1992.04.01 SPDES permit

91-20-2 (2/86)—30a

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

STEVE VOGEL

State Pollutant Discharge Elimination System (SPDES)
DISCHARGE PERMIT
Special Conditions (Part 1)

Industrial Code 1422
Discharge Class (CL) ~~08~~ 01
Toxic Class (TX) 04
Major D.B. 13
Sub D.B. 01
Water Index Number H-239

Facility ID Number: NY- 000 4880
UPA Tracking Number: 41-86-0067
Effective Date (EDP): April 1, 1987
Expiration Date (ExDP): April 1, 1992
Modification Date(s): August 7, 1987
Attachment(s): *General Conditions (Part II, 2/85)*

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").

Attn: Jeffrey Frazer, Tech. Dir.

Permittee 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: Norlite Corporation

Location (C,~~T~~,V): Cohoes County: Albany

Mailing Address (Street): 628 South Saratoga Street

Mailing Address (City) Cohoes State: NY Zip Code: 12047

from Outfalls

from Outfall No. 001 at: Latitude 42°45'14" & Longitude 73°40'20"

into receiving waters known as: Salt Kill Creek, Class D

and: (list other Outfalls, Receiving Waters & Water Classification)

003 Salt Kill Creek Class D 42°45'14"/73°40'20"

in accordance with the effluent limitations, monitoring requirements and other conditions set forth in this permit.

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 as prescribed by Sections 17-0803 and 17-0804 of the Environmental Conservation Law and Parts 621, 752, and 755 of the Departments' rules and regulations.

PERMIT ADMINISTRATOR	DATE ISSUED	ADDRESS Region IV Headquarters
Jeffrey J. Sama	Aug. 7, 1987	2176 Guilderland Avenue Schenectady, NY 12306

Distribution:
DOW - A. Geisendorfer
R. Hannaford, Rm 318
DOH - Albany
DRA
Dr. Baker

SIGNATURE

ADDITIONAL REQUIREMENTS

1a. The permittee has installed four groundwater monitoring wells in the vicinity of the scrubber recycling pond. The location of these wells are shown on page 3 of 5. Water quality samples will be obtained quarterly and analyzed for the following parameter as described below:

Water level in the well (Monthly)
Total Organic Carbon
pH
Sulfate
Cadmium, Total
Barium, Total
Iron, Total
Manganese, Total
Temperature
Lead, Total
Selenium, Total
Chloride
Conductivity

b. The results of groundwater analysis shall be submitted no later than the 28th day of the following month and shall be included with the Discharge Monitoring Report.

2. By EDP + 6 months, the permittee shall submit a Best Management Plan (BMP) to minimize the potential for the generation and discharge of coal pile runoff and leachate at this facility. A copy of the plan shall be submitted to the NYSDEC Central Office (BWFD), the NYSDEC Region 4 office and to the Albany County Health Department.

3. By EDP + 1 year the permittee shall submit the results of a priority pollutant analysis of settling pond wastewater and discharge 001 during a discharge event during or immediately preceding a discharge from 001 of recycling pond wastewater. The priority pollutant analysis need not include the pesticide fraction or dioxin. Severing the connection between the settling pond and the middle pond may be substituted for the above requirement.

4. The permittee shall maintain a log of discharge flow from the settling pond. Date and time of occurrence, duration of discharge flow rate and discharge flow volume shall be recorded. This log shall be appended to the Discharge Monitoring Report.

MONITORING, RECORDING AND REPORTING

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 sampling for subsequent inspection by the Department or its designated agent.

☒ Summarized and reported by submitting completed and signed Discharge Monitoring Report forms once every 1 month(s) to the locations specified below. Blank forms available at department offices listed below.

The first report will be due no later than May 28, 1987

Thereafter, reports shall be submitted no later than the 28th of the following month(s): each month.

Department of Environmental Conservation
Regional Water Engineer
2176 Guilderland Avenue
Schenectady, NY 12306

Albany County Health Dept.
Director, Division of Env. Health Srvs
South Ferry & Green Streets
Albany, NY 12201

Department of Environmental Conservation
Division of Water
50 Wolf Road,
Albany, New York 12233

☒ (Applicable only if checked)

Dr. Richard Baker, Chief
Permit Administration Branch
Planning & Management Division
USEPA Region II, 26 Federal Plaza
New York, New York 10278

c) If so directed, Monthly Wastewater Treatment Plant Operator's Reports should be submitted to the Regional Engineer and County Health Department or County Environmental Control Agency specified above.

d) Monitoring must be conducted according to test procedures approved under 40 CFR Part 136, unless other test procedures have been specified in this permit.

e) If the permittee monitors any pollutant more frequently than required by the permit, using test procedures approved under 40 CFR 136 or as specified in the permit, the results of this monitoring shall be included in the calculations and recording of the data on the Discharge Monitoring Reports.

f) Calculations for all limitations which require averaging of measurements shall utilize an arithmetic mean unless otherwise specified in this permit.

g) 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.

h) On or after April 1, 1984, any laboratory test or sample analysis required by this permit for which the State Commissioner of Health issues certificates of approval pursuant to section five hundred two of the Public health Law shall be conducted by a laboratory which has been issued a certificate of approval. Inquires regarding laboratory certification should be sent to the Laboratory Certification/Quality Assurance Group, New York State Health Department Center for Laboratories and Research, Division of Environmental Sciences, The Nelson A. Rockefeller Empire State Plaza, Albany, New York 12201.

Norlite Corporation

628 SO. SARATOGA ST.
P.O. BOX 694
COHOES, N.Y. 12047
TEL.: (518) 235-0401
FAX.: (518) 235-0233

March 17, 1992

WJZ-034-93

Mr. William Clarke
Regional Permit Administrator
New York State Department of
Environmental Conservation
Region 4
2176 Guilderland Ave.
Schenectady, NY 12306

RE: Request for Delay in Completion Deadline for Construction of Wastewater Plant in order to Investigate Zero Discharge Option for Scrubber Water Management.

Dear Mr. Clarke:

I. **Introduction**

Norlite believes it is technically feasible to discharge the scrubber water directly to the kilns resulting in a zero discharge of scrubber water at the site. This option would be environmentally sound and eliminate the need for a wastewater treatment plant.

As proposed at our meeting of March 3, 1993, Norlite would like to determine the feasibility of this zero discharge option for management of the scrubber water from Kilns No. 1 and 2. Since the only significant source of metals in all of the wastewater discharge streams from Norlite originates only from the scrubber blowdown, an alternative means of managing this blowdown eliminates the need for a wastewater treatment plant. Note that the following outfalls, which comply with effluent discharge standards currently without treatment, would continue.

Outfall 001 - Non-contact cooling water, boiler blowdown and stormwater
Outfall 003 - Quarry water
Outfall 004 - Shale fines leachate

Outfall 005, "Air Pollution Control Saline Water", would be eliminated, if the zero discharge option proposed by Norlite proved viable.

II. Nature of Proposed Zero Discharge Option

Norlite currently has limits on the maximum kiln back end temperature, (Condition VIID(1) of the Part 373 Permit). Maintaining this maximum back end temperature limit requires the injection of up to 13 gpm of cooling water directly to the kiln. Norlite is currently operating in this manner on a regular basis, and also operated in this manner during the low temperature condition of the recent trial burn in the fall of 1992.

It is proposed to replace the cooling water with the scrubber blowdown stream. The minimum scrubber blowdown rate of 4.4 gpm is consistent with the minimum cooling water demand of the kiln to control back end temperature. The scrubber blowdown consists only of water, chloride salts and metals, and does not contain hazardous organic constituents. The water would be evaporated, and the metals and salts in the scrubber blowdown would be collected in the baghouse as a particulate, or deposited in the shale feed and incorporated with the clinker. Calculations are provided below to demonstrate the minimal impact on emissions of the metals and salts in the blowdown.

III. Factors Affecting Emission

The metal feed rates from the scrubber blowdown that would be introduced to the kiln are insignificant compared with metals feed rates from the shale and LGF, as summarized below:

Impact of Scrubber Blowdown Feed on Allowable Metal Feed Rates and Emissions

	Metals Contribution from Scrubber Blowdown, lbs/hr	LGF Metals Feed Limit, lbs/hr	Shale Metals Feed Limit, lbs/hr	% of Total Metal Feed Limits Represented by Scrubber Water
Sb	.0020	0.24	.0088	0.80
As	.0017	0.12	5.63	0.030
Ba	.0016	0.72	51.0	0.0031
Be	.0002	0.0058	0.132	0.15
Cd	.000033	0.144	0.092	0.014
Cr	.0017	2.4	2.16	0.037
Cu	.0018	4.8	1.83	0.027
Pb	.0017	2.69	2.3	0.034
Hg	.0000638	0.216	0.0352	0.025
Ni	.0013	2.88	4.18	0.018
Se	.0017	0.12	0.0528	0.98
Ag	.0013	0.096	0.132	0.57
Tl	.0017	0.24	0.0881	0.52
Zn	.0027	4.8	3.79	0.031

The above scrubber blowdown data is from the trial burn during which all metals were introduced to the kiln at their maximum permitted feed rates. The increase in metal loading to the kiln averages 0.24% which will have an insignificant impact on emissions. The more common metals, lead, chromium, cadmium, nickel, copper, and zinc, represent an increase of only 0.027%. The metals loading from the scrubber water will therefore result in no significant increase in metal emissions. Despite this fact, Norlite proposes to plan the LGF feed rate by factoring in the metals contribution from the scrubber blowdown feed, such that the total metal feed rate to the kiln does not change. Therefore, there is no increase in metal feed rates or metal emission rates resulting from the use of scrubber blowdown as kiln cooling water.

The only other significant compound present in the scrubber blowdown is sodium chloride. When feeding organic bound chlorine from LGF at 440 lbs/hr, as demonstrated during the trial burn, the blowdown contains 160 lbs/hr chloride, or 36% of the original halogen feed in the waste. This chloride in the scrubber blowdown is present as stable alkali metal salts. Acid gas or HCl vapors form from organochlorine compounds present in the waste feed, which combust to form HCl and pass through to the lime in the baghouse and the scrubber water. In contrast, the sodium chloride present in the scrubber water will not combust, but will form particulate salt which will be dispersed in the aggregate. This 160 lbs/hr chloride equates to 265 lbs/hr of sodium chloride. However, the shale contains 4.1% alkali metal salts indigenous to the shale. The scrubber blowdown will therefore increase the salt content of the aggregate from 4.1% to 4.6%.

Sodium chloride does not dissociate under heat, but remains a stable compound. Its boiling point is 2600°F, which greatly exceeds the kiln exit temperature by 1500°F, so the NaCl will tend to remain dispersed as a particulate in the kiln. There is therefore no potential for buildup of concentration of the chloride in the scrubber water or baghouse lime over time. There will therefore be no impact on the removal efficiency of the APC system.

IV. Fate of Metals

The fate of the additional metals in the scrubber blowdown injected into the kiln is expected to be insignificant, as the average change in metal loading to the kiln is only increased by 0.23%. Since Norlite will plan the metals feed to stay within the total metal limits, there will be no concern for additional metal loading in the scrubber, or for metals concentrating in the scrubber water.

An evaluation of the trial burn data to determine the fate of the metals shows that only 0.3% of the metals end up in the scrubber water, with 7 to 14% of the metals partitioning in the APC dust, and the balance remaining in the clinker, primarily the fraction initially associated with the shale feed. The test data therefore supports that the metals will not build up in the scrubber water blowdown over time, particularly since the total feed rate of metals will be held within the allowable LGF feed rate limits, i.e., the metal feed rate from the scrubber water plus the LGF will not exceed the LGF feed rate limits.

V. Waste Feed Rate

As there are no organics in the scrubber blowdown, Norlite believes that the feed rate is not subject to the permit requirement limiting low grade fuel fed to the kilns. Therefore, scrubber water would be excluded from the determination of compliance with the limit of LGF feed rate.

VI. Schedule

It is requested that DEC allow Norlite a period of 8 months to evaluate this option, during which period construction of the wastewater treatment plant would be suspended. During this time Norlite will install the necessary piping to route the scrubber water blowdown to the kiln cooling water system, and will operate in this manner to evaluate any potential problems with this approach. During this period of operation, samples of the baghouse dust and scrubber water will be taken for metals analysis to confirm that metals are not concentrating in these streams over time. If the metals content of the baghouse and scrubber blowdown remains relatively constant, and operations using scrubber water as cooling prove to be stable, then Norlite proposes to proceed with this approach permanently. Upon confirmation of these results, a report will be submitted to DEC along with a request to modify the SPDES permit by eliminating Outfall 005 and the kiln 1 alkaline scrubber water blowdown from Outfall 001.

This option eliminates the need for a major capital investment in a wastewater treatment plant, and also eliminates concern for effluent management when the stream is reclassified in the future. A zero discharge option is environmentally superior and will allow Norlite to comply with the intent of the SPDES permit compliance schedule much earlier than November 1993.

We are available to meet to further discuss the details of this zero discharge process. If you have any questions, please contact Bill Voshell or myself.

Sincerely,

William J. Ziegler

William J. Ziegler
Vice President of Health, Safety
and Environmental Affairs

WJZ:ncm

cc: Sanjay Saraiya, NYSDEC Wolf Road
Carol Lamb-LaFay, NYSDEC, Region 4, Schenectady
Donald Faul
William Voshell
Mark Taylor
Larry Small
Dallas Robinson
Rich Schlauch

Norlite Corporation

A ROTARY KILN "Norlite" EXPANDED SHALE AGGREGATE

P.O. BOX 694 628 SO. SARATOGA ST. COHOES, N. Y. 12047 TEL.: (518) 235-0401

December 27, 1991

RS-074-91

William J. Clarke
Regional Permit Administrator
New York Department of Environmental Conservation
Region IV
2176 Guilderland Avenue
Schenectady, New York 12306

SUBJECT: Comments Regarding Norlite 373 and SPDES Permit - Factors Affecting Solubility of Heavy Metal Ions in Scrubber Waters from Thermal Combustion Process Off-gases

Dear Mr. Clarke:

During the process of finalization of the draft permit conditions for Norlite's Part 373 and air permits, it became apparent that the DEC Division of Water has expressed concerns over increases in the allowable feed rates of certain metals in low grade fuel used by Norlite to operate the LWA kiln.

We would like to provide the Division of Water with the technical rationale as to why it should be expected that the concentrations of these metals will not increase in the discharge for Outfall 005. In providing this technical rationale, Norlite emphasizes that we fully intend to install wastewater treatment capability for the SPDES discharge. Norlite provides these comments mainly to clarify that the higher metal limits in the LGF feed will have no adverse impact on the effluent discharge to Outfall 005, even prior to installation of the wastewater treatment facilities. For this reason, Norlite requests that the Additional Special Condition No. 2 of the SPDES Permit Modification, and the same special condition in the Part 373 permit, be eliminated since the higher LGF metals limits will not have a negative impact on the effluent quality from Outfall 005. The technical basis of this conclusion is provided as follows.

Discussion of Theory of Fate of Metals in Water Outfall

During thermal combustion of material containing heavy metals, where oxygen is constantly available during the combustion process, the metal oxides of the non-refractory metal will form since these are the most thermodynamically stable form of the metals under these conditions. Depending on the specific metals present and the characteristics of other materials being combusted some percentage of these combustible metals forming oxides can be carried by the off-gas stream to the scrubber water phase in either gaseous or particulate form. Whether or not any of these metals exist in the gaseous metal oxide state in the off-gas depends on the temperature of the off-gas. In as much as the off-gas scrubbing process is carried out under conditions that maintain the scrubber water in the liquid phase, the metal oxides in both the liquid and gaseous scrubber streams will be in the solid or particulate state as they exit the scrubbing process. This is necessary since the temperature of both the liquid and gas scrubbing streams exiting the scrubber are well below the boiling point of water. In general, these exit temperatures will be less than 190°F at which temperature it is impossible for any heavy metal (or heavy metal oxide) to exist in the gaseous phase.

Once in the particulate form, these metal oxides will partition into the scrubber liquid stream and remain primarily as suspended solids until they are physically removed by wastewater treatment processing. Most heavy metal oxides are essentially insoluble in the scrubber water and remain in this form because they are thermodynamically stable under these conditions. Some metal oxides have a slight degree of solubility in the scrubber water and form metal hydroxides as they dissolve in the scrubber water.

The solubility of any heavy metal, whether it exists in the scrubber water as the oxide or the hydroxide is controlled by a chemical equilibrium process between the solid and aqueous phases by a relationship known as the solubility product constant. No more metal can exist dissolved in the water phase than a specific concentration of metal as governed by these solubility product constants for each metal. For any metal, the solubilities of the metal oxides and hydroxides (defined as concentration of metal in solution) can be found by consulting text books in chemistry and various published handbooks such as the Chemical Rubber Company Handbook of Physics and Chemistry (i.e., CRC Handbook). There are also tables listing the specific solubility product constant of each metal ion in water at constant temperature and pH of the water solutions.

This means that no metal can exist in aqueous solution at concentrations higher than the solubility product relationship defined for that metal hydroxide, as long as pH and temperatures are controlled at the values specified for that solubility product constant. All excess metal present in the scrubber water that exists at concentrations greater than the solubility product constant allows for, has to exist as solid metal hydroxide. As long as the pH and temperature of the scrubber water are controlled, the concentration of any heavy metal in the scrubber water solution will be limited to a specific value. This value is the maximum concentration permitted by the pH and temperature conditions (basically the ionic activity) present in the water solution. The solubility of the metals is most affected by the pH of the solution. Temperature variations less than the boiling point of water have only a slight affect on the solubility of metal hydroxides. So as long as the pH is controlled at neutral to alkaline values the concentration of dissolved heavy metals in the scrubber water will be controlled (as shown by the attached Figure). Adding alkali (such as lime or caustic to the scrubber water) ensures that the metals are maintained in precipitated form.

Therefore, the concentration of heavy metals that will exist as dissolved species in the scrubber water is essentially independent of the mass of heavy metals in materials being combusted in the thermal combustion unit and in the off-gas stream entering the scrubber system. The concentration of heavy metal dissolved in the scrubber water is primarily dependent on the pH of the scrubber water. Dissolved metals are controlled to limited concentrations by maintaining neutral to alkaline conditions in the scrubber water and wastewater treatment system by automatic pH controls.

Application of Theory to Norlite's Discharge

The scrubber water from the air pollution control system for the Norlite lightweight aggregate kiln is required to be maintained at a pH of greater than 8.0, by the addition of lime as specified by condition C(7)(a) and (b) of Module VII of the Air Pollution Control and Hazardous Waste Management permit. As discussed above, metal solubility is dependent upon pH, and at alkaline pH, the metals are maintained in precipitated form. Therefore, the solubility product constant limits the amount of metals that will solubilize, at a given pH, and the solubility of metals is independent of the mass of precipitated metals.

Therefore, despite the higher metal limits in the LGF feed to the kiln and the resulting higher metal input rates to the scrubber; at the pH of the scrubber water controlled by permit conditions, the increase metals will remain in precipitated form, and not in soluble form. Therefore, the effluent concentration of metals will not increase significantly, as the solubility product constant limits the amount of metal that can solubilize.

In conclusion, therefore, the higher feed limits for copper, mercury, nickel, selenium and zinc proposed in the Module VII of the draft 373 permit will have no negative impact on the current quality of the effluent discharge to Outfall 005. For this reason, Norlite requests that Special Condition No. 2 be eliminated from the modified permit.

Sincerely,

William J. Ziegler

William J. Ziegler

RS:nm

cc: Carol Lamb-LaFay, NYSDEC Region IV
Richard Schlauch
Donald Faul
Mark Taylor

ACTIVE QUARRY

DISPOSAL AREA

DEWATERING AREA

Liner Material Borrow Area 10.6 Acres

Hole K-1
Orig. Elev. 248.0'

Hole N-0670
Orig. Elev. 183.0'

Hole N-0570
Orig. Elev. 208.5'

Hole N-0470
Orig. Elev. 198.5'

Hole N-0770
Orig. Elev. 174.0'

Hole N-0870
Orig. Elev. 176.0'

Hole N-0170
Orig. Elev. 221.0'

Hole N-0270
Orig. Elev. 212.5'

Hole C-4
Orig. Elev. 208.5'

Hole B-7
Orig. Elev. 207.0'

Hole A-6
Orig. Elev. 181.5'

B83-1

B83-2

B83-3

B83-4

B83-6

B83-6A

B83-7

B83-8

B83-9

B83-10

B83-10A

B83-11

B83-12

B83-13

PHASE 1A

PHASE 1B

PHASE 2

PHASE 3

Water Level El. 130.7'

FLOODED W.L. ~150'

Property Line

Niagara Mohawk Power Corp.

Town of Colonie
City of Cohoes

Delaware & Hudson Railroad

transformer

PK in pole El. 186.00'

Solvent Fuel Tanks

Catch Basin

Dike

office

No. 1

No. 2

No. 3

No. 4

No. 5

Leachate Pond

Make-up Lagoon

Mid Pond

Settling Pond

piles

pile

change house

storage

kiln

B-1

B-3

B-4

B-5

B-6

A-A'

B-B'

C-C'

D-D'

ACS Manhole

Bench Mark
USGS El. 38.91'
Plant Datum El. 184.44'

LEGEND:

- Limit of Fill and Two Foot Thick Liner
- 190 Final Contour
- Subgrade Contour
- △ Proposed Ground-Water Monitoring Well
- Salt Kill 100-year floodplain (rev. 1)

NOTES:

1. All grades are approximate and should not be used for construction without verification.
2. All grades are referenced to plant datum.
3. March 26, 1986 bid package to only include Phase I construction

PHOTOGRAMMETRICALLY COMPILED
BY
COL-EAST, INC.
BOSTON, PITTSFIELD, MASS.

0 100 200 300 400 500
1" = 100'

W. OF R.R. 5' C.I. E. OF R.R. 2' C.I.

HORIZONTAL & VERTICAL CONTROL IS LOCAL ARBITRARY
C-E NO. 5305
DATE OF PHOTO - NOV. 25, 1969

ATTACHMENT 2

REVISIONS:	BY:	DATE
1. Add Salt Kill 100 yr. floodplain	JPB	1/30/84
2. Add border of Liner Material Borrow Area	JEG	2/29/84
3. Add area of liner material borrow area	JEG	8/30/85
4. Note 3	DAM	3/26/86

James P. Behan, Jr. P.E.
N.Y.S. P.E. No. 049663

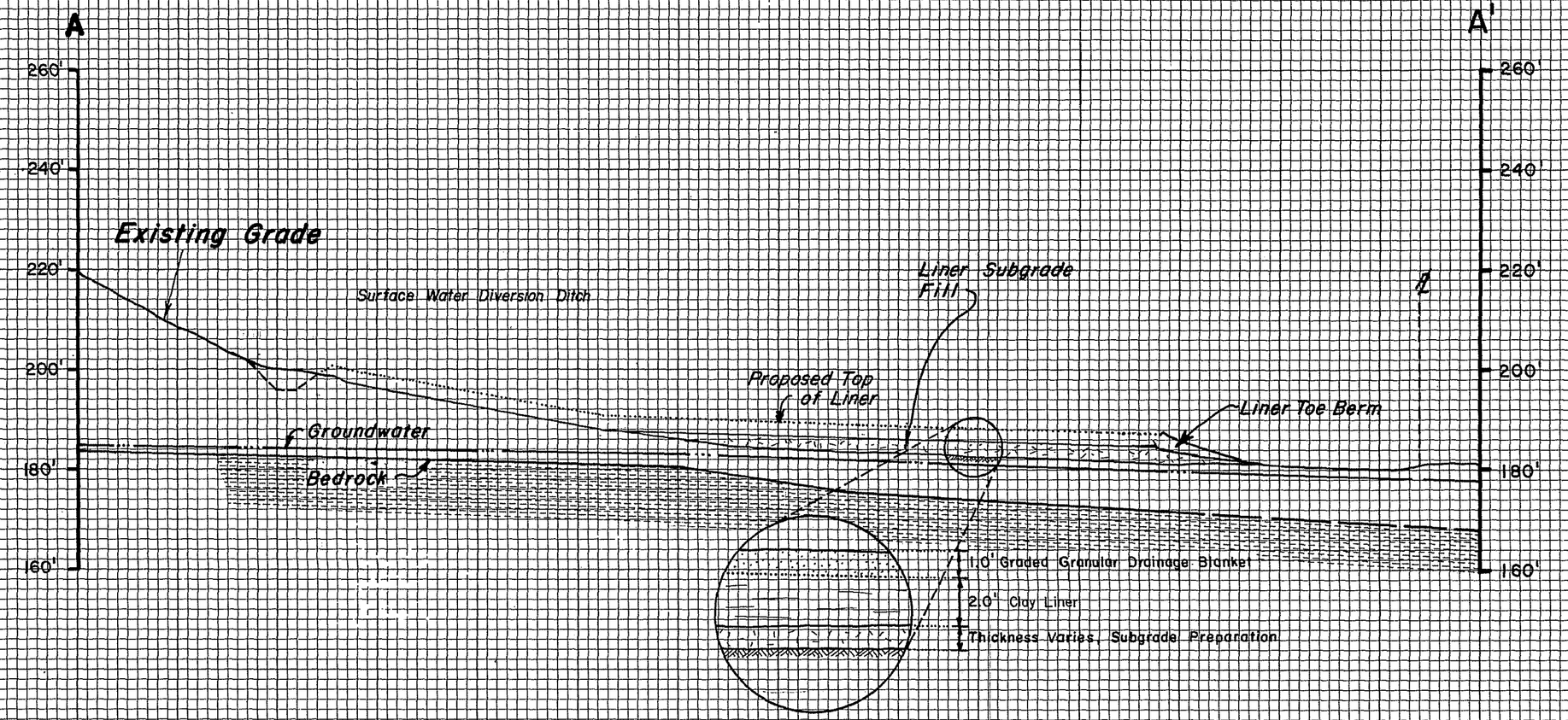
DUNN ENGINEERING COMPANY
5 Northway Lane North
Latham, N.Y. 12110

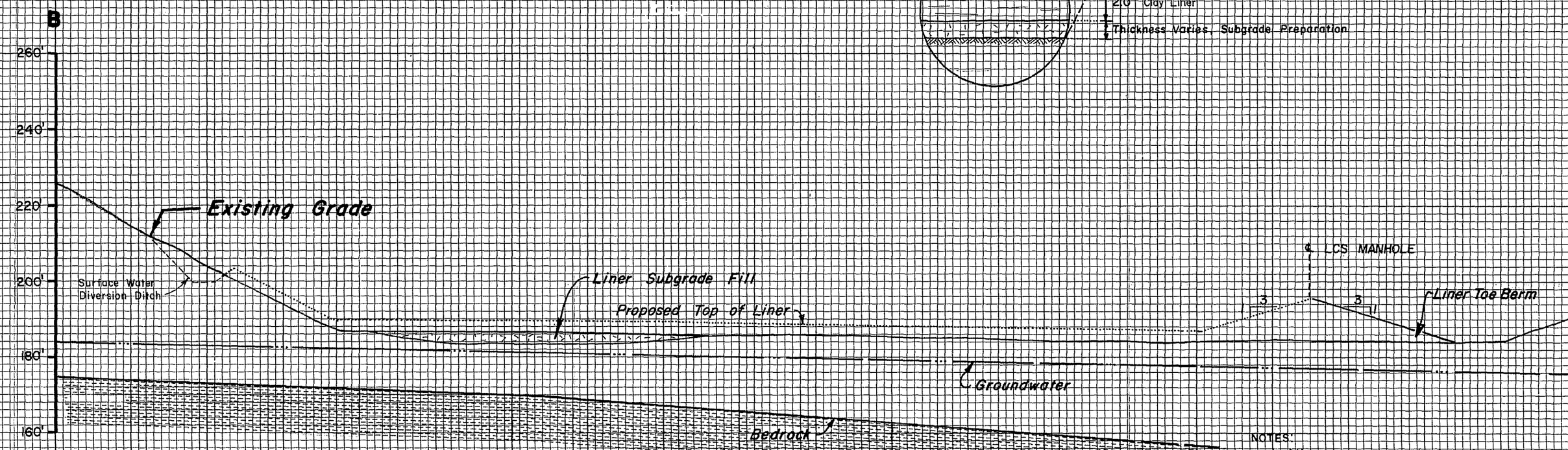
PROPOSED SHALE FINES DISPOSAL FACILITY PLAN

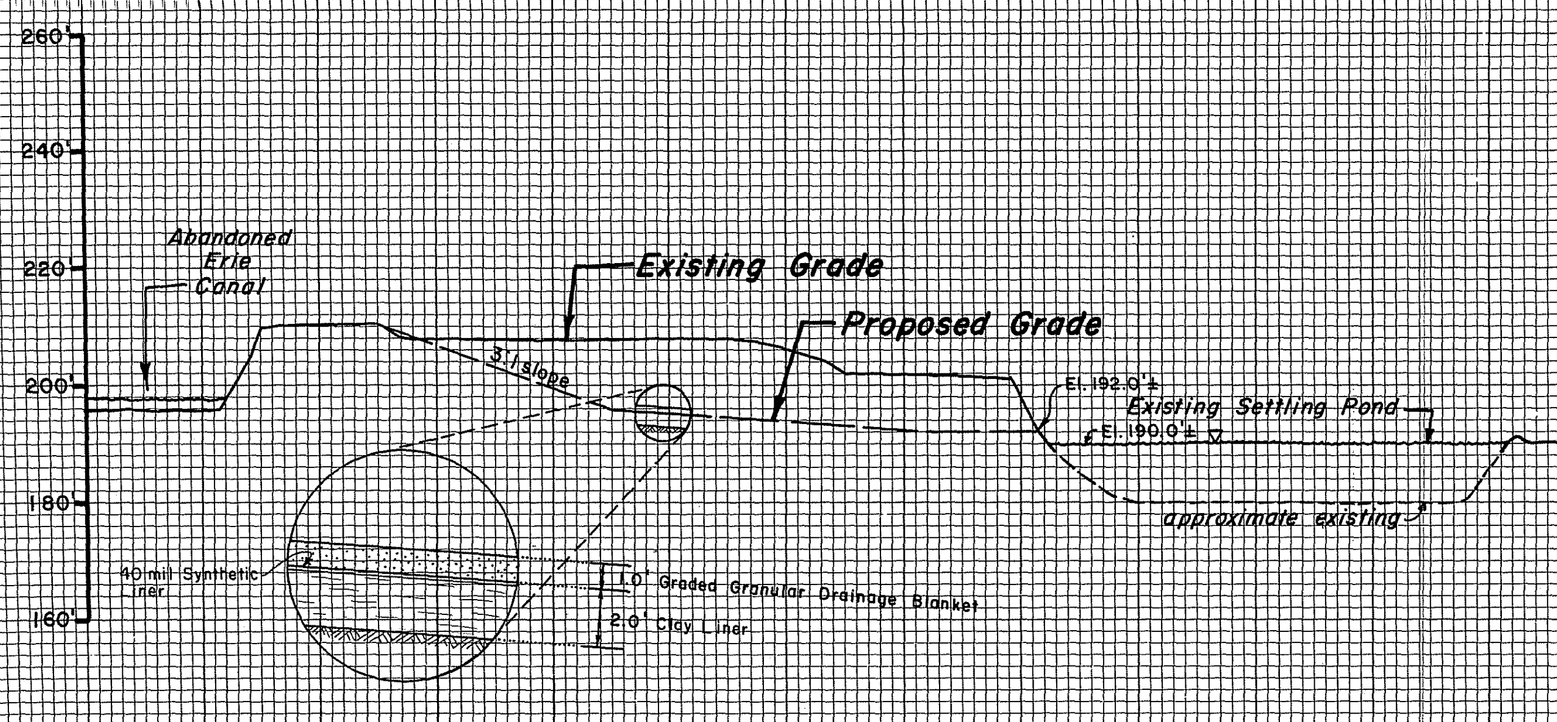
NORLITE CORPORATION

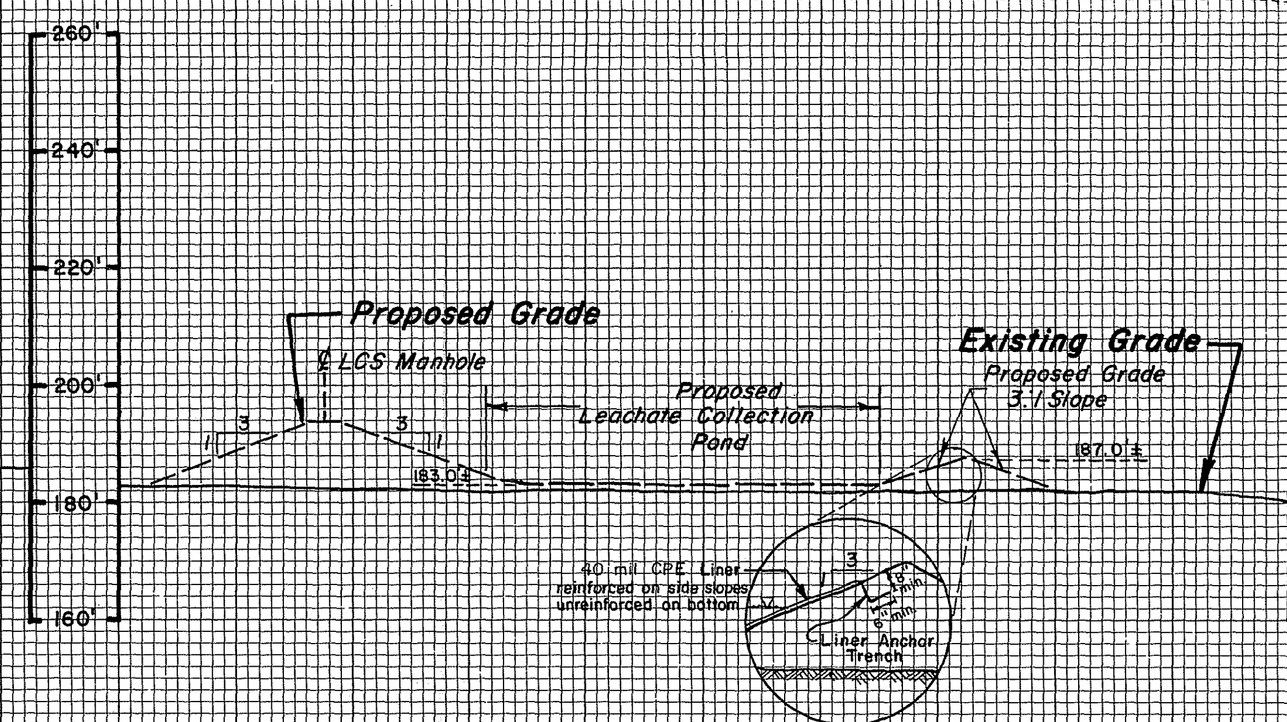
CITY OF COHOES — ALBANY COUNTY, N.Y.

PREPARED BY: James P. Behan, Jr.	SCALE 0 50 100 feet	PROJECT NO. 05-147-17-2702
DRAFTED BY: Robert W. Shuey	DATE Dec. 20, 1983	MAP NO. 6391
CHECKED BY: JPB		SHEET 1 OF 3









NOTES:

1. All grades are approximate and should not be used for construction without verification.
2. All grades are referenced to plant datum. See sheet 1 for USGS equivalency.
3. 3/25/86 bid package to only include Phase I construction.

Attachment 2A

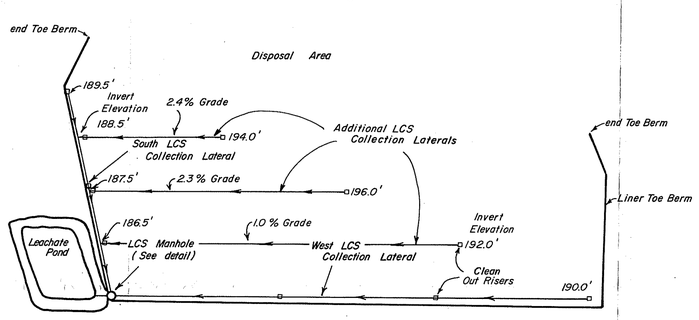
REVISIONS		BY	DATE
1	Miscellaneous	JPB	3/11/86
2	Note 3 & Diversion Ditch added	DAM	3/26/86
3	Permit Special Conditions	MPM	2/19/88
4	Pre Construction Revision		9/8/88

James P. Bacon, Jr. P.E.
NYS. P.E. No. 049865

DUNN ENGINEERING COMPANY
12 Metro Park Road
Albany, N.Y. 12205

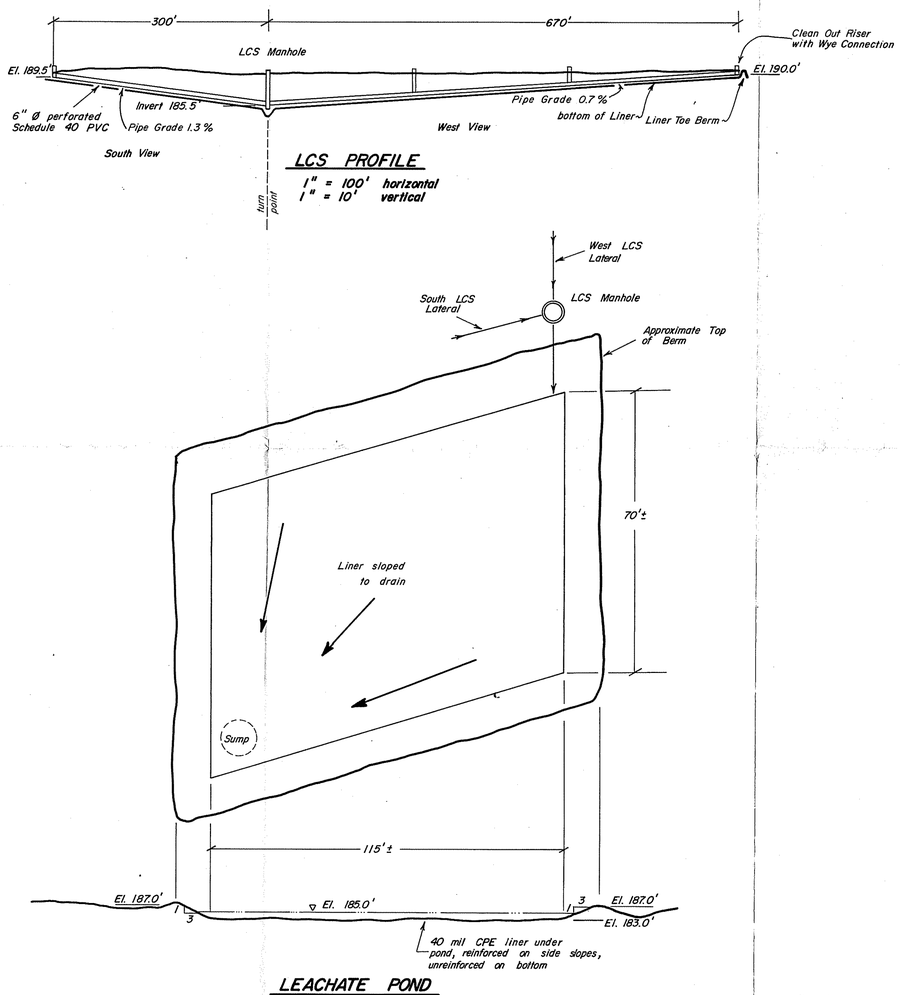
CROSS SECTIONS
NORLITE CORPORATION
CITY OF COHOES – ALBANY COUNTY, N.Y.

PREPARED BY:	James J.P. Bacon, Jr.	SCALE: 0 10 20 Feet	PROJECT NO. 85-147-17-2702
DRAFTED BY:	Robert W. Bluey		MAP NO. 6392
CHECKED BY:	JPB	DATE: Dec. 20, 1985	SHEET 2 OF 3



LEACHATE COLLECTION SYSTEM (LCS) SCHEMATIC

no scale

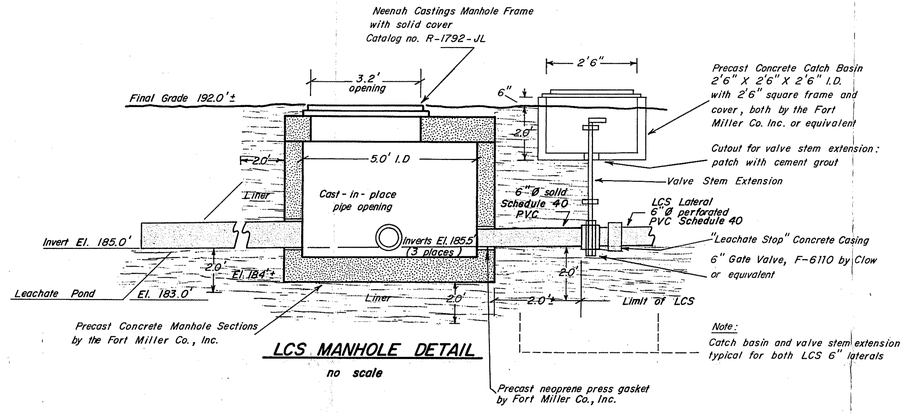


LCS PROFILE

1" = 100' horizontal
1" = 10' vertical

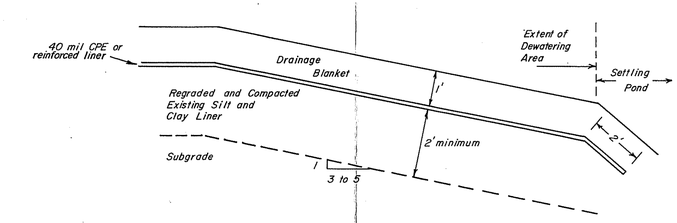
LEACHATE POND

no scale



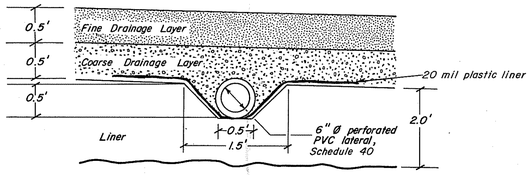
LCS MANHOLE DETAIL

no scale



DEWATERING AREA DETAIL

no scale



LCS LATERAL DETAIL

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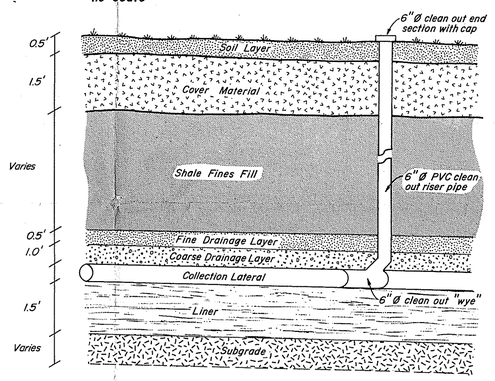
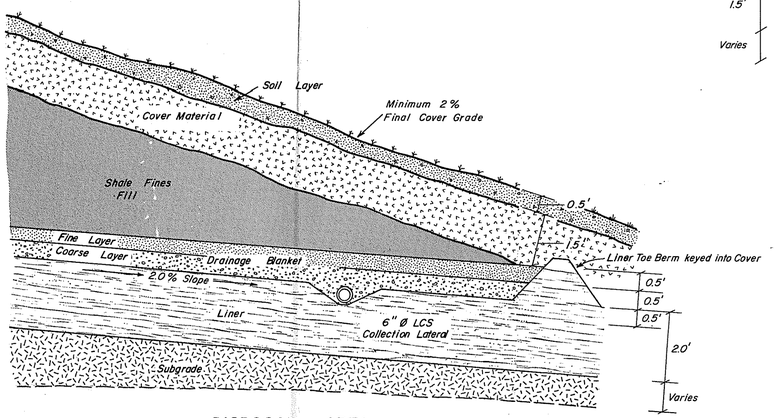


LCS LATERAL DETAIL WITH CLEAN OUT

no scale



DISPOSAL AREA TYPICAL SECTION

1" = 2'

NOTES:

1. Refer to Appendix B of Part 360 report for additional details.
2. Liner & Cover Materials Specifications presented in Section B.3.0 of the 1984, Part 360 Application as modified by subsequent correspondence.

REVISIONS:	BY:	DATE
1. Miscellaneous	JPB	3/11/85
2. Miscellaneous	RLH	6/21/85
3. Miscellaneous	JEG	9/4/85
4. Miscellaneous	DAM	3/26/86
5. Miscellaneous	MPM	2/19/88

James P. Behan, Jr. P.E.
N.Y.S. P.E. No. 049663

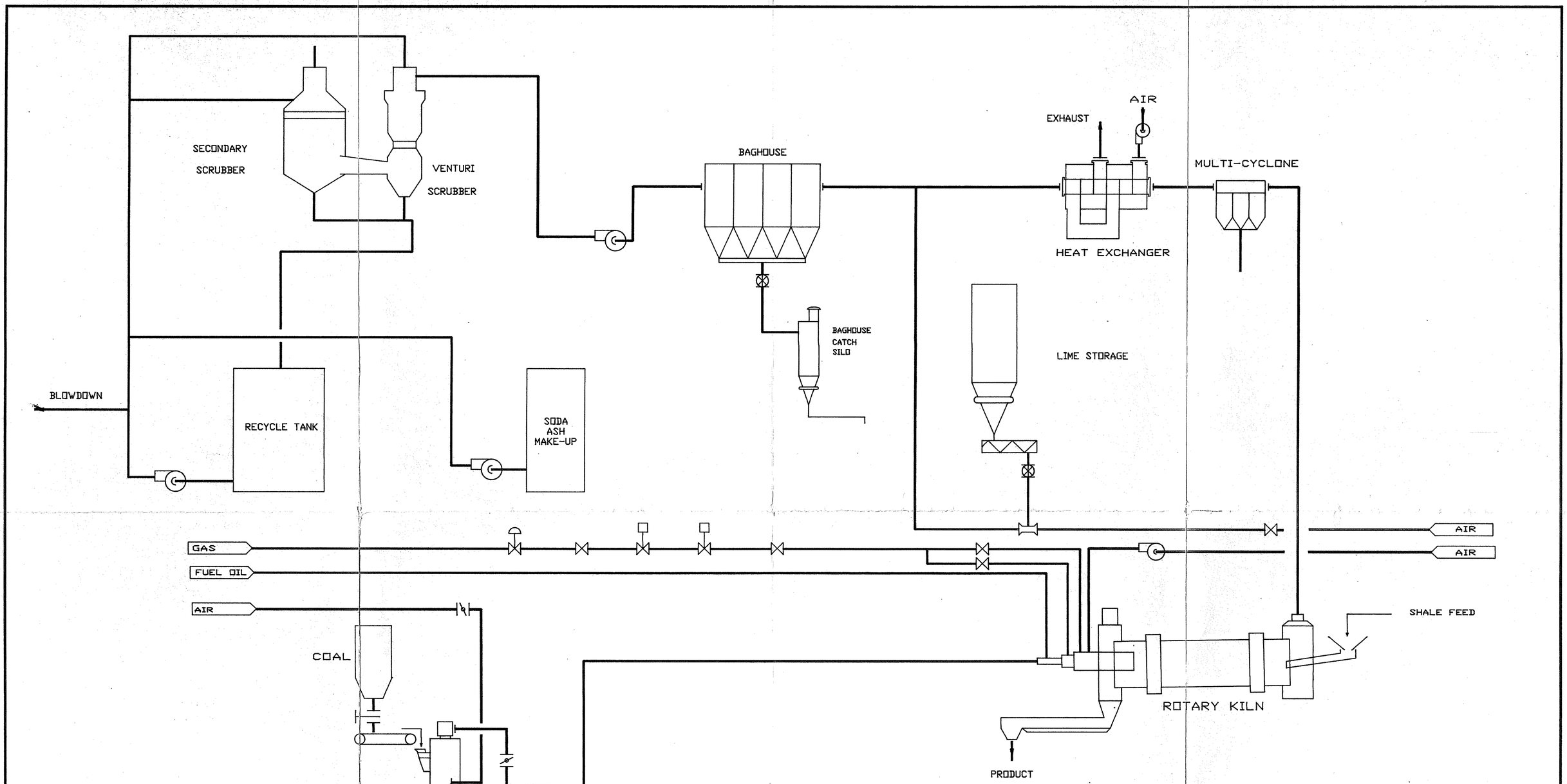
DUNN ENGINEERING COMPANY
12 Metro Park Road
Albany, N.Y. 12205

DETAILS

NORLITE CORPORATION

CITY OF COHOES — ALBANY COUNTY, N.Y.

PREPARED BY: James P. Behan, Jr.
DRAFTED BY: Michael T. Maksymik
CHECKED BY: JPB
SCALE 0 50 100 feet
DATE Jan. 6, 1984
PROJECT NO. 05-147-17-2702
MAP NO. 6403
SHEET 3 OF 3

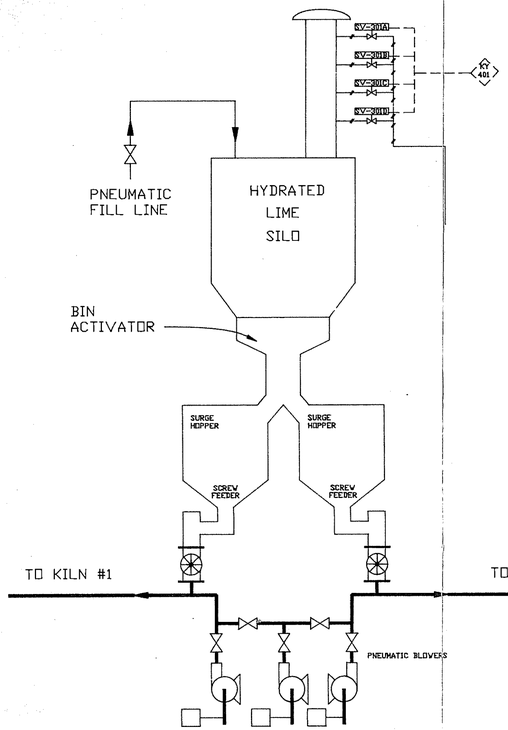


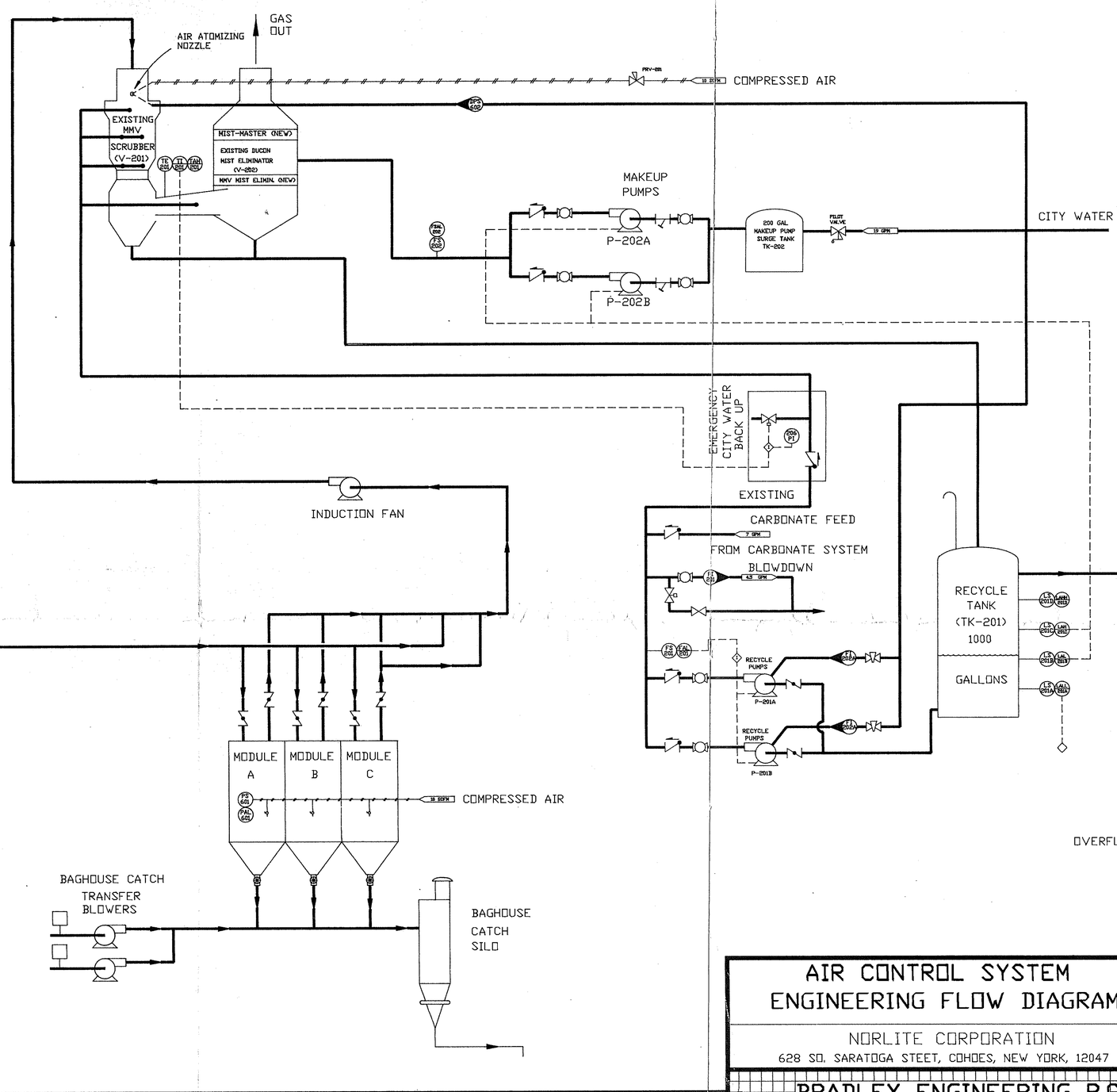
ROTARY KILN
ENGINEERING FLOW DIAGRAM

NORLITE CORPORATION
628 SO. SARATOGA STEET, COHOES, NEW YORK, 12047

BRADLEY ENGINEERING P.C.
RD 6, BOX 206
TROY, NEW YORK 12180

DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
JSB			JUNE 8TH, 1990
FILE : D:\NORLITE\NORKLN3	DWG. NO.	SHEET : 1 OF 1	SCALE: NONE





REV.	BY	DATE	DESCRIPTION	APPR'D	BY

AIR CONTROL SYSTEM ENGINEERING FLOW DIAGRAM

NORLITE CORPORATION

628 SO. SARATOGA STEET, COHOES, NEW YORK, 12047

BRADLEY ENGINEERING P.C.

RD 6, BOX 206

TROY, NEW YORK 12180

DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE: JUNE 14TH, 1990
FILE : D:/NORLITE/NORLN3	DWG. NO.	SHEET :	SCALE: