HW - 2002.03.08 Revised WAP

Norlite Corporation

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March 8, 2002

Mr. William Clarke
Permit Administrator
NYSDEC –Region 4
1150 North Westcott Road
Schenectady, NY

Re: Redrafted Waste Analysis Plan
Norlite Corporation

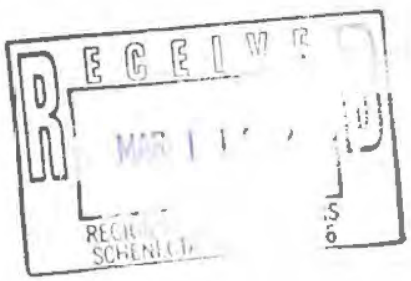
Dear Mr. Clarke:

Enclosed please find a new copy of Section C for the Part 373 Permit Renewal Application for Norlite Corporation, as well as a "response to comments" document. This document has been redrafted and reorganized consistent with comments from and discussions with NYSDEC in December 2001. As discussed below, we've addressed the comments of NYSDEC received informally from Parag Amin in his draft, dated December 5, 2001. We have also revised the format to be consistent with guidance document, Waste Analysis At Facilities That Generate, Treat, Store, And Dispose Of Hazardous Wastes, A Guidance Manual. As a result, the document is no longer two documents with the "Waste Analysis Plan" being a separate appendix to the application. We've also included a Table of Contents in order to facilitate review. Please feel free to call me with any questions.

Sincerely,

William Morris
Environmental Director
NORLITE CORPORATION

CC: Parag Amin



General Comment 4. The waste oil/used oil/Waste Fuel A issue is now address in its own section of the plan which can be found starting in Page C-23, Section C-1(e).

General Comment 5. Throughout the document, the text has been revised to indicate that the analysis is performed onsite. Pesticide and dioxin/furan testing will still be performed offsite. The plan does not call for an offsite laboratory to confirm WAP-2 concentrations. Rather, onsite analysis will be performed on at least a monthly basis to collect data to confirm the calculation method used to prepare WAP-2 sheets.

General Comment 6. The WAP-1 table has been revised and lists the LLGF acceptance limits.

General Comment 7. References to SLGF have been removed except for the discussion at Section C-5(i) regarding the LDR Determination on the clinker.

General Comment 8. The whole section has been revised.

Comment 6. The text throughout the document has been changed to affirmatively state that Norlite will not accept waste containing greater than 5% total pesticide constituents. See pages C-7, C-20 and C-41.

Comment 7. PCBs are now discussed in Section C-4(h). We've maintained the limitation of 25 ppm of total PCBs and have defined the term as 25 ppm of total PCBs determined by the sum of the Aroclors under Method 8082. Norlite cannot support a limitation of 2 ppm of a single Aroclor as suggested by the Department since we can find no basis in the regulations. The text of the plan does not contain the notification requirement that has been followed for wastes containing 10 ppm PCBs. This was an oversight and the notification requirement will be added back in the next submission.

Comment 8. On page C-39, we state that the normal detection limit for PCBs is 2 ppm but that we would normally obtain a detection limit of 1 ppm. Total PCBs has been added to the text and the term has been defined as described in Comment 7.

Comment 9. See Comment 8. We've also removed the "In the alternative ..." text from the plan.

Comment 10. See Comments 7, 8 and 9. PCBs are discussed in Section C-4(h).

Comment 11. Norlite's position on dioxin/furan characterization and testing is found on pages C-41 and C-67. We will not require characterization analysis unless the presence of the compounds is suspected by the generator or blender. However, we will perform a single analysis on a random shipment from a blender on an annual basis. The presence of these compounds is highly unlikely considering the industry served by this facility, including other commercial TSDFs. We have affirmatively screened out listed dioxin-containing waste. Generators are required to perform thorough hazardous waste determinations and we use that information during waste characterization. The compounds, themselves, are lower on the Thermal Stability Index than the POHCs used during the Trial Burn where we demonstrated a DRE of greater than 99.999%. So, if characterization and verification procedures do not detect the presence of these compounds in extremely minute concentrations, then the process will destroy them effectively without any difficulty or increase of emissions.

Comment 12. K124 and K125 are now listed once on page C-10.

Comment 13. The alternative PCB acceptance proposal has been removed.

Comment 14. Norlite has retained the use of ASTM Method D-808 for the total halogens determination. We have done this since this method, which uses silver nitrate in the titration, has a positive interference if bromine and iodine are present in the solution being titrated. If bromine and iodine need to be quantified separately, the combustate from ASTM Method D-808 (also SW-846 Method 5050) can be analyzed with ion specific electrodes, although certified methods are not available for this method of detection. SW-846 Method 9056, which uses ion chromatography does not yield results for iodide and has difficulty yielding acceptable results for bromide if excess nitrate is present in the solution. Since the individual concentrations of halogens will be summed anyway, using the method that experiences the positive interference approaches the true intent of the analysis.

Comment 15. See response to Comment 11 for dioxins/furans. We have changed the pesticides handling to affirmatively state that no waste with greater than 5% total pesticide constituents will be accepted, we identify SW-846 Methods 8081A, 8141A and 8151A as testing methods in Table WAP-1. Method 8150B is no longer in SW-846. On page C-67, we commit to analyzing a random shipment from a blender on a quarterly basis for pesticides. The loads that are selected will be loads that are not supposed to have pesticides. We also maintain the preshipment testing of waste streams that do contain pesticides.

Comment 16. See response to Comment 8.

Comment 16a. TOC refers to Total Organic Carbon and the reference was for Total Halogens. We changed "Cl probe" to "ion specific electrode" in Table WAP-1. This is not an approved method through EPA but it is still a method whereby Norlite can generate information regarding the individual halogens, if necessary.

Comment 17. See response to Comments 14 and 16a. We have not developed any more specific information on the use of the ion specific electrodes but we can do so at the Department's request.

Comment 18. See response to Comment 17.

Comment 19. This language has been removed. These items are addressed in Norlite's QA/QC manual.

Comment 20. LDR and Bevill sampling and analysis are now included on Table WAP-1.

Comment 21. Requested language change was made and is now found beginning on page C-61.

Comment 22. Requested language change was made and is now found beginning on page C-57.

Additional Comments

These were not numbered but we will still take them in order. Since the format of the entire document has changed, the page references are no longer relevant. In some cases, the subject text has been removed from the plan, especially if it was duplicative. Where possible, we indicate which page the corrections or adjustments may be found.

Page C-1 Done.

Page C-3 Exhibit C-1 is now included.

Page C-5 D003 remains since the characteristic code may still apply to a waste or combination of wastes if the reactivity characteristic was not removed by deactivation, even if the mixture no longer exhibits the characteristic.

Page C-12 The pesticides issue is dealt with throughout Section C-1(b)(3), C-1(b)(5), C-1(b)(6), C-5(a), C-5(c) and C-6(b). Norlite insists that if generators or blenders submit pesticides analysis, that it be done by an ELAP, NELAP or other State laboratory certification approved lab using the proper analytical procedures. Evidence of this would be on the submitted laboratory report. The LLGF specification sheet requires the submission of complete and accurate information, to which the generator or blender attests and certifies. Norlite does not pursue the generators or blenders any further since it is impractical to supervise their activities.

Page C-15 The language has been simplified and is now found on Page C-7.

Page C-16 The 5% restriction has been reinserted in text and can be found on Page C-20.

Page C-27 The format of the plan has been revised to address this type of issue.

Page C-28 The language has been removed from the plan. Container sampling is described in Section C-3(b).

C-30 to C-42 The format of the plan has been revised to address this type of issue.

Page C-31 The QA/QC manual has been redrafted and has already been submitted to the Department. It exists now as Appendix C-1 due to the reformatting of the section.

Page C-32 Sampling of delivered of LLGF in bulk and in drums are now described separately in Sections C-3(a) and C-3(b).

Page C-33 Sampling of drums is more clearly defined in Section C-3(b). Compatibility analysis is described in Section C-4(c).

Page C-36 Method 6010B is used for all metals except for mercury. This is reflected in Section C-4(g).

Page C-37 The method of sampling for wastes generated onsite is now found in Section C-3(e).

Page C-38... The section on the Bevill Determination is now found in Section C-5(h) and the subsections are listed in the proper format. The requirements have been added to Table WAP-1.

Page C-41 LDR requirements have been added to Table WAP-1. The individual SW-846 analysis methods already include the required references to the extraction methods, such as Methods 3540C and 3541 for semivolatile organics.

Page C-43 The referenced guidance document was consulted in the re-write and re-format of this entire section. However, the plan does not speak to "compliance" with this guidance since the guidance is not promulgated regulation.

Page C-44 The sampling section references SW-846, 3rd Edition, September 1986, Chapter 9 on page C-27.

Page C-44 We did not specifically address the sample caps that are referenced now on Page C-28. The plan calls for the use of polyethylene lined caps which are acceptable for general use. We agree that glass, Teflon or stainless steel should be used for samples requiring organics analysis and we will modify this reference in our next submission.

Page C-46 The temperature reference has been corrected per the Department's request. See Page C-28.

Page C-46 There was no reference to a log book in this section so no change was made. Viscosity is discussed in Section C-4(f).

Page C-48 Table WAP-1 has been modified to indicate Method 3050B as the sample preparation method for metals in shale. The use of this method is also found on Page C-38.

Page C-49 The new shale metal feed table is found on Page C-59. Norlite anticipates no changes in the allowable metal feed contribution from shale as defined in the Part 373 Permit, dated January 8, 1997, except for the mercury feed rate which is yet to be determined. Norlite will be updating the Risk Assessment, submitted October 2001, using the higher shale metals feed rates that were derived to arrive at the feed rates prior to the June 2001 permit modification. We are also adjusting the noncarcinogenic metal feed rates back to their previous levels. We've calculated the emission rates from this increased metal feed using the system removal efficiency and inserted them into the risk model. The carcinogenic risk is still below the 1E-05 benchmark and the hazard index for noncarcinogens did not have any appreciable increase. We are not yet prepared to propose a feed rate for mercury so we have delayed in formally proposing the metal feed rates for shale and LLGF. This will occur when the comments on the Risk Assessment are resolved. Until then, we retain the higher feed rates.

Page C-50 Sampling is more clearly defined in Section C-3(a), (b) and (c) with respect to "loads" and "tanks". The PCB compositing rationale is described in Section C-4(h).

Page C-50 On Page C-54, Norlite is proposing a weekly confirmatory analysis of a tank sample for comparison to the calculated model. The Norlite laboratory is certified for PCB analysis.

Page C-51 Since Norlite's laboratory is certified for PCB analysis, Norlite has not indicated that it must wait for offsite laboratory confirmation in the plan.

Page C-52 Norlite's QA/QC manual has been redrafted and previously submitted to the Department.

Page C-52 Section C-5(b) describes the procedure for fuel receipts. We indicate on Page C-50 that we normally can take up to 25 times the permitted feed rate but, under certain circumstances, can accept up to 100 times the permitted burn rate. Many other variables are considered in our decisions to take or reject loads of high-metal-containing waste fuels that are based on operations and scheduling, rather than the fuel itself so we've prescribed a higher limit than what we normally accept. Table WAP-1 has acceptance limits listed which are 100 times the concentration-based feed limits.

Page C-53 Exhibit C-1 is provided. The language change was not made since the original language is no longer in the plan. Waste characterization requirements are now found in Section C-5(a).

Page C-54 Pesticide methods are listed in WAP-1. Any updates to SOPs will be included in the next submittal and more detail on the analytical procedures can be found in the QA manual submitted previously and included as Attachment C-1.

Page C-54 The test has been reworded to require analysis down to the detection limit of the method used to quantify a particular analyte. The revision is found twice in the plan, Page C-42 and Page C-44.

Page C-54 The text has been reworded and can be found on Pages C-42 and C-45.

Page C-55 No revision to this text has been made. As stated, the language requires disclosure and quantification of hazardous constituents down to 100 ppm for known compounds. This differs from quantifying hazardous constituents from streams that are less characterized where analysis is used to qualify and quantify unknown constituents.

Page C-55 The language has not been modified. As stated, the paragraph expects that a waste stream is characterized with enough detail to identify the hazardous constituents necessary to ensure compliance with the permit. On a practical basis, this is valid only for organic constituents, most of which would be destroyed based upon Norlite's demonstrated DRE. This is never used for metals, total halogens and PCBs since these are normally characterized analytically, regardless of the level of detail provided by the generator or blender. And, when the loads are accepted, the waste streams are not merely fingerprinted, but are characterized again since PCBs, metals and total halogens are determined analytically when received. It is not within the scope of this waste analysis plan to perform the hazardous waste determination for the generator of any given waste stream. However, enough information is gathered or generated by Norlite through analysis and the LLGF

Characterization sheet to reasonably know if the hazardous waste determination and waste stream characterization are complete and accurate.

C-56 to C-59 Any changes made to the Generator section of Section C-5(a)(1) were made to the Blender Section of C-5(a)(2). Norlite disagrees that disclosure of generators by Blenders is unacceptable. If the Blender's waste analysis plan is complete and identifies the required elements of a waste stream characterization and if the Blender properly implements their waste analysis plan, then the Blender, who is the generator to Norlite, can characterize a waste stream or blend as effectively as a generator of a single waste stream. In many cases, information from Blenders is more complete than generators since waste management is their primary function as opposed to a necessary distraction as it is for generators. Norlite maintains that the Blender's waste analysis plan and their disclosure of SIC codes gives sufficient information that the waste stream has been properly characterized.

Page C-59 Norlite's load acceptance criteria is covered under Section C-5(b) and Table WAP-1.

Page C-64 Pesticide load acceptance is now described in Section C-5(c). The requested reference to an NYS ELAP lab is found on Page C-51.

Page C-64 This language was deleted from plan.

Page C-67 Page C-55 lists the personnel with authority and responsibility to generate a WAP-2 sheet.

Page C-70 Norlite has retained the 5 degree Centigrade heat rise for compatibility. 2 degrees Farenheit is not a large enough change to indicate an adverse reaction. Norlite will consider this request more with more information from the Department on its rationale and source.

Page C-70 At the time of revision, we did not have the update reference for the heat of combustion method ASTM D240. We will replace this page when the remainder of the application revisions are submitted.

Page C-73 Total halogens and the analytical methods are discussed in the response to Comment 14.

Page C-75 The example found on the original page C-75 is no longer in the waste analysis plan.

Page C-77 This section regarding outside laboratory analysis has been removed from the plan.

Page C-77 This section regarding outside laboratory analysis has been removed from the plan. PCBs performed onsite are now discussed in Section C-4(h).

Page C-78 This section regarding outside laboratory analysis has been removed from the plan. Metals performed onsite are described in Section C-4(g).

Page C-79 Any outside laboratory used by Norlite will be NYS ELAP or NELAP approved asstated on Page C-33.

Page C-82a Table WAP-1 has been updated.

C-83 to C-85 The QA manual has been revised and previously submitted to the Department. It now appears as Appendix C-1 in Section C.

SECTION C

WASTE CHARACTERISTICS

This section describes the chemical and physical nature of hazardous wastes stored at Norlite Corporation and the Norlite Waste Analysis Plan for sampling, testing, and evaluating the wastes to assure that sufficient information is available for their safe handling. This information is submitted in accordance with the requirements of 6NYCRR Subpart §373-1.5(a)(2)(ii) and (iii) and 6NYCRR Subpart §373-2.2(e)(1), (2) and (3) and 6NYCRR Subpart §373-2.2(I). The Waste Analysis Plan was selected based on the waste type, facility type, and management procedure.

Norlite's hazardous waste activity consists of the tank and container storage of hazardous waste and low grade fuel (LLGF) from various industrial sources, as well as non-hazardous wastes. This low grade fuel is beneficially reused for energy recovery and/or incinerated for destruction by combustion in Norlite's aggregate kilns. Norlite also transships hazardous waste for proper management at other permitted TSDFs. Tank sludge, filter sludge and ancillary waste materials that are generated in this process are accumulated in drums or containers for proper disposal.

The transportation, storage and burning of hazardous waste in industrial furnaces is regulated under 40 CFR Part §266 of the federal RCRA regulations. These processes are also fully regulated by New York State under the Hazardous Waste Regulations 6 NYCRR Part §370, et sequential, and the Air Pollution Regulations 6 NYCRR Part §200, et sequential.

Norlite receives liquid Low Grade Fuel ("LLGF") from generators and blenders. Blenders of LLGF for energy recovery at Norlite are regulated as specified in 40 CFR Subpart §261.6(c) as owners and operators of facilities that store recyclable materials under all applicable provisions of 40 CFR Parts §264 and §265. Therefore, the characteristics and identification of the source of the recycled material will be made and documented by the Blender.

In this application, Norlite has stressed the waste characterization necessary for the safe tank and container storage of its hazardous waste so that no pretreatment of the waste is necessary. In that regard, Norlite has implemented practices to assure no difficulties with the waste/tank compatibility. Norlite's Waste Analysis Plan has been designed to meet the requirements of the state and federal hazardous waste

regulations, the state air pollution regulations and Norlite's own safety needs.

C-1 Facility Description

C-1(a) Description of Facility Processes and Activities

Hazardous wastes are stored at Norlite's facility in four (4) covered tanks with a capacity of 105,656 gallons, six (6) 7300-gallon tanks, 85-gallon or smaller drum containers, and rolloffs. Norlite's current storage capacity is for four (4) covered tanks with 105,656 gallon capacity and six (6) 7300 gallon tanks as well as 14,685 gallons container storage (excluding rolloff storage). The design specifications for the container storage area and for the storage tanks are described in Section D. The capacity for roll-off storage is 32,320 gallons. The hazardous wastes received are blended and used as fuel in two lightweight aggregate kilns.

C-1(b) Identification of Hazardous Wastes Managed

Norlite has developed a program to ensure the proper identification of waste with a proper chemical and physical analysis. A LLGF Specification Sheet is submitted by each generator or blender. Exhibit C-1 shows a copy of the LLGF Specification Sheet. This form

requires the Generator or Blender to identify itself and provide waste shipping information, waste description, waste source(s), waste analysis, and a list of any hazardous constituents as defined in 40 CFR §261 - Appendix VIII and/or 6NYCRR Part §371 - Appendix 23. The LLGF Specification Sheet also requires a verification by the Generator that the information is accurate, that if any changes occur, the Generator will notify Norlite promptly, and that the LLGF is not regulated as a PCB waste under 40 CFR Part §761.

Norlite reviews the LLGF Specification Sheet to assure that the material to be received can meet the permit limits and the compatibility requirements.

C-1(b)(1) Characteristic Flammable Waste

Typical constituents in D001 Waste may include the following categories that are not otherwise included as a listed waste:

Saturated Aliphatic Hydrocarbons	Amides
Unsaturated Aliphatic Hydrocarbons	Amines
Aromatic Hydrocarbons	Carbamates
Organic Nitro Compounds in an organic solution	Ethers

Phenols or Cresols in an organic solution	Esters
Halogenated Organics	Alcohols
Aldehyde	Ketones

With this array of chemicals, there is only limited potential for reactivity. The absence of incompatibility is verified with a compatibility test as part of the incoming inspection.

C-1(b)(2) Corrosive and Reactive Waste

In addition, certain corrosive D002 wastes may be contained in the LGF received at Norlite. Examples may include such materials as amines like triethanolamine, acetic or propionic acid, formaldehyde and certain amides. Norlite also receives D003 waste in LGF blends. No highly reactive or toxic D003 wastes are accepted. Norlite will not accept waste(s), which exhibit (the) reactivity characteristic pursuant to SOP#4-10. However, certain generator waste streams may still require the D003 waste number designation to ensure compliance with Land Disposal Restriction (LDR) and waste characterization requirements.

C-1(b)(3) Toxicity Characteristic Wastes

In addition, combustible waste that may have heavy metals content, which makes it characteristically hazardous is acceptable if the metal content is controlled to not exceed the permitted maximum feed rate levels of the metal in the total hazardous waste fed to the kiln. These Waste Codes include the following:

Metal	EPA Waste Code
Arsenic	D004
Barium	D005
Cadmium	D006
Chromium	D007
Lead	D008
Mercury	D009
Selenium	D010
Silver	D011

In addition, certain combustible wastes may have pesticides that are leachable making them characteristically hazardous. These pesticides are not present in the waste in highly concentrated or pure form, but are leachable at traces PPM levels. Therefore, these wastes can be combusted in the kiln process. These codes include:

Pesticide	EPA Waste Code
Endrin	D012
Lindane	D013
Methoxychlor	D014
Toxaphene	D015
2,4D	D016
2,4,5 TP Silvex	D017

The screening procedure described in Section C-5 will be used to restrict the level of any pesticide constituent to 1.7%. Norlite will not accept waste containing greater than 5% of the total pesticide constituents.

The following toxicity characteristic organic wastes are accepted if they are within the specifications listed herein (e.g., BTU Value, total chlorine content, etc.).

EPA Waste Code	Organic Constituent
DO18	Benzene
DO19	Carbon tetrachloride
D020	Chlordane
DO21	Chlorobenzene
DO22	Chloroform
DO23	o-Cresol

DO24	m-Cresol
DO25	p-Cresol
D026	Cresol
DO27	1,4-Dichlorobenzene
DO28	1,2-Dichloroethane
DO29	1,1-Dichloroethylene
DO30	2,4-Dinitrotoluene
D031	Heptachlor
DO32	Hexachlorobenzene
DO33	Hexachlorobutadiene
DO34	Hexachloroethane
DO35	Methyl ethyl ketone
DO36	Nitrobenzene
D037	Pentachlorophenol
DO38	Pyridine
DO39	Tetrachloroethylene
DO40	Trichloroethylene
D041	2,4,5-Trichlorophenol
D042	2,4,6-Trichlorophenol
DO43	Vinyl chloride

C-1(b)(4) Listed Non-Specific Source Waste (F Specified Waste)

Norlite will accept waste designated as listed non-specific source waste with the following codes. The

definitions of these wastes are found at 40 CFR 261.31 and 6 NYCRR 371.4. These wastes include mixtures and wastes that are derived from the treatment of these wastes so long as they are amenable for treatment at Norlite as discussed in the waste analysis plan.

F001	F002	F003	F004	F005	F032
F034	F035	F037	F038	F039	

C-1(b)(5) Listed Specific Source Waste (K Specified Waste)

Norlite will accept waste from a variety of specific sources including the Petroleum refining industry. These waste codes include the following:

K001	K023	K083	K116
K002	K024	K084	K117
K003	K025	K085	K118
K004	K026	K086	K136
K005	K027	K087	K141
K006	K028	K093	K142
K007	K029	K094	K143
K008	K030	K095	K144
K009	K036	K096	K145
K010	K042	K100	K147
K011	K043	K101	K148
K013	K046	K102	K149

K014	K048	K103	K150
K015	K049	K104	K151
K016	K050	K105	K152
K017	K051	K111	K156
K018	K052	K112	K157
K019	K060	K113	K158
K020	K061	K114	K159
K022	K062	K115	K161

Metal feed rates from LGF blends containing K codes with metals will not exceed permitted levels, due to the feed planning procedures followed by Norlite to comply with metal limits in the permit.

The following waste codes contain pesticide constituents, and the pesticide constituents are not accepted by Norlite in concentrated form. However, these waste codes may be present as minor constituents in organic blends received by Norlite with pesticide constituents at levels of up to 1.7%. Norlite will not accept waste containing greater than 5% of total pesticide constituents. Shipments for these pesticide constituents are screened in accordance with procedures described in the Section C-5.

K031	K032	K033	K034	K035	K037
K038	K039	K040	K041	K097	K098
K099	K123	K124	K125	K126	

C-1(b)(6) Listed Hazardous Chemical Wastes (U and P Specified Wastes)

Specified listed hazardous chemical product wastes are accepted on a case-by-case basis if the waste is hazardous because of Ignitability or Toxicity, and is otherwise within the specification listed herein.

The following P waste codes are accepted by Norlite. Organo-metallic constituents are restricted based on the metal limits in the 6NYCRR Part §373 permit for LGF.

P001	P028	P058	P097	P127
P002	P029	P060	P098	P128
P003	P030	P062	P099	P185
P005	P034	P064	P101	P188
P007	P036	P066	P102	P189
P008	P038	P067	P103	P190
P010	P039	P068	P104	P191
P011	P040	P069	P105	P192
P012	P041	P070	P106	P194
P013	P042	P071	P108	P196
P014	P043	P072	P109	P197
P016	P044	P074	P110	P198
P017	P045	P075	P111	P199
P018	P046	P077	P113	P201

P020	P047	P082	P114	P202
P021	P048	P084	P115	P203
P022	P049	P085	P116	P204
P023	P054	P088	P118	P205
P024	P057	P089	P119	P026
P093	P120	P027	P094	P121
P122				

These listed non-acute categories (U designated wastes), are listed in 6NYCRR Subpart §371.4(d)(6). The following hazardous wastes, as listed in 6NYCRR Subpart §371.4(d)(6), will be accepted.

U001 Acetaldehyde (Ethanol)
U002 Acetone (2-Propanone)
U003 Acetonitrile (Ethane nitrate)
U004 Acetophenone
U005 2-Acetylaminofluorene
U006 Acetyl chloride
U007 Acrylamide
U008 Acrylic acid (2-Propenoic acid)
U009 Acrylonitrile
U010 Azirino(2',3':3,4) pyrrolo(1,2-a)indole-4,7 dione
U011 Amitrole
U012 Aniline
U014 Auramine
U015 Azaserine
U016 Benz[c]acridine
U017 Benzene, dichloromethyl
U018 Benz (a) anthracene
U019 Benzene
U020 Benzenesulfonic acid chloride

U021 Benzidine
U022 Benzo (a) pyrene
U024 Dichloromethoxy ethane
U025 Dichloroethyl ether
U026 Chlornaphazin
U027 Dichloroisopropyl ether
U028 1,2 Benzenedicarboxylic acid, bis (2-ethylhexyl)ester U029 Methyl bromide
U030 4-Bromophenyl phenyl ether
U031 Butanol (Butyl alcohol)
U034 Chloral
U035 Chlorambucil
U036 Chlordane, alpha and gamma isomers
U037 Chlorobenzene
U038 Chlorobenzilate
U039 P-chloro-m-cresol, Phenol, 4-chloro-3-methyl-
U041 Epichlorohydrin
U042 2-chloroethylvinyl ether, Ethene, (2-chloroethoxy)-
U043 Ethene, chloro
U044 Chloroform (Methane, trichloro)
U045 Methane, chloro (Methyl chloride)
U046 Chloromethyl methyl ether, methane, chloromethoxy-
U047 Beta-Chloronaphthalene
U048 O-Chlorophenol, Phenol, 2 chloro
U049 Benzenamine 4-chloro-2-methyl-hydrochloride, 4-chloro-o-toluidine, hydrochloride
U050 Chrysene
U051 Creosote
U052 Cresols, cresylic acid
U053 Crotonaldehyde
U055 Cumene
U056 Cyclohexane
U057 Cyclohexanone
U058 Cyclophosphamide

U059 Daunomycin
U062 Diallate
U063 Dibenz [a,h] anthracene
U064 Dibenzo [a,i] pyrene
U066 1,1-Dibromo-3-chloropropane
U067 Ethane, 1,2-dibromo
U068 Methane, dibromo-
U069 Dibutyl phthalate
U070 1,2-Dichlorobenzene (o-Dichlorobenzene)
U071 1,3-Dichlorobenzene (m-Dichlorobenzene)
U072 1,4-Dichlorobenzene (p-Dichlorobenzene)
U073 3,3'-Dichlorobenzidine
U074 2-Butene, 1,4-dichloro
U075 Dichlorodifluoromethane
U076 Ethane, 1,1-dichloro
U077 Ethane, 1,2-dichloro
U078 Ethene, 1,1-dichloro (1,1-dichloroethylene)
U079 Ethene, trans 1,2-dichloro (1,2-dichloroethylene)
U080 Methylene, dichloro (Methylene chloride)
U081 2,4-Dichlorophenol
U082 2,6-Dichlorophenol
U083 Dichloropropane
U084 1,3-Dichloropropene
U085 1,2:3,4-Diepoxybutane
U086 N,N'-Diethylhydrazine
U087 0,0-Diethyl S-methyl dithiophosphate
U088 Diethyl phthalate
U089 Diethylstilbesterol
UO90 Dihydrosafrole
U091 3,3'-Dimethoxybenzidine
U092 Dimethylamine
U093 P-Dimethylaminoazobenzene
U094 7,12 Dimethylbenz [a] anthracene
U095 3,3'-Dimethylbenzidine
U096 alpha,alpha-Dimethylbenzylhydroperoxide

U097 Dimethylcarbamoyl chloride
U098 Hydrazine, 1,1-dimethyl-
U099 Hydrazine, 1,2-dimethyl-
U101 2,4-Dimethylphenol
U102 Dimethyl phthalate
U103 Dimethyl sulfate
U105 2,4-Dinitrotoluene
U106 2,6-Dinitrotoluene
U107 Di-n-octyl phthalate
U108 1,4-Dioxane
U109 1,2-Diphenylhydrazine
U110 Dipropylamine
U111 Di-n-propylnitrosamine
U112 Ethylacetate
U113 Ethylacrylate
U114 Ethylenebisdithiocarbamic acid, salts & esters
U115 Ethylene oxide
U116 Ethylenethiourea
U117 Ethyl ether
U118 Ethylmethacrylate
U119 Ethyl methanesulfonate
U120 Fluoranthene
U121 Methane, trichlorofluoro-
U122 Formaldehyde
U123 Formic acid
U124 Furan (Furfuran)
U125 2-Furancarboxaldehyde (Furfural)
U126 Glycidylaldehyde
U127 Hexachlorobenzene
U128 Hexachlorobutadiene
U129 Lindane
U130 Hexachlorocyclopentadiene
U131 Ethane, 1,1,1,2,2,2-hexachloro
U132 Hexachlorophene
U133 Hydrazine

U134 Hydrofluoric acid
U135 Hydrogen sulfide
U137 Indeno [1,2,3-cd] pyrene
U138 Methane, iodo-
U140 Isobutyl alcohol
U141 Isosafrole
U142 Kepone
U143 Lasiocarpine
U144 Lead acetate
U146 Lead subacetate
U147 Maleic anhydride
U148 Maleic hydrazide
U149 Malononitrile
U150 Melphalan
U152 Methacrylonitrile
U153 Methanethiol
U154 Methanol
U155 Methapyrilene
U156 Methylchlorocarbonate
U157 3-Methylcholanthrene
U158 4,4'-Methylenebis (2-chloroaniline)
U159 Methyl ethyl ketone (Butanone)
U160 Methyl ethyl ketone peroxide
U161 Methyl isobutyl ketone (4-Methyl-2-pentanone)
U162 Methyl methacrylate
U163 N-methyl N'-nitro N-nitroguanidine
U164 Methylthiouracil
U165 Naphthalene
U166 1,4-Naphthalenedione
U167 Alpha-Naphthylamine
U168 Beta-Naphthylamine
U169 Nitrobenzene
U170 P-Nitrophenol
U171 2-Nitropropane
U172 N-Nitrosodi-n-butylamine

U173 N-Nitrosodiethanolamine
U174 N-Nitrosodiethylamine
U176 N-Nitroso-N-ethylurea
U177 N-Nitroso-N-methylurea
U178 N-Nitroso-N-methylurethane
U179 N-Nitrosopiperidine
U180 N-Nitrosopyrrolidine
U181 5-Nitro-o-toluidine
U182 Paraldehyde
U183 Pentachlorobenzene
U184 Ethane, pentachloro
U185 Benzene, pentachloro-nitro
U186 1,3-Pentadiene (1-Methylbutadiene)
U187 Phenacetin
U188 Benzene, hydroxy (Phenol)
U190 Phthalic anhydride
U191 2-Picoline
U192 Pronamide
U193 1,3-Propane sultone
U194 1-Propanaimine (n-Propylamine)
U196 Pyridine
U197 2,5-Cyclohexadiene-1,4-dione
U200 Reserpine
U201 Resorcinol
U202 Saccharin, & salts
U203 Safrole
U206 Streptozotocin
U207 Benzene,1,2,4,5-tetrachloro
(1,2,4,5-Tetrachlorobenzene)
U208 Ethane,1,1,1,2-tetrachloro(1,1,1,2-
Tetrachloroethane)
U209 Ethane,1,1,2,2-tetrachloro(1,1,2,2-
Tetrachloroethane)
U210 Ethene, tetrachloro (Tetrachloroethylene)
U211 Methane, tetrachloro (Carbon tetrachloride)

U213 Tetrahydrofuran
U214 Thallium acetate
U218 Tioacetamide
U219 Thiourea
U220 Toluene (Benzene, methyl)
U221 Benzenediamine, ar-methyl-, Toluenediamine
U222 o-Toluidine hydrochloride
U223 Toluene diisocyanate
U225 Methane, tribromo-
U226 Methylchloroform (1,1,1-trichloroethane)
U271 Benomyl
U277 Carbamodithioic acid, diethyl-;2-chloro-
2,propenyl ester
U278 Bendiocarb
U279 Carbaryl
U280 Barban
U364 Bendiocarb phenol
U365 H-Azepine-1-carbothioic acid, hexahydro-, S-ethyl
ester
U366 Dazomet
U367 Carbofuran phenol
U372 Carbendazim
U373 Carbamic acid, phenyl-, 1-methylethyl ester
U375 Carbamic acid, butyl-, 3-iodo-2-propynyl ester
U376 Carbamodithioic acid,dimethyl-
tetraanhydrosulfide with orthothioselenious acid
U377 Potassium n-methyldithiocarbamate
U378 Potassium n-hydroxymethyl-n-methyldi-
thiocarbamate
U379 Sodium dibutyldithiocarbamate
U381 Sodium diethyldithiocarbamate
U382 Sodium dimethyldithiocarbamate
U383 Potassium dimethyldithiocarbamate
U384 Metam Sodium
U385 Carbamothioic acid, dipropyl-, S-propyl ester

U386 Carbamothioic acid, cyclohexylethyl-, S-ethyl ester
U387 Carbamothioic acid, dipropyl-, S-(phenylmethyl) ester
U389 Carbamothioic acid, bis(1-methylethyl)-, S-(2,3,3- trichloro-2-propenyl) ester
U390 Carbamothioic acid, dipropyl-, S-ethyl ester
U391 Carbamothioic acid, butylethyl-, S-propyl ester
U400 Bis(pentamethylene)thiuram tetrasulfide
U401 Bis(dimethylthiocarbamoyl) sulfide
U402 Thioperoxydicarbonic diamide, tetrabutyl
U403 Thioperoxydicarbonic diamide, tetraethyl
U404 Triethylamine
U407 Ethyl Ziram
U409 Thiophanate-methyl
U410 Tiodicarb
U411 Propoxur
U227 Ethane, 1,1,2-trichloro (1,1,2-trichloroethane)
U228 Trichloroethene (trichloroethylene)
U235 Tris(2,3-dibromopropyl) phosphate
U236 Trypan blue
U238 Ethyl carbamate (urethane)
U239 Xylene (Benzene, dimethyl)
U243 1-Propene, 1,1,2,3,3,3-hexachloro-
U244 Thiram
U246 Cyanogen bromide
U248 o-Chlorophenol
U249 4-Chloro-o-toluidine, hydrochloride
U328 o-Toluidine
U353 p-Toluidine
U359 Ethanol, 2-ethoxy-
U392 Butylate
U393 Copper dimethyldithiocarbamate
U394 A2213
U395 Diethylene glycol, dicarbamate

U396 Ferbam

The following P and U codes contain pesticide constituents that are restricted to 1.7%.

P004	U060	P037	U061	P050	U240
P051	U247	P059	P123		

Shipments of waste containing these codes are screened in accordance with procedures described below. Norlite will not accept waste containing greater than 5% of the total pesticide constituents.

C-1(c) Specification of the Low Grade Fuel

LLGF is either ignitable with a flash point of 140 degrees Fahrenheit or lower or it is combustible. The LLGF is not reactive. However, LLGF may be a Toxic waste as defined in 6NYCRR Subpart §371.3(e) because the heavy metal and organic compound concentration may exceed the limits set forth in that section. Also, LLGF may contain a characteristic corrosive waste.

Norlite stores the LLGF in its storage tanks or in a container storage area. The tanks and containers are located in a diked area. The design and operation for the tanks and containers are described in Section D, Section F (under Inspection), and Section G -- the Emergency and Contingency Plan. The LLGF, having been pre-screened, is non-corrosive to the glass-lined (Tanks

300-600) or carbon steel (Tanks 100 A,B,C and 200 A,B,C) storage tanks designed with suitable corrosion allowance. The necessary specification for the fuel has been provided to the suppliers, and has been confirmed with their LLGF Specification Sheet, and with the Norlite analysis provided prior to burning and unloading.

C-1(d) Waste Generated Onsite

Hazardous wastes are generated from the cleaning of the LGF storage tanks, they also include filter sludge generated during the off-loading of the LLGF into the storage tank, and ancillary waste material such as absorbent pads, contaminated personnel protective equipment, glass sample jars, laboratory pipets from sampling and analysis. The waste is generally contaminated with waste solvent and alcohol. The sludge is hazardous because of Ignitability and Toxicity. The sludge is manifested, at a minimum, with the following waste classifications: D001, F001, F002, F003 and F005 due to its ignitable characteristic and the presence of solvent as well as being a "derived from" waste. Other waste codes are included as appropriate.

The tank cleaning operation is conducted periodically based on estimates of sludge quantity in the storage tank. The sludge generated by the tank cleaning operation is removed from the tanks and placed in drums for disposal. Norlite has contracted with an experienced

environmental contractor for the tank cleaning operation. The cleaning of one storage tank generates from approximately 20 to 80 drums. These drums are temporarily stored in the truck containment area while the contents are being analyzed and arrangements are being made for disposal. Generally, the drums are disposed of within three to six weeks from the date of generation.

The LLGF filters are cleaned daily during delivery operations. The filter sludge is stored in the drum container storage area. The drums will then be loaded and disposed of at a licensed TSD Facility or, in the alternative, the contents will be burned in the kiln for energy recovery under Norlite's Waste Minimization Program.

The sludge and filter sludge (primarily waste solvent and alcohol) has proven to be compatible with the storage containers which are constructed of low carbon steel that meets U.S. Department of Transportation specifications No. 17C. The drums are labeled and dated and are kept closed except during the loading/disposing of the waste material. The drums are spaced according to the plan set forth in Section D. The filter sludge and tank sludge are Ignitable with a flash point less than 140 degrees Fahrenheit. Norlite has found the filter sludge and tank sludge not to be Corrosive or Reactive. They are, typically Toxic, because heavy metal and organic compound

concentrations that exceed the Toxicity Characteristic limits set forth in 6NYCRR §371.3(c).

C-1(e) Used Oil Fuel and Waste Fuel A

Norlite uses nonhazardous waste fuels that can be defined as used oil under 40 CFR 279 and 6 NYCRR 374-2, or Waste Fuel A as defined in 6 NYCRR 225-2. This fuel is used to supplement the hazardous waste LLGF in operating the lightweight aggregate kilns. Used oil is classified as either specification used oil fuel or off-specification used oil fuel. Specification used oil fuel is defined as used oil meeting the following criteria:

Parameter	Limitation
Arsenic	< 5 ppm
Cadmium	< 2 ppm
Chromium	< 10 ppm
Lead	< 100 ppm
Flash Point	> 100°F
Total Halogens	< 4,000 ppm*
PCBs	< 2 ppm.

*any used oil containing greater than 1,000 ppm total halogens is considered a hazardous waste because it is presumed to be mixed with listed hazardous waste. This presumption may be rebutted by demonstrating that the used oil does not contain listed hazardous waste constituents pursuant to 40 CFR 279.10(b)(ii) and 6 NYCRR 374-2.2(a)(2)(i).

Used oil that does not meet this specification is considered off-specification used oil fuel. Norlite uses

specification used oil fuel for start up and shutdown of the kilns and any time the units are not operating under the Part 373 permit parameters (e.g. after an automatic waste feed cut off (AWFCO)). This fuel is considered equivalent to virgin fuel oils and may be used in place of virgin fuels as they are described in the permit.

Off-specification used oil fuel and/or Waste Fuel A are not used during start up or shutdown of the kilns. They are used as the primary supplement to the hazardous waste LLGF when required by the operators. These fuels may also be used after an AWFCO provided the carbon monoxide hourly rolling average (HRA) is below 500 ppm.

These fuels are characterized upon receipt at the facility. In order for Norlite to accept specification used oil fuel, it must be demonstrated, prior to receipt, that it meets the specification listed above. This is primarily done by onsite analysis but may also be done by submission of analysis from marketer of the used oil fuel. Similarly, Waste Fuel A loads must also be scrutinized to ensure that it meets the definition at 6 NYCRR 225-2 and this is performed by onsite analysis only. Off-specification used oil fuel is also sampled and analyzed prior to receipt.

C-2 Waste Analysis Parameters

The waste analysis parameters considered by Norlite are presented in Table WAP-1 as they relate to each hazardous waste managed at the facility.

C-2(a) Rationale for Parameter Selection

An accurate representation of a waste's physical and chemical properties is critical in determining its acceptability at Norlite. Accordingly, the waste analysis parameters must provide sufficient information to ensure:

- Compliance with applicable regulatory requirements (e.g., LDR regulations, newly identified or listed hazardous wastes)

- Conformance with permit conditions (i.e., ensure that wastes accepted for management fall within the scope of the facility permit, and process performance and air emission standards can be met)

- Safe and effective waste management operations (i.e., ensure that no wastes are accepted that are incompatible or inappropriate given the type of management practices used by the facility).

C-2(b) Special Parameter Selection Requirements

Norlite is subject to regulations promulgated at 40 CFR 266 Subpart H and 6 NYCRR 374-1.8 for boilers and industrial furnaces that burn hazardous wastes. These regulations establish control standards for emissions of toxic organic compounds, toxic metals, hydrogen chloride, chlorine gas, and particulate matter from the burning of hazardous wastes in boilers and industrial furnaces (BIFs). Therefore, analysis of these parameters are considered in this plan. Norlite has performed a trial burn in which the facility's destruction removal efficiency (DRE) for organic wastes was demonstrated and the its system removal efficiency (SRE) was derived for metals. The data from the trial burn is used to determine the allowable feed rate of metals and chlorine to the kilns. The DRE was demonstrated using principal organic hazardous constituents (POHCs) that are considered difficult to incinerate and are rated on the Thermal Stability Index.

As a result of special nature of a combustion facility, the contribution of all feed streams, hazardous waste or otherwise, are considered. Therefore, the used oil fuel/Waste Fuel A that is co-fired with hazardous waste is characterized to account for its contribution of the key parameters. The shale raw material that becomes the lightweight aggregate is also characterized to account for its contribution of metals to the process.

C-3 Sampling Procedures

Sampling is performed using the procedures described in EPA SW-846, 3rd Edition, September 1986, Chapter 9.

C-3(a) Incoming Loads, Bulk

Sampling of the LLGF and used oil/Waste Fuel A from each tanker is accomplished with an aluminum coliwasa sampler with a teflon or rubber stopper. The sampling tool is similar to that described in EPA SW-846, Third Edition, 9/86, Chapter 9. Section 1.2.1.1 and reference in Part 371 - Appendix 19. Aluminum is used because of its non-sparking characteristics. Previous testing experience shows the aluminum not to be corroded, and it also minimizes the risk of breakage.

Sampling is accomplished through the top hatch of the tank truck. Since the coliwasa is 96", it ensures that a full cross-section of the tank truck can be sampled. Sufficient samples are taken to fill a stainless steel quart pitcher. If there is more than one compartment, a proportional representation is taken from each compartment. In this case, composite samples will be taken from the top, middle, and bottom third of the truck.

Between each use of a sampler, it is washed and rinsed to assure the removal of any contamination from

previous samples. Likewise, the pitchers are rinsed between each use.

Approximately, a 500 ml. aliquot is taken from the stainless steel pitcher to perform the waste analysis and waste evaluation. The remainder in the stainless steel pitcher is returned to the tank truck. The aliquot is labeled and carried to the laboratory analysis.

After analysis, the remainder of the sample is stored in its glass jar with a Polyethylene lined cap. The jar is marked to indicate the following:

Date Received
Norlite Sample Number
Generator

Each sample will be stored in the non-flammable storage refrigerator at a temperature of 4°C for at least three months or until the material has been burned or until all questions are resolved regarding the received material, whichever is longer.

At the time of sampling, Norlite will compare the sample to the LLGF Specification Sheet provided by the Generator. With the LLGF Specification Sheet as a reference, each waste stream can be checked for proper name and identification and to ensure that the wastestream has not changed significantly.

C-3(b) Incoming Loads, Drums

The coliwasa sampler, hollow tube, or thief is employed to sample the drums of waste received from generators off-site. Norlite performs 100% sampling of drums, with composites of each unique waste stream prepared for analysis. At least 100 ml is taken as a representative sample of each drum. One composite sample is prepared for each unique waste stream using the samples of no more than three drums of the waste stream. The composite samples are managed in the same manner as the incoming bulk samples with respect to labeling and storage. Further details on container management are provided in SOPs in the attachments to the Waste Analysis Plan.

C-3(c) Storage Tanks

As necessary, storage tanks are sampled for confirmatory analysis or to obtain waste material for compatibility determinations. This is performed on a grab basis for the agitated storage tanks. For the non-agitated tanks, a composite of sample is taken from the top third, middle third, and bottom third of the tank.

C-3(d) Shale

Norlite operates an active shale quarry onsite. Once or twice per month, shale is blasted and conveyed to the primary crushing plant for sizing prior to introduction to the kiln. Norlite must consider the contribution of metals and chlorine to the kiln from the shale. Raw shale samples will be collected from the blasted shale after every blast. There will be four (4) grab samples taken and composited for analysise Grab samples will be collected in a clean "ZIPLOCK" style plastic bag for delivery to the onsite laboratory.

This composite sample for the blast will be prepared as followse A randomly selected portion of each grab sample shall be crushed an placed into "ZIPLOCK" style plastic bag. This composite will the be analyzed for the metals and total halogense

C-3(e) Wastes Generated Onsite

The tanks sludge is accumulated in the containers on the storage pad. Each container is labeled indicating when accumulation in the containers has occurred. The containers are sampled when 80 or more containers have been accumulated. A sample from one container from each sludge accumulation episode is collected. The samples are not composited and each sample is analyzed for the parameters required by the disposal vendor or for

Norlite's 6NYCRR Part §373 incinerator parameters, if the sludge is incinerated on-site.

Filter cleaning wastes are sampled in the same manner as the tank sludge wastes although they may be composited.

A clean metal or glass coliwasa, hollow tube, or sample thief is used to sample since it is known that the waste is not corrosive to these materials. All samples are stored in glass quart containers with lined caps. Cleaning of the sampler and containers is accomplished by the method used to rinse the coliwasa sampler used for tank truck. Alternatively, the sampler equipment can be disposed as a waste following Norlite procedures.

C-3(f) Retained Samples

For future reference, approximately a 300 ml. sample representative of each LLGF delivery will be placed in a clean glass jar with an aluminum polyethylene lined cover. The jar top marked to indicate the following:

A. Date received
B. Norlite sample number
C. Generator

Each such sample will be stored in the flammable storage refrigerator at a temperature of 4°C for at least three months or until the material has been burned or

until all questions are resolved regarding a material, whichever is longer.

C-4 Laboratory Testing and Analytical Methods

With the exception of select organic constituent analysis (i.e. pesticide and dioxin/furan analysis), all analyses under this waste analysis plan are performed by the onsite analytical laboratory. The Norlite Laboratory is certified under New York State ELAP and the national ELAP programs. A quality assurance/quality control ("QA/QC") program has been set up for the Norlite laboratory for the parameters analyzed:

specific gravity
quantity verification
heat of combustion (BTU)
total halogens
compatibility
viscosity
PCBs
metals.

Additionally, a QA/QC program has been established by a primary outside contract laboratory. This independent laboratory provides for the analysis of pesticides when required. The outside laboratory will also perform analysis for select organic constituents as may be

required on an annual basis for Generators and Blenders as well as perform duplicate analysis of those parameters performed onsite as a quality control check. Additionally, for analysis submitted by a Generator or Blender, Norlite requires that the analysis be performed using the methods contained in this plan and that the analysis is performed by a laboratory that is certified under ELAP, NELAP or the appropriate state agency in which the laboratory is located.

C-4(a) Specific Gravity

The specific gravity is measured by the hydrometer method because of the ease and reliability, or by measuring the weight per unit volume of materialee Small quantities of sludge or sampling discoloration do not affect the method. Neither does evaporation effect the results significantly. The hydrometer reading is taken in a 100 mle Graduated cylinder in accordance with Norlite SOP#4-003e The specific gravity result is used as an indicator of conformity of the waste to the original preshipment waste stream characterized. If the result does not agree within 10% with the original preshipment waste, the generator will be contacted and the shipment waste samples further evaluated. If it is determined that the shipment can be handled within compliance with Norlite's permit, based on further

analysis and discussions with the generator, then the waste will be accepted.

C-4(b) Quantity Verification

Each tanker truck load of LLGF will be weighed before and after unloading, and the net weight determined. The quantity verifications is recorded on the scale ticket which is filed with the hazardous waste manifest as part of the record of delivery, Quantity verification for shipments of containers will be by piece count.

C-4(c) Compatibility

A 100 ml. Portion of the representative sample from each LLGF delivery is mixed in a container with a 600 ml. Portion of a LLGF sample representative of the storage tank into which the LLGF is to be unloaded (for Tanks 300-600). For the smaller LLGF storage tanks, 100A,B&C and 200A,B&C, a 100 ml aliquot is used for the tank sample, since these tanks are of similar capacity to a tanker load. A thermometer will be used to measure any temperature rise. Observations of the mixed samples are made at least every five minutes for up to 30 minutes to determine if any adverse reactions have taken place particularly heat generation and rise. Observations of the mixed samples are made at least every five minutes

for up to 30 minutes to determine if any adverse reactions have taken place particularly heat generation and polymerization. If a temperature rise of 10^0 temperature rise is used since that will be large enough to indicate a reaction has occurred. If the temperature is between 5^0 and 10^0, special handling consideration concerning the rate of blending will be made.

In addition, ASTM D-34 Proposal P. 168 provides a compatibility chart for hazardous waste. The relevant part on the chart is included in Norlite SOP#4-005 to assist the laboratory in recognizing possible incompatibilities.

C-4(d) Heat of Combustion

A portion of the sample from each LLGF delivery shall be used to determine heat of combustion by Parr oxygen bomb calorimeter in accordance with ANSI/ASTM method D240-76, "Standard Test Method for Heat of Combustion Of Liquid Hydrocarbon Fuels by Bomb Calorimeter". Heat of combustion calculations will be recorded on the Norlite Corporation Low Grade Fuel Analysis Report The following Parr Instrument Company manuals are also referred as part of the heat of combustion analytical method:

(1) Parr Instrument Company Manual No. 147, "Instructions for the 1341 Plain Jacket Oxygen Bomb Calorimeter."

(2) Parr Instrument Company Manual No. 148, "Instructions and Methods for Parr Oxygen Bombse"

Calibration procedures are as described in the Parr Instrument Company Manual using Benzoic Acid. Each bomb is recalibrated every six months or before being put into servicee Experience shows the Bomb Calibration factor does not change over the period of usee A complete combustion results in a decomposition of organics and the residue is triply rinsed with water for use in the chlorine analysise therefore the decontamination is part of the procedure. If oxidation has not fully occurred, then a cleaning with soap, water and a solvent, and then rinsing with water is performed on the bomb. Sample analysis is conducted in duplicate for at least every 20th sample. Procedures are described in the "Instructions and Methods for Parr Oxygen Bombse"

C-4(e) Halogen Determination

The total halogen content is determined in accordance with ANSI/ASTM Method D808-63 (1986)e "Standard Test

Method for Chlorine in New and Used Petroleum Products (Bomb Method)." At this time, using these methods for chlorine analysis will constitute the "total halogen" analysis since fluorine, bromine and iodine contribute positive interference to the methods and chlorine is the predominant halogen in the waste received at Norlite. Should better speciation be necessary, the samples may be prepared using the bomb and the rinsate can be analyzed with ion specific electrodes for fluorine, chlorine, bromine and iodine. The concentrations of the individual halogens would then be summed to yield a value for "total halogens".

The total halogen determination is made using the test washings from the heat of combustion, employing a silver nitrate titration with dichloroflourescein indicator. Total halogen calculations are recorded on the Norlite Corporation, Low Grade Fuel Analysis Report Form.

The total halogen determination for shale includes the Parr Bomb preparation, SW-846 Method 5050, followed by Method 9056 for analysise

C-4(f) Viscosity

The viscosity of the material will be determined in accordance with ASTM Method D2393 as needed. The viscosity is measured using a Brookfield Test to verify

the pumpability of the waste. If the sample of the waste appears to be too viscous to be effectively pumped at the fuel farm, the laboratory will perform this procedure.

C-4(g) Metals

The laboratory will perform analysis for the 14 metals described in the permit. The methods employed are as described in SW-846, with Method 3050B normally used for sample preparation for LLGF and used oil/Waste Fuel A samples. Pending submittal of equivalency data and subsequent Department approval, Method 3052 will be used. Mercury analysis is performed solely by Method 7471A. The shale samples are also prepared by Method 3050B, as was performed for the shale samples taken as part of the Trial Burn and Supplemental Risk Burn. Modification or deviations of procedures, if necessary, to achieve the reported detection limits will be documented.

The metals for analysis and the analytical methods used for them are:

Metal	Method
Arsenic	6010B
Barium	6010B
Beryllium	6010B
Cadmium	6010B
Chromium	6010B

Copper	6010B
Lead	6010B
Mercury	7471A
Nickel	6010B
Selenium	6010B
Antimony	6010B
Silver	6010B
Zinc	6010B
Thallium	6010B

C-4(h) PCBs

PCB analysis will be by EPA SW-846 Method 8082 or its updates with a detection limit of not greater than 2 ppm for each Aroclor. Norlite will normally achieve a detection limit of 1 ppm for each Aroclor. All positive PCB results will be analyzed with a matrix spike or matrix spike duplicatese LLGF samples, representative of no more than five (5) deliveries may be composited in equal proportions by volume for PCB analysise LLGF samples and used oil/Waste Fuel A samples shall not be combined in composite samples for PCB analysise

Should initial analysis indicate PCB concentrations in composite samples greater than the quotient of 25 ppm divided by the number of samples in the composite, a sample representative of each delivery comprising the composite will be analyzed for PCBse Only those

deliveries indicating PCB concentrations of less than 25 ppm of total PCBs will be unloaded into the storage tanks and burned. For the purposes of this waste analysis plan, "25 ppm of total PCBs" is defined as the sum of the quantified Aroclors from Method 8082. Norlite will provide the Department notice of any LLGF shipment received with a PCB concentration greater than 10 ppm of total PCBs within 24 hours of receipt of the analytical resultse Norlite will not accepte or incinerate wastes containing over 25 ppm of total PCBse

C-5 Special Procedural Requirements

This section of the waste analysis plan describes the procedures used to apply the sampling and analytical procedures to the hazardous wastes and raw materials managed at the facility.

C-5(a) Hazardous Waste Characterization

An LLGF Specification Sheet, Exhibit C-1 or its equivalent, will be completed and signed by each Generator and Blendere This document will be reviewed and approved by Norlite prior to any shipment of hazardous waste to the facility. The LLGF Specification Sheet will be reviewed and updated on an annual basis or if and when the described waste stream changes. Norlite

does not accept polychlorodibenzo-p-dioxin (PCDD) or polychlorodibenzo-p-furan (PCDF) containing wastes and hazardous wastes listed as F020, F021, F022, F023, F026, F027 and F028e Any waste stream presented for approval that contains PCDD or PCDF will be denied approvale Wastes containing pesticides are accepted only with the restrictions described in this section. Norlite will not accept waste containing greater than 5% of total pesticide constituentse Wastes containing PCBs are restricted to those containing less than 25 ppm total PCBs, as defined as the sum of the Aroclors quantified by EPA Method 8082e Additionally, Norlite will not accept waste containing PCBs that are regulated under 40 CFR Part 761 or are defined as PCB waste under 6 NYCRR 371, regardless of the PCB concentration.

C-5(a)(1) Generator

In addition to the LLGF Specification Sheet and as documentation for theeinformation contained therein, a Generator, for the first time and at least annually, must provide the following information:

(a) Analysis for BTU, Chlorine, Ash, Norlite's 14 regulated metals and PCB contente Norlite's on-site lab may perform this analysis for the generatore

(b) The identity of any hazardous constituents identified in Appendix 23 to 6NYCRR Part §371 known to be present in the wastestream must be disclosed. Any analysis performed to identify such hazardous constituents must be performed in accordance with SW-846 methods for the target compoundse The analysis must achieve the method's detection limit, corrected for any dilution required for the extract of the sample's matrix. A generator need only conduct the test necessary to identify the hazardous constituents that are suspected of being presente If a generator can identify and document the hazardous constituents and the concentration limits with sufficient accuracy to assure Norlite that the PERMIT LIMITS will be met, no test results are necessary to satisfy this requirement.

(c) For those wastes produced by a known process, all chemicals present in concentrations in excess of 5% must be identified accounting for 100% of the composition. The components listed should include volatile aromatic organics, volatile chlorinated organics, other volatile organics, semi-volatile organics and nonvolatile organicse This information must be

substantiated by analytical data or other documentation (such as material safety data sheets).

(d) For those wastes produced by a process which is less well characterized, the Generator must produce an analysis identifying all chemicals present in concentrations in excess of 5 percent and Appendix 23 to 6NYCRR Part §371 constituents that have a substantial concentration (in excess of 100 ppm) accounting for approximately 100 percent of the composition. The analysis could include one or more of the analyses identified in WAP-1 Annual Verification.

(e) Waste produced by known processes are those where the hazardous constituents can be identified without need for analysis and the concentration limits can be estimated with sufficient accuracy to assure Norlite that the PERMIT LIMITS will be met. Waste produced by processes that are less well characterized are wastestreams not meeting the foregoing definition.

C-5(a)(2) Blenders

Blenders are subject to the similar requirements as Generators. Prior to receiving a load for the first time from a Blender, the Blender must complete a LLGF Specification Sheet and submit a copy of its waste analysis plan. Norlite will work with the Blender to assure that the Blender's fuel meets Norlite's PERMIT LIMITS. This objective can be achieved by the Blender providing information and analyses on the component waste streams or producing information and analyses on a representative sample of the blended fuel. The same criteria applicable to Generators applies to Blenders.

A Blender must provide the following information:

(a) Analysis for BTU, Chlorine, Ash, Norlite's 14 regulated metals and PCB content. Norlite's on-site lab may perform this analysis for the blender.

(b) The identity of any hazardous constituents identified in Appendix 23 to 6NYCRR Part §371 known to be present in the waste stream must be disclosed. Any analysis performed to identify such hazardous constituents must be performed in accordance with SW-846 methods for the target compounds. The analysis must achieve the

method's detection limit, corrected for any dilution required for the extract of the sample's matrix. A blender need only conduct the test necessary to identify the hazardous constituents that are suspected of being presente If a blender can identify and document the hazardous constituents and the concentration limits with sufficient accuracy to assure Norlite that the PERMIT LIMITS will be met, no test results are necessary to satisfy this requiremente If testing is required, the test could either be done on a representative sample of the blended fuel or by doing the requisite analysis on the component waste stream that cannot be adequately identified by other meanse

(c) For those wastes produced by a known process, all chemicals present in concentrations in excess of 5% must be identified accounting for 100% of the composition. The components listed should include volatile aromatic organics, volatile chlorinated organicse other volatile organics, semi-volatile organics and nonvolatile organicse This information must bee substantiated by analytical data or other documentation (such as material safety data sheetse.

(d) For those wastes produced by a process which is less well characterized, the Blender must produce an analysis identifying all chemicals present in concentrations in excess of 5 percent and Appendix 23 to 6NYCRR Part §371 constituents that have a substantial concentration (in excess of 100 ppm) accounting for approximately 100 percent of the composition. The analysis could include one or more of the analyses identified in WAP-1 Annual Verification.

(e) Waste produced by known processes are those where the hazardous constituents can be identified without need for analysis and the concentration limits can be estimated with sufficient accuracy to assure Norlite that the PERMIT LIMITS will be met. Waste produced by processes that are less well characterized are waste streams not meeting the foregoing definition.

(f) Blenders will not be required to identify the name and location of their Generators. Blenders will be required to identify the Standard Industrial Code(s) or the industrial group of their Generators. Norlite is attempting to maintain flexibility with its handling of

Blenders, while, at the same time, ensuring that it will not accept any LLGF that would prevent it from meeting its PERMIT LIMITS, adversely impairing plant operations, or is ineligible for thermal treatment by regulation.

(g) Blenders are required under 6 NYCRR Part §373 and 40 C.F.R. Part §264 or 265 to have their own approved waste analysis plan, the flexible approach identified herein will avoid duplication of sampling effort and, at the same time, provide adequate safeguard that only acceptable LLGF will be received by Norlite. Norlite will inspect each Blender's waste analysis plan to determine if adequately addresses waste characterization and critical LDR requirements with respect to combustion. If a Blender is permitted to manage hazardous wastes for which Norlite is not permitted, than Norlite will notify the Blender in writing of the discrepancy.

C-5(a)(3) Onsite Generated Wastes

Occasionally the storage tanks need to be cleaned out, generating a tank bottom material. The tank sludge will have an EPA waste designation number depending on

the material collected for burning (e.g., F001, F002, F003, F005 and/or D001)e The sludge from the tank bottom will be a semi-solid. This material may contain paint or ink solids or other solid or semi-solid polymeric materialse

The identification of the sludge is made by completing a waste profile sheet as required by the disposal vendor. Since the waste is a "derived from" hazardous waste, analysis is not required to perform a hazardous waste determination. The analyses that are performed are those required by the disposal vendor in order to assure the safe storage, transport and management by reuse for energy recovery or incineration of this materiale Typical requirements for each shipment may include analysis for the toxic metals.

The characteristics of this waste typically contain 30%-50% organic constituents, including solvents and oil. The remaining is polymer and solidse The flashpoint is less than 140°F.

The filtered solids from the offloading pad is a similar waste stream to the tank bottom sludge and is managed in the same way.

The personal protective equipment that is contaminated with the waste is characterized using generator knowledge so no sampling and analysis take placee The waste is characterized as "derived from"

waste based upon the waste stream with which it is contaminated.

C-5(b) Hazardous Waste and Used Oil/Waste Fuel A Receipts

After a waste stream has been characterized as described above, the material may be scheduled for delivery to the facility. When the waste arrives, the manifest (or other shipping paper as for the used oil deliveries) is inspected and the load is sampled as described in Section C-3e The following PARAMETERS are analyzed from each bulk or containerized delivery of Low Grade Fuel - specific gravity, heat of combustion, total halogen content, 14 metals, compatibility and solid content (visual determination). A composite of not more than 5 LLGF or used oil samples is analyzed for PCBse The LLGF samples are not combined with the used oil/Waste Fuel A samples for PCB compositing.

If a load is within the PERMIT LIMITS, it is accepted for unloading to the tankse However, if a load exceeds the PERMIT LIMITS, the load is reviewed to see whether it can be blended to or within the PERMIT LIMITS. If the material cannot be blended, the load is not to be unloaded and the truck is to be removed from the site as soon as possiblee The reason for the rejection is noted in item 19 of the manifest and a copy of the manifest

returned to the Generator. Norlite will provide the Department written notification of the rejection in accordance with 6NYCRR Subpart §373-2e

Typically, Norlite will accept LLGF that up to 25 times the permitted feed rate of a constituente Any LLGF that is over this threshold warrants careful consideration regarding its acceptability. Norlite will accept up to 100 times the permitted feed rate of a constituent depending on the volume of the LLGF with the very high concentrations of metals or total halogens and the volume and characteristics of the LLGF on hand as well as the LLGF that is expected to be received in the near futuree For example, an LLGF load with 100 times the concentration of copper may be acceptable if the volume is only 100 gallons and the remainder of the LLGF in the plant is very low in copper.

Used Oil/Waste Fuel A loads are sampled in the same way that hazardous waste LLGF loads are sampled, which is described in Section C-3e They are analyzed for the same parameters as the hazardous waste LLGF since the fuel will be co-fired with the LLGF and Norlite must consider all feed streams to the kiln while burning hazardous wastee The analysis will be reviewed to ensure that the fuel meets the definition of Waste Fuel A found at 6 NYCRR 225-2e For used oil that is shipped to Norlite as specification used oil fuel and will be used at Norlite as specification used oil fuel, the load will be sampled

and analyzed for the parameters necessary to demonstrate that it does indeed meet the specification. Norlite may use analysis provided by the marketer of the used oil fuel to make this demonstration but will analyze the load for PCBs and Total Halogens. If Norlite accepts specification used oil fuel and intends to co-fire it with the LLGF, as is done with the Waste Fuel A, then the specification used oil fuel shall be analyzed for the same parameters as the LLGF since Norlite must consider all feed streams to the kiln while burning hazardous waste.

C-5(c) Receipt of Hazardous Wastes Containing Pesticides

The following waste codes contain pesticide constituents.

D012	D013	D014	D015	D016	K031	K032
K033	K034	K035	K037	K038	K039	K040
K041	K097	K098	K099	K123	K124	K125
K126	P004	P037	P050	P051	P059	P123
U060	U061	U240	U247			

For LLGF containing these waste codes a pre-shipment sample is analyzed for pesticides. This analysis is provided by the generator/waste blender from a NYS ELAP

certified laboratory, NELAP certified laboratory or laboratory certified by another stateés agency with jurisdiction over testing laboratories, or Norlite will have the analyses performed by an NYS ELAP certified laboratory or a NELAP certified laboratory. Any waste stream containing levels of pesticides in excess of 5000 PPM will be designated for shipment pretesting. A threshold concentration of 5000 PPM is designated for a given pesticide constituent. If the acceptance test indicates an exceedances of this levelę an analysis will be performed by a NYS ELAP certified laboratory to determine if the concentration exceeds 1.7% for any given pesticide constituentse If the pesticide exceeds 1.7%, and the material cannot be blended to below this level, the shipment will be rejected. Additionally, Norlite will not accept waste containing greater than 5% total pesticide constituentse

C-5(d) Blended LLGF for Burning

When preparing a tank of LLGF for burning, Norlite determines the heat value of the fuel and the concentration of metals and total halogens in the fuele This is accomplished by 1) calculation based upon the original analysis of the fuel that makes up the tank, or 2) sampling and analysis of the tank. Each load of LLGF is sampled and analyzed upon receipt as described in

Section C-5(b). A control procedure will prevent the burning of any waste until the BTU, Total Halogens, PCB, and metal parameters have been verified. An analysis form (WAP-2¢ will be completed for each tank burned indicating the analyzed or calculated values for each permit parameter, the dates of analysis and/or calculation, and the date of authorization to burn the waste from the designated tank. The tank will be locked while being filled and will not be unlocked until the PCBs, Metal, Specific gravity, and Halogen content is completed and verified.

C-5(d)(i) LLGF Kiln Feed by Calculation

The calculation for BTU, Halogen content, and PCB will be accomplished by using a weighted average of the results analyzed for the tank or for the received loads of LLGF that were placed in the tank:

$$\frac{(Vol_1)(X_1)+(Vol_2)(X_X)^{+\cdots}}{(Vol_{totale})} = X_{total}$$

After a tank of LLGF has been burned, a reading of the level of the tank is taken and reported to the laboratory. The laboratory personnel will consider this residual volume the next time the tank is used to make a

fuel blend. All transfers of LLGF within the tank farm are reported to the laboratory so that an accurate accounting of fuel analysis is kept.

The results of the metals and total halogens calculations of the LLGF tank is used to prepare a WAP-2 form documenting the metals and total halogens feed to the kiln. The metals and total halogens feed rates from LLGF must be in compliance with the LLGF metals limits in the Part §373 Permit.

C-5(d)(ii) LLGF Kiln Feed by Analysis

Due to the propagation of error that can potentially occur in the calculation method described above, Norlite randomly confirms and calibrates the calculated values through sampling and analysis. On a weekly basis, a storage tank is sampled as described in Section C-3(c) and analyzed. The subject tank will be one that has multiple waste transfers and has not been thoroughly emptied over the previous week.

When a storage tank is tested for confirmation of the calculated results it is tested for total halogens, ash, and the ten regulated BIF metals (i.e., antimony, arsenic, barium, beryllium, cadmium, chromium, lead, mercury, silver, and thallium) and for four additional metals (copper, nickel, selenium and zinc) which are

monitored as part of the permit. PCBs are not reanalyzed.

The results of the metals and total halogens analyses of the LLGF (Liquid Low Grade Fuel) tank sample is used to prepare a WAP-2 form documenting the metals and total halogens feed to the kiln. The metals and total halogens feed rates from LLGF must be in compliance with the LLGF metals limits in the Part §373 Permit. When an analysis is performed to confirm the calculation, the analysis will be used to complete the WAP-2 form for the tank.

Norlite LGF laboratory personnel will sign and date the WAP-2 form. An authorized Norlite supervisor will also review and sign the form prior to release of the tank.

The following Norlite personnel will be trained and are authorized to execute form WAP-2:

LGF LABORATORY PERSONNEL
Laboratory Director
Q.C. Technicians

SUPERVISORY PERSONNEL
Plant Manager
Laboratory Director
Q.C. Technicians
Kiln Supervisors

One copy of all written laboratory analysis reports will be maintained in the operating record until closure

of the facility in accordance with 6 NYCRR 373-2e5 (c)(2)(iii)e.

Compliance with metals and total halogens limits is determined on a lbs/hr basis, consistent with standards in the BIF regulations under 40 CFR 266.102(e)(6)e and the manner in which the Trial Burn, Air Dispersion Modeling and Risk Assessment evaluations were performed by ENSR. Since the ultimate goal is to control emission rates to allowable levels, the important compliance objective is to control metals and total halogens feed rates on a lbs/hr basise Concentration limits are not necessary since LLGF is fed from agitated tanks but are provided in the application for convenience.

Compliance with allowable halogen and thermal input feed rates is planned in accordance with the SOP attached to this Waste Analysis Plan. The SOP 4-009 is titled "Process Control Procedure - Preparation for and Incineration of Waste Blends Containing High Concentrations of Organic Halogens or High BTU Materials".

C-5(e) Special Precautions for Ignitable and Incompatible Wastes

The LLGF blends are generally ignitable or combustible. Norlite has taken special precautions to

meet all the requirements for the storage of ignitable wastes. The precautions are described in Sections D and F of this Application. As described above, hazardous waste streams are tested for compatibility with the other wastes with which they are being stored. Any waste stream which fails this compatibility test during the characterization and approval process will be denied approval. Any approved waste streams that fail the compatibility test when a shipment arrives onsite will be rejected. When generating waste onsite, Norlite does not combine the wastes generated from different storage tank cleanings unless the compatibility test is performed and the materials are deemed compatible.

C-5(f) Combustion prohibition for inorganic wastes

As part of the waste characterization process described in this plan, Norlite will ensure compliance with the dilution prohibition as a substitute for treatment requirements. Listed in Appendix 54 of 6 NYCRR 376 are hazardous wastes for which combustion is inappropriate and, therefore, prohibited. Norlite will not accept for combustion any wastes listed in this appendix unless, the waste, at the point of generation or after bona fide treatment (such as cyanide destruction

prior to combustion), specifically meets one of the exceptions found in 6 NYCRR 376.1(c)(3)(i) through (vi).

C-5(g) Shale Analysis

Shale is sampled as described in Section C-3(d). The results for each blasted shale composite analysis are used in calculating and confirming allowable metal feed rates and total halogens feed rate for all raw shale to the kilns, as well as the total metal feed rate and total halogens feed rate to the kilns. The composite analysis is considered valid for the entire batch of blasted shales. The term of feed represented by this composite sample shall be from the point of blast to the next blast.

SHALE METAL FEED LIMITS*		
	Maximum	Net Maximum
Metals	**Concentration (mg/kg)**	**Shale Feed Rate (lbs/hr)**
Antimony	2.96	0.13
Arsenic	53	2.35
Barium	260	11e45
Beryllium	3.0	0.132
Cadmium	7.73	0.34
Chromium	127e7	5.62
Copper	190e5	8.38
Lead	87e3	3ee84
Mercury	0.1	0.e044
Nickel	95e0	4ee18
Selenium	1.2	0.e528
Silver	39e1	1.72
Thallium	7.5	0.33
Zinc	498.6	21.77

*at 22 tons/hour shale feed rate

Note: Shale metals concentration and feed rates are based on 22 ton/hour. If a given pre-blast composite meets the concentration standards in the above table, then no reduction in shale feed rates will be necessary for the term of feed represented by that blast.

If the metals and total halogens in the shale are within these feed limits or concentration limits, then no reduced allowable shale feed rate is needed for the batch

blast. If the concentration of any metal and total halogens feed rate results in an exceedance of the limits above, then the allowable shale feed rate must be reduced in proportion to the measured metal concentration until a new analysis of a batch of shale confirms that the concentration is within specification for the maximum permitted shale feed rate. Or, Norlite will request approval from NYSDEC to process raw shale exceeding the feed limits. This request will be made at least 15 days prior to the shale being processed. The request will seek a reduction in the LLGF/used oil/Waste Fuel A metals feed rate and/or total halogens feed rate so that the total feed rate to the kilns does not exceed the feed rate specified in the Part 373 Permit for the subject parameter. Form WAP-3 is used by the laboratory to calculate the allowable shale feed rate, up to a permitted maximum of 22 tons/hour. The form is posted in each kiln control room until the next quarry blast analysis is completed.

C-5(h) Bevill Exclusion Determination for APC Wastes

Pursuant to NYCRR 374-1.8(m), a residue from a boiler or industrial furnace that burns hazardous waste may be excluded from the definition of a hazardous waste if it meets the requirements of the section. This section of

the regulation allows the owner/operator the opportunity to compare the waste-derived residues from the unit with normal residues or compare the concentrations of constituents of concern from the waste-derived residues with published health-based limits.

Norlite demonstrates that the concentrations of toxic constituents of concern (COCs) are below the health-based limits in 40 CFR 266 Appendix VII as referenced in 6 NYCRR 374 Appendix 47. This method is consistent with 6 NYCRR 374-1.8(m)(2)(ii).

C-5(h)(i) Nonmetal Constituents

Through the sampling and analysis plans described below, the residues from the baghouse and the multiclone APC devices and the filtercake produced from the treatment of the scrubber blowdown shall be analyzed for constituents of concern that are derived from 6 NYCRR Part 371 Appendix 23 (See Table 1). The list of constituents contains most of the compounds listed in Appendix VII of 40 CFR Part 266 and all of the compounds listed in Appendix VIII of 40 CFR Part 266. In order for the residues to be excluded from the definition of hazardous waste under this part of the regulation, the concentrations shall be less than those listed in Appendix VII. For the nonmetallic constituents that are not listed in Appendix VII, the concentrations must be

less than the level of detection of the analytical method (using analytical procedures prescribed in SW846) or less than 0.002 µg/kg, whichever is higher. Should any of these constituents be found at concentrations that exceed the health risk-based standards listed in Appendix VII, the results will be compared to the standards for F039 nonwastewaters found in 6 NYCRR Part 376. Should the results exceed these F039 standards for these constituents, the residues will be considered hazardous waste and ineligible for the Bevill Exclusion.

Analysis for the nonmetal constituents will be performed on an annual basis.

C-5(h)(ii) Metal Constituents

As described in the sample and analysis plans for this protocol, the residues from the baghouse and multiclone APC devices and the filtercake produced from the treatment of the scrubber blowdown shall be compared to the Toxicity Characteristic Leaching Procedure (TCLP) extract concentration limits found in Appendix VII of 40 CFR Part 266. In order for the residues to be excluded from the definition of hazardous waste under this part of the regulation, the concentrations shall be less than those listed in Appendix VII.

C-5(h)(iii) Sampling and Analysis Plan

The regulation requires that the waste-derived residue be sampled and analyzed as necessary to determine whether the residue generated during each 24-hour period has concentrations of toxic constituents that are higher than the health-based levels. Based upon the consistency of the operation and the inherent unlikelihood of organic constituents being found in the residues, Norlite will sample and analyze for organics on an annual basis and the metals on a monthly basis. Norlite shall sample the residue from the baghouse and the multiclone on the same kiln (i.e. Kiln #1 or Kiln #2). Over a 24-hour period, grab samples will be taken on a two-hour interval resulting in twelve (12) grab samples taken. These samples shall be composited to yield a 24-hour composite sample. As a contingency, the remainder of grab sample material shall be retained for control purposes. A sampling log shall be kept indicating the sampling time, location and sampler. Sample jars shall be labeled with the sample date, time and location. The resulting composite samples shall be clearly labeled with the sample date and sample location.

The samples shall be submitted to a NYS ELAP-certified laboratory of a NELAP-certified laboratory for analysis. Analysis shall include the TCLP extraction of the sample and analysis of the extract for the metals

listed in Appendix VII of 40 CFR Part 266. For nonmetal constituents, samples shall be extracted and analyzed by the prescribed methods found in SW-846.

C-5(i) LDR Determination for Clinker

Hazardous waste LLGF is received and burned as fuel for energy recovery at Norlite. However, pursuant to 6 NYCRR 374-1.3(a)(2), the clinker must meet the following criteria in order to be used as a unrestricted product if Norlite is incinerating hazardous waste for the purposes of destruction:

- The product must not exhibit a characteristic of a hazardous waste; and
- The product must meet the nonwastewater Universal Treatment Standards (UTS) found in 40 CFR 268.48.

Norlite has proposed the to incinerate solid hazardous wastes, termed "SLGF", and hazardous waste wastewater, separate from the LLGF feed. These two activities will not occur unless successfully demonstrated during an additional Trial Burn or "Miniburn". If Norlite engages in either or both of these activities, then the clinker becomes subject to 6 NYCRR 374-1.3(a)(2) and will follow the procedures indicated here.

Based on the thermal process, the clinker will not exhibit the characteristics of ignitability, corrosivity

or reactivity. Indeed, the material is quite inert. The material should also not be expected to contain any organic compounds or leachable metals. However, due to varied feed and the remote possibility that some organic compounds might survive the temperature in the kiln, Norlite shall perform sampling and analysis of the clinker to ensure that it meets the UTS. Since the clinker does contain metals, sampling and analysis shall also be performed for metals using the TCLP to show that the clinker does not exhibit the toxicity characteristic for metals and also meets the UTS.

This sampling will be performed on a grab basis as required by the LDR. Norlite shall sample and analyze the clinker for metals on a monthly basis and the organics on an annual basis. Norlite does not expect a monthly analysis for organic compounds to be necessary due to the nature of the operation.

The samples shall be submitted to an ELAP-certified lab for analysis. Analysis shall include the TCLP extraction of the sample and analysis of the extract for the metals. For organic constituents, samples shall be extracted and analyzed by the prescribed methods found in SW-846 (See Table WAP-1).

C-6 Waste Evaluation Frequency

Due to Norlite's status as a "commercial TSDF", it is important that the facility be particularly thorough in evaluating and re-evaluating wastes. In order to ensure compliance with the operating permit and ensure the safety of the personnel, the community and the environment, Norlite frequently evaluates all wastes to (1) confirm that the information provided by the Generator and/or Blender is correct, and (2) detect any changes in the waste properties while managing the waste.

C-6(a) Initial Characterization and Re-evaluation

Prior to any shipments of hazardous waste to Norlite, a waste stream is characterized and approved as specified in Section C-5(a). On an annual basis or when evidence exists that it has changed, the approved waste stream will be re-evaluated under the characterization procedures described in Section C-5(a). For the re-evaluation, the Generator or Blender may certify that the waste stream has not changed provided there has been no evidence that the waste stream has changed.

C-6(b) Hazardous Waste and Used Oil/Waste Fuel A Receipts

As described in Section C-5(b), all shipments of hazardous waste and used oil/Waste Fuel A are sampled and analyzed. All containers of wastes are sampled and composites are prepared as discussed in Section C-3. Specification used oil fuel is sampled and analyzed for PCBs and total halogens, at a minimum. This only occurs if the supplier has provided analysis proving the used oil meets the used oil specification.

On a quarterly basis, a random shipment from a Blender will be sampled and analyzed for pesticide constituents. The sample will be taken from a shipment that has be characterized as being absent of pesticide constituents.

On an annual basis, a random shipment from a Blender will be sampled and analyzed for PCDD/PCDF even though the characterization indicates these constituents to be absent.

C-6(c) Onsite Generated Wastes

Wastes generated onsite are characterized at least annually. They are typically characterized when generated if they are to be reintroduced to Norlite's

process or when they are shipped offsite to an authorized treatment facility.

C-6(d) Storage Tanks Prior To Burning

On a monthly basis, at least one (1) tank of LLGF will sampled and analyzed prior to burning. The purpose of this sampling will be to confirm the accuracy of the calculations used to certify tanks for burning since every shipment of hazardous waste is sampled and analyzed for the key permit parameters.

C-7 Laboratory Quality Assurance/Quality Control

Norlite has developed a quality assurance/quality control (QA/QC) plan that provides for the attainment of desired quality levels in its onsite laboratory. The QA/QC plan has been designed to meet or exceed the guidance criteria of the United States Environmental Protection Agency and the New York State Department of Environmental Conservation. This QA/QC plan document has been designed to assure that the analytical results provided by the laboratory are reliable and valid (including the qualities of accuracy, precision,

completeness, representativeness, and comparability.) Norlite's QA/QC program and the list of methods for which the laboratory is certified is attached hereto as Appendix C-1. As required by NELAP, this document will be reviewed and modified on a periodic basis. Any revisions will be forwarded to NYSDEC for review.

Norlite obtained state and national certification (ELAP 11526 & NELAP NYS11526) to conduct all analyses onsite. On a monthly basis, a random LLGF sample will be split and submitted to an independent, ELAP certified laboratory for metals, total halogens and heat content. On occasion, an independent, ELAP certified laboratory may be utilized to confirm a result if an instrument in Norlite's laboratory is down for repairs or other reasons unknown.

C-8 Tables

Tables WAP-1, WAP-2 and WAP-3 follow below.

TABLE WAP-1
WASTE ANALYSIS PLAN

STREAM	PARAMETER	ANALYTICAL METHOD	TECHNIQUE	DETECTION LIMIT	RATIONAL FOR PARAMETER	PERMIT LIMITS	ACCEPTANCE CRITERIA
LLGF	Specific Gravity	ASTM-1298-85	Mass/Vol Measurement	(+/-) 0.002	Waste Verification		10%
LLGF	Viscosity	ASTM-D2393	Brookfield	Pumpability	3000 SUS @ 80°F		10%
LLGF	Heat of Combustion BTU	ASTM-D240 Norlite SOP#4-001	Oxygen Bomb	100 BTU/lb	Assess Burning Efficiency Requirements		
LLGF	Total Halogens	ASTM D808 (D2361) Norlite SOP#4-002	Modified Titration or ion specific electrode	(+/-) 0.05	Halogen Content Required	115 lbs/hr	10%
LLGF	Compatibility	Norlite SOP#4-005	Thermal Mixing	5 Degree C Temp Rise	Ensure Materials are compatible		5 Degree C Temp Rise
		Oxidzer	Spot Test	Neg / Pos	Verify Absence of an Oxidizer		
		Peroxide	Spot Test	Neg / Pos	Verify Absence of a Peroxide		
LLGF	PCB	EPA 8082 Norlite SOP#4-006	GC	2 ppm per Aroclor	Verify Presence of PCBs	25 ppm total as sum of Aroclors	25 ppm total as sum of Aroclors
LLGF	Arsenic	EPA 3050B/6010	ICP	0.04 mg/kg	Verify Metals Below Permit Levels	0.104 lb/hr	<2100 mg/kg
	Beryllium	EPA 3050B/6010	ICP	0.02 mg/kg	Verify Metals Below Permit Levels	0.0058 lb/hr	<118 mg/kg
	Cadmium	EPA 3050B/6010	ICP	0.03 mg/kg	Verify Metals Below Permit Levels	0.144 lb/hr	<2940 mg/kg
	Chromium	EPA 3050B/6010	ICP	0.03 mg/kg	Verify Metals Below Permit Levels	2.16 lb/hr	<44,100 mg/kg
	Copper	EPA 3050B/6010	ICP	0.10 mg/kg	Verify Metals Below Permit Levels	4.74 lb/hr	<96,800 mg/kg
	Lead	EPA 3050B/6010	ICP	0.14 mg/kg	Verify Metals Below Permit Levels	2.69 lb/hr	<54,900 mg/kg
	Barium	EPA 3050B/6010	ICP	0.05 mg/kg	Verify Metals Below Permit Levels	0.72 lb/hr	<14,700 mg/kg
	Mercury	EPA 7471A	Cold Vapor	95 ug/kg	Verify Metals Below Permit Levels	to be determined	to be determined
	Nickel	EPA 3050B/6010	ICP	0.03 mg/kg	Verify Metals Below Permit Levels	2.88 lb/hr	<58,800 mg/kg
	Antimony	EPA 3050B/6010	ICP	0.04 mg/kg	Verify Metals Below Permit Levels	0.24 lb/hr	<4900 mg/kg
	Selenium	EPA 3050B/6010	ICP	0.03 mg/kg	Verify Metals Below Permit Levels	0.12 lb/hr	<2400 mg/kg
	Silver	EPA 3050B/6010	ICP	0.11 mg/kg	Verify Metals Below Permit Levels	0.096 lb/hr	<1960 mg/kg
	Thallium	EPA 3050B/6010	ICP	0.05 mg/kg	Verify Metals Below Permit Levels	0.24 lb/hr	<4900 mg/kg
	Zinc	EPA 3050B/6010	ICP	0.12 mg/kg	Verify Metals Below Permit Levels	4.8 lb/hr	< 100,000 mg/kg
LLGF	Pesticides	EPA 8081A/8141A/ 8151A	GC and GC/MS		Verify Presence & Ensure Below Permit Levels	<1.7% Each and <5% Total	<5% Total

TABLE WAP-1
WASTE ANALYSIS PLAN

STREAM	PARAMETER	ANALYTICAL METHOD	TECHNIQUE	DETECTION LIMIT	RATIONAL FOR PARAMETER	PERMIT LIMITS	ACCEPTANCE CRITERIA
LLGF	PCDD/PCDF	EPA 8290 or 8280A	GC/MS		Verify Absence	must be absent	must be absent
Raw Shale	Arsenic	EPA 3050B/6010	ICP	0.04 mg/kg	Verify Metals Below Permit Levels	2.35 lb/hr	
	Beryllium	EPA 3050B/6010	ICP	0.03 mg/kg	Verify Metals Below Permit Levels	0.132 lb/hr	
	Cadmium	EPA 3050B/6010	ICP	0.02 mg/kg	Verify Metals Below Permit Levels	0.34 lb/hr	
	Chromium	EPA 3050B/6010	ICP	0.02 mg/kg	Verify Metals Below Permit Levels	5.62 lb/hr	
	Copper	EPA 3050B/6010	ICP	0.05 mg/kg	Verify Metals Below Permit Levels	8.38 lb/hr	
	Lead	EPA 3050B/6010	ICP	0.06 mg/kg	Verify Metals Below Permit Levels	3.84 lb/hr	
	Barium	EPA 3050B/6010	ICP	0.07 mg/kg	Verify Metals Below Permit Levels	11.45 lb/hr	
	Mercury	EPA 7471A	Cold Vapor	50 ug/kg	Verify Metals Below Permit Levels	to be determined	
	Nickel	EPA 3050B/6010	ICP	0.04 mg/kg	Verify Metals Below Permit Levels	4.18 lb/hr	
	Antimony	EPA 3050B/6010	ICP	0.04 mg/kg	Verify Metals Below Permit Levels	0.13 lb/hr	
	Selenium	EPA 3050B/6010	ICP	0.05 mg/kg	Verify Metals Below Permit Levels	0.0528 lb/hr	
	Silver	EPA 3050B/6010	ICP	0.03 mg/kg	Verify Metals Below Permit Levels	1.72 lb/hr	
	Thallium	EPA 3050B/6010	ICP	0.07 mg/kg	Verify Metals Below Permit Levels	0.33 lb/hr	
	Zinc	EPA 3050B/6010	ICP	0.08 mg/kg	Verify Metals Below Permit Levels	21.77 lb/hr	
Clinker	Metals	EPA 1311	ICP (Cold Vapor for Hg)	varied	Verify that Clinker meets LDR	6 NYCRR 376.4	
	Volatile Organics	EPA 8015B/8021B/ 8260B	GC and GC/MS	varied	Verify that Clinker meets LDR	6 NYCRR 376.4	
	Semivolatile Organics	EPA 8270B/8081A 8290/8082	GC and GC/MS	varied	Verify that Clinker meets LDR	6 NYCRR 376.4	
Multiclone Dust, Baghouse Dust, FilterCake	Metals	EPA 1311	ICP (Cold Vapor for Hg)	varied	Ensure Eligibility for Bevill Exclusion	6 NYCRR 374-1.8(m)	
	Volatile Organics	EPA 8015B/8021B/ 8260B	GC and GC/MS	varied	Ensure Eligibility for Bevill Exclusion	6 NYCRR 374-1.8(m)	
	Semivolatile Organics	EPA 8270B/8081A 8290/8082	GC and GC/MS	varied	Ensure Eligibility for Bevill Exclusion	6 NYCRR 374-1.8(m)	

KILN

WAP-2
NORLITE CORPORATION
LGF TANK CERTIFICATION

FILE #
W-OIL FILE #

T/ #
TOTAL GALLONS
DATE RELEASED
LGCS
WOCS

MAX WASTE OIL GALLONS PER/MIN
MAX OIL GALLONS PER/MIN
Lbs/hr Lime Feed
OIL BTU/GAL LGF BTU/GAL
TOTAL BTU/HR MAX 62.0-M

DATE	GENERATOR	CTRL#	MANIFEST#	GALLONS

LGF CONCENTRATION		WASTE OIL	FEED RATE		ALLOWABLE LIMITS	
Gravity	g/ml	g/ml	WO-OIL BTU/hr		at	gpm
BTU #		BTU/#	LGF BTU/hr		at	gpm
Chlorine	%	%		lbs/hr	MAX 115	lbs/hr
Ash	%	%		lbs/hr		
Arsenic	ppm	ppm		lbs/hr	MAX 0.1200	lbs/hr
Beryllium	ppm	ppm		lbs/hr	MAX 0.0058	lbs/hr
C ium	ppm	ppm		lbs/hr	MAX 0.1440	lbs/hr
Ch nium	ppm	ppm		lbs/hr	MAX 2.1600	lbs/hr
Copper	ppm	ppm		lbs/hr	MAX 4.8000	lbs/hr
Lead	ppm	ppm		lbs/hr	MAX 2.6900	lbs/hr
Barium	ppm	ppm		lbs/hr	MAX 0.7200	lbs/hr
Mercury	ppm	ppm		lbs/hr	MAX 0.1240	lbs/hr
Nickel	ppm	ppm		lbs/hr	MAX 2.8800	lbs/hr
Antimony	ppm	ppm		lbs/hr	MAX 0.2400	lbs/hr
Selenium	ppm	ppm		lbs/hr	MAX 0.1200	lbs/hr
Silver	ppm	ppm		lbs/hr	MAX 0.0960	lbs/hr
Thallium	ppm	ppm		lbs/hr	MAX 0.2400	lbs/hr
Zinc	ppm	ppm		lbs/hr	MAX 4.8000	lbs/hr

DATE : LGF Laboratory Authorization:

DATE: Supervisor Authorization:

DATE: TIME: Started BURNER:

DATE: TIME: Completed BURNER:

NATURAL GAS METER

START	STOP

WASTE OIL METER

START	STOP

WAP-3

NORLITE CORPORATION

SHALE FEED CERTIFICATION

SHALE BATCH # _____

DATE OF BLAST _____

DATE RELEASED FOR USE _____

Maximum Shale Feed Rate Basis for Calculations below: _____ton/hour shale feed

Metal	Concentration	Metal Feed Rate	Part 373 Permit
Antimony		0.12	
Arsenic		2.35	
Barium		10.6	
Beryllium		0.132	
Cadmium		0.315	
Chromium		5.20	
Copper		7.76	
Lead		3.56	
Mercury		0.0352	
Nickel		3.87	
Selenium		0.05	
Silver		1.59	
Thallium		0.306	
Zinc		20.11	
Osmium		1.06	
Vanadium		8.40	
Manganese		30.63	
Cobalt		2.33	

Date_____ Laboratory Authorization_____

Date_____ Supervisor Authorization_____

Date and Time Batch Started: _____

Date and Time Batch Completed: _____

Exhibit C-1

Norlite Corporation

628 South Saratoga Street
Cohoes, New York 12047
Phone: (518) 235-0401 Fax: (518) 235-0233

WASTE STREAM PROFILE No. _____

Approved for Acceptance: ❑ Yes ❑ No
Reviewed by: _____ Date _____
Approved by: _____ Date _____

PLEASE ATTACH: All Material Safety Data Sheets (MSDS), Analysis Reports, Handling Precautions, Additional Hazard Information, Support Data & Comments.

GENERATOR INFORMATION

Site Name _____
Address _____

Mailing Name _____
Address _____

EPA I.D. # _____
Technical Contact _____
Phone # _____ Fax # _____
Shipping Contact _____
Phone # _____ Fax # _____

Billing Name _____
Address _____

Contact _____
Phone # _____ Fax # _____
Transporter Name _____
Address _____

EPA I.D. # _____
Contact _____
Phone # _____ Fax # _____

WASTE DESCRIPTION

Generators Name For Waste _____
Process Generating Waste _____

SHIPPING INFORMATION

DOT Shipping Name _____
DOT Hazard Class _____ Packing Group _____ UN/NA No. _____
EPA Hazardous Waste Codes _____
Estimated Volume _____
Container Type: ❑ Bulk ❑ Drum ❑ Roll-Off

PHYSICAL CHARACTERISTICS @ 70° F

Color _____ ❑ Liquid ❑ Single Phase
Odor _____ ❑ Semi-Liquid ❑ Bi-Layered
Specific Gravity _____ ❑ Solid ❑ Multi-Layered
pH _____ % Solids _____ % Water _____
Viscosity: ❑ Low ❑ Medium ❑ High

WASTE ANALYSIS

Heat of Combustion _____ Btu's/lb. Flash Point _____ °F
Halogens _____ % Sulfur _____ % Ash _____ %
PCB's _____ ppm Corrosivity _____ mm/yr.

OTHER COMPONENTS

Herbicides _____ ppm Cyanide _____ ppm
Pesticides _____ ppm Sulfide _____ ppm
Dioxins _____ ppm PBB _____ ppm

CHEMICAL COMPOSITION - (Totals to 100%)

_____	_____ %	_____	_____ %
_____	_____ %	_____	_____ %
_____	_____ %	_____	_____ %
_____	_____ %	_____	_____ %
_____	_____ %	_____	_____ %
_____	_____ %	_____	_____ %
_____	_____ %	_____	_____ %
_____	_____ %	_____	_____ %

TOTAL METALS

Antimony (Sb)	_____ ppm	Lead (Pb)	_____ ppm
Arsenic (As)	_____ ppm	Mercury (Hg)	_____ ppm
Barium (Ba)	_____ ppm	Nickel (Ni)	_____ ppm
Beryllium (Be)	_____ ppm	Selenium (Se)	_____ ppm
Cadmium (Cd)	_____ ppm	Silver (Ag)	_____ ppm
Chromium (Cr)	_____ ppm	Thallium (Ti)	_____ ppm
Copper (Cu)	_____ ppm	Zinc (Zn)	_____ ppm

OTHER CHARACTERISTICS (Yes/No)

Reactive	_____	Infectous	_____	Explosive	_____
Biological	_____	Pyrophoric	_____	Radioactive	_____

List Acute Hazardous Wastes as defined in 40CFR 261.33(e) or 6NYCRR 371.4(d)(5). List any Hazardous Constituents as defined by 40CFR 261 Appendix VIII. Describe any special handling requirements associated with this waste system.

CERTIFICATION: I attest and certify that all information provided is complete and accurate. This low grade fuel is properly described with no willful omissions and that all known or suspected hazards have been disclosed and the low grade fuel is not a PCB waste that is defined in 40 CFR 761.3. Any changes or additional information obtained about this waste stream will be promptly conveyed to the Norlite Corporation.

Print Name and Title _____ Signature _____ Date _____

Appendix C-1

NORLITE CORPORATION

ANALYTICAL LABORATORY

QUALITY ASSURANCE MANUAL

NYS ELAP ID #: 11526
NELAC Accredited

Quality Manual

Laboratory Manager: Prince M. Knight III
Technical Director: Jon-Alan Minehardt
Quality Assurance Officer: Jon-Alan Minehardt

Phone (518) 235 - 0401

Approved Document:_____
Laboratory Manager

Approved Document: _____
Technical Director / QA Officer

Original Signatures Must Be Present on Authorized Copy

Revision Record

Revision	Date	QC Officer	Description
1	??	Frank Kovacs	Initial release
2	12/12/00	Jon-Alan Minehardt	NELAC Update
3	01/30/01	Jon-Alan Minehardt	Draft Modifications
4	11/28/01	Jon-Alan Minehardt	Updates & Revisions

The following personnel have read this manual. A copy of this page will be included in the employee's training file. Original signature page is included in the QA Officer's copy of this manual.

Name	Title	Date
Prince Knight	Laboratory Manager	December 1, 2001
Jon-Alan Minehardt	Technical Director / QA Officer	December 1, 2001
David Bryk	Chemist	December 1, 2001
Thomas VanVranken	Organic Chemist	December 1, 2001
Mark Turcotte	Analytical Technician	December 1, 2001
Tony Becker	Analytical Technician	December 1, 2001
Michael Cozzy	Analytical Technician	December 1, 2001

Table of Contents

1.0 Quality Policy

Norlite Laboratory's quality objective is to produce accurate, technically defensible data in order to support our industrial process. Our generated data is reported to New York State and the EPA for the regulatory requirements of our facility. These regulations include Norlite's Waste Analysis Plan (6NYCRR Part 373 permit), SPDES and state and federal hazardous waste requirements. Norlite Laboratory is commited to performing all laboratory analysis in conformance to the NELAC (National Environmental Laboratory Approval Conference) standards which are designed to improve laboratory quality over time. This commitment will result in the following examples:

-adequately staffed and equipped laboratory facility.

-successful participation in the proficiency program operated by the New York State Environmental Laboratory Approval Program (ELAP).

-successful implementation of an NELAC compliant quality system.

-periodic internal audits with management review.

-timely reporting of all laboratory test results to appropriate departments or regulatory agencies.

-analytical data that is supported by quality control measures and documented laboratory testing procedures.

The Quality policy and Quality Manual are communicated to all employees and is part of our training policy for new hires. Management will document and review the policy's implementation through employee evaluation, internal auditing and document control process.

It is Norlite Laboratory's goal to develop and maintain good laboratory practices in the manners described in the Quality Manual. All employees who have read and signed the acknowledgment will strive to help achieve this goal.

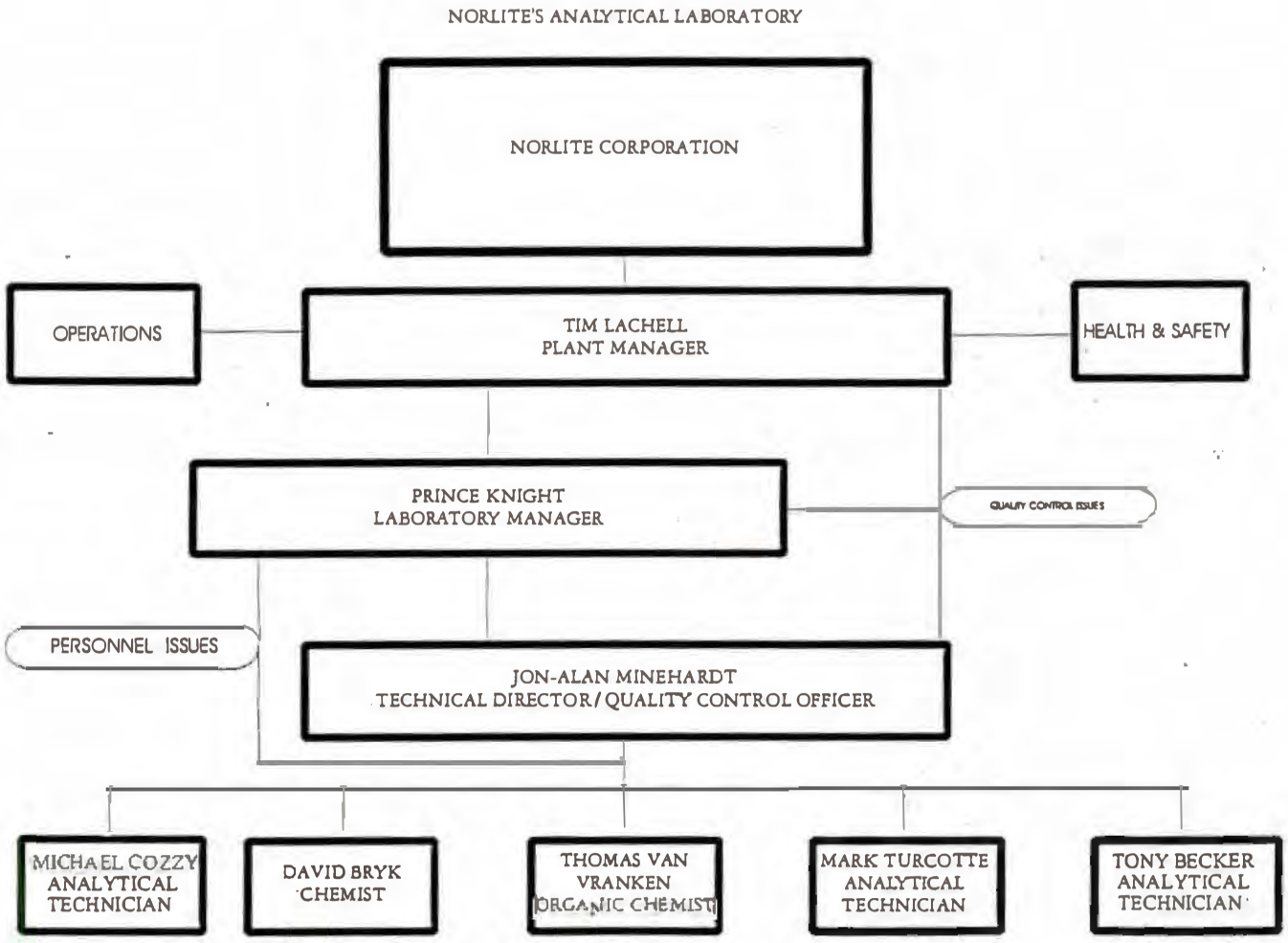
2.0 Accredited Test Methods

Test	Method
pH	EPA Method 150.1
Temperature	EPA Method 170.1
Total Suspended Solids	SM 18 2540D
Total Dissolved Solids	SM 18 2540C
B.T.U.'s in Fuel	ASTM D240-87
Metals in Waste Water	EPA Method 200.7
Metals in Hazardous Waste	SW-846 3050B / 6010B
Mercury in Waste Water	EPA Method 245.2
Mercury in Hazardous Waste	SW-846 7471A
Polychlorinated Biphenyls	SW-846 8082

2.1 Instrumentation and Support Equipment

-Accumet Model30 pH and Conductivity Meter
-Thermolyne RC2200 Hot Plate
-Metler PC220 & AT200, Ohaus Adventurer - Analytical Balances
-Fisher Scientific FS6014 Sonicator
-Fisher Scientific Isotemp 220 Water bath
-VWR 1300U Oven
-Thermolyne 6000 Muffle Furnace
-CEM MDS 2000 Microwave
-(2) Parr 1261 Automated Bomb Calorimeter
-Leeman Labs PS200-II Cold Vapor Mercury Analyzer
-Varian CP-3800 Gas Chromatograph w/ Dual Electron Capture Detectors
-Fisons 3410+ Sequential ICP-AES
-Varian Vista RL CCD Simultaneous ICP-AES
-Barnstead Thermolyne Deionized Water System

3.0 Organizational Chart



4.0 Relationship Between Management, Technical Operations, Support Services, and the Quality System

4.1 The laboratory manager has overall responsibility for the operation of the laboratory. It is the laboratory manager's responsibility to ensure adequate staffing, instrumentation and resources to perform all required tasks. The laboratory manger is also responsible for all personnel issues concerning the laboratory staff. The laboratory manager and technical director interact to oversee all support services including instrument service contracts, subcontracted analyses, and physical maintenance of the laboratory. The laboratory manager also interacts with the plant manager, department supervisors and regulatory compliance in coordination of laboratory support services. The laboratory manager reports directly to the plant manager.

4.2 The technical director is ultimately responsible for all analytical data generated by the laboratory staff. The director is responsible for providing supervision to all laboratory personnel, adherence to documented procedures, and implementation of the quality manual. The technical director reports directly to the laboratory manager.

4.2.1 The technical director will certify that all laboratory personnel maintain adequate educational or technical experience to perform any accredited tests. This will include, but is not limited to, training procedures and documentation, quality control samples, and periodic audits.

4.2.2 The director must certify that all accredited test procedures follow appropriate methodology and quality control. Additional responsibilities include maintaining appropriate EPA and NYS ELAP approved test methods by reviewing and updating the Standard Operating Procedures (SOP's) of the laboratory.

4.2.3 The technical director will ensure that the laboratory's policies and objectives for quality of testing services are documented in the quality manual. The director will assure that the Quality Manual is communicated to, understood and implemented by all personnel concerned. Periodic review and updating of the Quality Manual are required to support laboratory development.

4.3 The quality assurance officer is responsible for the quality system and its implementation. This will be achieved through daily, weekly, monthly and annual reviews of quality control data produced by the laboratory staff. The QA officer has direct access to the highest level of management at which decisions are made on laboratory policy, resources, and results. This access is critical to ensure appropriate corrective measures whenever required.

(**NOTE:** The QA officer is also the technical director due to the size of the laboratory. When the director / QA officer is not present, those responsibilities are maintained by the laboratory manager. If both individuals are absent, a staff member who is familiar with the quality system and all test procedures will be appointed to supervise.)

5.0 Job Description of Staff

Laboratory Manager -will oversee all operations of the laboratory. The laboratory manager is responsible for all communications between departments within the facility and scheduling of laboratory responsibilities. All internal NYS ELAP & NELAC issues are coordinated with the technical director. The laboratory manager is responsible for all personnel issues in the laboratory.

Technical Director - is ultimately responsible for all analytical data produced by the laboratory. The technical director will maintain all analytical procedures and ensure that all staff will have the necessary resources to adhere to those procedures. Review of staff qualifications and training of all new employees will be coordinated through the technical director. All NYS ELAP & NELAC accredited analyses will be certified in the name of the technical director.

Quality Assurance Officer - is responsible for the implementation of the quality policy. The QA officer will conduct periodic audits and quality control reviews to ensure data reliability. Deficiencies of the quality system will be communicated to the laboratory manager and plant manager. The QA officer will also be responsible for coordinating all proficiency analyses required for certification.

Laboratory Chemists / Technicians - will provide all analytical support for the laboratory. This will include analytical procedures pertaining to Low Grade Fuel (LGF), water and shale analyses. Responsibilities will also include daily maintenance and cleaning of laboratory instrumentation and work areas. The technical director and manager may delegate any other duties to the technicians as deemed necessary for laboratory operations.

6.0 Document Control

This quality manual and related documents are subject to document control. Distribution of controlled documents is limited to those indicated on the distribution list. Controlled documents are indicated by the paper color referenced in the footer. Uncontrolled copies are indicated by reproduction on any other type of paper. The Quality Assurance Officer controls the supply of paper used to produce controlled copies.

The purpose of the document control system is to ensure that only the most recent revisions are available to the appropriate personnel, revisions are timely, and receive the required approvals. The QA Officer is responsible for the document control system and maintains a master list of the location of all documents and their current revision. The laboratory manager and QA Officer approve all newly released and revised documents. Where necessary, one original of each revision may be retained for legal reasons or knowledge preservation. This original will be maintained by the QA Officer. All obsolete revisions will be destroyed by the QA Officer. Each page of controlled documents will contain the effective date, revision number, document number and title. Controlled documents will have an approval signature page, a revision record page and a distribution list.

7.0 Traceability of Measurements

Verification and/or validation of equipment, such as, balances and thermometers, will be performed with National Institute of Standards and Technology (NIST), traceable standards. Calibration certificates must indicate NIST Traceability along with measurement results and the associated uncertainty and/or statement of compliance with an identified metrological specification(e.g., tolerance). Reference standards, such as Class S weights and NIST traceable thermometers, are used for calibration only and will be calibrated by an organization that can provide traceability to NIST.

All analytical reagents and standards will be obtained through certified sources and vendors, where applicable. All Certificates of Analysis will be maintained for the active life of the standard. When a material expires, the certificate of analysis will be maintained in an inactive file for a time period equal to the retention of data generated using that reference material.

8.0 Review of All New Work

All new work is initiated by the technical director who delegates responsibilities for the new work according to available resources. Staff meets prior to initiation of new work in order to determine if appropriate facilities and resources are available. The plan for any new testing will be reviewed and approved by the technical director before commencing such work. For any new testing requirements, a designated employee will write a standard operating procedure (SOP) and demonstrate capability to perform those tests and reporting results. The SOP and initial proficiency demonstration will be submitted to the QA officer to be included in the quality assurance program.

9.0 Calibration / Verification of Test Procedures

9.1. Calibration and/or verification procedures are designed to ensure that the data will be of known quality and be appropriate for a given regulation or decision. Good laboratory practices are used in determining these procedures. Details of instrument calibration and/or test method verification, including acceptance criteria, are included in each test method SOP. Following are general procedures utilized in the laboratory.

9.1.1 Sufficient raw data must be retained to reconstruct the calibration used to calculate the sample result.

9.1.2 All calibration curves are verified with a second source standard which is traceable to a national standard by a certificate of analysis.

9.1.3 Calibration standards will include a concentration at or below the regulatory / decision level but above the Practical Quantitation Level (PQL) See detection limits sec 9.2.

9.1.4 Results of samples must be within the calibration range or the results must be flagged accordingly.

9.1.5 No data associated with a calibration that is out of control will be reported without additional verification from a calibration in control.

9.2 Detection Limits are established for each method and matrix analyzed by the laboratory. This will ensure that all values reported are within laboratory capabilities for quantification. Practical Quantitation limits as described below will be the reporting detection limit for each method.

9.2.1 Method Detection Limits(MDL): The MDL has been determined for each analysis where spiking solutions exist. The statistical procedure for the calculations is documented in 40 CFR Part 136, Appendix B. revision 1.11. All sample processing steps are included in the determination of an MDL. In summary, seven spiked replicates are processed through a complete method procedure. The spiking level is at, or near, the expected MDL not to exceed five times the calculated MDL. The MDL is the product of 3.143 times the standard deviation. MDLs are included in appendix A.

9.2.2 Instrument Detection Limits (IDL): The IDL has been determined for each analytical instrument where spiking solutions exist. The statistical calculations are based upon similar methodology as MDLs. The spiking levels are at, or near, your expected IDL. Five replicates are only processed through the analytical portion of the procedure, any sample preparation steps are excluded. The IDL is used to determine only instrument capabilities. The IDL is the product of 3.747 times the standard deviation. The five replicates are run on three non - consecutive days and the average IDL for all three days is reported as the IDL. IDLs are included in appendix A.

9.2.3 Practical Quantitation Limits (PQL): The PQL is the reportable detection limit for the method of concern. The PQL is the greater of the MDL and IDL. All reportable results generated by the laboratory will use the PQL's listed in Appendix A unless otherwise flagged and detailed by a case narrative. PQLs for TSS, TDS and BTU are defined by the methodolgy. PQL's are included in appendix A.

9.2.4 Matrix Specific Method Detection Limits (MSMDL): It is necessary to prove the detection limit capabilities of each method for any specific matrix. This is due to the possibilities of interferences which may affect detection capabilities. An MSMDL study is completed by performing an MDL study spiking the matrix of concern instead of deionized water (or blank oil for organics). Using the same spiking levels and statistical calculations described for an MDL, an MSMDL can be determined. If the MSMDL is greater than the previously calculated PQL, then the MSMDL will become the PQL for that matrix only. Established MSMDLs are included in appendix A.

9.2.5 Detection limit studies should be repeated if there are any significant changes to a method, an instrument, the matrix or regulatory policies. All detection limit studies will be maintained and coordinated by the QA officer. Any analytical concerns based on detection limit capabilities will be communicated to the plant manager.

10.0 Sample Handling

10.1 Sample acceptance policy - Designated Norlite employees, trained as sample collectors are the only official collectors of samples for which results must be reported to the regulating authority. Collection is performed using approved plastic or glass container of sufficient volume for the analyses required. Each sample will be identified using permanent marker or label with the date and point of origin.

Obtaining sample aliquots from a submitted sample as part of the test method is carried out using procedures as written in each method SOP. Appropriate techniques to obtain representative aliquots are documented in the method SOP. (Sample collection method SOP#04 -004 in Norlite's Waste Analysis Plan)

All samples are submitted to the laboratory unpreserved and at actual temperature. This is necessary due to the fact that all samples received at the laboratory are process samples and must be analyzed as is. The following summary lists the analytes, appropriate container and required holding times for valid results.

Analyte	Container	Size	Holding Time unpreseverd / preserved
LGF - Metals	Glass	1 Quart	180 Days / 180 Days
LGF - Mercury	Glass	1 Quart	28 Days / 28 Days
LGF - BTU's	Glass	1 Quart	N/A
LGF - PCB's	Glass	1 Quart	7 days to extraction; 40 Days to Analyze
Wastewater - ph, Temp	Plastic	1 Gallon	15 min / N/A
Wastewater - TSS,TDS	Plastic	1 Gallon	7 Days / N/A
Wastewater - Metals	Plastic	1 Gallon	24 Hours / 180 Days
Wastewater - Mercury	Plastic	1 Gallon	24 Hours / 28 Days
Shale - Metals	Plastic	64 oz. Bag	180 Days
Shale - Mercury	Plastic	64 oz. Bag	28 Days
Shale - Chlorine	Plastic	64 oz. Bag	28 Days after preparation

10.2 Chain of Custody and Sample Receipt Protocol - For all LGF and Waste Water samples, sample custody is maintained by "line of sight" from time of sample collection to delivery to the laboratory. For all other samples, a chain of custody, manifest or Norlite profile must accompany the sample when submitted to the laboratory. The analytical process will not begin without the appropriate paperwork submitted with the sample.

All samples are identified with a Norlite unique identification number as follows:

10.2.1 LGF samples are identified accordingly in the Fuel sample log book. Hazardous samples and nonhazardous samples are segregated for easy identification. The date and time of sample receipt are noted in the log book and any associated comments of sample condition. The Norlite sample number is recorded on the sample and any associated paperwork.

10.2.2 Wastewater samples are identified in the Wastewater log book. The date and time of sample collection are recorded along with the samplers initials. Any observations made at the time of sample collection are also noted in the log book and the information is communicated to the shift supervisor or plant manager.

10.2.3 Miscellaneous samples (profile samples, outside clients or tank samples) are entered into their appropriate log book. The condition of the sample should be noted on the accompanying paperwork and date and time of receipt noted in the log book.

10.3 Sample Storage - Samples are stored according to NYS ELAP procedures documented in the methodology. All samples will ultimately be stored in a walk in cooler at 0-6 °C . LGF samples are stored in the original containers with the original identification numbers. Waste water samples are preserved with 2.5ml concentrated nitric acid and transferred to a one quart glass container. All samples are retained for a period of not less than 90 Days.

11.0 Laboratory Environment

11.1 Calibration and analysis only occur within the laboratory, maintained as laboratory space. The laboratory space is monitored by the laboratory manager and technical director to ensure that environmental conditions will not affect analytical results. Any adverse environmental conditions that occur are identified and corrected before analysis may be completed (if the director and/or manager determine that the change in conditions might affect data quality).

11.1.1 Temperature may affect calibration status of some instruments. If a significant temperature change is noticed throughout the laboratory, a calibration verification must be performed. If the verification fails, the instrument must be re calibrated or analysis must be suspended until the temperature stabilizes.

11.1.2 Due to the nature of the industry, dust is a constant factor for the laboratory. Precautions are taken to protect instruments and samples. All samples must be covered during preparation and analysis. Instruments are routinely cleaned and checked for excessive dust contamination. Good house keeping practices are employed to help dust control.

11.1.3 The ambient air in the laboratory is slightly acidic due to the amount of acids used in preparation, analysis and cleaning. All acid work must be conducted in fume hoods and work areas and instruments will be wiped down periodically to remove any corrosive properties.

11.1.4 For health, safety and sample integrity reasons, eating, drinking or tobacco use of any kind is strictly prohibited within the designated area of the laboratory.

11.2 All equipment, reference materials, traceability certificates and working documents are maintained in the laboratory. If any of these materials leave laboratory space, the QA officer must approve the transport of any item and will record the action in his/her personal log book.

12.0 Procedures for Calibration, Verification. and Maintenance of Equipment

12.1 Equipment is maintained, inspected, and cleaned according to the written SOP for each method and instrument. Any defective item is clearly marked and taken out of service until it has been shown to perform satisfactorily. Any maintenance performed on an instrument is logged into the instrument's maintenance log book with recorded date, time and individual(s) completing the maintenance.

12.2 All reference materials are clearly labeled to show its calibration status or working concentration.

12.3 Equipment and reference material records include:

1) name of equipment or material
2) manufacturer, identification, serial number
3) date received and placed in service
4) current location
5) condition when received
6) copy of, or location of, manufacturer's instructions or manuals
7) dates and results of calibrations/verifications and date of next calibration/verification. (Only required on instruments not calibrated/verified daily)
8) details of maintenance carried out and planned for the future
9) history of any damage, malfunction, modification, or repair.

12.4 All service of equipment is performed by qualified service organizations. All records and certificates are retained.

12.5 All equipment, primary and support, are calibrated/verified using NIST traceable references over the range of use. Appendix B details all necessary QA/QC requirements for verification of all analytical and support equipment. Any deviations from these procedures must be recorded and reported to the QA Officer to initiate corrective action procedures.

13.0 Proficiency Testing Participation, Interlaboratory Comparisons, Use of Reference Materials

13.1 The laboratory participates in the semiannual New York State ELAP proficiency testing program. The results are used to evaluate the ability of the laboratory to produce accurate data. These results may also be used for initial or continuing proficiency demonstration and/ or analyst Demonstration of Capability (DOC). All test reports along with all associated raw data are retained at the laboratory by the QA Officer.

13.2 The laboratory participates in interlaboratory comparisons at the direction/recommendation of the QA Officer, plant manager or the Corporate Environmental Director. This may be a "round robin" method of comparison organized by an outside vendor.

13.3 The laboratory purchases external reference samples which are certified by the manufacturer. The Certificate of Analysis is retained by the QA Officer. These reference samples may be used for calibration, verification, proficiency demonstration, detection limit studies or any other purpose deemed necessary by the QA Officer.

14.0 Internal Quality Control Procedures

14.1 All quality control procedures, results or problems are communicated, coordinated and reviewed by the QA Officer. It is the QA officer's responsibility to ensure all data are supported by appropriate quality control or flagged accordingly. Any discrepancies noted in the quality control program must be addressed by the QA Officer and corrective actions are implemented.

Each method SOP includes detailed information on QC procedures and acceptable limits for that analysis. Appendix B "QA/QC Requirements" and the method SOP's should be reviewed for a summary of the laboratory's quality control program.

14.2 Quality control limits are established and maintained by the QA Officer. QC limits are generated for laboratory control samples (LCS), matrix spikes (MS), and duplicates. These limits are referenced for acceptance criteria for each method. Analytical data generated with QC samples that fall within acceptance limits indicate the test method was in control and data may be reported accordingly. Any data generated with QC samples outside of acceptance limits is deemed out of control and must be reanalyzed or flagged accordingly. The QA Officer must be notified if QC samples are outside acceptance limits.

14.2.1 QC limits for LCS, MS and Surrogates are based on the historical mean recovery plus or minus three standard deviation units. Warning Limits are based on the historical mean plus or minus two standard deviation units. A control chart is established based on 20 samples at least every quarter. Data points outside of the acceptance limits are not considered in future control charts.

14.2.2 Duplicate acceptance limits are based on plus or minus three times the standard deviation of the historical difference. Duplicate warning limits are based on plus or minus two times the standard deviation of the historical difference. A duplicate chart is established based on 20 samples at least every quarter. Data points outside of the acceptance limits are not considered for future control charts.

14.2.3 In cases where historical data is not available, interim QC limits will be used. Interim limits for LCS and MS recoveries will be 80 - 120%. Interim limits for duplicates will be 20% relative percent difference (RPD).

14.3 Calculations for the QC samples are as follows:

LCS % Recovery = (Analyzed Result / Expected Result) * 100

MS % Recovery= ((Spike Result - Sample Result) / Spiked Concentration) * 100

Surrogate % Recovery= (Analytical Result / Surrogate Concentration) * 100

RPD % = (Difference of Duplicates/ Average of Duplicates)* 100

14.4 Method Blanks are performed at a frequency of daily or one per batch of twenty samples. These blanks must be processed through the entire analytical process including all preparation steps. The results are used to determine batch acceptance. When blanks exceed the method PQL the source of contamination is investigated and measures are taken to correct, minimize and eliminate the problem. (The PQL may be raised according to the method blank concentration if data quality objectives are still obtained. If the PQL is raised, the QA Officer must be notified and the data reported accordingly.)

14.5 Laboratory control samples (LCS) are performed at a frequency of daily or one per batch of twenty samples. The LCS must be prepared using a certified source. The results are used for batch acceptance.

14.6 Matrix spikes (MS) and / or matrix spike duplicates (MSD) are performed at a frequency of daily or one per batch of twenty samples. The MS/ MSD must be prepared using a certified source. The results are used to determine if the batch is in control and to determine how the matrix affects the analysis. If MS/ MSD samples are outside acceptance criteria, the associated batch must be reanalyzed or flagged accordingly unless one of the following:

- Matrix interference is confirmed by re-preparation and reanlayis of the same MS.
- A post digestion / extraction spike is run within acceptable limits.
- Method of Standard Additions is performed on the sample associated with the MS.

If any of the above events occur, the data will be flagged and the analysis will be investigated by the QA Officer.

14.7 Laboratory duplicates are performed at a frequency of daily or one per batch of twenty samples. Duplicates are a measure of precision and reproducibility. If the RPD is outside acceptance criteria, the analytical batch is out of control. If a duplicate passes, the first sample is always reported as the analytical result. Any duplicates outside of acceptance criteria are reported to the QA Officer.

15.0 Testing Discrepancies and Corrective Actions

15.1 Whenever testing discrepancies are identified by out of control QC samples, general procedures are used to determine data quality and reporting. All QC discrepancies must be reported to the QA Officer so that these procedures are implemented. All required documentation is determined by the Corrective Action Procedure identified in Section 15.2.

15.1.1 The most ideal response to unacceptable QC is sample re-analysis. However, due to LGF schedules and analytical time frames, it is not always possible to repeat the analysis. If data is to be reported and is out of control, all samples associated must be flagged with the appropriate qualifier.

15.1.2 Only the Technical Director and QA Officer may authorize data reporting if the QC is out of control. He or she must implement the corrective action procedure and notify any managers or regulatory agencies of the data qualification.

15.2 Corrective action is the process of identifying, recommending, approving, and implementing measures to counter unacceptable departures from policies and procedures or out of control QC performance which can affect data quality. Any QC measure that falls outside of acceptance limits requires corrective action.(**Note:** Duplicate occurrences of failed QC which are less than three months old and would require the same investigation and corrective actions are not required to be reported in the Corrective Actions Log).The Quality control officer is required to review the Corrective Actions Log periodically to evaluate any negative trends in data quality.

15.2.1 The steps in corrective action are as follows:

1) The QC discrepancy is reported to the QA Officer.
2) The QA Officer and Analyst discuss the method and appropriate details of the QC sample.
3) The QA officer will recommend corrective actions to the analyst and ensure implementation.
4) The analyst will perform the corrective actions and report results to the QA Officer.
5) The QA officer will report findings to management and / or regulatory agency.
6) The QA Officer will record the corrective action as described in 15.2.2.
7) All corrective action steps must be taken prior to the reporting of the effected data.

15.2.2 Each entry in the Corrective Action Log Book will contain:

1) The date and time of the analysis.
2) The method and samples affected
3) The analyst reporting the discrepancy.
4) All corrective measures taken and the respective results.
5) Final decision if the samples are to be reported and the appropriate data qualifier.
6) Any suggestions for future corrective actions.
7) The initials of the QA Officer that the issue is closed.

15.3 Management, including the QA Officer, must review the failed QC and the details of the attempts made to correct the deficiency when evaluating data qualifiers. Items that will be considered are the type of QC sample which failed (i.e., blank, spike, duplicate, etc...), QC samples that passed, data quality objective for the affected samples, matrix, instrument status, and availability of additional samples. When all factors are reviewed and the qualified data is reported, all parties involved, including the analyst, must be notified that the data was reported with appropriate qualifiers.

16.0 Exceptionally Permitted Departures From Documented Policies and Procedures or From Standard Specifications.

16.1 The Technical director has responsibility for ensuring that the laboratory adheres to its policies and procedures. Arrangements for known and controlled departures from documented policies and procedures are allowed. Planned departures do not require audits, however, the departure will be fully documented and include the reason for the departure, the effected SOP(s), the intended results of the departure and the actual results. If the data reported to the authority is adversely affected, it will be notified in writing. The procedures used to document any specific departure is the same as the corrective action procedure. (The same log book may be used)n

17.0 Reporting Analytical Results

17.1 The results of each test are reported accurately, clearly, unambiguously, and objectively. The data is provided to the respective department(s) or individual(s). All data release is coordinated through the laboratory manager or director. The QA Officer has the right to delay the reporting of any analytical result pending a testing discrepancy or QC investigation.

17.2 Appropriate qualified data may be reported below PQL's for plant process evaluation if authorized by the QA Officer.

17.3 All data required to be reported to a regulatory agency (i.e., SPDES or NYS DEC) will be reported to Norlite's Compliance department in a timely manner. The QA Officer will maintain records of this data submission for future reference.

18.0 Complaints and Results Inquiries.

18.1 All complaints and/ or data inquiries about Norlite's laboratory will be handled by the laboratory manager. All information will be documented in a complaint file maintained in the laboratory. The file will contain the date and name of the person receiving the complaint, a description of the complaint, the source of the complaint, the resolution, and any written material accompanying the complaint.

18.1.1 Complaints must be resolved to the satisfaction of the source (i.e., client, department, etc..) All communications will be coordinated by the laboratory manager and information will be documented in the complaints file. Any corrective actions resulting from the complaint will be documented in the Corrective Actions log book.

18.1.2 Results Inquiries occur when any person(s) or organization(s) question the validity of data generated at Norlite's Laboratory. Inquiries are coordinated by the laboratory manager and investigated by the technical director. The investigation will include, but not be limited to, review of all associated QC, review of instrument status, re-analysis, analysis of additional QC samples or sub contracting to another certified laboratory for confirmation analysis. The QA officer may also conduct an internal audit of the affected departments and include the findings in the resolution. Any corrective actions resulting from the inquiry will be documented in the Corrective Actions log book.

18.1.3 The Technical Director or Laboratory Manager must sign off and date all final resolutions to document closure of the complaint or inquiry.

19.0 Data Review and Internal Audits.

19.1 All data including original observations, calculations, calibration records, QC records, and reports resulting from the analysis will be maintained for the life of the facility to allow historical reconstruction of the final result. The QA officer will review all data reported to ensure that calculations are correct and to detect transcription errors. Only authorized laboratory signatories may sign off on report review. Any errors detected in the review process are referred to the analyst for corrective action. The QA Officer must ensure that all errors and corrective actions are documented in the Corrective Actions log book.

19.2 In order for Norlite's Analytical laboratory to demonstrate good laboratory practice, three different types of Internal audits will be conducted. These audits are designed to assure data quality and to identify any potential analytical or procedural problems. (**Note:** Audits may be conducted by any person delegated by the QA officer or Laboratory Manager).

19.2.1 Method Audit

1) Audit is blind and unannounced
2) Performed monthly (minimal)
3) Randomly choose one method performed by the laboratory and review all pertinent information, e.g.,
   - -Calibration
   - -Controls
   - -Check standards
   - -Spikes
4) Process blind control sample and record results in a log book (Optional)

19.2.2 Sample Audit

1) Audit is blind and unannounced
2) Performed quarterly (minimal)
3) Follow sample through complete analysis and processing
   -All associated documents (e.g., WAP 2 sheets, Fuel farm paperwork, Quatro Pro, QA, etc.)
4) Check all QC data from a sample, e.g.,
   - ICP calibration
   - spike recovery
   - duplicate reproducibility
5) All necessary tests done on sample
6) Review all Waste water data associated with the date the sample was processed.

19.2.3 Laboratory Audit

1) Announced 1 week before performed
2) Performed yearly (minimal)
3) Choose random days and check all QC data from that day
4) Verify all notebooks are up to date, e.g.
   - balances checked weekly
   - eppendorfs checked weekly
   - refrigerator temperature checked daily
   - pH/Conductivity probes done daily
   - thermometers checked yearly
   - calorimeter calibrated bi-monthly
5) Consult the laboratory's quality manual to ensure policy implementation.

Note: A copy of these three audit types is posted in the laboratory for analyst knowledge. This copy is attached as Appendix C.

19.3 All internal audit information is recorded, and reviewed by the Quality Assurance officer. Any significant deficiencies, or discrepancies are reported to the laboratory and plant managers for corrective action.

19.4 The laboratory manager and technical director will review the laboratory's quality system and its analytical activities annually to introduce any changes or improvements. The review will consider, but not be limited by, outcomes of internal audits, assessments by external audits (NYSDOH, NYS DEC, US EPA, etc..), results of ELAP proficiency tests, corrective actions or any other changes in the laboratory.

20.0 Training and Review of Personnel Qualifications

20.1 Laboratory management reviews an applicant's level of qualification, experience, and skills against the laboratory's job description before assigning an employee to the laboratory. Each analyst has adequate experience and education to perform any required analyses. This experience may come from educational institutions, research and development programs, special training classes or former employment with other laboratories. The analyst must understand their function and maintain a general knowledge of laboratory operations, test methods, QC procedures and records management.

20.2 All positions held in the laboratory must meet or exceed NYS DOH ELAP requirements for laboratory personnel.

20.3 The Technical Director will maintain a training file for each employee which contains:

1) A statement from each employee that they have read, understood, and are using the latest version of the laboratory quality manual and SOPs. This statement will be signed and dated.

2) A statement from each employee that they have read, understood, and acknowledged their personal ethical and legal responsibilities including the potential punishments and penalties for improper, unethical or illegal actions. (Section 21.0 of the quality manual) This statement will be signed and dated.

3) Documentation of any training courses, seminars and/or workshops.

4) A Demonstration of Capability (DOC) for each employee for any accredited method performed.

5) Documentation of each employee's continued proficiency demonstration for any accredited analyses by one of the following annually:

-acceptable performance of a blind sample
-at least four consecutive Laboratory Control Samples with acceptable levels of precision and accuracy.
-acceptable result in a NYS ELAP Proficiency test.
-analysis of authentic samples that have been analyzed by another trained / certified analyst with statistically indistinguishable results.

Note: Item numbers four and five are documented by Norlite Laboratory's in house training certificate.

An example is attached as Appendix D.

20.4 A DOC must be performed by any analyst before his / her data is used for reporting purposes. The DOC procedure will follow ELAP Certification Manual Item 233. Norlite will use established control charts for QC acceptance and DOC certification statement.

21.0 Education and Training in Ethical and Legal Responsibilities Including the Potential Punishments and Penalties for Improper, Unethical, or Illegal Actions.

21.1 All laboratory personnel will abide by all policies and procedures documented in Norlite Corporation's Employee Manual. Laboratory employees must conduct their work according to both the quality manual and employee handbook.

21.1.1 Employees are required to provide proof of eligibility and identification.(Sec 1.02)

21.1.2 Employees must adhere to the business confidentiality policy (Sec 4.01)

21.1.3 Employees will participate in Norlite's entrance and exit physical exams (Sec 4.07)

21.1.4 Employees are subject to Norlite's drug and alcohol policies, including random screening. (Appendix A of the employee manual)

21.2 Norlite's Laboratory requires that employees must disclose any information which would potentially cause a conflict of interest for any analytical data generated by that employee. This includes, but is not limited to, family members as clients, financial obligations or endeavors with clients, past employment with clients, or personal relationships with clients. This disclosure will be used to review the circumstances on a case per case basis to determine if the employee should proceed with analyses affecting those clients.

21.3 Employees are encouraged to discuss any personal situation with their supervisor that might affect their daily work routine. This may include any commercial, financial or undue pressures they are experiencing. Laboratory management may also initiate these discussions if it is suspected that the employees personal life is negatively impacting on analytical responsibilities. These discussions will be monitored by Norlite's Human Resources Manager so that appropriate steps may be taken to improve the situation and limit the affect on analytical data.

21.4 Blind samples, internal proficiencies, managerial monitoring and employee co-monitoring may be used to ensure all analyses are being performed by method SOPs. Post analysis and method auditing may be used to identify any inappropriate reporting practices. Any suspect actions discovered should be reported to the QA officer for further investigation and documentation.

21.5 Any employee suspected or observed in any improper, unethical, or illegal actions will be subject to penalties set forth by Norlite Corporation. This can include, but is not limited to, probation, suspension, or termination. All conversations with employees suspected of any of these actions will take place in the presence of Norlite's Human Resources Manager.

21.6 Laboratory management will educate employees on appropriate analytical and reporting techniques including all new work. At any time, employees may ask laboratory management for clarification of these techniques to ensure appropriate actions.

22.0 References

1. National Environmental Laboratory Accreditation Conference, Constitution Bylaws, and Standards, Approved July 1999, Chapter 5, Quality Systems.

2. New York State Environmental Laboratory Approval Program, Certification Manual, October 15, 1999

3. EPA SW-846 Methods Manual

4. Standard Methods for the Examination of Water and Wastewater, 18th ed. 1992 APHA

5. Quality Manual example, provided by NYS ELAP, NELAC Conference on March 8, 2000

APPENDIX A

Analysis of Wastewater Using Method 200.7
Fisons ICP Model 3410 Plus

PQL IN PPM

	METALS	MDL	MS MDL	IDL	*PQL*
*	As	0.018	0.012	0.049	*0.049*
*	Ba	0.000	0.006	0.007	*0.007*
	Be	0.001	0.005	0.032	*0.032*
*	Cd	0.003	0.005	0.015	*0.015*
*	Cr	0.006	0.009	0.028	*0.028*
*	Cu	0.006	0.008	0.025	*0.025*
	Fe	0.033	0.017	0.014	*0.033*
	Ni	0.009	0.006	0.026	*0.026*
*	Pb	0.007	0.009	0.023	*0.023*
	Se	0.018	0.022	0.042	*0.042*
	Zn	0.005	0.007	0.036	*0.036*
	S	0.235	35.600	0.103	*35.600*
	Ag	0.019	0.129	0.074	*0.129*
	Al	0.030	0.038	0.021	*0.03*
	Ca	0.215	0.694	0.031	*0.694*
	Sb	0.023	0.016	0.015	*0.023*
*	Tl	0.026	0.014	0.012	*0.012*
*	V	0.005	0.005	0.015	*0.015*

Detection Limits Conducted November 2000

* These IDL's use the 50ppb IDL Runs. All others use the 100ppb IDL Runs.
****PQL equals the greater of IDL, MDL, and MSMDL****

Analysis of LGF Using Method SW 846 6010
Varian Vista ICP

PQL IN PPM

METALS	MDL	MS MDL	IDL	*PQL*
Ag	0.0118	0.1077	0.0155	*0.1077*
As	0.0442	0.0270	0.0312	*0.0442*
Ba	0.0043	0.0538	0.0017	*0.0538*
Be	0.0110	0.0216	0.0040	*0.0216*
Cd	0.0066	0.0266	0.0036	*0.0266*
Cr	0.0116	0.0270	0.0047	*0.0270*
Cu	0.0126	0.1038	0.0044	*0.1038*
Hg	0.0416	0.0414	0.0162	*
Ni	0.0113	0.0321	0.0096	*0.0321*
Pb	0.0194	0.1374	0.0280	*0.1374*
S	0.0402	1.6425	0.0570	*1.6425*
Sb	0.0385	0.0402	0.0263	*0.0402*
Se	0.0223	0.0292	0.0257	*0.0292*
Tl	0.0212	0.0497	0.0302	*0.0497*
Zn	0.0088	0.1170	0.0062	*0.1170*

Detection Limits conducted November 2000
*PQL Pending a reasonableness study
****PQL equals the greater of IDL, MDL, and MSMDL****

Analysis of Shale Using Method SW 846 6010
Varian Vista ICP

PQL IN PPM

METALS	MDL	MS MDL	IDL	*PQL*
Ag	0.0118	0.0280	0.0155	*0.0280*
As	0.0442	0.0275	0.0312	*0.0442*
Ba	0.0043	0.0697	0.0017	*0.0697*
Be	0.0110	0.0259	0.0040	*0.0259*
Cd	0.0066	0.0185	0.0036	*0.0185*
Cr	0.0116	0.0202	0.0047	*0.0202*
Cu	0.0126	0.0510	0.0044	*0.0510*
Hg	N/A	N/A	N/A	*N/A*
Ni	0.0113	0.0363	0.0096	*0.0363*
Pb	0.0194	0.0599	0.0280	*0.0599*
S	0.0402	N/A	0.0570	*0.0570*
Sb	0.0385	0.0205	0.0263	*0.0385*
Se	0.0223	0.0548	0.0257	*0.0548*
Tl	0.0212	0.0658	0.0302	*0.0658*
Zn	0.0088	0.0754	0.0062	*0.0754*

Detection Limits Conducted November 2000
****PQL equals the greater of IDL, MDL, and MSMDL****

Detection Limits of Wastewater by EPA Method 245.2 Cold Vapor Analysis
Leeman Labs PS200II Hg Analyzer

ALL VALUES IN PPB

METALS	MDL	MS MDL	IDL	*PQL*
Hg	0.1	0.1	0.2	*0.2*

Detection Limits of LGF by Method SW 846 7471A Cold Vapor Analysis
Leeman Labs PS200II Hg Analyzer

ALL VALUES IN PPB

METALS	MDL	MS MDL	IDL	*PQL*
Hg	0.1	95.05	0.2	*95.05*

Detection Limits of Shale by Method SW 846 7471A Cold Vapor Analysis
Leeman Labs PS200II Hg Analyzer

METALS	MDL	MS MDL	IDL	*PQL*
Hg	0.1	80.82	0.2	*80.82*

Detection Limits Conducted November 2000
****PQL equals the greater of IDL, MDL, and MSMDL****

APPENDIX B

QA/QC Requirements

Scope: The following is a list of all quality assurance/quality control requirements performed at Norlite's analytical laboratory. These guidelines are based upon NYS ELAP, NELAC, EPA SW-846 and ASTM methods.

LGF-ICP

1) Preparation Blank
2) Laboratory Control Sample: must be +/- 20% recovery*
3) 4 calibration standards plus a blank with a regression of 0.997 or more run at beginning of each analysis day, or more if needed
4) Duplicate Sample: must be +/- 20% reproducibility*
5) Matrix Spike: must be +/- 20% recovery*(run once a day and after 20 samples)
6) Matrix Spike Duplicate**: must be +/- 20% recovery*, and +/- 20% reproducibility(run once a day and after 20 samples)
7) Initial Calibration Verification (alternate source): must be +/- 10% recovery
8) Initial Calibration Blank (run immediately after ICV)
9) Continuing Calibration Verification (run at the start of a run, after 10 samples, and at the end of a run): must be +/- 10% recovery
10) Continuing Calibration Blank (run immediately after CCV)
11) Interference Check Standard A: must not show any interference
12) Interference Check AB: must not show any interference
13) Maintenance
    a) Torch cleaned once a week unless data proves sooner cleaning is required
    b) Pump tubing changed every other day
    c) Spray chamber and nebulizer cleaned once a week, unless data proves sooner cleaning is required, or nebulizer becomes blocked

****NOTE****
If for any reason, a sample or batch of samples, fails QC requirements for one or more elements, the sample(s) must be rerun during the next available certified analysis. The Quality Assurance officer, pending a detailed investigation of the failed QC parameter, may report the initial results if he feels that the data integrity is not compromised by the failed QC. In this case, the re-analysis of the sample(s) should demonstrate reproducibility with the original results within acceptable duplicate controls. These exceptions must be based on Norlite's Quality Control Manual sections 9.1.5, 15.1.1 and 15.3.

Waste Water ICP

1) Preparation Blank
2) Laboratory Control Sample: must be +/- 20% recovery*
3) 3 calibration standards plus a blank with a regression of 0.997 or greater run at the beginning of every analysis day or more if needed
4) Duplicate Sample: must be +/- 20% reproducibility*
5) Matrix Spike: must be +/- 20% recovery*(run once a day, and after 20 samples)
6) Matrix Spike Duplicate**: must be +/- 20% recovery, and +/- 20% reproducibility*(run once a day and after 20 samples)
7) 100 ppb Check Standard (alternate source): for internal instrument performance
8) 50 ppb Check Standard (alternate source): for internal instrument performance
9) Interference Check Standard: must not show interference
10) 1 ppm Initial Calibration Verification (alternate source): must be +/- 10%
11) Initial Calibration Blank (run immediately following ICV)
12) Continuing Calibration Verification (done at the start of a run, after 10 samples, and at the end of a run): must be +/- 10% recovery
13) Continuing Calibration Blank (run immediately after the CCV)
14) Maintenance:
    a) Torch cleaned once a week unless poor recoveries indicate sooner
    b) Spray chamber, and nebulizer cleaned once a week unless recoveries indicate sooner, or nebulizer becomes blocked
    c) Pump tubing replaced once a week

Gas Chromatograph

1) Preparation Blank
2) Laboratory Control Sample: must be +/- 15% recovery*
3) Continuing Calibration Verification (run in the morning, after 20 samples, after calibration, and at the end of a run): must be +/- 15%
4) Matrix Spike: must be +/- 15% recovery*(run once a day and after 20 samples)
5) Matrix Spike Duplicate: must be +/- 15% recovery*(run once a day and after 20 samples)
6) Surrogates (run with every sample): must be +/- 20% recovery*
7) Maintenance:
    a) Check Helium and Nitrogen tanks to ensure there is ample gas and pressure
    b) Verify GC has reached all set points for method
    c) Fill autosampler bottle if low
    d) Change injection septa once a week
    e) Leak check gas lines to the GC, column connections, and injector once a week
    f) Change injection port liner once a month
    g) Condition the column once a month, or sooner if needed
    f) Other maintenance may be required based on instrument performance

Mercury Analyzer

1) Preparation Blank
2) Laboratory Control Sample: must be +/- 20% recovery*
3) Matrix Spike: must be +/- 20% recovery*(run once a day and after 20 samples)
4) Matrix Spike Duplicate**: must be +/- 20% recovery*,+/- 20% reproducibility (run once a day and aftern 20 samples)
5) Alternate Source 10 ppb Check (done at the start of a run, after every 10 samples, and at the end of the run): must be +/- 10% recovery
6) 1 ppb (using the 1 ppb standard for calibration verification) for internal instrument performance
7) 4 standards plus a blank for calibration ranging from 1 ppb to 15 ppb: must have a regression of at least 0.997 run at beginning of each analysis day or more if needed
8) Maintenance: when requested by analyzer, or when poor recoveries start to occur

Bomb Calorimeter

1) Bombs calibrated every two weeks
2) Samples Duplicated every 20 samples: must be within control limits
3) Control samples run every 100 firings: must be within control limits
4) Maintenance:
    a) Bomb parts replaced every 500 firings
    b) Bombs sent back to Parr for servicing every 1500 firings
    c) Water replaced whenever too much algae collects in reservoir

pH/Temperature/Conductivity

1) 3-point pH calibration run every day, or whenever a new probe is used
2) 7.0 pH calibration standard analyzed as sample: must be +/- 0.05 pH units
3) 1-point calibration of Conductivity meter
4) Maintenance
    a) Probes cleaned once a week, and stored in pH storage solution
    b) Conductivity probe re-platinized whenever poor performance is observed

Microwave

1) Calibration Verification performed quarterly
2) Maintenance
    a)flush pressure control line at the end of each day 3 x with deionized water
    b) Call service representative if any major service is required

Desiccator

1) Maintenance
    a) desiccant changed quarterly
    b) re-activate desiccant when color changes from a deep blue, to a light pink

Eppendorfs

1) Weekly check accuracy of each eppendorf at three different volume settings
2) Yearly use eppendorf accuracy kit
3) Maintenance
    a) send eppendorfs back to manufacturer for re-calibration
    b) trade-in old, broken eppendorfs for new ones

Balances

1) Check calibration weekly: must be +/- 0.0005g for the PC220 balance, and 0.005g for the AT200 balance
2) Auto-calibration performed daily
3) Service representative every 6 months unless balance fails calibration verification, or is in need of other servicing
4) Maintenance
    a) Cleaned daily
    b) Balance level checked daily

Flashpoint

1) Control sample run once every 20 samples: must be +/- 20% recovery
2) Duplicate run every 10 samples: must be +/- 20% reproducibility*
3) Maintenance
    a) Cleaned daily
    b) Gas lines checked

Thermometers

1) Calibration and accuracy checked annually

Walk-In Cooler

1) Temperature checked daily and recorded in the appropriate log book
    a) must be 0 - 6 oC

Drying Oven

1) Temperature checked every time items are added, and/or removed from the oven and recorded in the appropriate log book.
    a) optimum temperature 110 °C

Water Bath

1) Temperature checked using a certified thermometer daily and recorded in the appropriate log book

* % recoveries and reproducibilities will depend on control chart limits
** Matrix spike duplicates may be used to supplement regular duplicates

APPENDIX C

INTERNAL AUDIT CRITERIA

Scope: In order for Norlite's Analytical laboratory to demonstrate good laboratory practice, three different types of Internal audits will be conducted. These audits are designed to assure quality data, and to identify any potential problem areas.

Method Audit

1) Audit is blind and unannounced
2) Performed monthly (minimal)
3) Choose one method performed by the laboratory and review all pertinent information e.g.
   - -Calibration
   - -Controls
   - -Check standards
   - -Spikes
4) Process blind control sample and record results in log book (Optional)

Sample Audit

1) Audit is blind and unannounced
2) Performed quarterly (minimal)
3) Follow sample through complete analysis and processing
   - -All associated documents (e.g. WAP 2 sheets, Fuel farm paperwork, Quatro Pro, QA, etc.)
4) Check all QC data from sample e.g.
   - - was ICP calibrated
   - - spike recovery
   - - duplicate reproducibility
5) All necessary tests done on sample
6) Review all Waste water data associated with the date the sample was processed

Laboratory Audit

1) Announced one week before performed
2) Performed yearly (minimal)
3) Choose random days and check all QC data from that day
4) Verify all notebooks are up to date, e.g.,
   - - balances checked weekly
   - - eppendorfs checked weekly
   - - refrigerator temperature checked daily
   - - pH/Conductivity probes done daily
   - - thermometers checked yearly
   - - calorimeter calibrated bimonthly

Note: All internal audit information is recorded, and reviewed by the Quality Assurance officer. Any significant deficiencies, or discrepancies are reported to the Laboratory and Plant Managers for corrective action.

APPENDIX D

NORLITE CORPORATION

Certificate of Proficiency

ELAP ID #11526

This certificate demonstrates that the following analyst has successfully demonstrated proficiency in:

ICP Analysis

METHOD: SW 846 6010B

Matrix: Low Grade Fuel

as per Norlite's laboratory Quality Control Manual.

David Bryk

_____ _____

Analyst Date

_____ _____

Jon-Alan Minehardt Date
Technical Director
Quality Assurance Officer