i) Any laboratory test or sample analysis required by this permit for which the State Commissioner of Health issues certificates of approvalpursuant to section five hundred two of the Public Health Law shall be conducted by a laboratory which has been issued a certificate of approval. Inquiries regarding laboratory certification should be sent to the Environmental Laboratory Accreditation Program, New York Health Department Center for Laboratories and Research, Division of Environmental Sciences, The Nelson A. Rockefeller State Plaza, [illegible] New York 12201

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ORDER ON CONSENT R4-1680-94-05

SCHEDULE OF COMPLIANCE

Operation and Monitoring of Current WWTP

1. Prior to commencement of the discharge to the Salt Kill and Mohawk River, Respondent shall configure the current WWTP in accordance with the schematic diagram in Attachment C.

2. Upon commencement of discharge to the Salt Kill, Respondent shall, at all times, properly operate and maintain all facilities and systems of treatment and control. Respondent shall not bypass its carbon units.

3. Respondent shall at all times comply with the effluent discharge limits, and monitoring reporting requirements set forth in Attachment B.

4. For the first 23 days of discharge to the Salt Kill, Respondent shall perform the monitoring specified in the operations report given in Attachment A. The monitoring data shall be prepared in accordance with Attachment A and shall be included in the engineering report.

5. Within 15 days of the execution of the order, Respondent shall submit for DEC approval, the plans and specifications for construction of the outfall line connecting the existing WWTP to the stormwater system of the City of Cohoes.

6. Within 30 days of DEC approval of the pipeline construction plans, Respondent shall commence construction of the outfall line connecting the existing WWTP to the stormwater system of the City of Cohoes. Prior to the connection to the stormwater system of the City of Cohoes, Respondent shall obtain all necessary approvals and authorizations.

7. Within 3 months of DEC approval of the pipeline construction plans, Respondent shall complete construction of the outfall line connecting the WWTP to the stormwater system of the City of Cohoes and shall cease all discharges of scrubber water to the Salt Kill and begin discharging through the stormwater system to the Mohawk River.

New WWTP

8. Within 60 days of the effective date of the Order, Respondent shall submit an approvable engineering report which provides a final and comprehensive description of the wastewater problem and proposed solution including applicable design criteria. In order to be considered approvable, the engineering report shall contain the information detailed in Appendix D. It must be able to stand alone without reference to prior correspondence. The wastewater characterization shall adequately reflect the complete spectrum of operating conditions. The ability of the proposed facility to meet the proposed metal effluent limits without dilution from the noncontact cooling water must be demonstrated at the highest concentrations of metals observed in the scrubber water.

9. Within 60 days of approval of the engineering report, Respondent shall submit detailed engineering plans and specifications.

10. Within 30 days of approval of the engineering plans, Respondent shall begin construction of the approved treatment plant.

11. Within 150 days of the approval of the plans and specifications, Respondent shall complete construction of the wastewater treatment plant.

12. Within 6 months of completion of the wastewater treatment plant, Respondent shall develop and submit an operations and maintenance (O&M) manual. The purpose of an O & M Manual is to give treatment system personnel the proper understanding, techniques and references necessary to efficiently operate and maintain the facility. EPA guidance document, "Considerations for preparation of Operation and Maintenance Manuals" should be consulted.

ATTACHMENT A

SAMPLE WORKSHEET

DATE	FLOW RATE INF	FLOW RATE NCC	p H INF	p H EFF	TDS INF	Ar INF	Ar EFF	Ba INF	Ba EFF	Be INF	Be EFF	Cd INF	Cd EFF	Cr,T INF	Cr,T EFF	Cu INF	Cu EFF	Pb INF	Pb EFF	Hg INF	Hg ***	Hg EFF	Ni INF	Ni EFF	Se INF	Se EFF	Zn INF	Zn EFF	Fe INF	Fe EFF	TSS EFF	SETT. SOLIDS EFF
01-Jun-94																															
02-Jun-94																															
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27-Jun-94																															
28-Jun-94																															
29-Jun-94																															
30-Jun-94																															
01-Jul-94																															

NOTES

*** Mercury sample taken prior to carbon units

INF => INFLUENT TO PLANT (SCRUBBER WATER ONLY)

EFF => EFFLUENT FROM PLANT - TAKEN AFTER SUFFICIENT TIME HAS ELAPSED AFTER INFLUENT SAMPLING TO ACCOUNT FOR THE DETENTION TIME IN THE TREATMENT PLANT

NCCW => NONCONTACT COOLING WATER

ATTACHMENT B
Page 1

EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the Period begining on the effective date of the order

and lasting until the wastewater treatment plant achelves operational level.

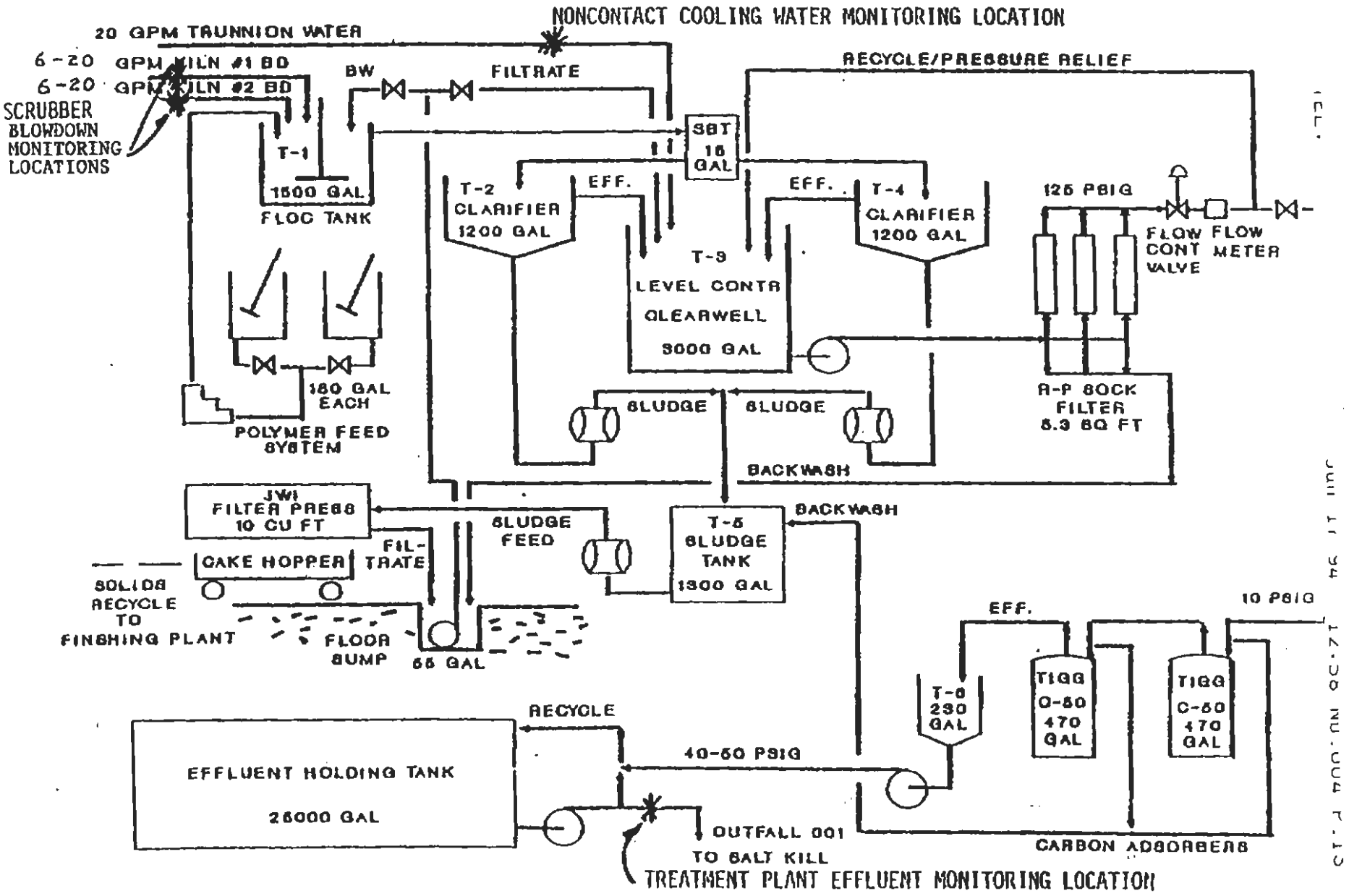
he discharges listed shall be limited and monitored by the Respondent as specified below:

Outfall Number & Effluent Parameter	Discharge Limitations Daily Avg.	Daily Max.	Units	Minimum Monitoring Requirements Measurement Frequency	Sample Type
Non-Contact Cooling Water					
Flow		Monitor	GPM	Daily	Recorder
Combined Scrubber Blowdown					
Flow		40	GPM	1/Hour	Grab
Final Effluent					
Flow		Monitor	GPM	Daily	Totalizer
Total Suspended Solids		50	mg/l	Daily	Grab
pH		6 to 9	SU	Daily	Grab
Arsenic, Total		0.15	mg/l	Daily	Grab
Barium, Total		4.0	mg/l	Daily	Grab
Beryllium, Total		2.0	mg/l	Daily	Grab
Cadmium, Total		0.05	mg/l	Daily	Grab
Chromium, Total		0.2	mg/l	Daily	Grab
Copper, Total		0.5	mg/l	Daily	Grab
Iron, Total		4	mg/l	Daily	Grab
Lead, Total		0.6	mg/l	Daily	Grab
Mercury, Total		0.05	mg/l	Daily	Grab
Nickel, Total		1.3	mg/l	Daily	Grab
Selenium, Total		0.1	mg/l	Daily	Grab
Zinc, Total		0.5	mg/l	Daily	Grab

OTES:

These are modified effluent limits for the interim period until the approved treatment system is opertional. These limits are based on the demonstrated performance of the existing treatments system and allows for dilution with noncontact cooling water. The final limits will be calculated using the design flow used to size the units in the approved engineering report. The final limits will not allow credit for the noncontact cooling water contribution except for zinc and copper.

NORLITE EXISTING WWTP SYSTEM FOR DISCHARGE TO SALT KILL CREEK



RECORDING, REPORTING AND ADDITIONAL MONITORING REQUIRMENTS

The monitoring information required in this order shall be tabulated and reported for each one month period to the following location:

Department of Environmental Conservation
Regional Water Engineer
1150 North Westcott Road
Schenectady, NY 12306-2014

The first reporting period begins on the effective date of this order and the reports will be due no later than the 28th day of the month following the end of each reporting period. The following certification must accompany the sampling results:

> I certify under penalty of law that I have personally examined and am familiar with the information submitted herin and based on my inquiry of those individuals immediately responsible for obtaining the information. I believe the submitted information is true and accurate and complete. I am aware that there are significant penalties for submitting false information including the possiblity of fine and imprisionment.

This certification must be signed by the principal executive officer or authorized agent.

APPENDIX I

PERSONNEL TRAINING
Description of Training Program

PERSONNEL TRAINING
Description of Training Program

Orientation	20-minute video overview of basic plant operations and safety regulations. Completed first day of employment; usually done during 24-hour intital training.
24-Hour Initial	24-hour initial classroom and practical instruction covering safety and regulatory requirements for working within a mining and a TSD/RCRA facility. This is conducted prior to working without direct supervision and is a one-time training session.
8-Hour Initial Supervisory	8-hour classroom and practical instruction to be given after 24-hour training is completed. This course is designed for supervisory personnel to ensure compliance with RCRA operations. This course covers RCRA regulations, compliance, emergency response, and review of our contingency plan.
Emergency Response-Operations Level	8-hour classroom and practical instruction designed to prepare individuals to properly handle accidental releases of hazardous materials. A refresher is completed yearly.
CPR/First Aid	9 & 3 hour classroom and practical instruction, respectively. Covers CPR and first aid for supervisory personnel required to respond to a medical emergency. CPR is repeated yearly; first aid is repeated every three years.
8-Hour Refresher	8-hour classroom and practical instruction serving as a "refresher" to 24-hour training. Basic safety procedures are reviewed in addition to covering any new regulations or procedures. This is completed on a yearly basis.
DOT	3-hour classroom instruction covering proper labeling, handling, shipping and transporation of hazardous materials. This is also included in Emergency Response.

Table I-1

Levels of Training for Hazardous Waste Personnel

Job Title	Orientation	24 Hour Initial	8 Hour Initial Supervisry	Emergency Response	CPR and First Aid	8 Hour Refresher	DOT
Director of Operations	Y	Y	Y	Y	N	Y	Y
Receiving Manager	Y	Y	Y	Y	Y	Y	Y
Director of Compliance	Y	Y	Y	Y	Y	Y	Y
Safety Manager	Y	Y	Y	Y	Y	Y	Y
Compliance Coord.	Y	Y	Y	Y	Y	Y	Y
Kiln Super.	Y	Y	Y	Y	Y	Y	Y
Lab Manager	Y	Y	Y	Y	Y	Y	Y
Lab Tech.	Y	Y	N	N	N	Y	Y
Receiving Tech.	Y	Y	N	Y	N	Y	Y
Trunnion Operator	Y	Y	N	Y	N	Y	Y
Burner Operator	Y	Y	N	Y	N	Y	Y
I&E Tech.	Y	Y	N	N	N	Y	N
Q/A Tech.	Y	Y	Y	Y	Y	Y	Y
Runner	Y	N	N	N	N	N	Y

APPENDIX J

NORLITE INSPECTION REPORT FORMS

Storm Water Discharge Check Sheet

Discharge Date _____

Start Time _____

End Time _____

Discharge Location _____

Reporting Person _____

Approval to Discharge _____ (Compliance Coordinator or Supervisor Signature)

(Note: Discharge Approval Must Be Obtained Prior To Discharge)

Description of Impounded Water Prior to Discharge

(Describe color, any presence of sheen, turbidity, etc.)

Note: If sheen is present notify Supervisor or Compliance for approval to discharge.

_____

_____

_____

_____

_____

Condition of Remaining Water in Impoundment

(Note color, presence of sheen, turbidity, etc.)

_____

_____

_____

_____

_____

Comments

_____

_____

_____

_____

_____

Compliance Review _____ **Date** _____

Note: Return Completed Form to Compliance

Kiln 1 2 Burner_____ Shift A B C D Date_____

TIME:												
LGF gpm												
#4 Oil gpm												
Gas												
Clinker Wt.												
Shale Tons per Hour												
Backend Temp												
Flame Temp												
Hood Pressure												
Atom. Air psi												
Cooler Temp												
B.H. Inlet Temp												
Heat Exch Temp												
Scrub Quench Temp												
B.H. DP (in W.C.)												
Venturi gpm												
Scrubber pH												
ID Fan Amps												
ID Fan Speed												
Barron Fan Amps												
Barron Damper												
Cooler Speed												
Oxygen %												
CO continuous												
CO HRA												
Analyzer #1 or #2												
E. Cooler Fan %												
W. Cooler Fan %												

	End	Start	Total
Shale Feed			
Gas Meter			

I. D. Fan Damper Position Fixed at 58% Open

Down Time Log

Time	Time	Reason for LGF Down Time

Time	Time	Reason for Shale Feed Down Time

Shift _____ Trunnion Operator Shift Log Date _____

Name:_____

Pier	Kiln 1 Trunnion	Oil Level OK	Amount Added	Temp. (optional)
Discharge	N. E.			
Discharge	N. W.			
Discharge	S. E.			
Discharge	S. W.			
Feed	N. E.			
Feed	N. W.			
Feed	S. E.			
Feed	S. W.			

Pier	Kiln 2 Trunnion	Oil Level OK	Amount Added	Temp. (optional)
Discharge	N. E.			
Discharge	N. W.			
Discharge	S. E.			
Discharge	S. W.			
Middle	N. E.			
Middle	N. W.			
Middle	S. E.			
Middle	S. W.			
Feed	N. E.			
Feed	N. W.			
Feed	S. E.			
Feed	S. W.			

Pump & Blower Oil Level			
	OK	ADDED	On/Off
Soda Ash Pump A			
Soda Ash Pump B			
Lime Blower A			
Lime Blower B			
Lime Blower C			
Lime Blower D			
K1 B.H. Blower A			
K1 B.H. Blower B			
K2 B.H. Blower A			
K2 B.H. Blower B			
K1 M/C Blower A			
K1 M/C Blower B			
K2 M/C Blower A			
K2 M/C Blower B			

	Greased? Y/N	
	Kiln 1	Kiln 2
Bull Gear		
East Bearing		
West Bearing		
ID Fan Bearings		
Tire Fan Bearings		
Barron Fan Bearings		
Barron Dust Valve		
Soda Ash Bearings		
CONVEYORS		
Shale Converyor 1		
Shale Conveyor 2		
Shale Conveyor 3		
Kiln 1 Clinker		
Kiln 2 Clinker		

DO NOT GREASE ELECTRIC MOTORS

Shift _____ Trunnion Operator Shift Log Date _____

		Order Y/N
Lime Silo Level		
Soda Ash Silo Level		

City Water Usage	Start	End	Total Gallons
Kiln 1 Scrubber			
Kiln 2 Scurbber			
Soda Ash Make Up			
Cooling Water			

Housekeeping

	OK	Cleaned
MCC Rooms		
Scrubber Buildings		
Piers Cleaned		
Catwalks Cleaned		
#4 Oil Room		
K1 Clinker Tunnel		
K2 Clinker Tunnel		
Shale Silo		
Trunnion Room		

Comments: _____

Scrubber	
K1 Recycle GPM	
K2 Recycle GPM	
K1 Blowdown GPM	
K2 Blowdown GPM	
K1 Recycle Pump	A / B
K2 Recycle Pump	A / B

Baghouse	Kiln 1	Kiln 2
Mod. A diff. press.		
Mod. B diff. press.		
Mod. C diff. press.		
Overall diff. press.		
Air Pressure		
Cleaning (Y/N)		

Soda Ash Tank	ON	OFF
North Mixer		
Middle Mixer		
South Mixer		

Soda Ash Concentration	
Time	%

Compressors	Air Filter	Temp.	Oil Level
K1 QUINCY			
K2 QUINCY			
K2 Ingersol Rand			

Fuel Operator's Daily LGF Inspection Report

Date:_____ Inspected by:_____

Item	Acceptable Yes	Acceptable No	Status	Action
Lower Pump Pad				
Valves				
Pumps				
Piping and Fittings				
Drip Pans				
Pump Pressure				
Tank 300 In ____ Out ____				
Tank 400 In ____ Out ____				
Tank 500 In ____ Out ____				
Tank 600 In ____ Out ____				
Concrete Pad				
Housekeeping				
Fire Extinguisher				
LGF Storage Building				
Any Leaks?				
Odd Sounds?				
[illegible]mps				
[illegible]ping				
Sumps				
Fire Extingusihers (2) Upstairs and Downstairs				
Housekeeping				
Nitrogen Pressure Gauge and Nitrogen Pressure Regulators				
Nitrogen Tank Level				
Tank 100 A In ____ Out ____				
Tank 100 B In ____ Out ____				
Tank 100 C In ____ Out ____				
Tank 200 A In ____ Out ____				
Tank 200 B In ____ Out ____				
Tank 200 C In ____ Out ____				
Pump Pressure				
Tank 100 C In ____ Out ____				
Tank 200 C In ____ Out ____				
Fuel Farm				
Security - Fence - Signs				
[illegible]ousekeeping				
[illegible]ping and Fittings				
Valves				

Fuel Operator's Daily LGF Inspection Report

Date:_____ Inspected by:_____

Item	Acceptable Yes	Acceptable No	Status	Action
Hoses				
Any Leaks?				
Odd Sounds?				
Nitrogen Pressure Gauge and Nitrogen Pressure Regulators				
Tank 300 In ____ Out ____				
Tank 400 In ____ Out ____				
Tank 500 In ____ Out ____				
Tank 600 In ____ Out ____				
Container Storage Truck Unloading Area				
Filters				
Gorator	Not In Use			
Hazardous Drums (No. of)				
Non-Haz. Drums(No. of)				
Secure Lids				
Proper Aisle Space				
Proper Labeling				
Corrosion-Leakage				
Drainage-Groundwater				
Equalizaton Tanks	Not In Use			
Any Leaks?	Not In Use			
Odd Sounds?	Not In Use			
Pumps	Not In Use			
Piping	Not In Use			
Sumps	Not In Use			
Housekeeping	Not In Use			
Nitrogen Pressure Gauge and Nitrogen Pressure Regulators				
Tank 101 A In ____ Out ____	Not In Use			
Tank 101 B In ____ Out ____	Not In Use			
Tank 102 A In ____ Out ____	Not In Use			
Tank 102 B In ____ Out ____	Not In Use			
Pump Pressure	Not In Use			
Tank 101 A In ____ Out ____	Not In Use			
Tank 101 B In ____ Out ____	Not In Use			
Tank 102 A In ____ Out ____	Not In Use			
Tank 102 B In ____ Out ____	Not In Use			

FUEL FARM SHIFT REPORT

DATE: SHIFT: OPERATOR:

TIME				
I. TANK LEVELS				
TK 3 (FEET-INCHES)				
TK 4 (FEET-INCHES)				
TK 5 (FEET-INCHES)				
TK 6 (FEET-INCHES)				
TK 100A (GAL)				
TK 100B (GAL)				
TK 100C (GAL)				
TK 200A (GAL)				
TK 200B (GAL)				
TK 200C (GAL)				
# 1 AUX FUEL - FUEL FARM (GAL)				
# 2 AUX FUEL - KILN (GAL)				
LIME FEED RATE KILN 1				
LIME FEED RATE KILN 2				
II. KILN FEED TK. NO.				
KILN 1				
KILN 2				
III. EMPTIED WATER PANS AND REMOVED STANDING WATER				

IV. SWITCHED TANKS	TIME	FROM	TO	FEEDING KILN(S)?

V. OTHER TANKS				
FIRE DAY TK LEVEL				
NITROGEN TK LEVEL				
HEATER DAY TK LEVEL		FILLED ?	TIME	

COMMENTS: ANY LEAKS, ODD NOISES, HIGH PRESSURES, PROBLEMS, ETC.